DRAFT BASIC ASSESSMENT REPORT:

THE DEVELOPMENT OF A LIGHT INDUSTRIAL AREA ON PORTION 58 OF THE FARM VAALBANK 289 JS, MIDDELBURG

Report prepared for: Bakkos Projects (Pty) Ltd.

Report dated: November 2020 (draft)

Report number: BA 2020/01

DARDLEA ref: 1/3/1/16 1N-217

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PROJECT INFORMATION SUMMARY

PROJECT TITLE	The development of a light industrial area on Portion 58 of the farm Vaalbank 289 JS, Middelburg

CLIENT	Bakkos Projects (Pty) Ltd.
CONTACT DETAILS	P.O. Box 546 Mokopane 0600 015-491 2520

CONSULTANT	AdiEnvironmental cc
CONTACT DETAILS	P.O. Box 647 Witbank 1035 013-697 5021

DARDLEA REFERENCE NO.	1/3/1/16 1N-217
AdiE REFERENCE NO.	BA 2020/01

REPORT VERSION	Basic Assessment Report – Draft
DATE	November 2020
REPORT VERSION	
DATE	

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UNDERTAKING BY EAP

as required in terms of Section 2(j) of Appendix 2 of the Environmental Impact Assessment Regulations, 2014.

Project: The development of a light industrial area on Portion 58 of the farm Vaalbank 289 JS, Middelburg (DARDLEA Ref. no.: 1/3/1/16 1N-217; AdiE Ref no.: BA 2020/01).

I, ADRIENNE ERASMUS, *hereby confirm that:*

- *the information provided in this Draft Basic Assessment Report is, to the best of my knowledge, correct as at the time of compilation thereof;*
- *comments and inputs obtained from stakeholders and interested and affected parties through the public participation process conducted to date have been included in this Draft Basic Assessment Report;*
- *information provided to interested and affected parties (to date) has been included in this Draft Basic Assessment Report;*
- *inputs and recommendations from the specialist reports are included in this Draft Basic Assessment Report.*

Signed at eMALAHLENI on this 11TH day of DECEMBER of 2020.

Signature: .....

Company: AdiEnvironmental cc

I, R Jansе van Rensburg, *hereby confirm that:*

- *the information provided in this Draft Basic Assessment Report is, to the best of my knowledge, correct as at the time of compilation thereof;*
- *comments and inputs obtained from stakeholders and interested and affected parties through the public participation process conducted to date have been included in this Draft Basic Assessment Report;*
- *information provided to interested and affected parties (to date) has been included in this Draft Basic Assessment Report;*
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Signed at eMalahleni on this 11th day of December of 2020.

Signature: .....

Company: AdiEnvironmental cc

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LIST OF ABBREVIATIONS

°C	Degrees Celsius
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
COGTA	Department of Co-operative Governance and Traditional Affairs
DAFF	Department of Agriculture, Forestry and Fisheries
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
ESA	Ecological Support Area
ha	hectares
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
km	kilometer
kl	kiloliter
ℓ	liter
l/s	liters per second
m	meters
mamsl	meters above mean sea level
mbgl	meters below ground level
mm	millimeter
MBSP	Mpumalanga Biodiversity Sector Plan
MTPA	Mpumalanga Tourism and Parks Agency
NFEPA	National Freshwater Ecosystem Priority Areas
PIA	Palaeontological Impact Assessment
PES	Present Ecological State
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANRAL	South African National Roads Agency Limited
SDF	Spatial Development Framework
STLM	Steve Tshwete Local Municipality
TRAC	Trans African Concession

SECTION 1: INTRODUCTION

The applicant, *Bakkos Projects (Pty) Ltd* (represented by Mr. K. Hassim), intends to develop a light industrial area on Portion 58 of the farm Vaalbank 289 JS, Middelburg. The said site is located adjacent to the R35 provincial road (Bethal Road) and in close proximity of the N4 national road, ±2.5km south of the Middelburg Mall.

The applicant intends to rezone the property from Agriculture to Light Industrial (Industrial 2) to make provision for motor showrooms, workshops, earthmoving equipment, etc. The property is ±22 ha in extent.

The Minister of Environmental and Water Affairs listed in terms of Sections 24(2), 24(5), 24D and 44, read with section 47A(1)(b) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), a number of activities that require an environmental impact assessment (either a Basic Assessment or a full Environmental Impact Assessment) before undertaking these activities.

The ultimate aim of an environmental impact assessment is to *"identify, predict and evaluate the actual and potential risks for and impacts on the geographical, physical, biological, social, economic and cultural aspects of the environment, in order to find the alternative and options that best avoid negative impacts altogether, or where negative impacts cannot be avoided, to minimise and manage negative impacts to acceptable levels, while optimising positive impacts, to ensure that ecological sustainable development and justifiable social and economic development outcomes are achieved."*(DEA, 2017).

The proposed activity would require a Basic Assessment process since the following listed activities (as identified in the Environmental Impact Assessment Regulations, 2014 (as amended)) are triggered:

Listing	Activity
Listing Notice 1 Listed Activity 27	*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except 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.*
Listing Notice 1 Listed Activity 28	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*

AdiEnvironmental cc. was appointed as independent environmental consultant to conduct the required Basic Assessment and compile the necessary documentation.

The objective of the Basic 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) *Identify the alternatives considered, including the activity, location, and technology alternatives;*
c) *Describe the need and desirability of the proposed alternatives;*
d) *Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the sites and locations and the risk of impact of the proposed activity and technology alternatives on these aspects to determine: (i) the nature, significance, consequence, extent, duration and probability of the impacts occurring; and (ii) degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated.*
e) *Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to: (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.*

The overall aim of the process is to provide the competent authority with adequate information to make an informed decision regarding the proposed activity, thereby ensuring that activities with an unacceptable degree of negative impacts are not authorized and that authorized activities are undertaken in a manner where environmental impacts are managed to acceptable levels.

The decision making authority is the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). This Department will decide to grant or refuse the approval of the project. On approval, an Environmental Authorisation and Record of Decision will be issued in the name of the project applicant.

Diagram 1 provides a schematic description of the Basic Assessment process followed and the current status of the process.

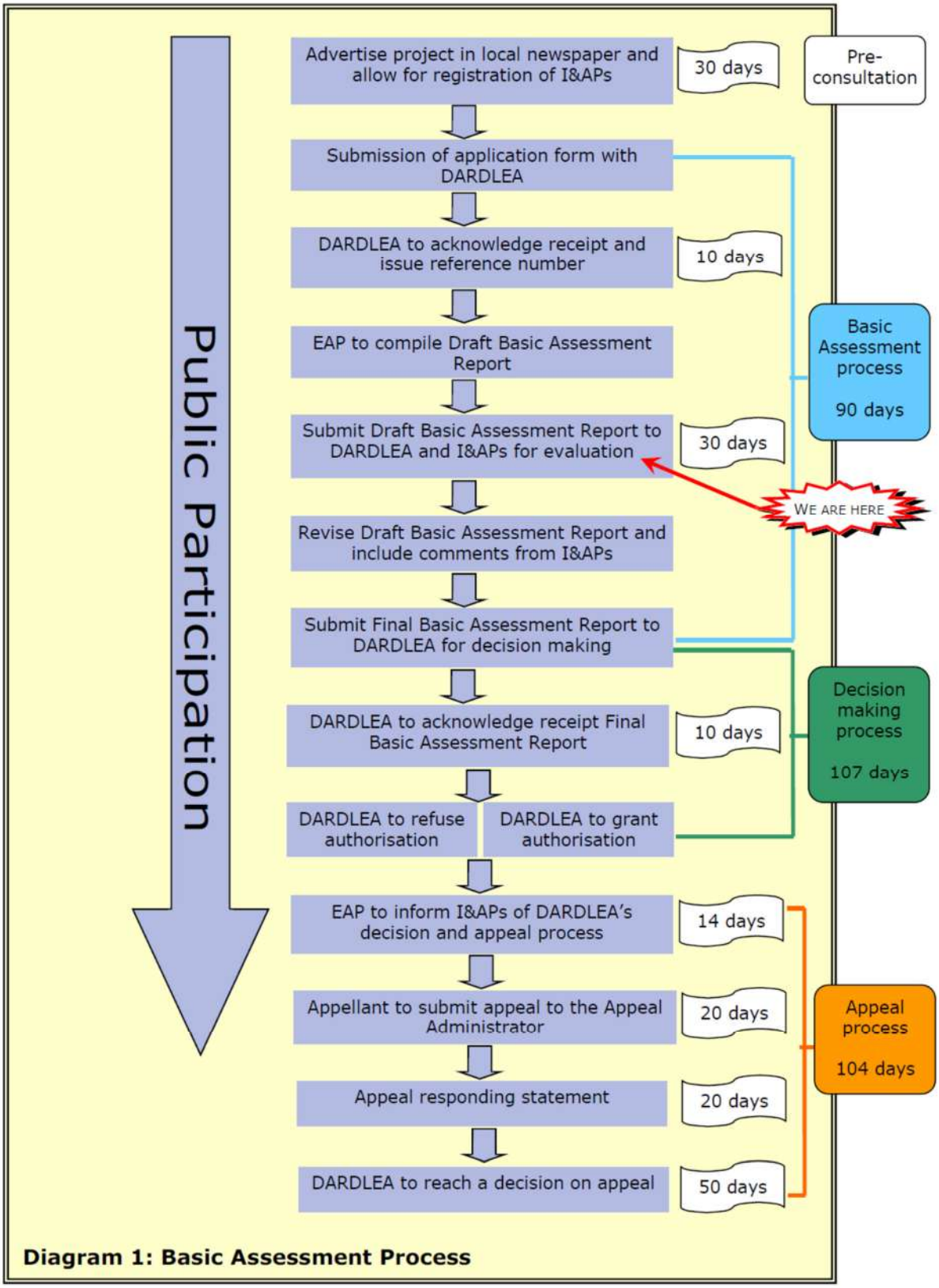


Diagram 1: Basic Assessment Process

SECTION 2: CONTACT DETAILS

As per Appendix 1 of the EIA Regulations, 2014 (as amended), this section provides the following details:

> *(i) the EAP who prepared the report; and*
> *(ii) the expertise of the EAP, including a curriculum vitae.*

In addition, the contact details of the applicant and the specialists who conducted the required specialist studies are also provided.

2.1 Details of the project applicant

Name of Applicant	Bakkos Projects (Pty) Ltd
Company Registration No	2014/021267/07
Address	P.O. Box 546 Mokopane 0600
Contact Person	Mr. Khaalid Hassim
Telephone number	015-491 2520
Fax number	015-491 6431
Cell number	071 678 6666
E-mail	khaalid@hassimholdings.co.za

2.2 Details of the registered landowner

Portion 58 of Vaalbank 289 JS is registered at the Deeds Office to Bakkos Projects (Pty) Ltd. A copy of the Title Deed is provided in Appendix 1.

Name of Applicant	Bakkos Projects (Pty) Ltd
Company Registration No	2014/021267/07
Address	P.O. Box 546 Mokopane 0600
Contact Person	Mr. Khaalid Hassim
Telephone number	015-491 2520
	015-491 6431
Cell number	071 678 6666
E-mail	khaalid@hassimholdings.co.za

2.3 Details of the Environmental Assessment Practitioner (EAP)

Bakkos Projects (Pty) Ltd appointed AdiEnvironmental cc, an independent environmental consultancy, to undertake the Basic Assessment process for the proposed development in accordance with the Environmental Impact Assessment Regulations (EIA), 2014 (as amended).

Name of company	AdiEnvironmental cc
Company registration number	CK99/036174/23
Address	P.O. Box 647 Witbank, 1035
Environmental Assessment Practitioner 1 (EAP1)	Adrienne (Adie) Erasmus *M.Sc* *Pr. Sci. Nat. (400078/96)* *EAP Registration No:2019/604*
Environmental Assessment Practitioner 2 (EAP2)	Riana Janse van Rensburg *M. Env. Mgt.* *EAP Registration No:2019/1341*
Telephone number	013-697 5021
Cell number	083 271 8260
E-mail	adie@adienvironmental.co.za riana@adienvironmental.co.za

Ms. A. Erasmus has a M.Sc with more than 25 years environmental management experience. She is a Professional Natural Scientist (Botanical and Ecological Science) registered with South African Council for Natural Scientific Professions. Ms. R. Janse van Rensburg has an M. Env. Mgt with more than 18 years environmental management experience. Both Ms. Erasmus and Ms. van Rensburg are Registered Environmental Assessment Practitioners (EAPs) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) – see the website www.eapasa.org for further details.

Ms. Erasmus and Ms. Janse van Rensburg have been involved in the management and execution of numerous environmental assessments. The Curriculum Vitae of the Environmental Assessment Practitioners (EAPs) are provided in Appendix 2 together with a list of projects completed to date.

Both EAPs comply with the requirements as stipulated in Regulation 13 of the EIA Regulations, 2014 (as amended) in terms of independence, expertise, objectivity, etc. The declaration and affirmation by the EAPs is included in the front of this document.

AdiEnvironmental cc has no vested interest (other than fair remuneration) in the approval of this project, and hereby declares its independence as required by the EIA Regulations, 2014 (as amended).

2.4 Details of the specialists

Specialist studies were undertaken as part of the Basic Assessment process to address issues that required further investigation.

The following specialists were appointed by the EAP:

Specialist Study	Consultant	Qualifications
Heritage Assessment	Prof Anton van Vollenhoven (Archaetnos Culture and Cultural Resource Consultants)	• BA • BA (HONS) Archaeology • MA Archaeology • Post-Graduate Diploma in Museology • Diploma Tertiary Education • DPhil Archaeology • MA Cultural History

Specialist Study	Consultant	Qualifications
		• Management Diploma • DPhil History *ASAPA Accreditation: 166* *SASCH Accreditation: CH001*
Palaeontological Assessment	Dr Heidi Fourie (Heidi Fourie Consulting)	• B.Sc Geology and Zoology • Ph.D Palaeontology *Member: Palaeontological Society of SA.*
Ecological Assessment	Ina Venter (Kyllinga Consulting)	• M.Sc (Botany) • B.Sc Hons (Botany) • B.Sc (Environmental Sciences) *SACNASP Registration: 400048/08*
	Lukas Niemand (Pachnoda Consulting)	• M.Sc (Zoology) *SACNASP Registration: 400095/06*
Soil Study	Mariné Pienaar (TerraAfrica Consult cc)	• M.Sc Environmental Science *SACNASP Registration: 400274/10*

The Curriculum Vitae and declarations of independence of the above-mentioned specialists are provided in Appendix 2.

The following specialists were appointed by the developer or as part of the town planning process:

Specialist Study	Consultant
Town planning Memorandum	Hlukani Development Consultants
Site Development Plan	Johan Hamman (Urban Dynamics Town & Regional Planners)
Traffic Impact Assessment	Brian Roberts (Moyeni Professional Engineering)

The results of the above-mentioned studies were included in the Draft Basic Assessment.

SECTION 3: DESCRIPTION OF THE ACTIVITY

The purpose of this section is to present sufficient project information to interested and affected parties, stakeholders and government departments in terms of the design parameters applicable to the project.

This section therefore provides information on the following as per Appendix 1 of the EIA Regulations, 2014 (as amended):

- *A description of the scope of the proposed activity;*
- *A description of the activities to be undertaken including associated structures and infrastructure;*
- *A plan which locates the proposed activity as well as associated structures and infrastructure (i.e. conceptual design/layout plan).*

It should be noted that the project description details are preliminary at this early stage of the project life-cycle. It is thus possible that some of the design parameters may change during the detailed design phase. However, the project description used in this Basic Assessment Report assumes a worst-case scenario, where the maximum development footprint and all associated infrastructure are taken into account.

3.1 Description of the site, design, size and scale of the development

3.1.1 Introduction

The applicant, Bakkos Projects (Pty) Ltd, intends to develop a light industrial area on Portion 58 of the farm Vaalbank 289 JS, Middelburg (Figure 3.1).

The applicant intends to rezone the property from Agriculture to Light Industrial (Industrial 2) to make provision for motor showrooms, workshops, earthmoving equipment, etc. The property is ±22 ha in extent.

Hlukani Development Consultants were appointed by the applicant to apply for the rezoning of the property. A copy of the town planning memorandum is provided in Appendix 3.

3.1.2 Location of site

The proposed development will be located on Portion 58 of the farm Vaalbank 289 JS, Middelburg. The said site is located adjacent to the R35 provincial road (Bethal Road) and in close proximity of the N4 national road, ±2.5km south of the Middelburg Mall.

Figure 3.1 indicates the location of the site and Table 3.1 provides the property details.

Table 3.1: Details of the property

Farm Name	Rockdale
Farm Portion	58
Title Deed Number	T7428/2014
21 Digit SG Code	T0JS00000000028900058

Registered Landowner	Bakkos Projects (Pty) Ltd
Size of property	22.6971 ha
Size (footprint) of development	19.9 ha
Centre Co-ordinates of site	25°50'01.31"S 29°27'51.06"E
Magisterial District	Steve Tshwete Local Municipality Nkangala District Municipality
Closest Town	Middelburg

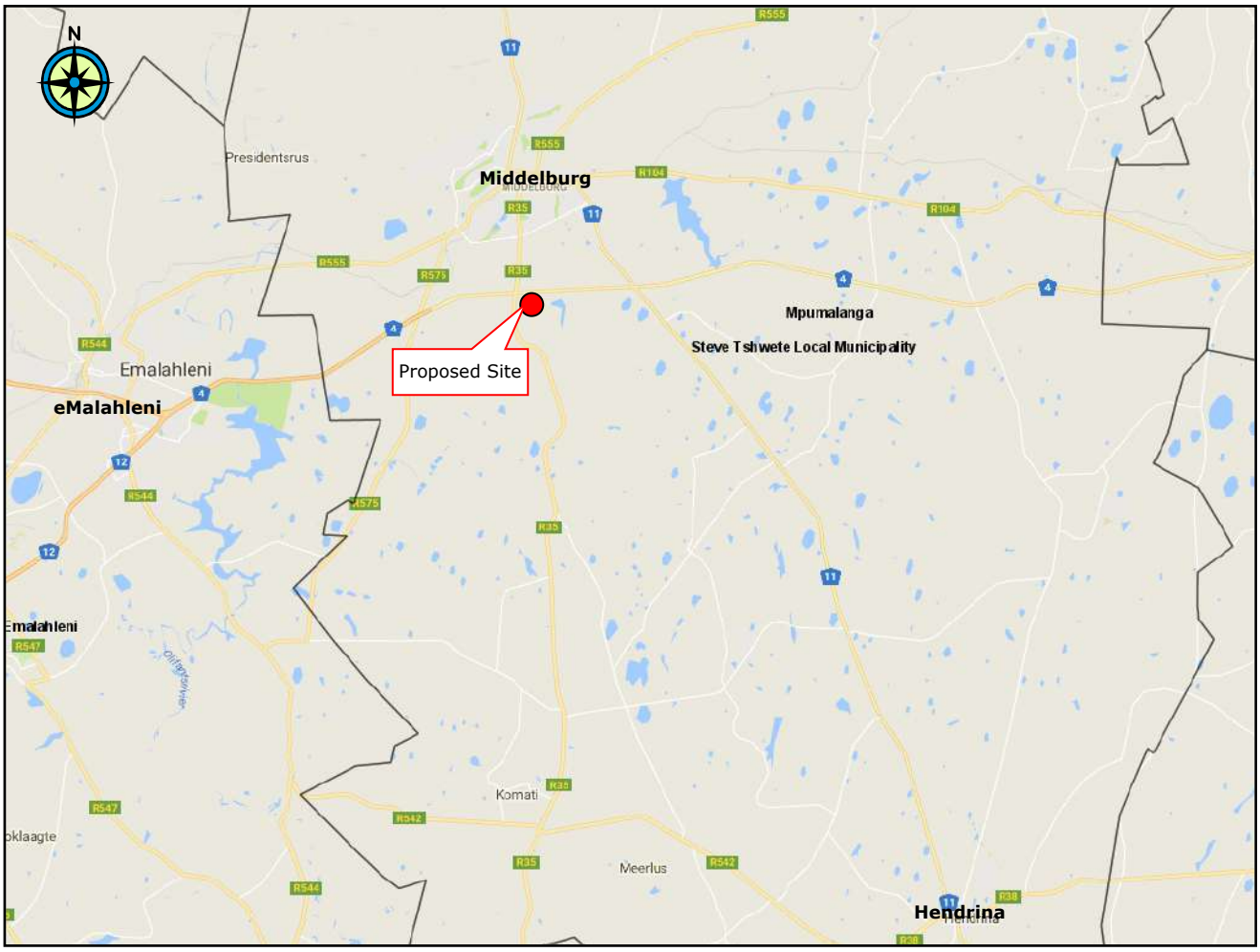


Figure 3.1: Location of proposed site in relation to the nearest towns

3.1.3 Layout plan

Figure 3.2 provides an indication of the proposed site development plan.

As indicated previously, the property will be rezoned from Agricultural to Industrial 2. The applicant intends to provide 20 erven on the property, which will be sold/rented to various businesses for light industrial activities. It is anticipated that the erven will be used for activities such as motor showrooms, workshops, earthmoving equipment, etc. The exact tenant mix has not been finalised and will depend on the market need at the point in time when all authorisations have been obtained.

A truck stop, diesel depot (Bulk Diesel on N4) and food kiosk (WowChow) are already present in the western portion of the site (Erf 18; Figure 3.2). An Environmental Authorisation (dated: 24 April 2019; Ref: 1/3/1/16/1N-142; Appendix 10) was issued for the truck stop and aboveground diesel tanks on 2.5ha of the property. This area (and activity) is thus excluded from this application.

Two other companies (Shosholoza and Cornwill Construction) are also present in the western portion of the site (Erven 16 and 19; Figure 3.2), adjacent to Bulk Diesel on N4. A building has also been constructed on Erf 20 (Figure 3.2).

Table 3.2 provides an indication of the proposed erven sizes.

Table 3.2: Proposed erven sizes

Erf number	Area (ha)	Erf number	Area (ha)
1	0.53	**11**	0.80
2	0.80	**12**	0.94
3	0.80	**13**	0.86
4	0.80	**14**	0.72
5	0.82	**15**	0.77
6	0.80	**16**	1.10
7	0.80	**17**	1.46
8	2.31	**18**	2.14
9	0.56	**19**	0.95
10	0.62	**20**	0.81
Total stands	**20**	**Total ha**	**19.39 ha**

According to Hlukani Development Consultants (2019), the following development controls in terms of the Steve Tshwete Land use Management Scheme (2008) would apply to the proposed development:

Use Zone	Industrial 2
Primary Land Use Rights	Service Industry, Industrial Building, Workshops, Motor Workshop, Business Premises, Petrol Filling Station, Parking Site, Warehouse, Parking Garage, Light Industry, General Industry.
Consent Usage	Communications Tower, Canteen, Buildings, Place of refreshment, Kiosk, Factory Shop, Retail Warehouse Outlet, Truck Stop.
Height	2 storeys
Parking	6 parking bays per 100m^2 GLA
Coverage	60%
FAR	1.6
Building Lines	3 m (rear and 1 side) 5 m (street boundaries)

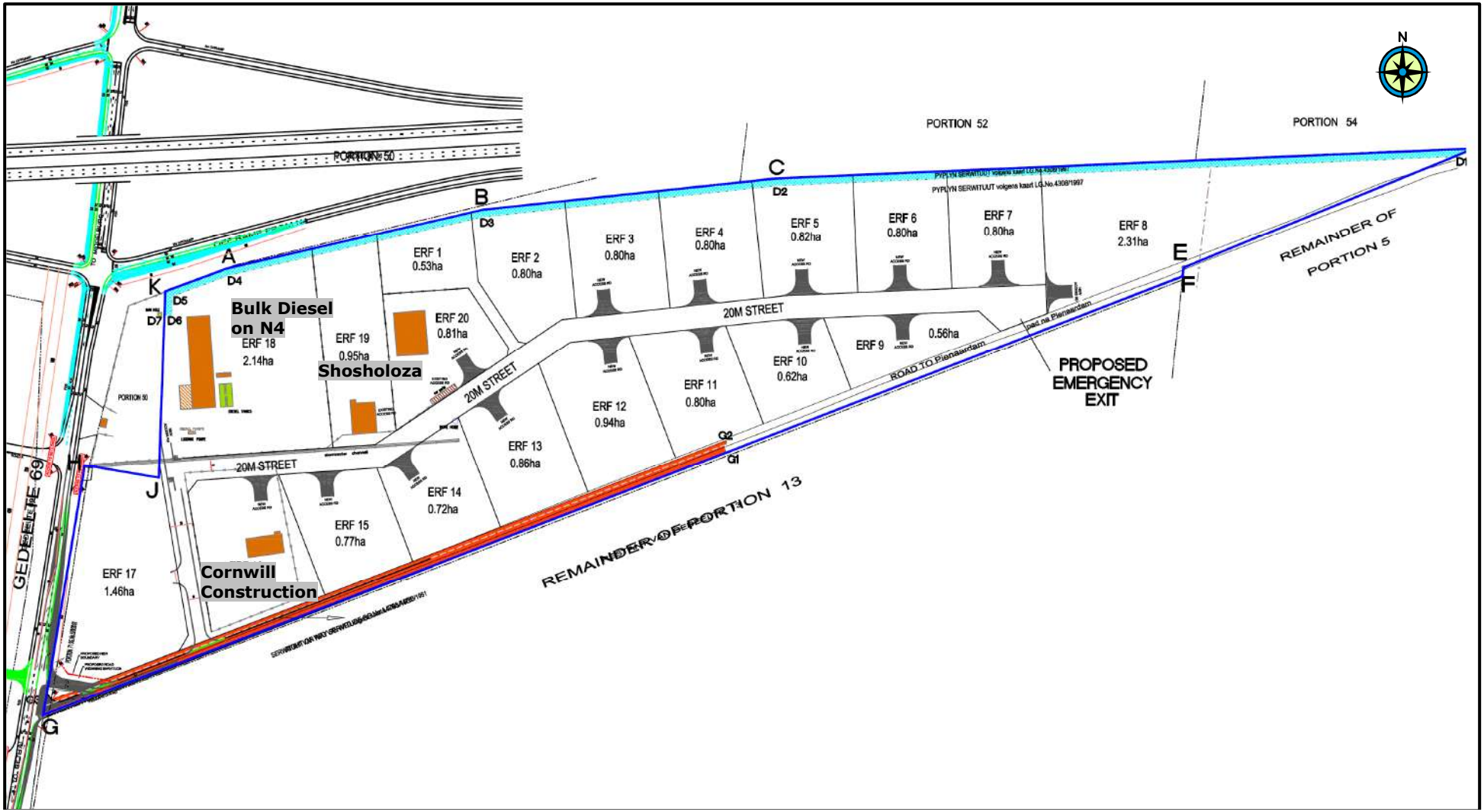


Figure 3.2: Proposed Site Development Plan

3.2 Services required

The said site is located just outside the Steve Tshwete Local Municipality (STLM) urban edge.

The link services (roads and electricity) and the internal reticulation (water, sewer, electricity, streets and street lighting) of the development will thus be done by the developer to the satisfaction of the Steve Tshwete Local Municipality.

3.2.1 Water

During the construction phase, the various contractors would have to provide potable water to the site workers.

According to the applicant, the proposed development will connect to the existing STLM water supply line via Black Wattle Colliery. A letter from Black Wattle Colliery confirming that water is already provided to Portion 58 through the municipal water supply line is provided in Appendix 3.

A borehole is also present on site, from where water could be abstracted in an emergency situation.

More information regarding the Steve Tshwete Local Municipality water reticulation network is provided in Section 7 (Alternatives).

3.2.2 Sewage

During the construction phase, the contractor would have to provide chemical toilets on site.

During the operational phase, each tenant will be responsible for the installation of a conservancy tank on the specific erf. The sizes of the conservancy tanks would depend on the type of activity and the number of employees on site. Each tenant will have to ensure that a contractor is sourced to empty the conservancy tanks on a regular basis.

3.2.3 Electricity

The proposed development falls under the jurisdiction of Eskom and is already connected to the existing Eskom network.

3.2.4 Waste management

During the construction phase, building rubble and a small amount of domestic waste would be generated on each erf. The various contractors would have to provide adequate containers for the collection of waste. The applicant would have to ensure that the specific contractors remove the building rubble and domestic waste to the registered Rietfontein Waste Disposal Site.

Any hazardous waste (e.g. soil contaminated with fuel/oil, paint tins, etc.) would have to be disposed at a Hazardous Waste Disposal Facility by a company dealing with such waste.

During the operational phase, each tenant will be responsible for their own waste management, including the removal of hazardous waste (e.g. oil, etc.) by specific contractors (e.g. Wastetech, Oilkol, etc.).

Waste management measures have been included in the environmental management plan (Section 9) drafted for the proposed development. It would also have to be included in the environmental management plans to be compiled for each specific light industrial development.

3.2.5 Storm water control measures

Presently, no municipal storm water infrastructure is present in the area. A concrete stormwater channel was installed by the applicant diverting stormwater runoff from the western portion of the site in an easterly direction towards the veld.

A proper stormwater water management system will be designed and installed on the entire site.

3.2.6 Access

As indicated in Figure 3.2, access to the site will be obtained from the Pienaardam road, connecting to the R35 provincial road. An emergency exit will be provided from the Pienaardam road near the eastern boundary of the site (Figure 3.2).

3.2.7 Fire fighting

All fire-fighting controls will be in accordance with the National Building Regulations, the SANS Code of Practice (related to Community Protection against Fire) and with "Red Book" standards.

3.3 Reason for project

The developer intends to rezone the property from Agriculture to Light Industrial in order to align the existing land use practices with the Steve Tshwete Town Planning Scheme (2004) and the Steve Tshwete Spatial Planning and Land Use Management Bylaw (2016). Once the property is rezoned, the intention is to expand the light industrial activities by developing an Industrial Park.

According to Hlukani Development Consultants (2019), the proposed development will provide numerous job opportunities, improve service delivery and boost the economy of the Municipality through the collection of revenue. In addition, the development will complement the existing surrounding land uses and the rezoning of the property will contribute to achieving the Development Objectives of the Spatial Planning and Land use Management Act (SPLUMA) (Act 16 of 2013).

Hlukani Development Consultants (2019) further indicated the following in terms of the merits of the project:

> *5.1 Steve Tshwete IDP - The proposed development fits perfectly to what is being articulated in the IDP in that firstly, the proposed development will create over 500 jobs directly from the development as small scale industries will be established on the subject site that will create employment opportunities for the local citizens and directly contributing to the economic growth of the municipality. The proposed development further aligns to the objective of the municipality to encourage the growth of SMME's and black owned industrial firms which are already in existence within the subject property. The IDP identifies industrial development as an opportunity whereby this development application aims to tap into that opportunity as it*

offers possible jobs and development of SMME's.

The location of the site, which is along the N4 Maputo Development Corridor, further presents an opportunity to the municipality to implement a special economic zone in the area as the site is located along a very strategic corridor, further positively contributing to the maximising of the localisation benefits of the road infrastructure in place. Moreover, the proposed development contributes towards the long term development plan of the municipality in that it contributes to the spatial transformation of the area and therefore maximising the localisation benefits of the industries. The IDP further directs that the focus should be on the establishment of development corridors and the fact that the subject site is located along the N4 national road to Maputo positively contributes to the directives of the IDP. Another directive from the IDP is to reduce poverty and the gap between the rich and the poor whereby the proposed development will play as a catalyst to positively create jobs.

More information regarding the 'development merits' of the proposed Industrial Park in terms of e.g. the National Development Plan 2030, Mpumalanga Vision 2030, SONA 2018, SPLUMA Development Principles, etc. is provided in Section 5 of the town planning memorandum (Appendix 3).

SECTION 4: APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The primary legal requirement for this project stems from the need for a Basic Assessment (BA) and Environmental Authorisation (EA) in terms of National Environmental Management Act, 1998 (NEMA) (Act 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended).

The Minister of Environmental and Water Affairs listed in terms of Sections 24(2), 24(5), 24D and 44, read with section 47A(1)(b) of NEMA, 1998 (Act 107 of 1998), a number of activities that require an environmental impact assessment (either a Basic Assessment (BA) or a full Environmental Impact Assessment (EIA)) before undertaking these activities.

The proposed activity would require a Basic Assessment process since the following listed activities (as identified in the Environmental Impact Assessment Regulations, 2014 (as amended)) are triggered:

Listing	Activity
Listing Notice 1: Listed Activity 27	*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except 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.*
Listing Notice 1: Listed Activity 28	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*

Appendix 1 of the EIA Regulations, 2014 (as amended) prescribes the content of the Basic Assessment Report and supporting documentation that must be submitted to the competent authority in order to obtain an EA. Table 4.1 provides an overview of where the requirements of Appendix 1 of the EIA Regulations (2014) are addressed in this BA Report.

Table 4.1: Content of the Basic Assessment Report in accordance with Appendix 1 of the EIA Regulations, 2014 (as amended)

APPENDIX 1 OF GN 326 OF 7 APRIL 2017	SECTION IN BA REPORT
3(1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—	
(a) details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	 (i) Section 2 (ii) Section 2 and Appendix 2
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	 (i) Section 5.1 (ii) Section 5.1 (iii) Section 5.1

APPENDIX 1 OF GN 326 OF 7 APRIL 2017	SECTION IN BA REPORT
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Figure 5.1 - Topographical map; Figure 5.2 - Aerial view
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	(i) Section 1.1 (ii) Section 3; Section 7
(e) a description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	(i) Section 4; Table 4.2 (ii) Section 4; Table 4.2
(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;	Section 3; Section 7; Section 10
(g) a motivation for the preferred site, activity and technology alternative;	Section 7
h) a full description of the process followed to reach the proposed preferred alternative within the site, including— (i) details of all the alternatives considered;	(i) Section 7
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	(ii) Section 6; Section 11 and Appendices 11-14
(iii) 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;	(iii) Section 6; Table 6.4
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	(iv) Section 5
(v) 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;	(v) Section 8
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	(vi) Section 8
(vii) 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;	(vii) Section 8
(viii) the possible mitigation measures that could be applied and level of residual risk;	(viii) Section 9 (EMPr)
(ix) the outcome of the site selection matrix;	(ix) Section 7
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	(x) N/A
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	(xi) Section 7.6
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 8
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring;	Section 8

APPENDIX 1 OF GN 326 OF 7 APRIL 2017	SECTION IN BA REPORT
(v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section 5; Section 9 (EMPr); Section 10
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	(i) Section 10 (ii) Section 9 (EMPr) and Figure 9.1 (iii) Section 7; Section 10
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Section 9 (EMPr)
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 10
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 10
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 10
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r) an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Front of Document
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t) any specific information that may be required by the competent authority; and	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

Table 4.2 provides a summary of the key policy and legislative requirements applicable to the proposed project, including how it was considered in the preparation of the report.

Table 4.2: Applicable legislation, policies and/or guidelines

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
Environmental Management			
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)	To establish a Constitution with a Bill of Rights for the RSA. It sets out of a number of fundamental environmental rights (Section 24).	Throughout the Basic Assessment process.	The development will not be harmful to the health or wellbeing of surrounding landowners/users. Mitigation measures will be implemented to ensure that the environment is not polluted or degraded.
National Environmental Management Act, 1998 (Act 107 0f 1998) and amendments	To provide for the integrated management of the environment. Chapter 1 sets out the national environmental principles. Chapter 5 deals specifically with integrated management. Chapter 7 deals with compliance and enforcement with specific reference to Section 28 (duty of care)	Throughout the Basic Assessment process.	Environmental management principles and general objectives of Integrated Environmental Management taken into account throughout the Basic Assessment process.
Environmental Impact Assessment Regulations, 2014 and amendments	Regulations pertaining to environmental impact assessments.	Throughout the Basic Assessment process. Listed Activities 27 and 28 of GN 983 (as amended).	Basic Assessment process undertaken for the proposed development in accordance with the requirements of the Regulations.
National Appeal Regulations, 2014 and amendments	To regulate the procedure contemplated in Section 43(4) of the Act relating to the submission, processing and consideration of a decision on an appeal.	N/A	On receipt of the Environmental Authorisation, I&APs will be informed that an Appeal against the decision can be lodged and the procedure as prescribed in the National Appeal Regulations, 2014 must be followed.
Public Participation Guideline in terms of EIA Regulations, 2017	Guideline on the public participation process	Section 6 - Public participation	Adjacent landowner/users, relevant stakeholders and interested and affected parties were consulted to obtain input with regards to the proposed development and to resolve any queries or concerns with regards to the activity.
Guideline on Need and Desirability in terms of EIA Regulations, 2017	Guideline with regards to need and desirability of activities	Section 3 - Project description Section 7 - Alternatives Section 10 - Impact statement	The need and desirability of the proposed development was considered during the Basic Assessment process.
Biodiversity			
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) and amendments	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the	Section 5.7 - Vegetation Section 5.8 - Animal life	No sensitive environments are present on site. General mitigation measures in terms of the protection of the natural environment are however, indicated in the EMPr (Section 9).

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
	protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African Biodiversity Institute; and for matters connected therewith.		
National Biodiversity Framework (NBF, 2008)	To co-ordinate and align the efforts of the organisations and individuals involved in conserving and managing South Africa's biodiversity	Section 5.7 - Vegetation Section 5.8 - Animal life	No sensitive environments are present on site. General mitigation measures in terms of the protection of the natural environment are however, indicated in the EMPr (Section 9).
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): National List of Ecosystems that are threatened and in need of protection (9 December 2011).	The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value.	Section 5.7 - Vegetation	The proposed development is not located within any threatened ecosystems listed in the NEM: Biodiversity Act.
Threatened or Protected Species Regulations (GN 152 of 23 February 2007)	To further regulate the permit system in terms of restricted activities involving threatened or protected species.	Section 5.7 - Vegetation Section 5.8 - Animal life	No threatened or protected species are present on site.
List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998)	Provides a list of protected tree species.	Section 5.7 - Vegetation	No protected tree species are present on site.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and amendments	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.	Section 5.7 - Vegetation Section 5.8 - Animal life	The site is located near the 'Vaalbank Private Nature Reserve', which is not managed as such and comprises of various properties utilized for agriculture, business, etc. See Section 5.7 for further details.
National Protected Areas Expansion Strategy (NPAES, 2008)	To achieve cost-effective expansion of the protected area network that enhances ecological sustainability and resilience to climate change.	Section 5.7 – Vegetation Section 5.8 – Animal life	The site is not located within or near a proposed expansion area.

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998) and amendments	To control nature conservation in Mpumalanga.	Section 5.7 - Vegetation Section 5.8 - Animal life	No conservation areas, CBA's or ESA's are indicated in the Mpumalanga Biodiversity Sector Plan (MBSP, 2013) for the site.
Conservation of the Agricultural Resources Act, 1983 (Act 43 of 1989) and amendments	To provide control over the utilization of the natural resources of the Republic in order to promote the conservation of soil, the water sources and the vegetation; and for matters connected therewith.	Section 5 - Biophysical description Section 9 - EMPr	Mitigation measures (e.g. erosion control) to be implemented during construction and operation to ensure compliance with the CARA Act. Mitigation measures included in the EMPr, Section 9.
Alien and Invasive Species Regulations, 2020; Alien and Invasive Species Lists, 2020.	Regulations regarding alien and invasive species.	Section 5.7 - Vegetation Section 5.8 - Animal life Section 9 - EMPr	Mitigation measures to be implemented during construction and operation to ensure that alien and invasive species are controlled. Mitigation measures included in the EMPr, Section 9.
Water			
National Water Act, 1998 (Act 36 of 1998) and amendments	To control water management aspects.	Section 3 - Storm water management Section 5.9 - Surface water and wetlands Section 9.5.7 - Water management	No rivers, streams or other surface water environments are present on or near the site. The closest river/stream is an unnamed tributary of the Vaalbankspruit, located ±700 m southeast of site. Mitigation measures (in terms of water management) to be implemented during construction and operation to ensure compliance with the National Water Act. Mitigation measures included in the EMPr, Section 9.
Water Use Licence Applications & Appeal Regulations, 2017	To prescribe the procedure and requirements for water use licence applications as contemplated in sections 41 of the Act; as well as an appeal in terms of section 41(6) of the Act.	N/A	The prescribed procedures will be followed if a water use licence for the proposed development is required.
Water Services Act, 1997 (Act 108 of 1997)	To provide for the rights of access to basic water supply and basic sanitation.	Sections 3 and 7 – Service provision.	Water and sewer services will be installed.
National Freshwater Ecosystem Priority Assessment (NFEPA) of 2012 and implementation manual.	Provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources.	Section 5.9 - Surface water and wetlands	The site is not located within a NFEPA priority area.
Best Practice Guidelines published by the Department of Water Affairs and Forestry: G1 - Storm Water Management	Provides best practice principles and guidelines in terms of water management.	Section 3 - Storm water management	Mitigation measures are included in the EMPr, Section 9.
Waste			
National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and amendments	To reform the law regulating waste management in order to protect health and the environment by providing for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.	Section 3 - Project description Section 9 - Waste management	During the operational phase, waste will be removed by the individual businesses and disposed at the licenced Rietfontein Waste Disposal Site.

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
Nkangala District Municipality Integrated Waste Management Strategy	A strategy dealing with waste.	Section 3.2–Services required Section 9 - Waste management	A waste management license is not required for this project.
Steve Tshwete Local Municipality Integrated Waste Management By-Laws	To regulate the management of waste within the Steve Tshwete Local Municipal area.	Sections 3 and Section 9- Waste management	Mitigation measures in terms of waste management are included in the EMPr, Section 9.
Development Planning			
Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)	To provide a framework for spatial planning and land use management	Section 3 - Description of activity Appendix 3 - Town planning Memorandum	The said property will be rezoned from 'Agriculture' to 'Industrial 2' to allow for the development of a light industrial park.
Integrated Development Plan for the Steve Tshwete Local Municipality	Broad spatial framework guidelines for the Steve Tshwete Local Municipality.	Appendix 3 - Town planning Memorandum	The IDP was taken into account in the town planning process.
Spatial Development Framework for the Steve Tshwete Local Municipality	Spatially based policy guidelines whereby changes, needs and growth in the region can be managed to benefit the whole community.	Section 5.17 - Sense of place Figure 5.24 – SDF Appendix 3 – Town planning Memorandum	In the SDF, the site forms part of a 'Precinct Plan Area' to be considered for inclusion in the Urban Edge.
Sub-division of Agricultural Land, 1970 (Act 70 of 1970)	To control the subdivision and, in connection therewith, the use of agricultural land.	Section 3 – Description of activity Appendix 3 – Town planning Memorandum	The site is agricultural land and will be rezoned to Industrial 2. The property will not be subdivided.
National Framework for Sustainable Development (NFSD, 2008)	To enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It proposes a national vision, principles and areas for strategic intervention that will enable and guide the development of the national strategy and action plan.	Throughout the Basic Assessment process.	Sustainable development principles taken into account throughout the Basic Assessment process.
Sustainable Development Goals, 2015	A universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030.	Throughout the Basic Assessment process.	Sustainable Development Goals taken into account in the Basic Assessment process in terms of minimizing damage to the environment (EMPr).
National Development Plan 2030 (NDP, 2012)	The NDP aims to eliminate poverty and reduce inequality by 2030. These goals can be realized by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.	Section 3.3 - Reason for project Section 7 – Alternatives Section 10 - Impact statement	The proposed development will create employment opportunities during the construction and operational phases and provide much needed space for new businesses/industries.
Heritage Resources			
National Heritage Resources Act, 1999 (Act 25 of 1999) and amendments	This legislation aims to promote good management of the national estate, and to enable and encourage communities to	Section 5.13 - Sites of archaeological/cultural interest Section 9 - EMPr	A Heritage Impact Assessment was conducted. No sites of archaeological interest were identified on site by the appointed archaeologist. A Palaeontological Impact

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
	nurture and conserve their legacy so that it may be bequeathed to future generations.		Assessment was conducted and mitigation measures provided in Section 9.
Air Quality			
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) and amendments	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures.	Section 5.11 - Air quality Section 9 - EMPr	The development will not produce emissions as it is a light industrial development, which would be provided with electricity. No noxious industries will be allowed on site. An emissions license is not required.
Highveld Priority Area Air Quality Management Plan, 2011	To achieve and maintain compliance with the ambient air quality standards across the HPA, using the Constitutional principle of progressive realisation of air quality improvements. The AQMP for the HPA provides the framework for implementing departments and industry to include AQM in business planning to ensure effective implementation and monitoring.	Section 5.11 - Air quality	The development is located within the Highveld Priority Area. The development will however, not produce emissions as it is a light industrial development, which would be provided with electricity.
National Dust Control Regulations, 2013	To prescribe general measures for the control of dust in all areas.	Section 5.11 – Air quality Section 9 – EMPr	Dust could be generated as a result of construction activities and use of heavy machinery. In addition, dust could be generated during the operational phase especially if the internal roads are not surfaced. Mitigation/management measures with regards to dust are indicated in the EMPr, Section 9.
Noise			
Noise Control Regulations (GN 154 of 1992)	To set out rules relative to the control of noise.	Section 5.12 - Noise Section 9 - EMPr	The ambient noise level of the site is high since the site is located adjacent to the N4 national road and the R35 provincial road which both carry high volumes of traffic throughout the day. Noise is also generated by existing mining activities adjacent to the site as well as existing light industrial activities taking place on site. Section 8.5.10 provides an indication of the potential noise impact during the construction and operational phases of the light industrial area. Mitigation/management
Steve Tshwete Local Municipality by-law with regards to noise and control.	To regulate noise within the Steve Tshwete Local Municipal area.	Section 5.12 - Noise Section 9 – EMPr	

Legislation/policies/guidelines	Aim of legislation, policy or guideline	Where considered in BA Report	Adherence of proposed activity
			measures with regards to noise are indicated in the EMPr (Section 9).
Health and Safety			
Health Act, 1977 (Act 63 of 1977) and amendments	To promote public health.	Section 9 - EMPr	Mitigation measures to reduce potential impacts on the site workers provided in the EMPr, Section 9.
Occupational Health and Safety Act, 1993 (Act 85 of 1993) and amendments	To provide for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work.	Section 9 - EMPr	Mitigation measures to reduce potential impacts on the contractors and employees/site workers provided in the EMPr, Section 9.
National Building Regulations and Standards Act, 1977 (Act 103 of 1977) and amendments	To provide for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities; for the prescribing of building standards; and for matters connected therewith.	Section 3 - Project description	The buildings will be constructed according to the National Building Regulations.
National Veld and Forest Fire Act, 1998 (Act 101 of 1998) and amendments	To prevent and combat veld, forest and mountain fires throughout South Africa.	N/A	The applicant must ensure that he complies with the Act.
General			
Protection of Personal Information Act, 2013 (Act 4 of 2013)	The purpose of this act is to give effect to the constitutional right to privacy by safeguarding personal information and to regulate the manner in which personal information may be processed.	Throughout Basic Assessment process.	Throughout Basic Assessment process.
Promotion of Access to Information Act, 2000 (Act 2 of 2000) and amendments	To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.	Throughout Basic Assessment process.	Throughout Basic Assessment process.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) and amendments	The Act aims to make the administration (e.g. Government and Parastatals) effective and accountable to people for its actions.	Throughout Basic Assessment process.	Throughout Basic Assessment process.

SECTION 5: BIOPHYSICAL DESCRIPTION

Appendix 1 of the EIA Regulations (2014, as amended) requires a description of *"the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects".*

This section provides an overview of the environmental features of the site and surrounding area, which includes the biophysical, socio-economic and cultural/heritage aspects. The aim of this section is to provide information on the current baseline conditions of the site that will be used to identify potential impacts of the development on the environment and vice versa in Section 8 (Impact Assessment) of this report.

5.1 Location of the site

The proposed development will be located on Portion 58 of the farm Vaalbank 289 JS, Middelburg. The said site is located adjacent to the R35 provincial road (Bethal Road) and in close proximity of the N4 national road, ±2.5km south of the Middelburg Mall (Figure 5.1).

The co-ordinates for the centre of the site are:

Site	Latitude (S):			Longitude (E):		
58/289	25°	50‘	01.31“S	29 °	27‘	51.06“E

The Surveyor-General 21 digit site reference number for the proposed project is:

T	O	J	S	0	0	0	0	0	0	0	0	0	2	8	9	0	0	0	5	8

The said property falls under the jurisdiction of the Steve Tshwete Local Municipality (MP313) and the Nkangala District Municipality (DC31).

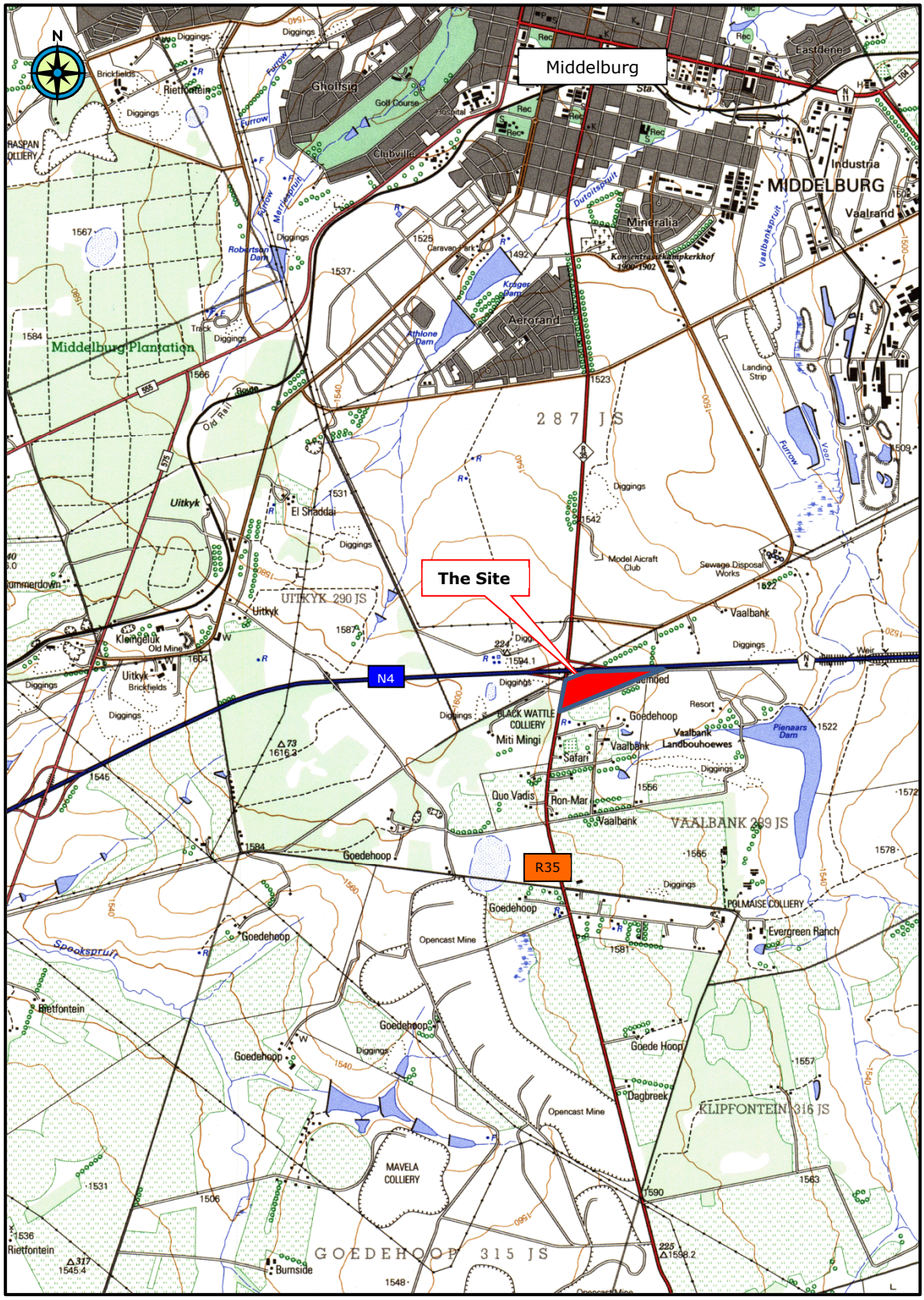


Figure 5.1: Location of site
(taken from 1: 50 000 2529 CD)

5.2 Climate

The South African Weather Bureau has partitioned the country into 15 climatic regions. This division is based on:

- Geographic considerations, more specifically the prominent mountain ranges (great escarpment) which constitute the main climatic divides, besides also other features such as rivers and political boundaries;
- The interior plateau - use has been made of the change from BW to BS and from BS to C climates according to the Köppen classification.
- The site falls within Climatic Region H – The Highveld.

The climate is typical of the Highveld, with warm summers and cold winters with occasional severe frosts. Rainfall typically occurs as high-intensity short duration thunderstorms. The average frost period is 111 days per annum. The mean annual temperature is 22.5°C, with recorded extremes of -11°C and 34°C.

The site occurs in Mpumalanga and falls in the summer rainfall region, which is characterised by thunderstorm activity and relatively low average rainfall. The mean annual rainfall is 735mm compared to the mean annual potential evaporation of 1500mm.

5.3 Land use

5.3.1 Land ownership

Portion 58 of Vaalbank 289 JS is registered at the Deeds Office to Bakkos Projects (Pty) Ltd. A copy of the Title Deed (T7428/2014) is provided in Appendix B of Appendix 1.

5.3.2 Zoning of the site

The property is zoned as 'Agricultural'.

5.3.3 Size of the site

The property is 22.6971 ha in extent. A portion of the said property has already been development as indicated in Section 5.3.5.

5.3.4 Servitudes

No servitudes are known to be present on site.

The property is however, affected by the road reserve of the N4 national road located on the northern boundary and the R35 provincial road located on the western boundary of the site (Figure 5.3). Building lines may apply. A Right-of-Way servitude road is located on the southern boundary (Figure 5.2; Figure 5.3 and Photo 5.1) and provides access to Pienaardam Leisure Resort.

According to the land surveyor, a servitude for a pipeline is located on the northern boundary of the site as indicated in Figure 5.2.

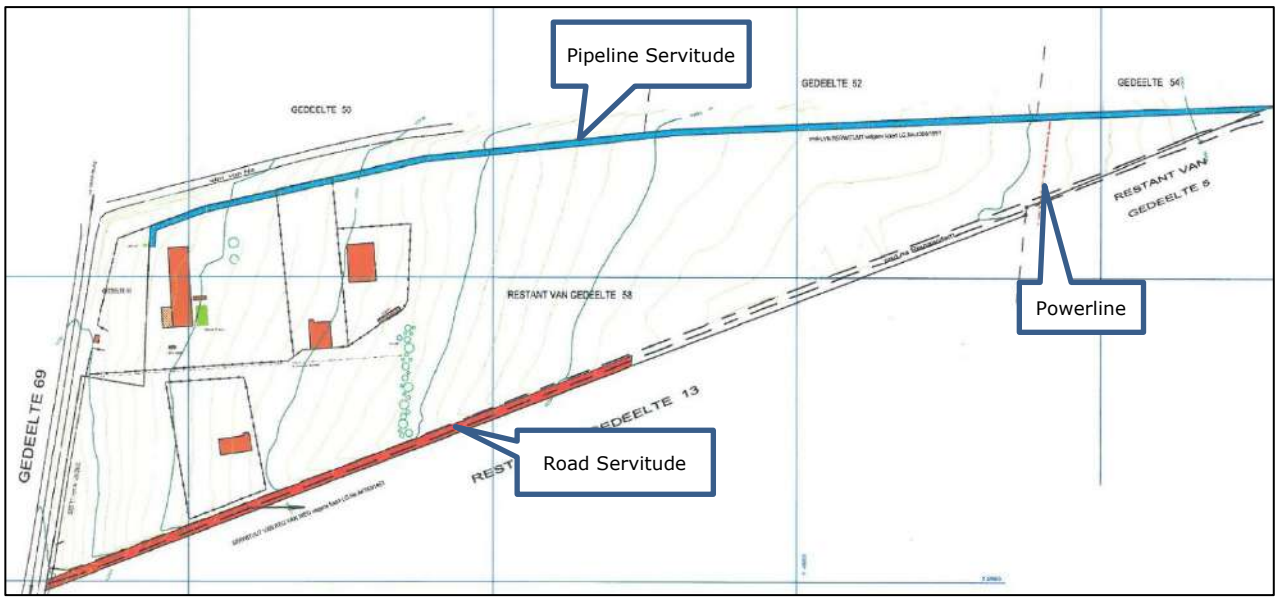


Figure 5.2: Servitudes identified by land surveyor (taken from Roberts, 2019)

Photo 5.1: A view of the Pienaardam servitude road extending along the southern boundary of the site

An overhead powerline (11kV) was noted extending across the property in the eastern portion of the site (Figure 5.2). A servitude might be associated with this powerline.

Photo 5.2: A view of the power line extending across the eastern portion of the site

5.3.5 Land use and existing infrastructure

Figure 5.3 provides an aerial view of the proposed development site. The following businesses are currently present on site: Bulk Diesel on N4 (diesel depot), Corwill Construction (engineering and construction), Heyneke Transport (transport) and Shosholoza (transport). Concrete storm water channels have been installed as part of the existing development.

Photo 5.3: Bulk Diesel on N4

Photo 5.4: Shosholoza

A farmstead used to be present (until 2011 according to aerial images) in the eastern section of the site (Figure 5.3). Today, a patch of kikuyu grass and a few fruit trees (indicative of an old garden) remain of the former farmstead area. No ruins are present. According to Pienaar (2020), the land surrounding this area shows signs of previous soil tillage (most likely for crop production). No agricultural activities (cultivation, grazing, etc.) presently take place on the said property (Pienaar, 2020).

5.3.6 Surrounding land uses

The proposed site is located within an area already utilized for light industrial and mining activities as indicated in Figure 5.4. The N4 national road is located on the northern boundary of the site and the R35 provincial road is located on the western boundary (Figure 5.3).

Black Wattle Colliery is located towards the west and an abandoned, partly rehabilitated mine (Vaalbank Colliery Minipit) towards the south (Figure 5.3). Pienaardam Leisure Resort is located to the south east of the proposed site (Figure 5.4). This property is used for recreation and agricultural purposes. Four centre pivot irrigation areas are present on the said property (Pienaar, 2020). The properties further south and south east of the site (Figure 5.4) are used for a variety of purposes e.g. coal trucking, residential, agriculture and business (e.g. a bar), etc.

Sensitivity Assessment

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a High sensitivity for the Civil Aviation Theme due to the site being located within 8km of a civil aviation aerodrome.

According to Google Earth and local knowledge of the area, the closest aerodrome is located 17km north of the site adjacent to the Botshabelo Nature Reserve. Helipads may however be present on private properties in the area. The proposed site is located within an area already utilized for light industrial and mining activities as indicated in Figure 5.4. The proposed height of the buildings will be restricted to two storeys as indicated in Section 3.1.3. It is therefore not expected that the proposed development will impact on any aviation paths. The sensitivity rating for the Civil Aviation Theme should therefore be **Low.**

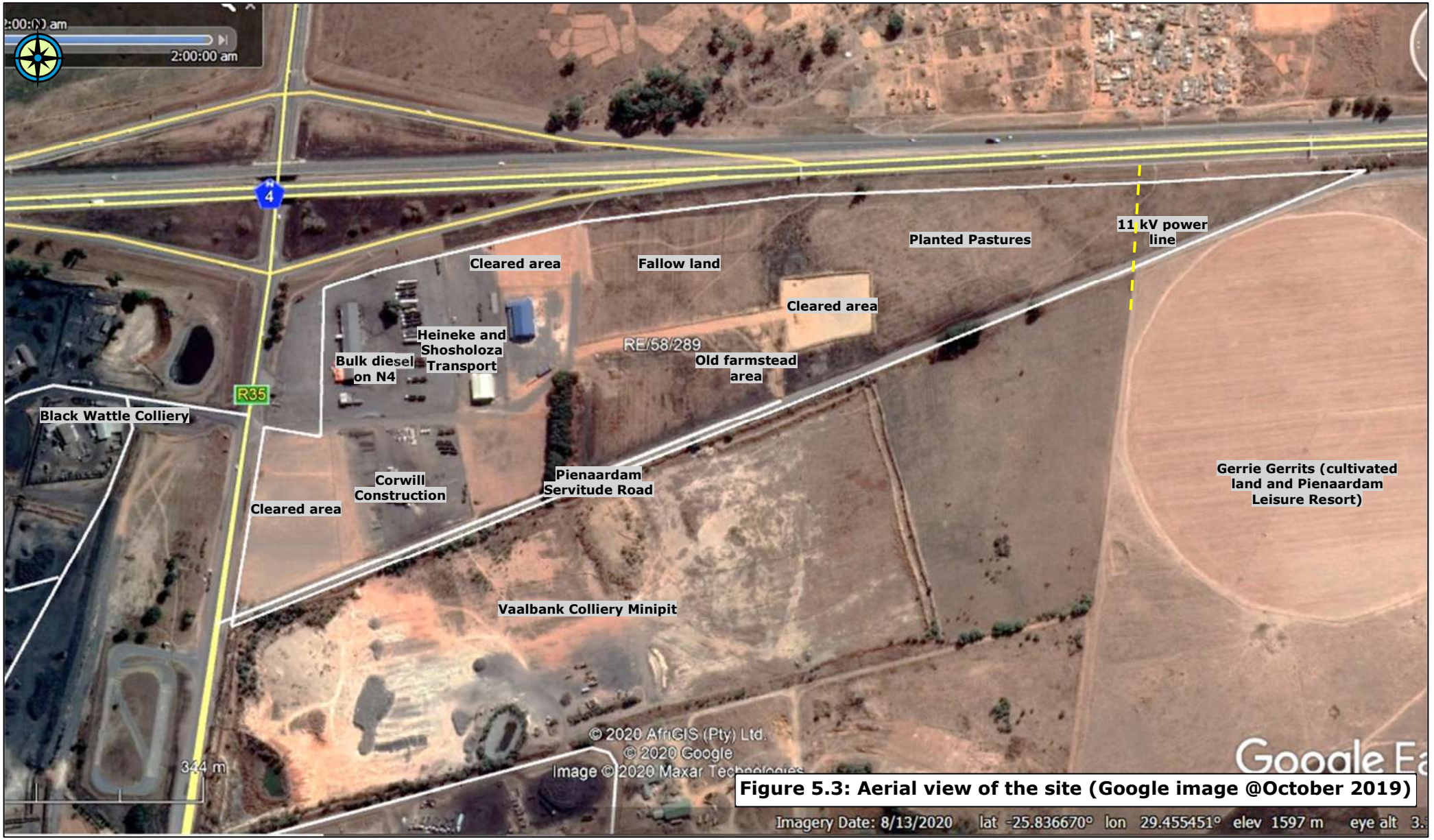


Figure 5.3: Aerial view of the site (Google image @October 2019)

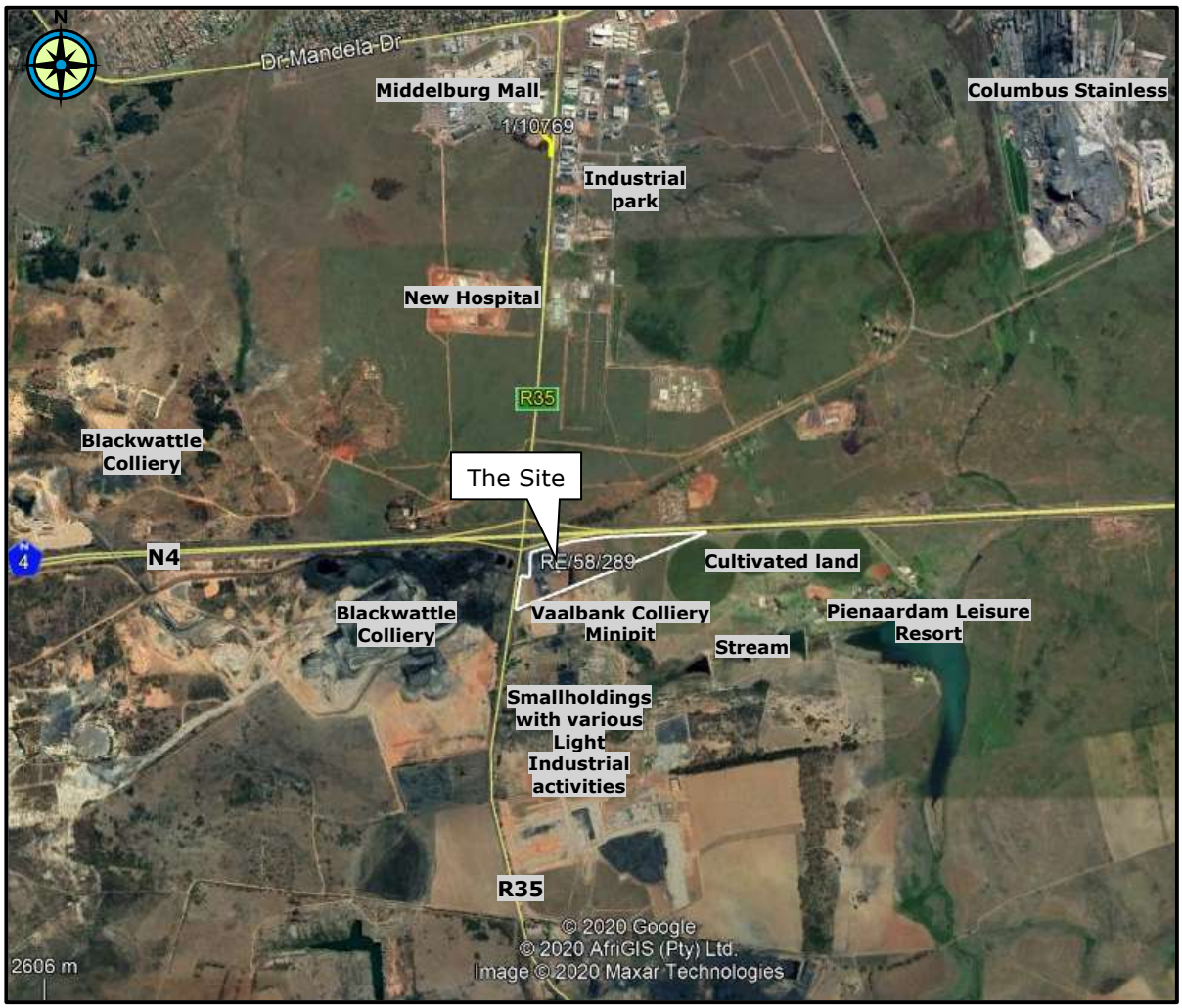


Figure 5.4: Surrounding land uses

5.4 Geology

A reconnaissance investigation regarding the foundation conditions and groundwater potential of the site was undertaken by Paul Hansmeyer of Engeolab cc (referred to as Hansmeyer, 2020). A copy of the said report is provided in Appendix 4.

5.4.1 Underlying geology

The geology of the site comprises Vryheid Formation (sandstone, shale, gritstone, conglomerates and coal measures), Karoo Sequence (grey-green; Figure 5.5) underlain by tillite of the Dwyka Group (olive; Figure 5.5) deposited on the rhyolite (felsites) of the Selonsrivier Formation, Rooiberg Group (orange; Figure 5.5).

According to Hansmeyer (2020), the Vryheid sediments and the underlying Dwyka tillite become progressively thinner eastwards, pinching out against the north-westward dipping basement rhyolite about 150m from the easterly corner against the N4 highway (Figure 5.5). Hansmeyer (2020) recorded no outcrops present on site.

The said site is not subject to undermining or dolomite related instabilities. In addition, the site is not located in an area of known active seismicity.

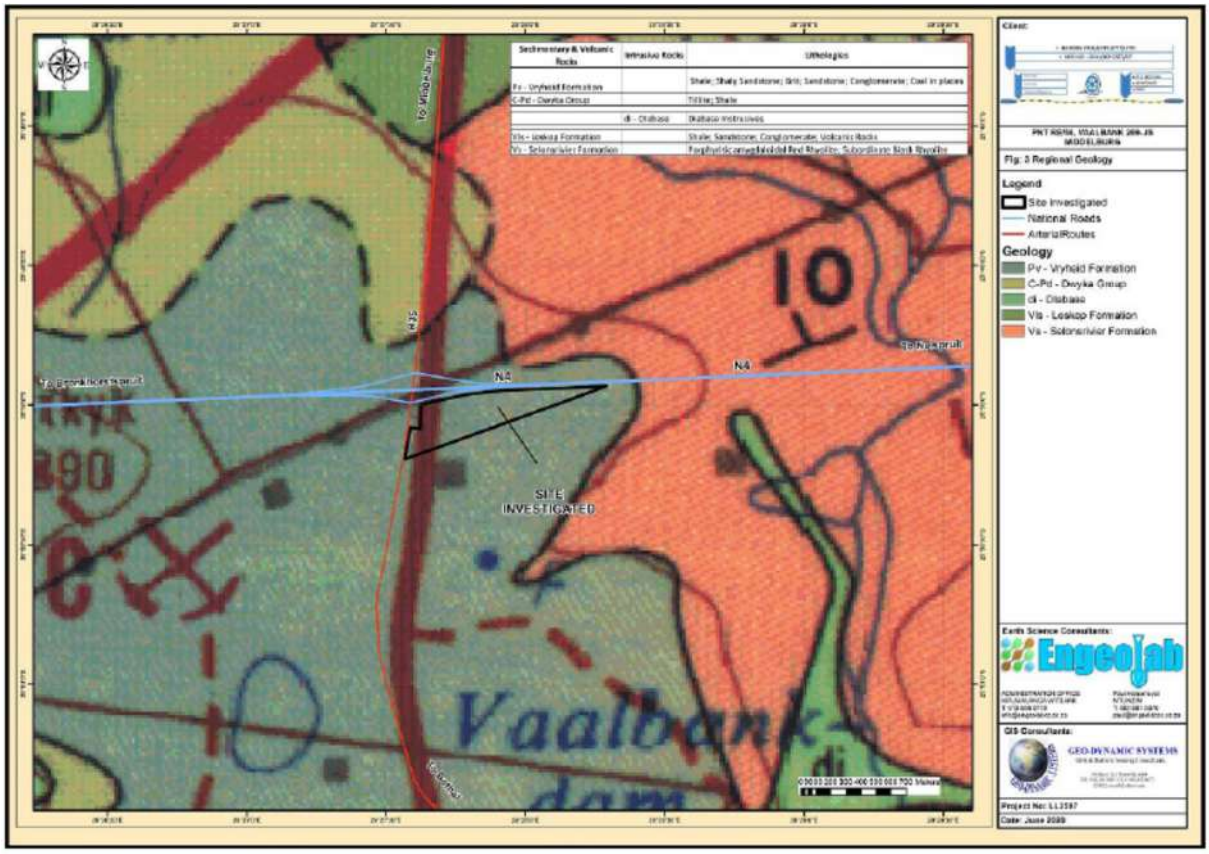


Figure 5.5: Geology of the site (taken from Hansmeyer, 2020)

5.4.2 Geotechnical zones identified

The underlying Vryheid sandstone is blanketed by silt-sand mixes of various origins.

According to Hansmeyer (2020), the site is blanketed by soft excavatable cover soils with an estimated thickness of 2.5m. These soils usually comprise silt-sand mixes and are notoriously compressible, causing settlement of structures.

The underlying residuum is usually only 0.5m thick and often partially to well ferruginised. This is underlain by intermediate excavatable sandstone bedrock which is ideal founding medium with limited settlement (<5mm).

According to Hansmeyer (2020), the top soils are usually fairly permeable. If ponding occurs, it usually evaporates within a day or two.

Imported material (to form an adequate wearing course for the transport trucks) is present in the hardstand areas of the site.

Table 5.1 provides a summary of tentative geotechnical aspects for the proposed development site.

Mechanical excavation with a 65KW powered TLB should be adequate to excavate through the soft overburden materials. A more powerful excavator will be required to excavate highly weathered sandstone bedrock estimated to be present from a depth of 3m. Difficult excavation and refusal should be experienced in moderately weathered bedrock.

Table 5.1: Summary of tentative geotechnical aspects (taken from Hansmeyer, 2020)

DEPTH (m)	SOIL/BEDROCK PROFILE	ORIGIN	*EXCAVATION CLASS	**G CLASS	GEOTECHNICAL ASPECTS	RECOMMENDATIONS
0 – 2.5	Light brown, medium grained sand-silt mixes	Transported soils of various origins	Soft	G8, G9	Loose consistency; highly erodible, highly compressible; prone to wind and water erosion; poor founding medium <50KPa; roots throughout top 0.3m, excavations requiring shoring.	Good subgrade material; compact in situ; access roads compact using vibratory smooth drum roller; compact at -1% to +2% of Mod. AASTHO max dry density.
2.5 – 3.0	Dark brown speckled orange usually coarse grained in partially cemented matrix of moist gravel-sand-silt mixes; where well cemented hardpan ferricrete is encountered which is indicative of perched water table.	Ferruginised sandstone residuum	Soft to Intermediate	G5-G7	Medium dense consistency; erosion prone; high to medium compressible; bearing capacity <100 KPa; low-medium plasticity (PI<12); GM = 1.5-2.0; friction angle 40°; Cohesion C- 10 KPa; excavations cut back to 45° from horizontal; excavations >1.5m require shoring.	Cut to stockpile; compact to 95% of Mod. AASHTO @ -1 to +2% of OMC; Mechanical and/or chemical stabilization beneficial; compacted foundation material bearing capacity -350KPa.
>3.0	Light ivory with orange-brown stained fracture surfaces.	Competent sandstone	Intermediate to hard excavation and heavy ripping.	G5	Medium dense to dense consistency; low compressibility; low erosion potential; settlement 5mm; bearing capacity = 1MPa; non-plastic; excavations vertical.	Good founding medium with minimal settlement.

5.5 Topography

According to the AGIS Comprehensive Map drafted by the Department of Agriculture, Forestry and Fisheries, the terrain type of the proposed site is indicated as plains with open low hills or ridges as indicated in Figure 5.6.

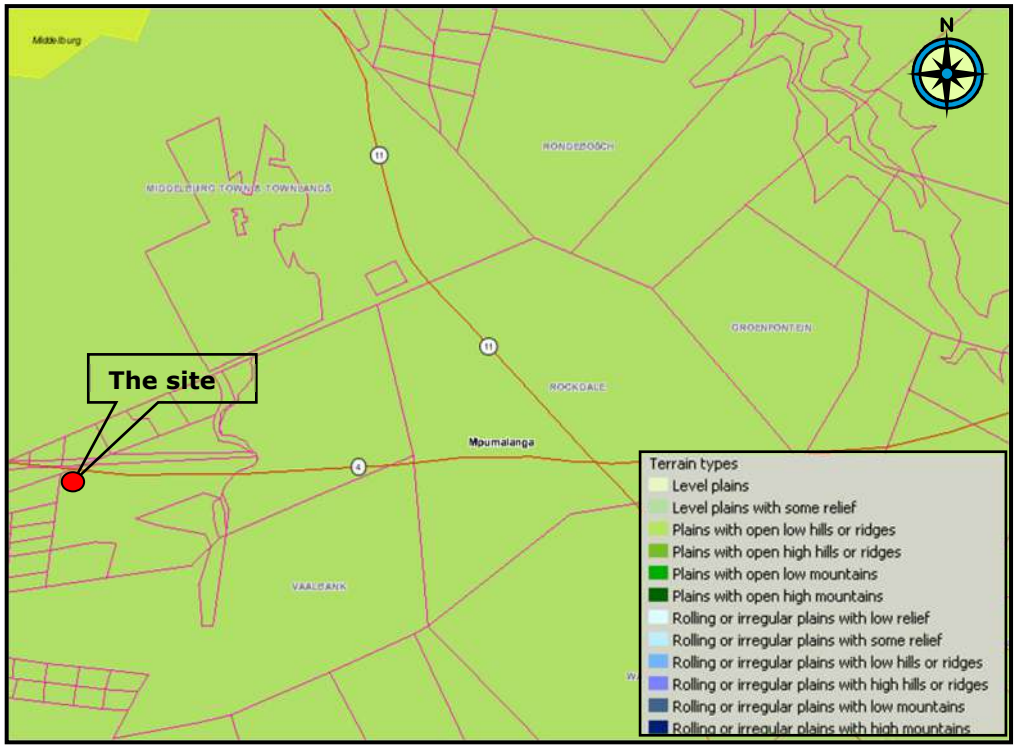


Figure 5.6: Terrain type of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

The proposed site lies at approximately 1590 meters above mean sea level (mamsl). According to Hansmeyer (2020), the terrain dips with an even gradient of about 1.3% eastwards as indicated in Figure 5.7.

Surface run-off should normally flow in this direction. However, the topography of the site and immediate surrounding area has been impacted by activities taking place on site (see Section 5.3.5) and this could have impacted on surface water runoff.

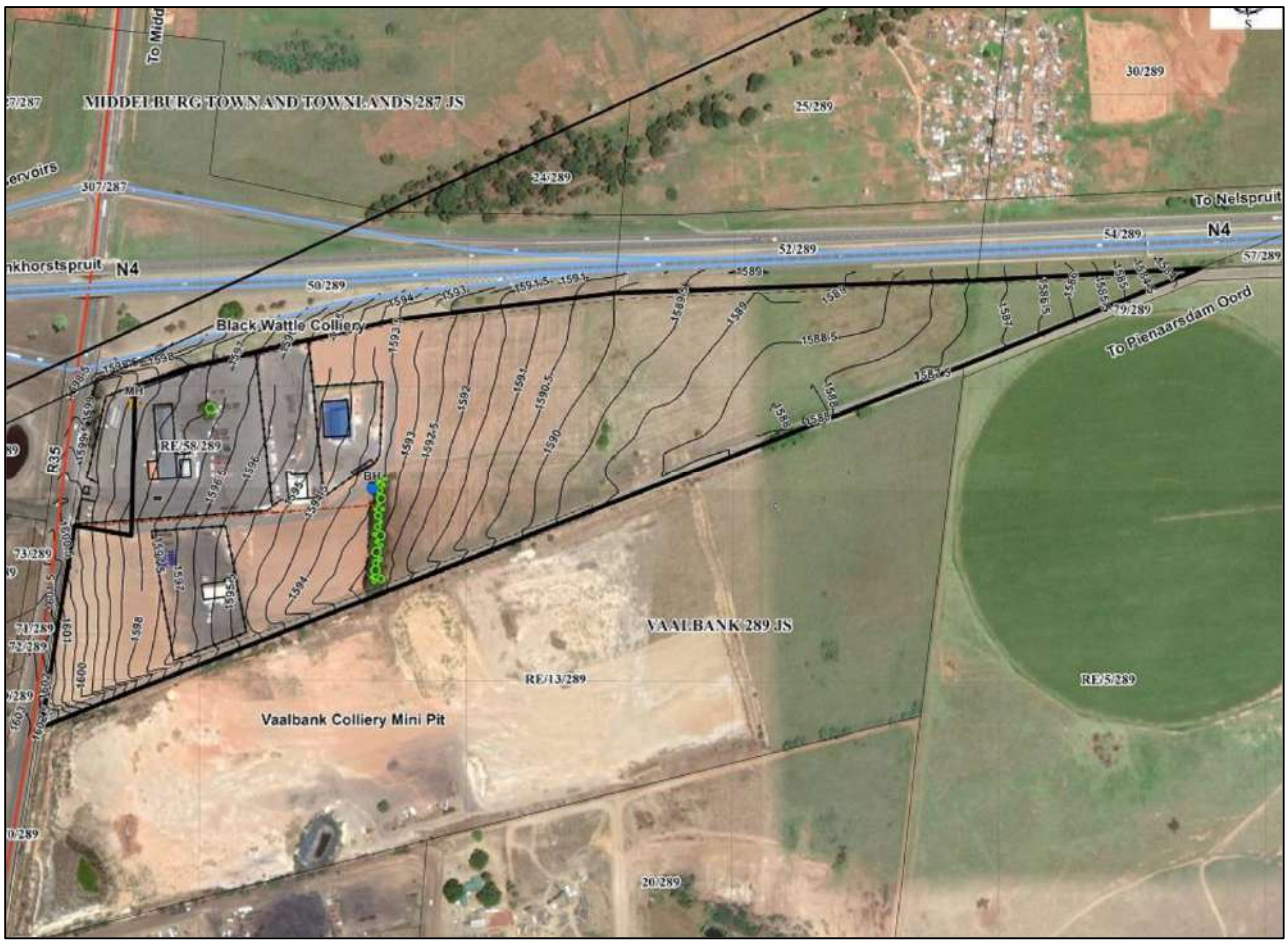


Figure 5.7: Contours of the proposed site (taken from Hansmeyer, 2020)

5.6 Soil

An agricultural agro-ecosystem specialist assessment of the site was undertaken by Mariné Pienaar of TerraAfrica Consult cc (referred to as Pienaar, 2020). A copy of the said report is provided in Appendix 5.

5.6.1 General

According to the AGIS Comprehensive Atlas of the Department of Agriculture, Forestry and Fisheries, the soils of the area are red, yellow and/or greyish soils with low to medium base status as indicated in Figure 5.8.

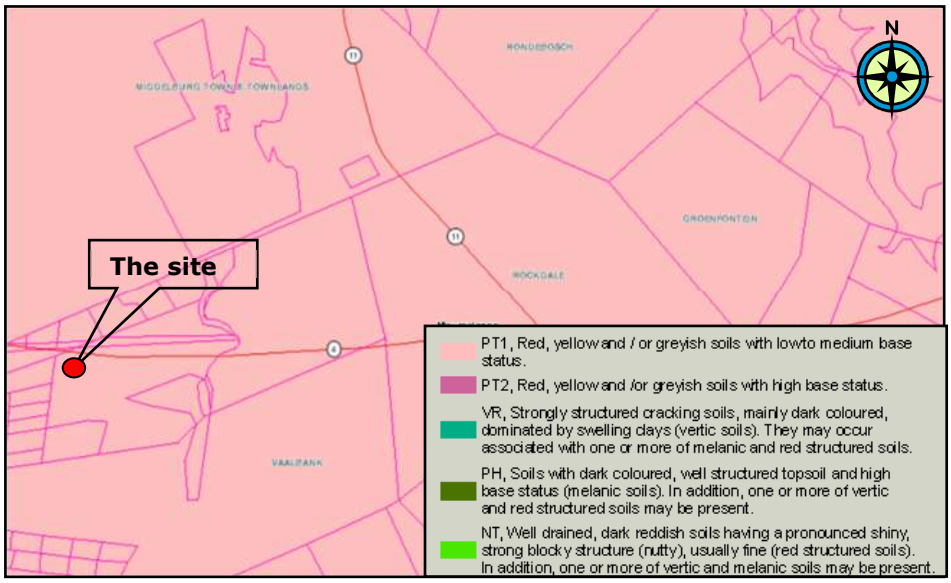


Figure 5.8: Generalized soil patterns (taken from Department of Agriculture, Forestry and Fisheries)

According to Pienaar (2020), a mixture of three different land capability classes (according to the land capability raster data layer (DAFF, 2017)) are present on site (Figure 5.9) namely: Class 08 (moderate); Class 09 (moderate-high and Class 10 (moderate-high).

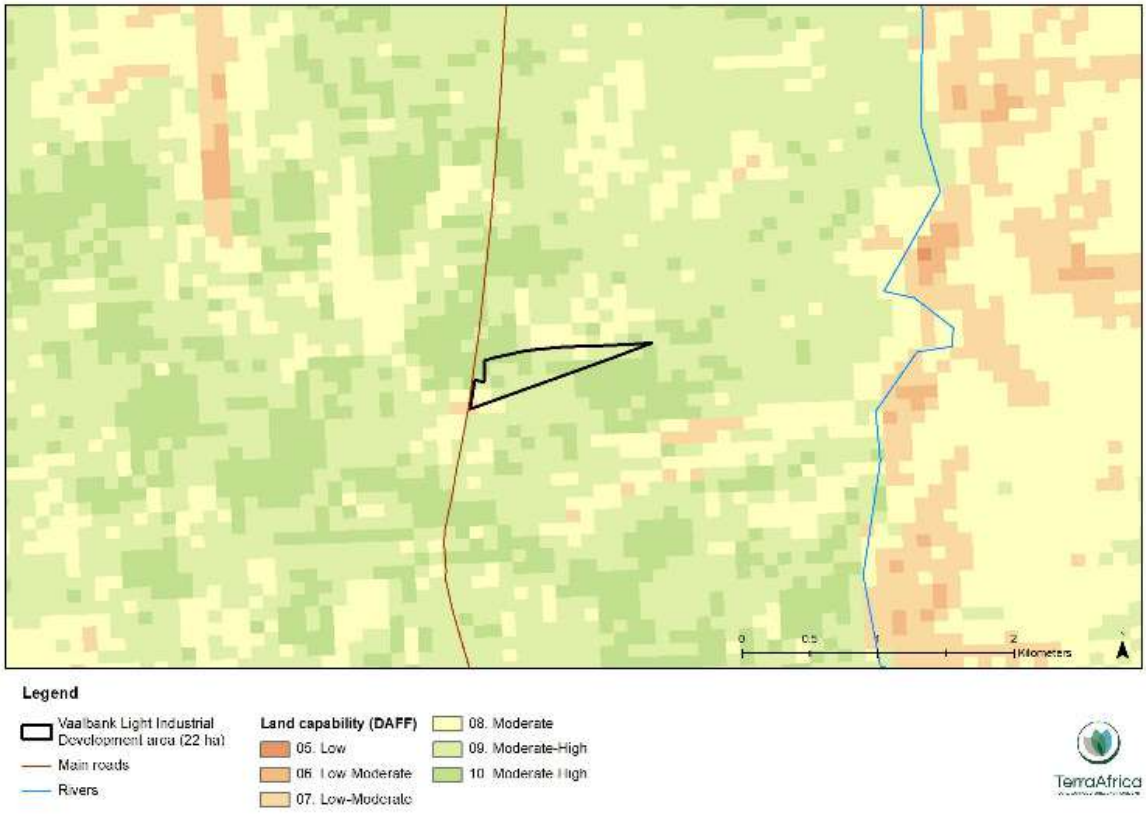


Figure 5.9: Land capability of the proposed site and immediate surrounding area (taken from Pienaar, 2020)

Pienaar (2020) indicated that the proposed site and immediate surrounding area have a grazing capacity of 5 ha/LSU. In terms of Small Stock Units (SSU), the area has a grazing capacity of 1.25 ha/SSU.

Only one land type is present on site namely Ba4 (Figure 5.10). According to the land type data sheet, Land Type Ba4 is underlain by shale and sandstone of the Ecca Group, Karoo Sequence.

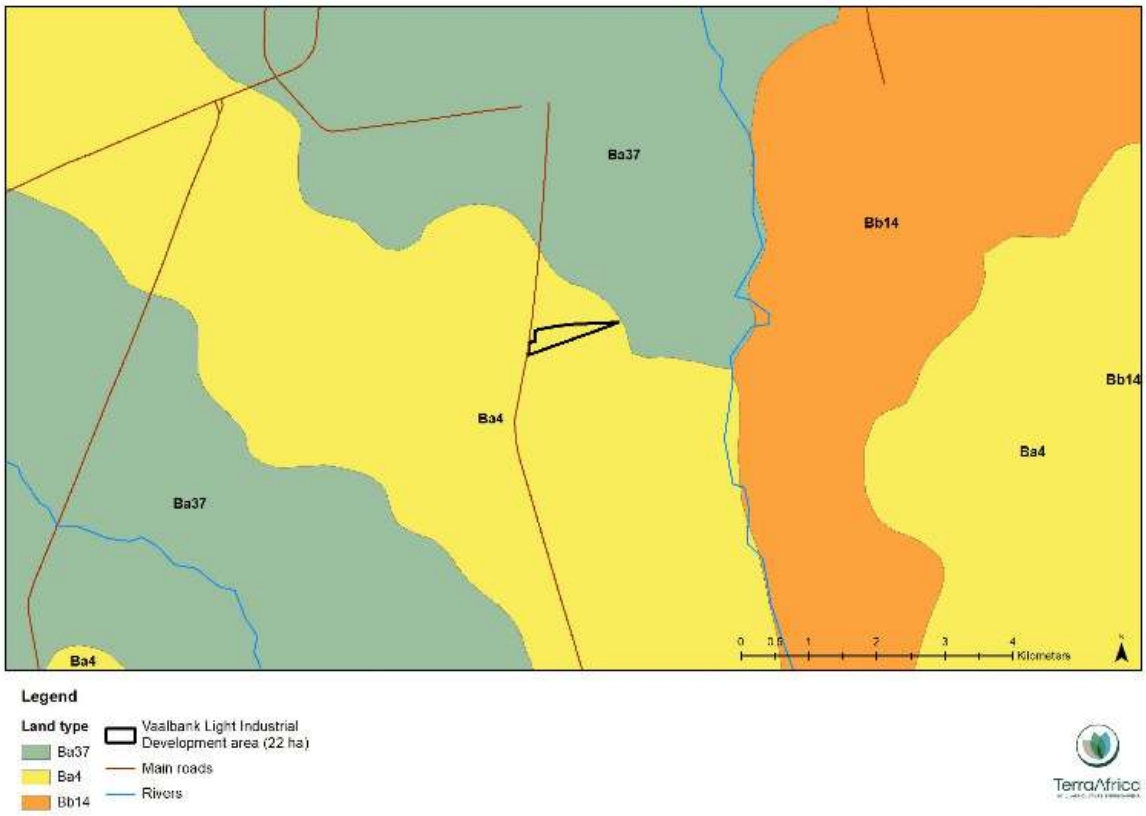


Figure 5.10: Land type of the proposed site (taken from Pienaar, 2020)

According to Pienaar (2020), the proposed site is located on a crest (Terrain unit 1) that transitions into Terrain unit 3 in the far eastern part of the site.

TERRAIN UNIT	LOCATION IN LANDSCAPE	SOILS
1	Higher lying flat plains; dominates landscape	35% deep Hutton, 10% Avalon, 10% Glencoe
3	Slight slopes (2 – 3%)	50% deep Hutton, 15% Avalon, 10% Longlands, other soils.

Further details regarding Land Type Ba4 are provided in Appendix 5.

5.6.2 Site specific soil conditions

Soil forms

Pienaar (2020) identified four different soil forms (Table 5.2; Figure 5.11) on site namely:

- Anthrosols;
- Hutton;
- Pinedene;

- Glencoe.

No hydromorphic soils (indicative of wetlands) were identified on site (Venter and Niemand, 2020).

Table 5.2: Soil forms and land capabilities identified on site (taken from Pienaar, 2020)

SOIL FORMS	DESCRIPTION	AREA (ha)	LAND CAPABILITY
Anthrosols (Figure 5.11; Photo 5.5)	Soils where the original soil horizons have been disturbed by human activities but have not undergone intentional transportation (Soil Classification Working Group, 2018). Soils that have undergone significant compaction are included in this definition. A number of impacts, e.g. disturbance of the surface horizons and soil compaction. This soil form is found where there are existing light industrial activities.	5.46 ha	Transformed (no food production capability)
	Recently cleared area. The entire topsoil horizon has been removed by earth-moving equipment and has been stored in berms around this area. The area is now considered suitable for grazing purposes (should the vegetation naturally re-establish in these areas).	0.47 ha	**Low-Moderate (Class 06)**
	TOTAL:	**5.93 ha**	
Anthrosol/ Hutton (Figure 5.11)	These two soil forms were grouped together as the main characteristics of the original soil profile (red apedal Hutton soil, deeper than 1.5m) are still evident. The profiles are significantly compacted (as observed through augering the profiles) as a result of vehicles traversing and parking in the area as well as trench digging. Topsoil horizon of these areas prone to soil particle removal through wind erosion as a result of the bare soil surfaces. May still have arable land capability (including rain-fed crop production) but only after compaction has been alleviated with deep-ripping techniques.	1.96 ha 2.61 ha	**Moderate (Class 08)**
	TOTAL:	**4.57 ha**	
Hutton (Figure 5.11)	Consists of orthic topsoil (0.35m thick) that covers a thick, red apedal horizon that reaches deeper than 1.5m. Highly suitable for arable agriculture, including rain-fed crop production.	3.66 ha	**Moderate-High (Class 10)**
	TOTAL:	**3.66 ha**	
Pinedene (Figure 5.11)	Consists of chromic (yellow-brown) topsoil that overlies yellow-brown apedal subsoil. Subsoil is underlain by gleyic material at depths between 1.2 – 1.5m. Soil profiles observed range in depth between 1.2 and 1.5m. Highly suitable for both irrigated and rainfed crop production.	2.14 ha	**Moderate-High (Class 10)**
	TOTAL:	**2.14 ha**	
Glencoe (Figure 5.11)	Consists of yellow-brown (chromic) structureless topsoil, overlying yellow-brown apedal subsoil that is limited in depth by a hard plinthic horizon. Deeper Glencoe soil profiles (between 1.0 and 1.4m) that is directly east of the Pinedene soils.	3.55 ha	**Moderate-High (Class 10)**
	Shallower Glencoe soils where the underlying hard plinthite is found at depths between 0.4 and 0.6m. Suitable for rain-fed crop production.	2.29 ha	**Moderate-High (Class 09)**
	TOTAL:	**5.84 ha**	

According to Pienaar (2020), the dominant soil textures in the area are sand to loamy sand. The sandy soil texture will be prone to compaction when earthworks are conducted during wet soil conditions (e.g. after a rainfall event). Further details are provided in Appendix 5.

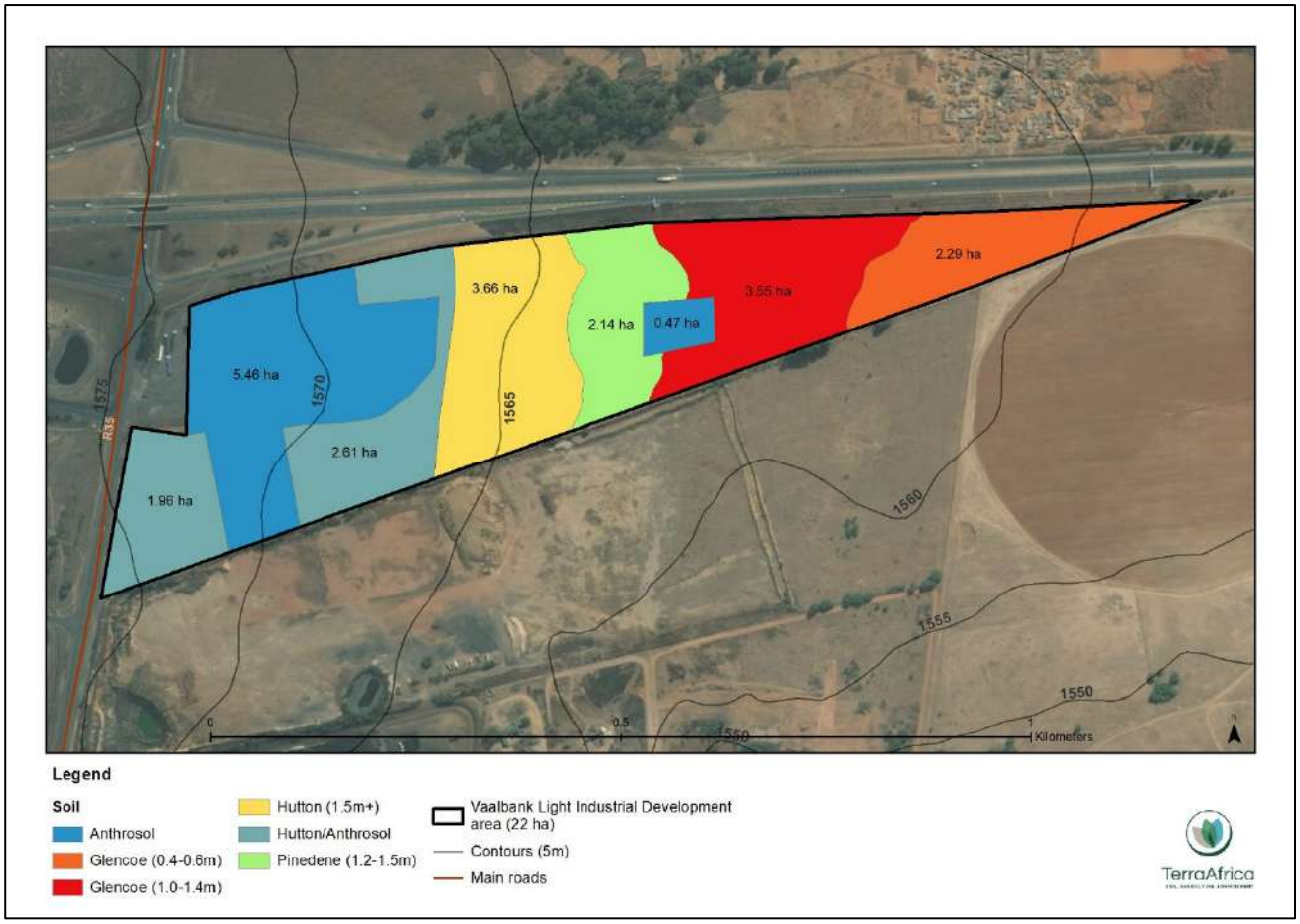


Figure 5.11: Soil classification of the proposed site (taken from Pienaar, 2020)

Land capability classification

Pienaar (2020) indicated that based on the soil classification data, the proposed site can be divided into four different land capability classes (in terms of its suitability for rainfed crop production) as indicated in Table 5.2 and Figure 5.12.

Photo 5.5: Recently cleared area with topsoil removed and stockpiled.

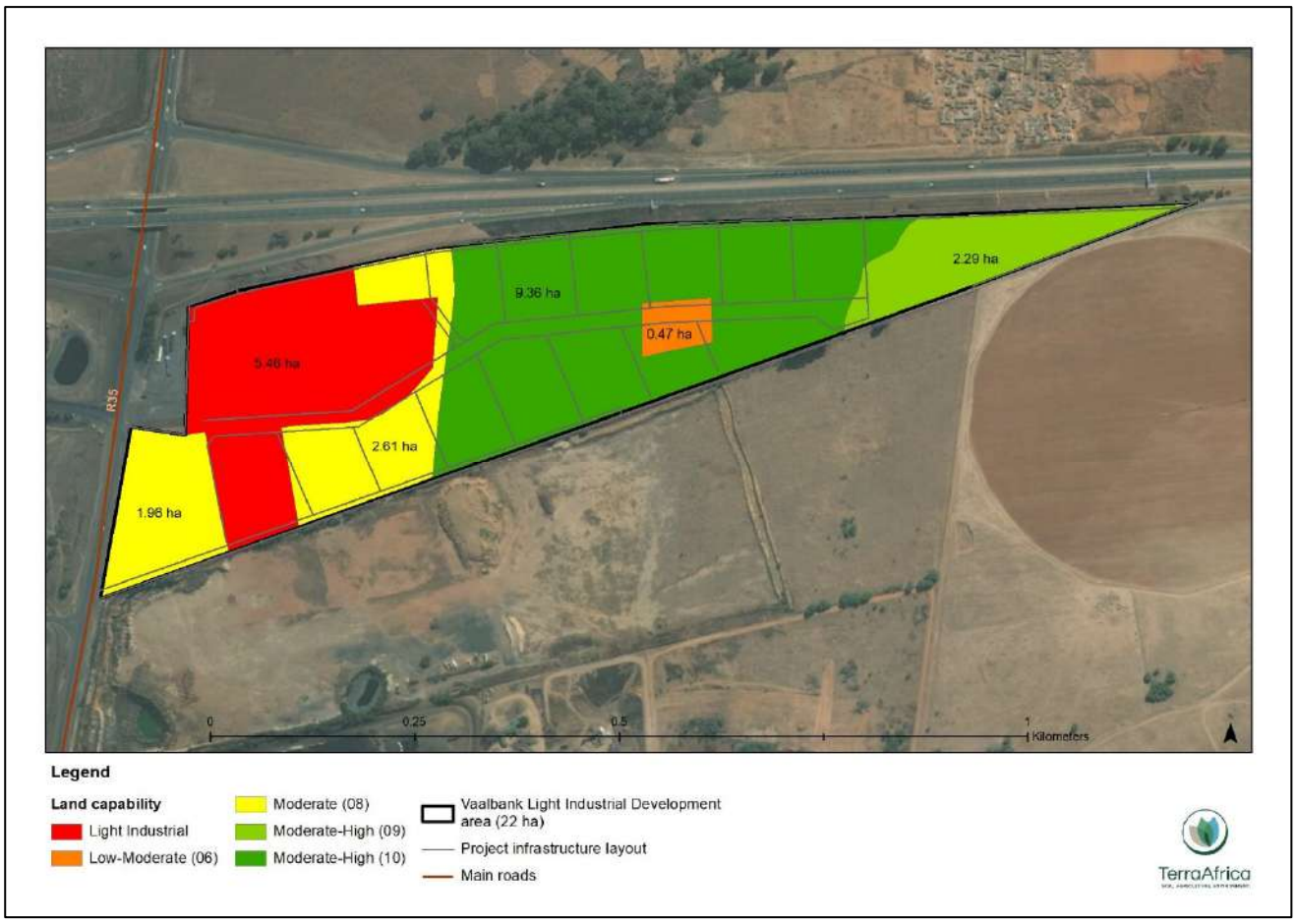


Figure 5.12: Land capability classification of the proposed site (taken from Pienaar, 2020)

Sensitivity Assessment

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a High sensitivity for the Agricultural Combined Sensitivity Theme (Figure 5.13). In view of this, an agricultural agro-ecosystem specialist assessment of the site was undertaken by Mariné Pienaar of TerraAfrica Consult cc (referred to as Pienaar, 2020). A copy of the said report is provided in Appendix 5.

Figure 5.13: Agricultural Combined Sensitivity Theme (as per the outcome of the National Screening Tool, 2017)

Pienaar (2020) indicated the following with regards to agricultural activities on site:

- No evidence of recent irrigated or rain-fed crop production;
- No evidence of livestock farming – will only be possible if there were fences along the very busy roads;
- The grazing capacity of 5ha/LSU would allow for 4 head of cattle or 16 head of sheep on the entire site which is not enough for an employment opportunity.

In terms of soil forms and land capability, Pienaar (2020) indicated the following:

- The proposed project site includes soil forms with high suitability for both rain-fed and irrigated crop production (Hutton, Pinedene and Glencoe forms). These soil forms have Moderate-High (Classes 9 and 10) land capability. Areas where deep Hutton soil profiles have already been impacted by the existing light industrial activities have a Moderate (Class 8) land capability. These areas (a total of 16.22 ha; Table 5.2) have a High Sensitivity to the proposed development.
- The remaining areas (5.78ha; Table 5.2) have already been affected by the existing light industrial activities as well as topsoil stripping and are considered to have Low sensitivity to the proposed development.

Analysis of historical aerial imagery shows that the area has not been actively used for crop farming the past nine years although the direction of previous tillage lines is visible in aerial imagery of 2011 (Figure 16 of Appendix 5). According to Venter and Niemand (2020), the vegetation present on site indicates crop fields have been fallow for more than 20 years. It is therefore concluded that the area has not been used for crop production for a period of between 9 and 20 years.

According to Pienaar (2020), the site has an overall **Medium Sensitivity** based on the site's land capabilities and absence of active agricultural production (over the last five years).

Conclusion
The proposed Light Industrial Park project area is located on natural soil forms (Hutton, Glencoe and Pinedene forms) as well as soils already affected by human activities (Anthrosols). The grazing capacity of the entire area is 5 (ha/LSU) and the site therefore has grazing available for 4 head of cattle. However, no evidence of current cattle (or other livestock) was observed on site.

The Light Industrial Park is considered a viable land use option for an area where it is evident that all agricultural activities ceased for many years and located in close proximity to other businesses (2.5 km south of Middelburg Mall). Pienaar (2020) indicated that the proposed development should be considered favourably subject to the implementation of soil management measures to prevent soil erosion and pollution.

5.7 Natural vegetation

5.7.1 Regional vegetation and conservation status

According to the 'The vegetation of South Africa, Lesotho and Swaziland', the study area falls within the Mesic Highveld Grassland Bioregion, specifically the Rand Highveld Grassland (veld type Gm11) (Mucina & Rutherford, 2006; Figure 5.14). The vegetation type was previously referred to by Low and Rebelo (1998) as Moist Sandy Highveld Grassland (38) and Rocky Highveld Grassland (34) and by Acocks (1953) as Bankenveld (61).

This grassland is found at an altitude of 1 300 metres above mean sea level (mamsl) to 1 635 mamsl in areas between rocky ridges from Pretoria to eMalahleni (Witbank). It also extends onto ridges in the Stoffberg and Roossenekal regions as well as west of Krugersdorp.

This vegetation type is species-rich and comprises wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes. The most common grasses on the plains belong to the genera *Themeda, Eragrostis, Heteropogon* and *Elionurus*. A high diversity of herbs, many of which belong to the *Asteraceae* family, is also a typical feature. Rocky hills and ridges carry sparse woodlands with *Protea caffra* subsp. *caffra, Acacia caffra* and *Celtis africana*, accompanied by a rich suite of shrubs among which the genus *Rhus* is most prominent.

Almost half of the Rand Highveld Grassland has already been transformed by cultivation, urbanisation, plantations and dams. This vegetation type has been afforded the status of endangered with a conservation target of 24%. Only approximately 1% of this vegetation type is currently conserved.

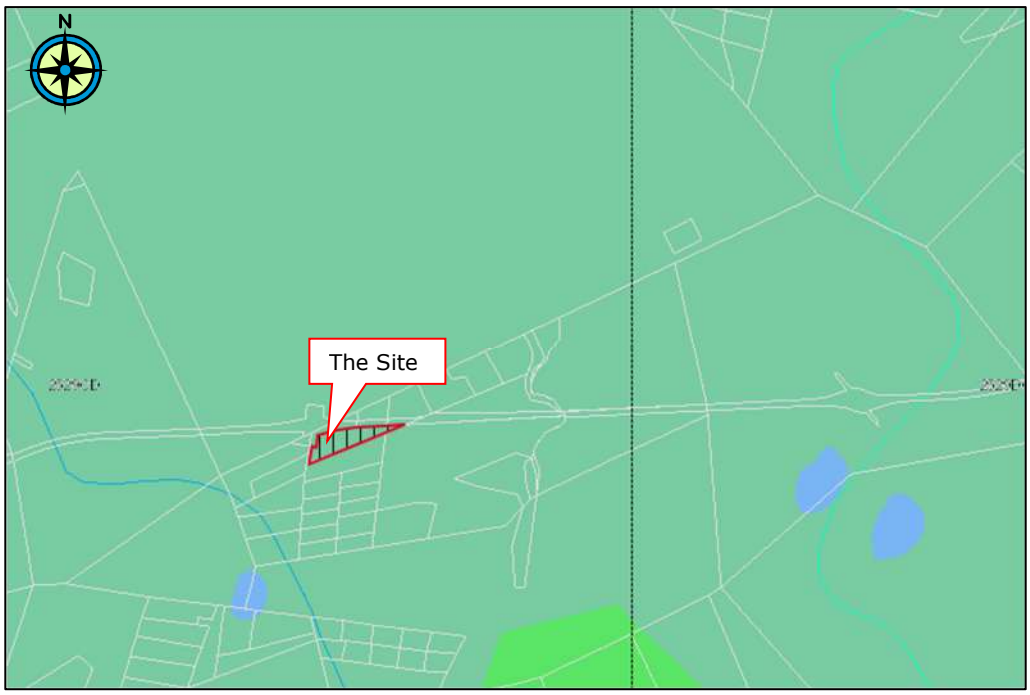


Figure 5.14: Vegetation type (taken from Mucina and Rutherford, 2006)

The National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), lists this vegetation type as **Vulnerable**.

Vulnerable (VU) ecosystems - being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems.

The stated purpose of listing 'threatened ecosystems' is primarily to reduce the rate of ecosystem degradation and species extinction.

Mpumalanga Biodiversity Sector Plan (MBSP, 2013) is a biodiversity planning tool that provides the most recent spatial biodiversity information to inform land-use and development planning (Lotter *et al*., 2014). The main mapping categories used in the MBSP (in descending order of importance in terms of meeting conservation targets), are:

- Protected Areas;
- Critical Biodiversity Areas (Irreplaceable and Optimal);
- Ecological Support Areas;
- Other Natural Areas;
- Modified (Heavily Modified and Moderately Modified: old lands).

This plan is also used to determine whether or not Listing Notice 3 of the Environmental Impact Assessment Regulations, 2014 (as amended) is triggered.

According to the MBSP (2013), the site is classified as **Heavily Modified, Moderately Modified, Old Lands, Other Natural Areas** (Figure 5.15). The site is however, located adjacent to a Protected Area (Figure 5.15) and falls within the Ecological Support Area (ESA) buffer zone of the said protected area.

The Vaalbank Private Nature Reserve (435.627 ha in extent) consists of a number of properties (including Pienaardam Leisure Resort, various small holdings, etc.) and was proclaimed in 1961. Pienaardam Leisure Resort is managed as a recreational area but agricultural activities also take place here (see Section 5.3.6).

In the Mpumalanga Biodiversity Sector Plan (2013), a 'Protected Area' (PA) is defined as:

> *Those areas that are already proclaimed under some legislation, including stewardship sites.*

According to the MBSP Land-Use Guideline (2013), these areas are managed primarily for biodiversity conservation. The management of PAs is provided for in laws and regulations at national and provincial level and as such requires a formally approved management plan. The required management plan must identify allowable activities, uses and developments and allocate them to appropriate zones. The plan must also deal with policy and implementation issues, time-frames, staffing, performance criteria, budgets, capacity building, resource use and other social and economic opportunities, including contractual and co-management arrangements. All operational aspects of managing PAs are subject to their main purpose, that of protecting and maintaining biodiversity.

The Vaalbank Private Nature Reserve is however not managed as such and currently a number of activities take place within this so-called private nature reserve. No information regarding de-proclamation of the nature reserve could be found.

Based on the above-mentioned, the proposed project however, does not trigger any listed activities in Listing Notice 3 of the EIA Regulations, 2014 (as amended).

Figure 5.15: Terrestrial biodiversity assessment of the Mpumalanga Biodiversity Sector Plan, 2013

5.7.2 On site vegetation

A vegetation survey was undertaken by I. Venter of Kyllinga Consulting (hereafter referred to as Venter and Niemand, 2020) as part of the overall ecological assessment. A copy of the report is provided in Appendix 6 and should be consulted with regards to methodology used.

Venter and Niemand (2020) identified three (3) main vegetation units on site with a number of sub-units as indicated in Table 5.3 and Figure 5.16. Approximately 45% (c. 10ha) of the site was historically ploughed and is currently represented by secondary grassland or grassland that is at an early successional stage. Some of these modified areas (23% of the study site) were subsequently converted to pastures consisting of *Digitaria eriantha* or *Paspalum notatum*.

Table 5.3: Vegetation units identified (taken from Venter and Niemand, 2020)

VEGETATION UNIT	VEGETATION SUB-UNIT	SIZE (ha)	%	SIZE (ha)
Bare areas and buildings	Bare areas	4.43	20	10.72
	Development	6.29	28	
Transformed	Old gardens	1.16	5	1.48
	Weedy	0.32	1	
Planted pasture (secondary grassland) (Photo 5.6)	Old field	4.68	21	9.95
	Digitaria dominated	0.96	4	
	Paspalum and *Digitaria* dominated	1.78	8	
	Paspalum dominated	2.53	11	
TOTAL AREA (ha):		**22.15ha**		**22.15ha**

Venter and Niemand (2020) indicated that no wetlands were identified on site. Some ponding does take place in areas (e.g. where shallow canals direct runoff away from the development, excavations in weedy areas) but these areas do not represent wetland conditions. In addition, no hydromorphic soils were identified on site.

The species present in the identified vegetation units are common and widespread and of little conservation importance. A total of 80 plant species (including 20 alien plant species) were recorded on site by Venter and Niemand (2020) – please refer to Table 2 of Appendix 6 for further details.

Photo 5.6: Planted pastures

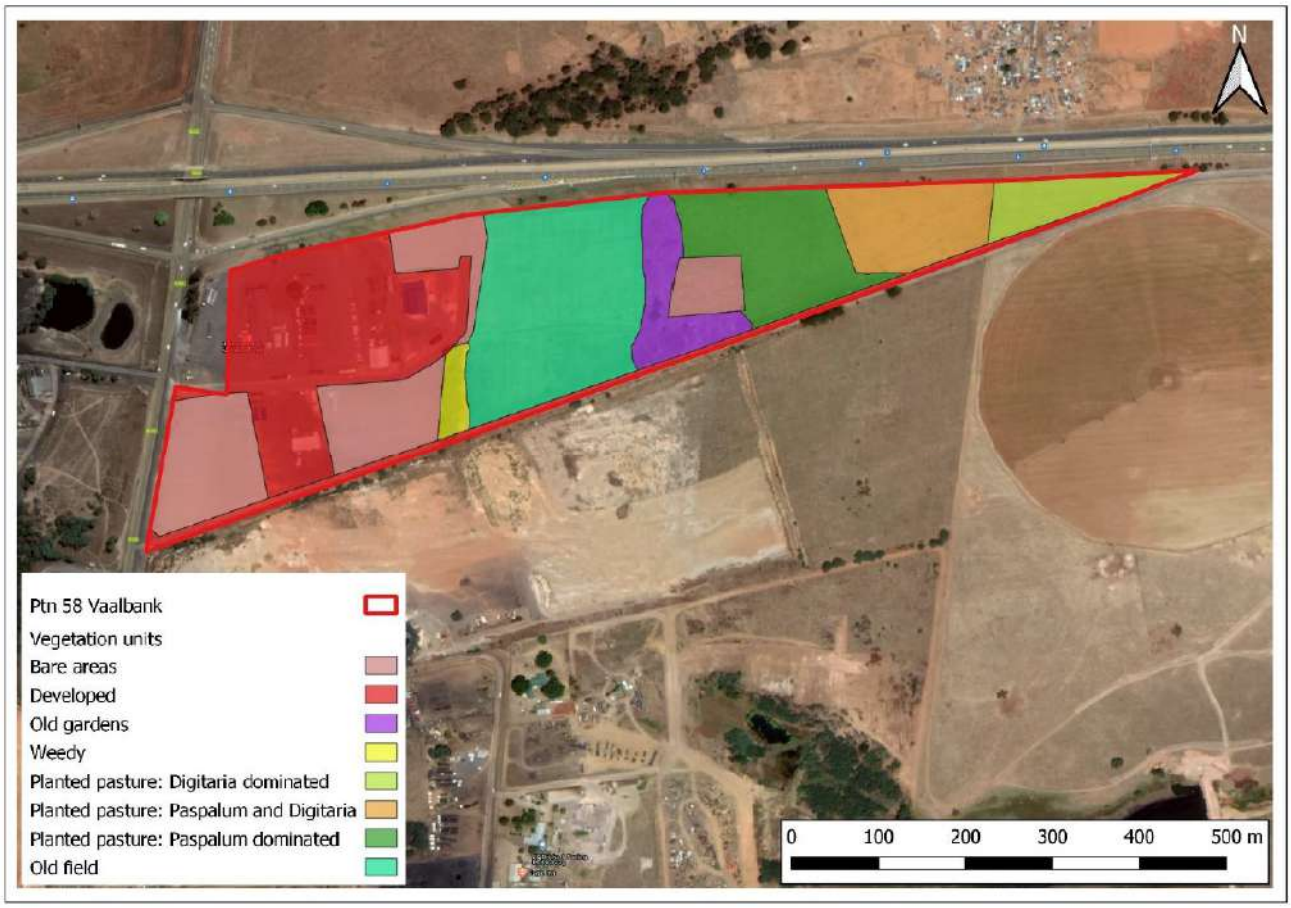


Figure 5.16: Vegetation units identified on site (taken from Venter and Niemand, 2020)

Bare areas and buildings vegetation unit (Table 5.3; Figure 5.16)
According to Venter and Niemand (2020), the bare areas and building vegetation unit is completely devoid of vegetation and therefore does not have any significance. This vegetation unit has a **Very Low Sensitivity**.

Transformed vegetation unit (Table 5.3; Figure 5.16)
The transformed vegetation unit (Table 5.3) consists of an Old garden (where the old farmstead was located) and Weedy areas. The dominant vegetation is alien and weedy and includes a number of fruit trees, extensive kikuyu (*Pennisetum clandestinum*), and a large clump of Spanish Reed (*Arundo donax*).

Both of these sub-vegetation units are highly disturbed and no longer resemble the Rand Highveld Grassland vegetation type since it is almost completely transformed to weedy and invasive species (see Table 2 of Appendix 5). This vegetation unit is highly transformed and has a **Low Sensitivity**.

Planted pasture vegetation unit (Table 5.3; Figure 5.16)
This vegetation unit consists of 4 sub-vegetation units as indicated in Table 5.3 and were cultivated in the past.

The Old field vegetation unit in the western portion of the site (Figure 5.16) was cultivated in the past. A secondary grassland (in the early stages of succession) is present that consists of a mix of vegetation which resembles vegetation typical of a cultivated area that was left fallow for several years

(likely more than 20 years). The species composition consists of a mix of common grass species, with a very low diversity of forb species (see Table 2 of Appendix 6). Although some superficial similarity to the Rand Highveld Grassland vegetation type exists, this vegetation type lacks the high species diversity (especially for forbs and geophytes) that are typically associated with primary Rand Highveld Grassland.

According to Venter and Niemand (2020), the species diversity in this vegetation unit is higher (see Table 2 of Appendix 6) than those in the other 3 vegetation units (where *Paspalum* or *Digitaria* dominates). The species diversity in all 4 vegetation units is however low (see Table 2 of Appendix 6).

Venter and Niemand (2020) indicated the remaining vegetation in the Planted Pasture vegetation unit is of **Moderate Sensitivity**.

5.7.3 Plant Species of Conservation Concern

The term 'Species of Conservation Concern' refers to the IUCN threatened and Near Threatened categories as well as the South African Red List categories (i.e. Critically Rare, Rare and Declining).

Venter and Niemand (2020) indicated that no threatened plant species were observed during the site visit and that none are expected on site.

Table 5.4 provides an indication of Species of Conservation Concern that could potentially occur in the area. Venter and Niemand (2020) indicated that no habitat is present for these species on site (Table 5.4) and that it is highly unlikely that any of these species will be present on site or can utilize the site as an ecological corridor.

Table 5.4: Species of Conservation Concern expected in the greater area (taken from Venter and Niemand, 2020)

Latin Name	Status	Habitat	Habitat on site
Anacampseros subnuda lubbersii	Vulnerable (VU)	Rand Highveld Grassland and Loskop Mountain Bushveld in Middelburg and Witbank area. On rhyolite boulders.	NO
Brachycorythis conica subsp. transvaalensis	Critically endangered (CR)	Short, open grassland or wooded grassland, on sandy gravel overlying dolomite or quartzite. Altitude of 1 000-1 705 m.	NO
Dioscorea sylvatica	Vulnerable (VU)	Wooded and relatively mesic places. Coastal bush, moister bushveld areas and wooded mountain kloofs.	NO
Frithia humilis	Endangered (EN)	Very shallow soils derived from coarse material from the Irrigasie formation, Ecca Group.	NO
Nerine gracilis	Vulnerable (VU)	Damp areas in undulating grassland	NO

5.7.4 Protected plant species

In addition to the IUCN categories, the following legislation affords protected status to selected indigenous plant species:

- National Forests Act (Act 84 of 1998),
- NEMA Biodiversity Act (Act 10 of 2004, as amended in 2007), and

- Mpumalanga Nature Conservation Act (No.10 of 1998).

National Forests Act (Act 84 of 1998)

The National Forests Act lists 47 tree species that may not be removed or damaged without a license from the National Department of Agriculture.

None of the 47 tree species listed in Schedule A of this Act occur on site or its immediate surroundings.

NEMA Biodiversity Act (Act 10 of 2004, as amended in 2007)

The intention of the Biodiversity Act is to protect plant species (e.g. cycads, yellow arum lily, protea, etc.) that are directly threatened in terms of their utilisation. The destruction, collection or trading of any species listed in this Act requires a permit.

No plant species listed in the NEMA Biodiversity Act were noted on site.

Mpumalanga Nature Conservation Act (No.10 of 1998)

A number of plant species are protected in the Mpumalanga Province under the Mpumalanga Nature Conservation Act, whether they are considered to be threatened or not. This includes, but is not limited to, the following common names: ferns, flame lilies, christmas bells, pineapple flowers, clivia, nerine, crinum, ground lily, fire lily, irises, all orchids. A permit has to be obtained prior to their removal.

Venter and Niemand (2020) indicated that numerous individuals of the orchid species, *Habenaria epipactidea*, are present in the eastern portion of the site (i.e. in areas dominated by *Paspalum* or *Digitaria*). This species is common and widespread. However, all orchid species area protected under the Mpumalanga Nature Conservation Act. Venter and Niemand (2020) recommended the relocation of the species on site (i.e. relocate to secondary grassland, not to primary grassland) rather than excluding development from the site.

5.7.5 Invasive species

A number of plant species are listed as alien invasive species in terms of the Alien Invasive Species (AIS) Regulations, as defined in the National Environmental Management Biodiversity Act (Act no. 10 of 2014). The AIS regulations place each declared alien invasive plant species into one of four categories and stipulates measures for the eradication of plants in each of the four categories.

Venter and Niemand (2020) recorded a total of 7 invasive species on site during the site visit as indicated in Table 5.5. These species will have to be controlled on site during the construction and operational phases. Additional disturbances on site may result in additional species encroaching into the site.

Table 5.5: Invasive species recorded on site during the site visit (taken from Venter and Niemand, 2020)

SPECIES	GROWTH FORM	ALIEN/INVASIVE	VEGETATION UNITS		
			OLD FIELD	OLD GARDEN	WEEDY
Arundo donax (Spanish reed)	Grass	Category 1b		X	
Datura ferox	Shrub	Category 1b	X	X	X

SPECIES	GROWTH FORM	ALIEN/INVASIVE	VEGETATION UNITS		
			OLD FIELD	OLD GARDEN	WEEDY
Datura stramonium (thorn apple)	Shrub	Category 1b		X	
Morus alba	Tree	Category 3		X	
Pinus patula (pine)	Tree	Category 2			
Verbena bonariensis	Forb	Category 1b		X	
Verbena braziliensis	Forb	Category 1b		X	

- *"Category 1a: Invasive species which must be combatted and eradicated. Any form of trade or planting is strictly prohibited.*
- *Category 1b: Invasive species which must be controlled and wherever possible, removed and destroyed. Any form of trade or planting is strictly prohibited.*
- *Category 2: Invasive species, or species deemed to be potentially invasive, in that a permit is required to carry out a restricted activity. Category 2 species include commercially important species such as pine, wattle and gum trees. Plants in riparian areas are Category 1b.*
- *Category 3: Invasive species which may remain in prescribed areas or provinces. Further planting, propagation or trade, is however prohibited. Plants in riparian areas are Category 1b."*

Venter and Niemand (2020) recorded *Arundo donax* (Spanish reed; Table 5.5) on site. This species is often confused with indigenous reed species including *Phragmites australis* (an obligate wetland species). Spanish reed is not an obligate wetland species. It is an indicator of disturbance.

5.7.6 Sensitivity Assessment

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced the following sensitivities:

- Plant species theme: **Medium** sensitivity due to the possible presence of five species.
- Terrestrial biodiversity theme: **Very high** sensitivity
    - Vulnerable ecosystem;
    - Focus area for land-based protected areas expansion;
    - Vaalbank Private Nature Reserve.

Plant species theme:

The vegetation of the site is modified to transformed, with very low species diversity. Venter and Niemand (2020) indicated the site sensitivity for plant species as **Low** (and not Medium as indicated in the Screening Report) due to the highly modified state of the site vegetation (Table 5.3), the low species diversity and the absence of habitat for the threatened species (Table 5.4).

Terrestrial biodiversity theme:

The site falls within the Rand Highveld Grassland vegetation type, which is a Vulnerable vegetation type. All portions of primary Rand Highveld Grassland (including areas affected by high grazing pressure) should therefore be considered to be of High conservation importance. The site has been cultivated in the past and the vegetation no longer represents the Rand Highveld Grassland vegetation type. The species diversity in the vegetation unit is very low. The Rand Highveld Grassland vegetation unit has a high species diversity, especially of forbs and geophytes.

The diversity of species across all units are very low, including grass and forb species and no geophytes were observed on site. The normal ecological drivers needed to sustain heathy grassland is absent from this portion, likely as a result of the small size of the grassland and the isolation from other grassland areas. An appropriate grazing and fire regime will result in improvement of the

grassland, but this is highly impractical on this portion, especially given the poor ecological connectivity of the site. With appropriate grazing and fire the grassland on site is still unlikely to return to a status representing primary Rand Highveld Grassland. Due to the modification on site, the remaining vegetation in the Planted Pasture vegetation unit is of moderate sensitivity. The other units, including the existing development and bare soil, as well as the transformed vegetation is of low sensitivity.

The eastern portion of the site is located in the 500m buffer zone of the Vaalbank Private Nature Reserve indicated in the Mpumalanga Biodiversity Sector Plan (Figure 5.15). This is likely why it is the focus area for land based protected area expansion. Due to the level of disturbance on site, poor ecological connectivity of the site and the existing light industrial developments on site, this site is not considered the best choice for expansion of the Vaalbank Private Nature Reserve. As previously stated, this area is also not currently managed as a protected area, but consist of the Pienaardam Leisure Resort and various smallholdings. The site is therefore considered to be of low biodiversity sensitivity.

5.8 Animal life

5.8.1 Regional conservation status

According to the MBSP (2013), the site is classified as **Heavily Modified, Moderately Modified, Old Lands, Other Natural Areas** (Figure 5.15). The site is however, located adjacent to a Protected Area (Figure 5.15) and falls within the Ecological Support Area (ESA) buffer zone of the said protected area.

The site is also classified as **Heavily Modified** with a few areas designated as Other Natural Areas in terms of the Freshwater Biodiversity Assessment (Figure 5.17).

It should be noted that the MBSP freshwater assessment includes information obtained from the National Freshwater Ecosystem Priority Areas (NFEPA) and threatened freshwater ecosystems databases (National Biodiversity Assessment 2011).

No Critical Biodiversity Areas (CBA's) for aquatic species or Ecological Support Areas (ESA's) for fish are present on or near the site (Figure 5.17).

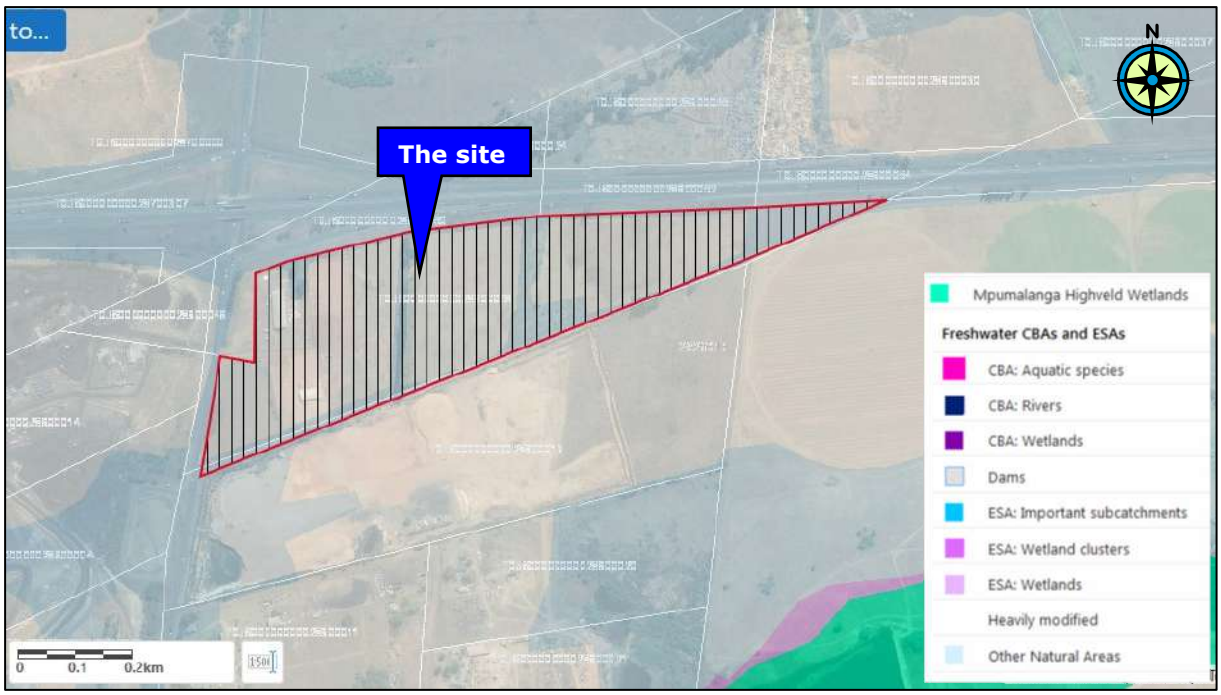


Figure 5.17: Freshwater biodiversity assessment of the Mpumalanga Biodiversity Sector Plan, 2013

A faunal survey was undertaken by Lukas Niemand of Pachnoda Consulting (hereafter referred to as Venter and Niemand, 2020) as part of the overall ecological assessment. A copy of the report is provided in Appendix 6 and should be consulted with regards to methodology used.

5.8.2 Mammals

5.8.2.1 Overview and taxonomic diversity

A total of 45 mammal species have been recorded in the study area (2529CD and 2529DC; *sensu* MammalMap) (Table 5 of Appendix 6).

In view of the poor ecological condition and past agricultural activities on site, only approximately nine (20 %) of these species have a high probability of occurrence (Venter and Niemand, 2020). Another seven mammal species have a moderate probability of occurrence, since under natural conditions (when habitat types are untransformed), these species are widespread in the area but peripheral and uncommon in secondary habitat. These latter species are hence regarded as occasional visitors on the study site (Table 5 of Appendix 6).

Approximately 29 (64 %) of the 45 species that occur in the region have a low probability of occurrence on site and are either absent (due to the absence of suitable habitat) or are highly irregular visitors owing to absence of optimal habitat (Table 5 of Appendix 6).

Some of the species listed in Table 8 of Appendix 6 are probably no longer natural to the area, and were introduced as game species (mainly large bovine species such as Blesbok *Damaliscus pygargus phillipsi*), while one species, the House Mouse (*Mus musculus*) is alien (exotic) to the area and could also occur on site (i.e. developed areas).

5.8.2.2 Mammal richness in habitat units

Approximately 24 mammal species could occur on site. These include 16 of the 45 mammal species that have been recorded in the region (*sensu* MammalMap, and an additional eight species not recorded by MammalMap) (Table 6 of Appendix 6).

Of the 24 expected species, only 13 (54% of the expected richness) have a high likelihood of occurrence, of which only the Black-backed Jackal (Canis *mesomelas*) was observed (based on spoor) on site during the site visit. Widespread species (e.g. Highveld Mole-rat *Cryptomys cf. pretoriae,* Highveld Gerbil *Gerbilliscus brantsii* and African Savanna Hare *Lepus cf. victoriae*) that are generally common (thereby having a high frequency of occurrence) in similar habitat types were virtually absent on site during the site visit. It emphasises the general poor ecological condition of the habitat units on site.

5.8.2.3 Mammal taxa of conservation concern

According to Venter and Niemand (2020), the site has a low probability for Threatened and Near-threatened mammal species to be present, based on poor habitat suitability and structure. MammalMap lists seven mammal species of conservation concern which are known to be present in QDS 2529CD and 2529DC, all of which have a low probability of occurrence. These include two threatened (c. Oribi *Ourebia ourebi* and Leopard *Panthera pardalis*) and five near threatened mammal species (c. Brown Hyaena *Parahyaena brunnea*, South African Hedgehog *Atelerix frontalis*, Serval *Leptailurus serval*, Cape Clawless Otter *Aonyx capensis* and African Striped Weasel *Poecilogale albinucha*) (*sensu* Child *et al*., 2016). Table 5.6 provides an inventory of threatened and near threatened mammal species that are present in QDS 2529CD and 2529DC, and their probability of occurrence on the study site. In addition, the MPTA database holds zero records of threatened or near threatened mammal species for the Farm Vaalbank 289 JS.

Table 5.6: An inventory of mammal species of conservation concern that occur (taken from Venter and Niemand, 2020)

VERNACULAR NAME	SCIENTIFIC NAME	RED LIST	PREFERRED HABITAT	STATUS ON SITE
Oribi	*Ourebia ourebi*	Endangered	Untransformed mixed grassland on undulating topographies. A selective grazer, preferring both short and tall grassland at a "climax" successional state.	Unlikely to occur, suitable habitat absent. The nearest farms where this species is currently known from are: Elandspruit 291 JS (10.4 km NW of study sire and Kalbasfontein 284 JS (21km NW of study site).
Leopard	*Panthera pardus*	Vulnerable	Varied, although preferring topographically complex habitat (e.g. mountains). Highly adaptable and catholic in diet (from insects to large bovines). Occupies large home ranges on Highveld.	Vagrant to the study site. Habitat on study site is considered to be marginal. The study region is peripheral to the core distribution of this species.
Brown Hyaena	*Parahyaena brunnea*	Near Threatened	Varied, although preferring large and extensive land. A secretive scavenger occupying large home ranges.	Vagrant to the study site. Habitat on study site considered to be marginal. The nearest farm where this species is currently known from is: Mooifontein 285 JS (15km NW of study site).
South African Hedgehog	*Atelerix frontalis*	Near Threatened	Dry grassland and well maintained urban gardens where persecution by humans and feral animals is absent.	Low, probably absent. Historical tilling of the natural grassland units on the study site considered to have displaced this species. This species is currently known from Farm Zeekoeiwater 311 JS (19km WSW of study site) but is believed to be present on adjacent farms where suitable habitat occurs. The study region is also considered to be peripheral to the core distribution range of this species which is more numerous west of Emalahleni.
Serval	*Leptailurus serval*	Near Threatened	Mainly moist tall grassland bordering wetland features with a high prey base (mainly rodents).	An irregular foraging visitor or vagrant to the study site. Habitat on study site considered to be marginal.
Cape Clawless Otter	*Aonyx capensis*	Near Threatened	Pans, dams, rivers and streams, will also utilize storm water channels and man-made features during dispersal.	Unlikely to occur, suitable habitat absent
African Striped Weasel	*Poecilogale albinucha*	Near Threatened	Varied, although strong bias to moist and montane grassland. High prey base (mainly rodents) required.	Status on study site uncertain, probably absent due to poor ecological condition of grassland units and low prey base.

5.8.3 Amphibians

Fifteen (15) frog species are known to be sympatric to the study area (according to QDC 2529CD and adjacent grid 2529DC; Table 5.7).

Only three of these species have a high probability of occurrence on site based on their widespread distribution ranges and their ability to breed in temporary rain-filled depressions and roadside verges during high precipitation events. These include the Common Caco (*Cacosternum boettgeri*), Guttural Toad (*Sclerophrys gutturalis*) and Bubbling Kassina (*Kassina senegalensis*).

The remaining species include four species with a moderate probability of occurrence (habitat suitability is marginal), while eight species having a low probability of occurrence (owing to the absence of breeding habitat). The absence of prominent wetland features (e.g. dams, pans and seeps) explains the low expected amphibian diversity on site.

According to Minter et al. (2004), the amphibian richness on site is moderate (c. 11-20 species) with a very low prevalence of endemic species (c. 1 species, *Amietia delalandii*). Therefore, the study site is not considered as an important amphibian diversity hotspot.

Table 5.7: A list of amphibian/frog species known from recent observations (sensu FrogMap) and historical distributional records for the study site (2529CD and adjacent grid 2529DC) (taken from Venter and Niemand, 2020).

Family	Scientific Name	Common Name	Conservation Status	Probability of occurrence on study site
Bufonidae	*Schismaderma carens*	Red Toad	Least Concern	Low (breeding habitat absent)
Bufonidae	*Sclerophrys capensis*	Raucous Toad	Least Concern	Moderate
Bufonidae	*Sclerophrys gutturalis*	Guttural Toad	Least Concern	High
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	Least Concern	High (during precipitation)
Hyperoliidae	*Semnodactylus wealii*	Rattling Frog	Least Concern	Low (probably absent)
Phrynobatrachidae	*Phrynobatrachus natalensis*	Snoring Puddle Frog	Least Concern	Low (probably absent)
Pipidae	*Xenopus laevis*	Common Platanna	Least Concern	Low (probably absent)
Ptychadenidae	*Ptychadena porosissima*	Striped Grass Frog	Least Concern	Low (probably absent)
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	Least Concern	Moderate to low
Pyxicephalidae	*Cacosternum boettgeri*	Common Caco	Least Concern	High (during precipitation)
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bull Frog	Near Threatened	Low (probably absent)
Pyxicephalidae	*Strongylopus fasciatus*	Striped Stream Frog	Least Concern	Low (probably absent)
Pyxicephalidae	*Tomopterna cryptotis*	Tremelo Sand Frog	Least Concern	Moderate
Pyxicephalidae	*Tomopterna natalensis*	Natal Sand Frog	Least Concern	Moderate
Pyxicephalidae	*Tomopterna tandyi*	Tandy's Sand Frog	Least Concern	Low (status uncertain - cryptic species)

The Giant Bullfrog (*Pyxicephalus adspersus*) is the only frog species of conservation concern which is known from QDS 2529CD and 2529DC in the region (Minter et al., 2004). Within QDS 2529CD (sympatric to the study site) it is known from a large pan on Farm Elandspruit 291 JS, which is located approximately 8.7 km west of the study site and also from Farm Rietfontein 286 JS which is located 10.7 km north of the study site (the locality is on the northern outskirts of Middelburg) (*sensu* MPTA database).

In general, the site is not considered to be an important breeding habitat for this species owing to the absence of suitable breeding habitat. In addition, the occurrence of this species on site is considered to be low since a large section of natural habitat was historically ploughed which would have disrupted or even induce mortalities to "aestivating" individuals (Venter and Niemand, 2020).

5.8.4 Reptiles

A total of 48 reptile taxa are known to be sympatric to the study area (according to QDC 2529CD and adjacent grid 2529DC; *sensu* Bates et al., 2014) (Table 9 of Appendix 6).

According to the habitat types present (and also when acknowledging the degraded ecological condition of the grassland units), the reptile richness on site is low (Bates *et al.,* 2014). Only 10 (20 %) of these species show a high probability of occurrence, while 14 species have a medium probability of occurrence and are regarded as uncommon to rare on the site. The remaining 24 species have low probabilities of occurrence. Most of the species with low probabilities of occurrences are marginal to the study area and have their distribution ranges centred in the Central Bushveld Bioregion (as opposed to the Grassland Biome) or are associated with rocky grassland and wetland habitat types that were absent on the study site.

The prominent species on site include the Rhombic Egg-eater (*Dasypeltis scabra*), Spotted Grass Snake (*Psammophylax rhombeatus*) and Speckled Rock Skink (*Trachylepis punctatissima*).

Reptile taxa of conservation concern

The near threatened Coppery Grass Lizard (*Chamaesaura aenea*) and Striped Harlequin Snake (*Homoroselaps dorsalis*) are known to be present in the study area. Both species are notoriously difficult to find and detect, which explains the low reporting rates obtained during the reptile atlas period (*sensu* ReptileMap). Both species have been recorded from QDS 2529CD although these records are old and were obtained during 1900 (probably from the Middelburg area; *sensu* MPTA database).

C. aenea occurs within fairly pristine grasslands and does not appear to tolerate any significant disturbances or habitat alterations. The national population of this species is scattered and appears to have experienced population declines over the last decade due to fragmentation and afforestation of its primary grassland habitat. It is also vulnerable towards veld fires and relies heavily on the presence of outcrops or rocky cover for protection against veld fires. However, it remains to be a very rare and unobtrusive species. For example, Whittington-Jones *et a*l. (2008) recorded only two specimens from Rietvlei Dam Nature Reserve in Gauteng over a period of ca. eight years. Based on the absence of suitable habitat on the study site, the probability that this species is present is low (it is probably absent).

Homoroselaps dorsalis is relatively widespread in South Africa but regarded to be rare in most parts of their geographic distribution. The population of *H. dorsalis* is highly fragmented and prone towards local extinction. Although not often encountered and mostly overlooked since it is often present underneath loose rocks and in termitaria. Based on the absence of suitable habitat on the study site, the probability that this species is present is low.

Please refer to Section 5.8.7 for more information regarding the occurrence of the Lobatse Hinged-back Tortoise (*Kinixys lobatsiana*) on site.

5.8.5 Avifauna (birds)

5.8.5.1 Species richness and composition

Approximately 94 bird species are expected to occur on site and immediate surroundings according to the available habitat units (Addendum B of Appendix 6). The expected richness was inferred from the South African Bird Atlas Project (SABAP1 & SABAP2)1 (Harrison et al., 1997; www.sabap2.org) and the presence of suitable habitat on site. This equates to 9.6 % of the approximate 9783 species listed for the southern African subregion4 (and approximately 10.9 % of the 856 species recorded within South Africa5). According to the SABAP2 database, the average number of species observed per pentad grid (with a minimum observation time of 2 hours) is approximately 49.7 species, with 25 species observed during the site visit. Therefore, it is clear that the observed richness is more than 50% lower than the mean derived for each card submitted on a pentad grid scale, thereby emphasising the poor species richness and degraded ecological condition of the habitat units on the study site.

In addition, the study site was also poorly represented by biome-restricted bird species (the Southern Bald Ibis *Geronticus calvus* may represent a rare to irregular foraging visitor to the area).

5.8.5.2 Dominance and general composition

An analysis of bird data generated from the point counts showed that the typical composition (the species with the highest frequency of occurrence) consists widespread of taxa. The majority of the composition consists of cryptic members of the Cisticolidae (cisticolas), granivores pertaining to the genera *Euplectes* (widowbirds), Passer (sparrows) and *Streptopelia* (doves) (Table 5.8). The typical composition is predominantly eurytopic and occurs in both natural untransformed as well as transformed habitat.

Table 5.8: The typical bird species (species with high frequency of occurrence) recorded on site (taken from Venter and Niemand, 2020).

Species	Average abundance	Consistency	% Contribution
Southern Red Bishop (*Euplectes progne*)	3.00	0.41	8.03
Cape Turtle dove (*S. capicola*)	0.75	0.41	5.37
Zitting Cisticola (*Cisticola juncidis*)	2.50	2.08	46.74
Cape Sparrow (*Passer melanurus*)	1.25	0.86	19.34
Red-eyed Dove (*Streptopelia semitorquata*)	1.00	0.89	15.56

The average bird richness per point count was low with 6.5 bird species recorded per count and rarely exceeding 10 species per count. The average

number of individuals is also low with 15.75 birds recorded per count (range=4-22).

5.8.5.3 Important Bird and Biodiversity Areas (IBAs)

The study site does not overlap with any Important Bird and Biodiversity Area as defined by Marnewick et al. (2015).

5.8.5.4 Bird species of conservation concern

Table 11 of Appendix 6 provides an overview of bird species of 'conservation concern' recorded in the study region, as well as those previously recorded in the area based on their known distribution range and the presence of suitable habitat (sensu SABAP1 and SABAP2).

According to Table 11 of Appendix 6, 19 threatened and near-threatened species are present on the study region according to recent (SABAP2) and historical (SABAP1) distribution records. The majority of these species are unlikely to be present on the study site owing to the absence of suitable habitat or the habitat on the study site does not meet their ecological requirements (e.g. the habitat on the study site is of poor ecological condition).

Of these 19 species, only the Lanner Falcon (*Falco biarmicus* - Vulnerable) was observed flying over the study site in a south-easterly direction towards the Vaalbank Private Nature Reserve (Figure 13 of Appendix 6). This species is not breeding on the site and is regarded as an occasional foraging visitor. It is unlikely that the proposed development will have a negative impact on this species, with specific reference to the poor habitat quality of the habitat units on the study site.

It is worth mentioning that the Southern Bald Ibis (*Geronticus calvus*) could also utilise the site during foraging bouts. However, this species is a widespread foraging visitor to the grassland patches in the area and is unlikely to roost or breed on the site (it roosts and breed colonially).

5.8.6 Conclusion

Based on the findings of the faunal (animal life) study, Venter and Niemand (2020) made the following conclusions:

- No habitat with a high conservation value was identified on site. The habitat types were either of moderate conservation value (represented by planted pastures) to low conservation value (represented by old fields, areas covered in weeds and old gardens).
- The overall faunal richness on site was low and provided habitat for a few widespread and generalist species. The poor faunal richness was the result of past disturbance regimes (e.g. tilling and ploughing) which resulted in modified and secondary grassland seres.
- The ecological connectivity of all regenerating and natural habitat types on site were severely constrained by nearby road networks and adjacent mining and agricultural activities, thereby limiting the dispersal of fauna species.
- The site hosts a low richness of mammal species with 24 species likely to occur, of which 13 species have high probability of occurrence. Widespread species (e.g. Highveld Mole-rat *Cryptomys cf. pretoriae,* Highveld Gerbil *Gerbilliscus brantsii* and African Savanna Hare *Lepus cf. victoriae*) that are generally common (thereby having a high frequency of occurrence) in similar habitat types were virtually absent on the study site.
- Wetland features were absent on site, which thereby contributed towards the low species richness and absence of facultative wetland mammal species.

- The probability for threatened and near threatened mammal species to occur on site is low.
- Fifteen (15) amphibian and 48 reptile species are known to be present in the study region, although only three frog species and 10 reptile species have a high probability of occurrence due to the availability of suitable habitat.
- Bird species richness was low with approximately 94 bird species that could occur on the study site and immediate surroundings. The typical bird composition comprised of widespread taxa (mainly granivores) which were predominantly eurytopic and occurs in both untransformed as well as transformed habitat.
- The only bird species of conservation concern observed on the study site is the Vulnerable Lanner Falcon (*Falco biarmicus*). It was observed flying over the site in a south-easterly direction towards the Vaalbank Private Nature Reserve. It was considered as an occasional foraging visitor to the site.

5.8.7 Sensitivity assessment

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a Medium sensitivity for the Animal Species Theme due to the possible presence of the following species:

- *Aloeides rossouwi* (Rossouw's Copper)
- Sensitive Species 13 (Lobatse Hinged-back Tortoise (*Kinixys lobatsiana*))

Rossouw's Copper is an Endangered butterfly (*sensu* Mecenero et al., 2013) and currently only known from two to five localities corresponding to two QDSs, namely 2529BB and 2529BD where it occurs on high altitude sandy grassland (also invariably interspersed with rocky gullies - a feature that is absent on the study site) in the Stoffberg mountain range, especially the southern parts of Stoffberg (Figure 14 of Appendix 6). At both these QDSs, its habitat corresponds to the Sekhukhune Montane Grassland vegetation Type (not Rand Highveld Grassland). There are also three other QDSs where this species possibly occurs although some of these remain questionable. These include De Berg and Verloren Vallei areas near Dullstroom (2530AC), the area above Waterval Boven (2530CB) and a questionable record from Limpopo Province in the Wolkberg - Strydompoort mountain range (2429BB) (Figure 14 of Appendix 6).

When considering that this species occurs in untransformed high-altitude grassland, and that the nearest known population is more than 50 km from the study site, it is highly doubtful that this species will be present on the study site (Venter and Niemand, 2020). In addition, the current ecological condition of the grassland patches on the study site is in a post-disturbed and secondary state, which also explained the poor representation of butterfly taxa on the site during the site visit when only two widespread species were observed (namely *Danaus chrysippus orientis* and *Eurema brigitta brigitta*). Therefore, based on the extant distribution range of *A. rossouwi* along with the degraded habitat quality of grassland on the study site, the probability for *A. rossouwi* to occur on the study site is very low (Venter and Niemand, 2020).

The **Lobatse Hinged-back Tortoise** (*Kinixys lobatsiana*) is Vulnerable (Hofmeyr & Boycott, 2018) and is near-endemic to South Africa and Botswana where it mainly occurs in bushveld areas in the Limpopo, Gauteng and marginally also northern Mpumalanga Provinces. It also occurs in the extreme south-eastern Botswana (e.g. at Lobatse, the type locality). In South Africa, its distribution range include three primary clusters, of which the largest is located in the bushveld regions of the Waterberg and associated mountain ranges, the

Bankenveld areas of Gauteng from Midrand and Centurion to Pretoria, the Magaliesberg and eastern Mpumalanga, as well as bushveld near Zeerust (Figure 15a of Appendix 6). It occurs primarily in rocky hills consisting of mixed thornveld (*Vachellia* and *Senegalia* Bushveld) and *Combretum* woodland. The presence of surface rock is a critical habitat feature for this species to survive fires and to "hibernate" during the austral winter. Its distribution does not appear to go further south than Emalahleni and Middelburg where bushveld habitat is replaced by grassland. Therefore, the probability for this species to occur on site is regarded as low, especially since the study site is mainly confined to grassland (in the absence of surface outcrops) which is also modified and of secondary ecological condition. However, a very old record of this species exists for QDS 2529CD and dates back to 1900 (Figure 15b). However, none was observed post-1900 from 2529CD, which provides motivation that this species is of low significance for the proposed project (Venter and Niemand, 2020).

5.9 Surface water

5.9.1 Catchment

The proposed site is located within the Upper Olifants Water Management Area (WMA) and more specifically the B12D quaternary catchment (Figure 5.18).

Figure 5.18: The proposed site in relation to the B12D quaternary catchment.

The table below provides more details regarding the B12D quaternary catchment.

Area (Ha)	Mean Annual Precipitation (mm)	Mean Annual Runoff (mm)	MAR as a % of MAP	Study area as % of the catchment
32 610	702.68	38.1	5.42	0.29

5.9.2 Floodline

No rivers, streams or other surface water environments are present on or near the site (Figure 5.1).

The closest river/stream is an unnamed tributary of the Vaalbankspruit, located ±700 m southeast of site, that flows into the Pienaardam, located in the Vaalbankspruit (Figure 5.18). The Vaalbankspruit drains towards the north to the Klein Olifants River (Figure 5.1).

The site is thus not affected by the 1:50 or 1:100 year floodlines.

5.9.3 Surface water runoff

The proposed site is located approximately 750m east of a local watershed (Hansmeyer, 2020). The site slopes towards the south east, towards a tributary of the Vaalbankspruit that flows into the Pienaardam (Figure 5.18).

According to Hansmeyer (2020), the east dipping topography (Figure 5.7) supports good drainage and ponding is unlikely. However, the cover soils are susceptible to erosion and a storm water management plan will have to be implemented (Hansmeyer, 2020).

The natural surface water runoff from the site has however, been impacted in terms of the activities already taking place on site and immediate surrounding area (Figure 5.3).

5.9.4 Wetlands

No wetland areas are indicated on site in the NFEPA database (Figure 5.19) or the latest NBA (2018) database (Figure 5.20).

The closest wetlands are present approximately 700m south east of the site (Figure 5.?).

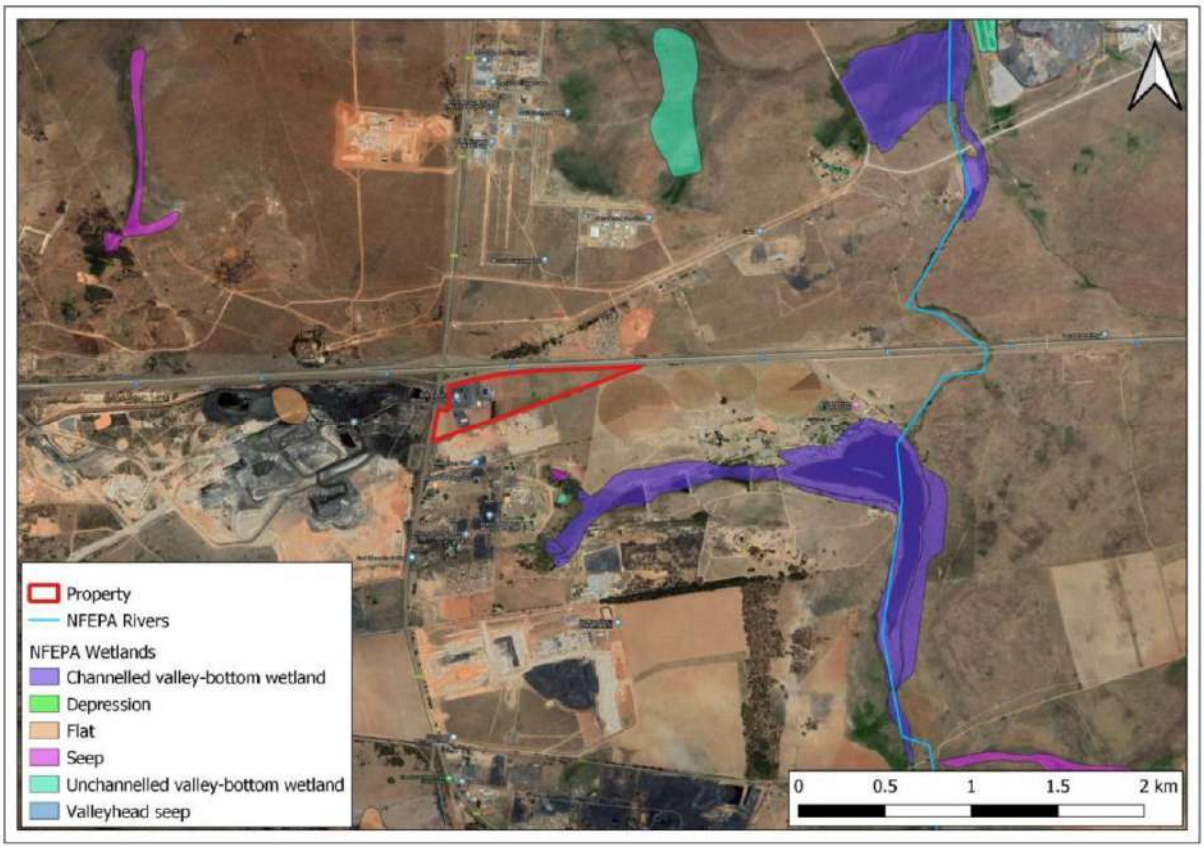


Figure 5.19: NFEPA wetlands located near the site (taken from Venter and Niemand, 2020)

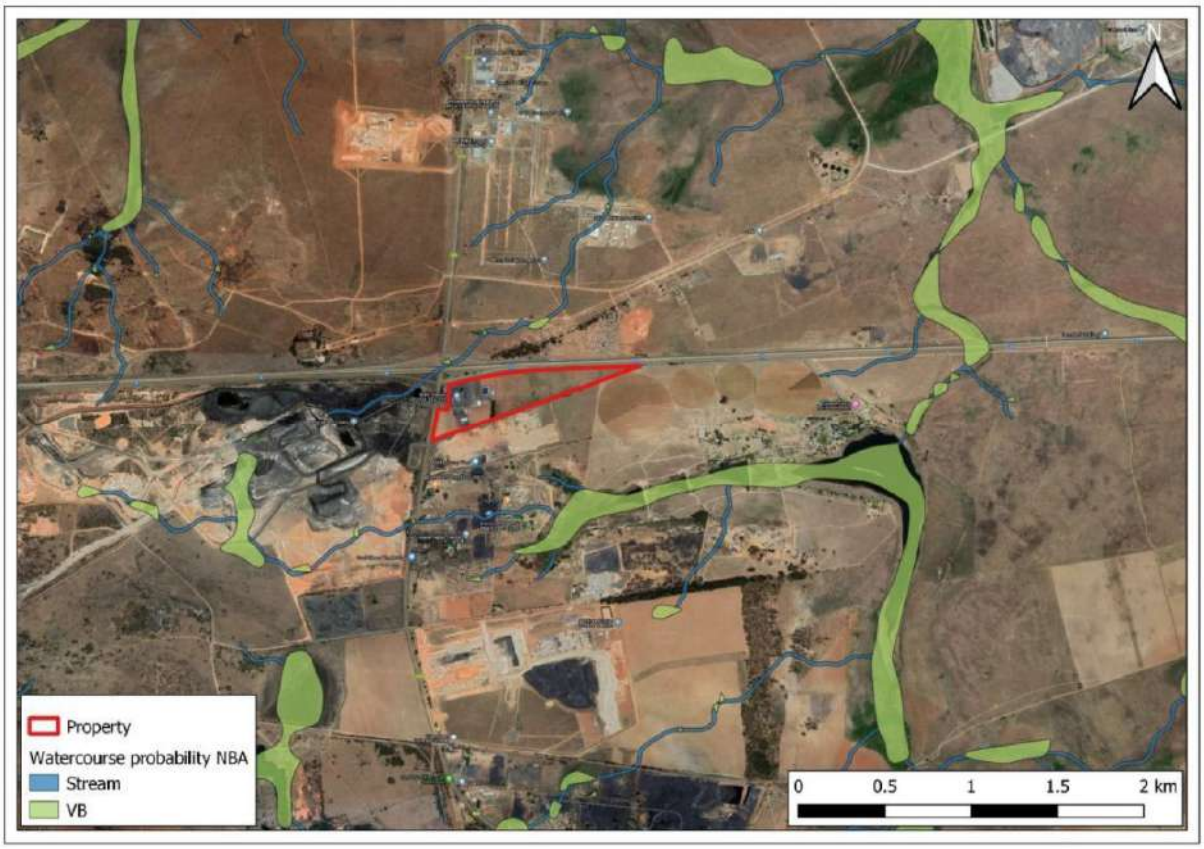


Figure 5.20: Watercourse probability according to the NBA (2018) database (taken from Venter and Niemand, 2020).

As indicated in Section 5.7.2, no wetlands were identified on site. Some ponding does take place in areas (e.g. where shallow canals direct runoff away from the development, excavations in weedy areas) but these areas do not represent wetland conditions. In addition, no hydromorphic soils were identified on site (Venter and Niemand, 2020).

Sensitivity assessment
The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a **Low** sensitivity for the Aquatic Biodiversity Theme, which is correct in view of no rivers, streams or wetlands being present on site (Figure 5.3) and no Critical Biodiversity Areas (CBA's) for aquatic species or Ecological Support Areas (ESA's) for fish are present on or near the site (Figure 5.17).

According to the MBSP Freshwater Biodiversity Assessment (2013), the proposed development site does NOT fall within an Ecological Support Area (ESA): Important subcatchment or Critical Biodiversity Area (Figure 5.17).

5.10 Groundwater

A reconnaissance investigation regarding the foundation conditions and groundwater potential of the site was undertaken by Paul Hansmeyer of Engeolab cc (referred to as Hansmeyer, 2020). A copy of the said report is provided in Appendix 4.

As indicated in Section 5.4, the onsite lithology comprises Vryheid sandstone underlain by Dwyka tillite deposited on rhyolite bedrock. The groundwater occurring in the Vryheid sediments, tillite and basement bedrock are controlled by fracturing, jointing and contact zones with dolerite intrusions.

According to Hansmeyer (2020), the geological succession can generally be assigned to the *d2* fractures class with yields up to 1,800l/h. Hansmeyer (2020) however, indicated that the onsite shallow aquifer(s) may yield much less than anticipated due to drainage into the adjacent open pit mine (Figure 5.3). Deeper boreholes into the basement rhyolite are expected to intersect higher yielding aquifers of the *d3* class with an expected yield range of 1,800l/h to 3.600l/h.

A borehole is present in approximately the middle of the site (Photo 5.7) and according to the applicant, is only used for emergency purposes.

Photo 5.7: The onsite borehole

It is anticipated that the groundwater quantity and quality of the site and immediate surrounding area could have been impacted in terms of mining activities taking place to the west (Black Wattle Colliery - Figure 5.4) and south of the site (abandoned, partly rehabilitated mine (Vaalbank Colliery Minipit) is present – Figure 5.4).

No rivers, streams or other surface water environments are present on or near the site (Figure 5.1). The closest river/stream is an unnamed tributary of the Vaalbankspruit, located ±700 m southeast of site, that flows into the Pienaar Dam (Figure 5.18).

As indicated in Section 5.7.2 and 5.9.4 , no wetlands were identified on site. Some ponding does take place in areas (e.g. where shallow canals direct runoff away from the development, excavations in weedy areas) but these areas do not represent wetland conditions. In addition, no hydromorphic soils were identified on site (Venter and Niemand, 2020).

5.11 Air quality

The proposed site is located in the Steve Tshwete Municipal area hot spot, which extends across the Steve Tshwete Local Municipality from its border with eMalahleni to Arnot in the east. This is an area where measured or modelled concentrations exceed, or are predicted to exceed, ambient air quality standards as identified in the Air Quality Management Plan for the Highveld Priority Area (HPA; Republic of South Africa, 2011). This Priority Area was declared in terms of Section 18(1) of the National Environmental Management:

Air Quality Act 2004 (Act 39 of 2004) due to poor air quality and associated health risks.

Three main nodes of non-compliance with ambient standards occur within this hotspot. In the Middelburg node, both modelled 24-hour SO_2 and PM10 standards are frequently exceeded. Ambient monitoring at Middelburg, a site influenced by industrial sources, confirms the PM10 exceedances. This hot spot is mostly attributed to emissions from the metallurgical industries and residential fuel burning. The contribution of industries in the area dominates the source contributions for all pollutants considered. In terms of PM10, residential fuel burning does contribute a sizeable percentage to ambient concentrations.

Ambient air quality monitoring stations
Five ambient air quality monitoring stations are operated and maintained in the Highveld Priority Area (HPA) by the South African Weather Service (SAWS). These stations are located in eMalahleni (Witbank), Middelburg, Ermelo, Secunda and Hendrina and were installed in 2008. The SAWS manages the network which includes routine maintenance, calibration, data management and reporting.

At each of the said stations the following is measured: PM10, PM2.5, SO_2, NO, NO_2, NO_x, O_3, CO, benzene, toluene, ethylbenzene and xylene. In addition, the following meteorological data is also measured: wind speed, wind direction, ambient temperature, relative humidity, rainfall, solar radiation, barometric pressure.

Middelburg Station
The Middelburg Station is located in the residential area of Aerorand, adjacent to the Middelburg Christian School. This site was selected to measure the impact of emissions from mining and industry especially the large industrial sources such as Columbus Stainless and Middelburg Ferrochrome.

MONITORING STATION	COORDINATES	MONITORING PERIOD	POLLUTANT SOURCES
Middelburg	S-25.79070; E29.462801	August 2008 – present	Large industrial sources (Columbus Stainless and Middelburg Ferrochrome, industries to the south and mine dumps to the north west, no local impact from domestic fuel burning.

Wind roses
Wind roses summarise the occurrence of winds at a location, representing their strength, direction and frequency. Figure 5.21 provides the wind rose for 1 January 2019 to 1 January 2020 for the Middelburg Station. As is evident from Figure 5.21, winds in the area are relatively stable with the dominant wind directions being north westerly and south easterly winds.

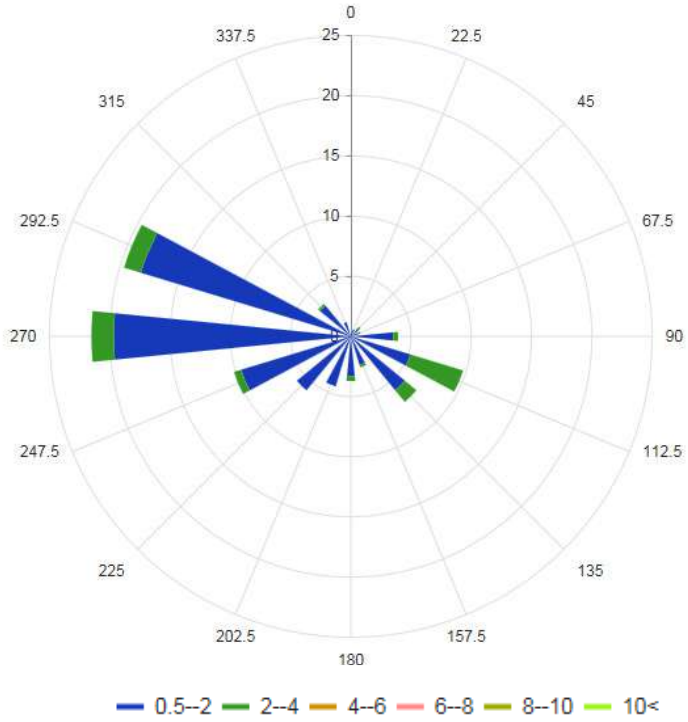


Figure 5.21 Dominant wind directions - January 2019 to January 2020 (taken from South African Air Quality Information System – SAAQIS, 2020)

Ambient air quality

According to the HPA: Air Quality Management Plan (2011), industrial sources are by far the largest contributor of SO_2 and NO_x, accounting for approximately 99.57 % of SO_2 and 95.97% of NO_x emissions. Mining is the largest contributor of PM10 emissions.

In general, it is expected that the air quality of the proposed development site is predominately governed by the various industrial and mining activities in and around Middelburg. The following could impact upon the air quality of the proposed development site:

- Various industrial activities in Middelburg (e.g. Columbus Stainless (Pty) Ltd., Middelburg Ferrochrome, etc.).
- Various power stations and opencast mining activities in the Steve Tshwete area.
- Emissions from vehicles utilizing the onsite and surrounding roads (e.g. N4, tar road to Pienaardam Leisure Resort, gravel roads, etc.);
- Dust from vehicles utilizing the onsite gravel roads as well as the gravel roads in the surrounding area (Figure 5.3);
- Dust from mining activities associated with Black Wattle Colliery (Figure 5.4);
- Dust from the abandoned, partly rehabilitated mine (Vaalbank Colliery Minipit) towards the south (Figure 5.3);
- Dust as a result of a variety of activities (e.g. coal trucking, residential, agriculture, business, etc. taking place on properties further south and south east of the site (Figure 5.4);
- Smoke emitted from veld fires.

5.12 Noise

The ambient noise of the site and surrounding area is predominantly governed by the following:

- Vehicles utilizing the N4 national road to the north of the site (Figure 5.3);
- Vehicles utilizing the tar road (to Pienaardam Leisure Resort) adjacent to the site (Figure 5.3);
- Vehicles utilizing the onsite gravel roads as well as the gravel roads in the surrounding area (Figure 5.3);
- Residential/light industrial activities taking place on the smallholdings (Figure 5.4).
- Mining activities associated with Black Wattle Colliery (Figure 5.4).

5.13 Sites of archaeological and cultural interest

5.13.1 Cultural Heritage sensitivity

A Heritage Impact Assessment (HIA) is required in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999) for any development or activity that will change the character of a site and exceeds 5 000m^2.

Prof. A.C. van Vollenhoven and D. Viljoen of Archaetnos Culture & Cultural Resource Consultants were appointed to conduct a Heritage Impact Assessment (referred to as van Vollenhoven and Viljoen, 2020). A copy of the said report is provided in Appendix 7 and should be consulted with regards to the methodology used.

5.13.1.1 Stone Age

The Stone Age is the period in human history when lithic material was mainly used to produce tools (Coertze & Coertze, 1996). In South Africa, the Stone Age can be divided into three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation.

The division for the Stone Age according to Korsman & Meyer (1999) is as follows:

- Early Stone Age (ESA) 2 million – 150 000 years ago;
- Middle Stone Age (MSA) 150 000 – 30 000 years ago;
- Late Stone Age (LSA) 40 000 years ago – 1850 - A.D.

No Stone Age sites are indicated on a map contained in a historical atlas of this area (Bergh, 1999). The closest known Stone Age occurrence is that of rock art close to the Olifants River to the south of Witbank (Bergh, 1999), i.e. southwest of the proposed site. This however should rather be seen as a lack of research in the area and not as an indication that such features does not occur.

Van Vollenhoven and Viljoen (2020) did not record any natural shelters during the survey. It is therefore possible that people did not stay here for long times. The close vicinity of water sources and ample grazing would have made it a prime spot for hunting and obtaining water in the past. Therefore, one may assume that Stone Age people probably would have moved through the area.

5.13.1.2 Iron Age

The Iron Age is the name given to the period of human history when metal was mainly used to produce metal artefacts (Coertze & Coertze, 1996).

In South Africa it can be divided in two separate phases according to Van der Ryst & Meyer (1999), namely:

- Early Iron Age (EIA) 200 – 1000 A.D.
- Late Iron Age (LIA) 1000 – 1850 A.D.

Huffman (2007) however indicates that a Middle Iron Age should be included. His dates, which now seem to be widely accepted in archaeological circles, are:

- Early Iron Age (EIA) 250 – 900 A.D.
- Middle Iron Age (MIA) 900 – 1300 A.D.
- Late Iron Age (LIA) 1300 – 1840 A.D.

No Iron Age sites are indicated around the town of Middelburg in a historical atlas, but this may only indicate a lack of research. The closest known Iron Age occurrences to the surveyed area are Late Iron Age sites that have been identified to the west of Bronkhorstspruit and in the vicinity of Bethal (Bergh, 1999).

Late Iron Age sites were however identified during a previous survey on the farm Middelburg Town and Townlands 287 JS (Van Vollenhoven & Pelser 2009). The good grazing and access to water in the area would have provided a good environment for Iron Age people although building material may have been reasonably scarce. One would therefore expect that Iron Age people may have utilized the area. This is the same reason why white settlers moved into this environment later on (Van Vollenhoven, 2020).

5.13.1.3 Historical Age

The Historical Age started with the first recorded oral histories in the area. It includes the migration of people that were able to read and write.

At the beginning of the 19th century the Phuthing, a South Sotho group, stayed to the south-east of Middelburg. The Koni of Makopole stayed to the north-east and the Ndzundza Ndebele to the east. During the Difaquane they fled to the south, southwest and north-west as Mzilikazi's impi moved in from the southeast. During this time the Swazi also moved into this area (Bergh, 1999).

The first white people to move through this area were the party of the traveller, Robert Scoon who passed through in 1836 (Bergh, 1999). Although the Voortrekkers moved across the Vaal River during the 1830's, it seems as if white people only settled here after 1850 (Bergh, 1999).

The town of Middelburg was established in 1872 (Bergh, 1999). During the Anglo-Boer War (1899-1902) both the Boer and British forces occupied the town, but no skirmishes took place close thereof (Bergh, 1999). There was however concentration camps for both white and black people during this time in Middelburg (Bergh, 1999).

Due to factors such as population growth and a decrease in mortality rates, more people inhabited the country during the recent historical past. Therefore, and because less time has passed, more cultural heritage resources from this era have been left on the landscape. One may therefore expect to find farm buildings, structures and objects in the area. During past surveys, many graveyards from this time period were identified in the surrounding area (Archaetnos database).

It is important to note that all cultural resources older than 60 years are potentially regarded as part of the heritage and that detailed studies are needed

to determine whether these indeed have cultural significance. Factors to be considered include aesthetic, scientific, cultural and religious value of such resources.

5.13.1.4 Conclusion

Van Vollenhoven (2020) indicated that no sites of cultural heritage significance were identified within the proposed development area. The development may therefore proceed, once the report has been approved by SAHRA.

In addition, Van Vollenhoven (2020) indicated that the subterranean presence of archaeological and/or historical sites, features or artefacts is a distinct possibility. It is possible that some sites may only become known later on. Operating controls and monitoring should therefore be aimed at the possible unearthing of such features. Care should therefore be taken when development commences that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence. Mitigation measures in this regard are included in the EMPr (Section 9) of this report and must be implemented.

Sensitivity assessment

The screening report (as per the outcome of the National Screening Tool, 2017; Appendix 1) produced a Medium – High sensitivity for the Archaeological and Cultural Heritage Theme:

High sensitivity	Within protected area	Incorrect – see Section 5.7.2.
High sensitivity	Within 1km of a protected area	Correct adjacent to the Vaalbank Private Nature Reserve – see Section 5.7.2.
Medium sensitivity	Mountain ridge	No mountains or ridges are present on site as indicated under Topography (Section 5.5).

As indicated above, Van Vollenhoven (2020) identified no sites of cultural heritage significance within the proposed site.

The sensitivity in terms of the Archaeological and Cultural Heritage of the site is therefore **Low**.

5.13.2 Palaeontological sensitivity

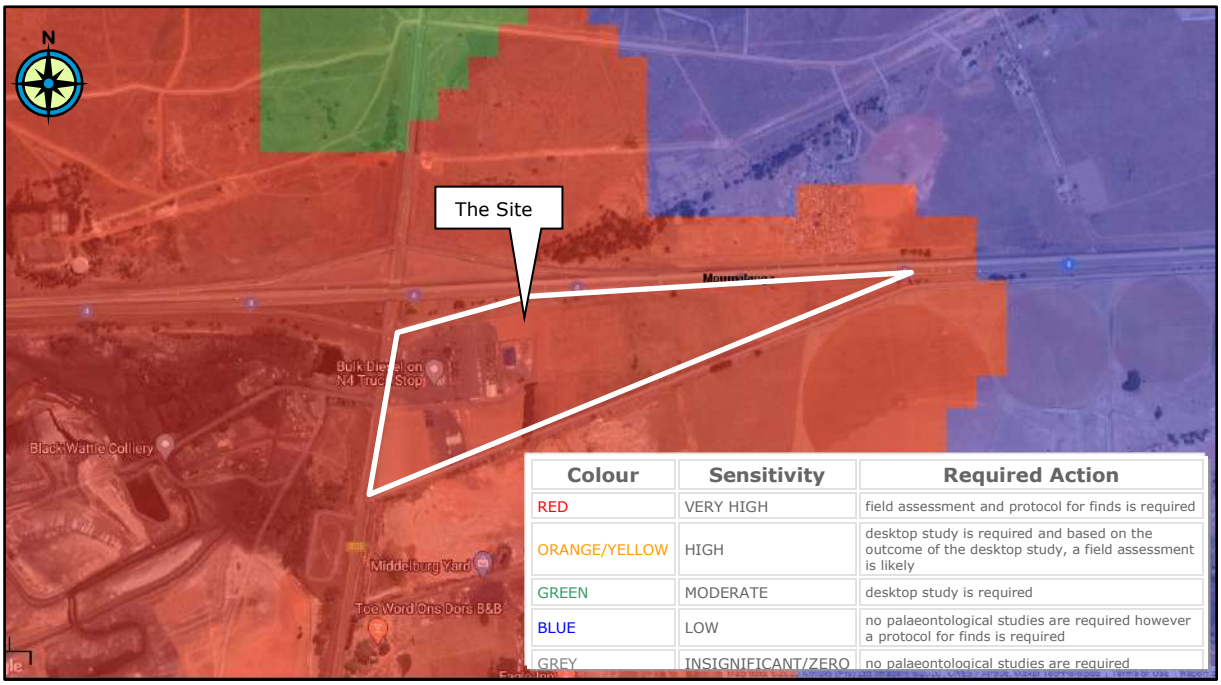
According to the palaeontological map supplied by the South African Heritage Resources Agency (SAHRA, 2014), the palaeontological sensitivity of the proposed site (Figure 5.22) is indicated as follows:

Sensitivity (Figure 5.22)	Geology	Required Action
Very High (Red)	Vryheid Formation	Field assessment and protocol for finds

Dr. Heidi Fourie (Heidi Fourie Consulting) was appointed to conduct a Palaeontological Impact Assessment – Phase 1 Field Study (referred to as Fourie, 2020). A copy of the said report is provided in Appendix 8 and should be consulted with regards to the methodology used.

The aim of a Phase 1 Field Study is to ascertain if any palaeontological sensitive material is present within the proposed development site, to indicate the potential

impact on the fossil heritage and state if any mitigation or conservation measures need to be implemented.



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required

Figure 5.22: Requirement for palaeontological study (taken from SAHRA, 2020)

5.13.2.1 Outline of the geology and palaeontology

The palaeontological sensitivity of a site is closely related to the underlying geology, since fossils mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature.

According to the 1: 250 000 Geological Series (number 2528 Pretoria), the site is underlain by the Vryheid Formation of the Ecca Group, Karoo Sequence (Figure 5.5).

The Karoo Supergroup is renowned for its fossil wealth. The Ecca Group may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson, 2009).

Glossopteris trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge, 2005).

The *Glossopteris* flora is thought to have been the major contributor to the coal beds of the Ecca. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield, 2006).

Table 5.9 provides an indication of the occurrence of fossils in the Vryheid Formation.

Table 5.9: Occurrence of fossils in the Vryheid Formation (Groenewald and Groenewald, 2014).

Deltaic mudrocks and sandstones, locally coastal and fluvial deposits, with occasional coal seams (Ecca 'Coal Measures')	Rich fossil plant assemblages of the Permian Glossopteris Flora (lycopods, rare ferns and horsetails, abundant glossopterids, cordaitaleans, conifers, ginkgoaleans), rare fossil wood, diverse palynomorphs. Abundant, low diversity trace fossils, rare insects, possible conchostracans, non-marine bivalves, fish scales.	Globally important fossil floras from Middle Permian Gondwana. Seriously under-collected in recent years, despite ongoing mining for coal.

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be LOW to VERY HIGH, and here the impact is potentially **VERY HIGH** for the Vryheid Formation, Ecca Group (Fourie, 2020).

Rocks of Permian age in South Africa are particularly rich in fossil plants (Rayner and Coventry, 1985). The fossils are present in the grey shale interlayered with the coal seams. The fossils are not very rare and occur also in other parts of the Karoo stratigraphy. It is often difficult to spot the greyish fossils as they are the same colour as the grey shale in which they are present as these coalified compressions have been weathered to leave surface replicas on the enclosing shale matrix.

Fossils likely to be found are mostly plants (Appendix 1 of Appendix 8) such as 'Glossopteris flora' of the Vryheid Formation. A locality close to Ermelo, also Vryheid Formation, has yielded *Scutum, Glossopteris* leaves, *Neoggerathiopsis* leaves, the lycopod *Cyclodendron leslii,* and various seeds and scale leaves (Prevec, 2011). The aquatic reptile *Mesosaurus* and fossil fish may also occur with marine invertebrates, arthropods and insects. Trace fossils can also be present.

Potential threats of the development were identified as: earth moving equipment/machinery (for example haul trucks, front-end loaders, excavators, graders, dozers) during construction, the sealing-in or destruction of fossils by development, vehicle traffic, and human disturbance.

During the survey it was confirmed that the site is directly underlain by the Vryheid Formation. Fourie (2020) indicated that no fossils and outcrops were found during the walk through.

Fourie (2020) raised no objection to the proposed development and indicated that the development may go ahead with caution. A Phase 2 Palaeontological Impact Assessment is not required since **no surface fossils were found** during the walk through.

However, special care must be taken during the construction phase (e.g. digging, drilling, blasting, excavating of foundations, removal of overburden, etc.). A protocol for finds and management plan are provided in Appendix 2 of Appendix 8. If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures (Fourie, 2020).

5.14 Sensitive landscapes

Venter and Niemand (2020) indicated that no wetlands were identified on site. Some ponding does take place in areas (e.g. where shallow canals direct runoff away from the development, excavations in weedy areas) but these areas do not represent wetland conditions. In addition, no hydromorphic soils were identified on site.

The site is however, located adjacent to a Protected Area (Figure 5.13) and falls within the Ecological Support Area (ESA) buffer zone of the said protected area. The Vaalbank Private Nature Reserve (435.627 ha in extent) consists of a number of properties (including Pienaardam Leisure Resort, various small holdings, etc.) and was proclaimed in 1961. Pienaardam Leisure Resort is managed as a recreational area but agricultural activities also take place here (see Section 5.3.6). The Vaalbank Private Nature Reserve is however not managed as such and currently a number of activities take place within this so-called private nature reserve. No information regarding de-proclamation of the nature reserve could be found.

No sensitive landscapes (including rivers, streams, wetlands, etc.) are therefore present on site or adjacent to the site.

5.15 Visual aspects

The visual aspects of the site have been impacted by the presence of existing light industrial activities on and adjacent to the site.

The proposed site is highly visible from:

- the N4 national road – north of the site (Figure 5.3);
- the R35 provincial road – west of the site (Figure 5.3);
- the tarred road leading to Pienaardam Leisure Resort – south of site (Figure 5.3);
- the property belonging to Pienaardam Leisure Resort – southeast of the site (Figure 5.3);
- the property belonging to Black Wattle Colliery – west of the site (Figure 5.3);
- the property where an abandoned, partly rehabilitated mine (Vaalbank Colliery Minipit) is present – south of the site (Figure 5.3).

5.16 Traffic

A traffic impact assessment was conducted by Brian Roberts of Moyeni Professional Engineering (MPE) (hereafter referred to as Roberts, 2019) for the proposed development. A copy of the report is provided in Appendix 9. This report should be consulted for methodology used.

5.16.1 Land use rights

The proposed development will be located on Portion 58 of the farm Vaalbank 289 JS, Middelburg. The said site is located adjacent to the R35 provincial road (Bethal Road) and in close proximity of the N4 national road, ±2.5km south of the Middelburg Mall (Figure 5.1).

Currently, 4 business (a large truck stop and 3 truck distribution logistic type operations (generally related to the transportation of coal) are present on the

property. The project applicant plans to rezone the property to Industrial 2 to allow the existing and proposed new businesses to operate on site.

The farm portion is 226 971 m^2 with a FAR of 0.1 (Table 5.10). This gives a total land use rights of 22 697m^2 for the said property (Table 5.10). As indicated in Table 5.10, approximately 4 130 m^2 GLA is already developed.

Roberts (2019) divided the undeveloped portions of the property into 3 Sites namely, Site A, Site B and Site C (Table 5.10). Here, a total of 15 313 m^2 of potential GLA can still be developed (Table 5.10).

Table 5.10: Land use rights summary (taken from Roberts, 2019)

EXISTING	SITE (m^2)	GLA	FAR
Truck stop	28 120	2 060	
Distribution 1	16 535	450	
Distribution 2 – Shosholoza	17 136	500	
Distribution 3	12 046	1 120	
SUB-TOTAL	**73 836**	**4 130**	
Farm portion	226 971	22 697	0.1
Remainder	153 135	18 567	
UNDEVELOPED PORTIONS OF PROPERTY			
Site A	16 535	1 653	0.1
Site B	14 781	1 478	0.1
SUB-TOTAL	**31 316**	**3 132**	
Site C	121 819	12 182	0.1
SUB-TOTAL	**153 135**	**15 313**	

Roberts (2019) however, indicated that a potential 18 567 m^2 of rights was investigated in terms of the Traffic Impact Assessment. In addition, the following three land use scenarios were investigated with regards to the undeveloped portions:

- Industrial only;
- Distribution only;
- Combination of Industrial and Distribution.

5.16.2 Existing road network and classification

Table 5.11 provides an indication of the existing road network and classification in the area surrounding the proposed development site. Figure 5.23 provides the location of the various roads in relation to the proposed development site.

Table 5.11: Road network classification (taken from Roberts, 2019)

ROAD/STREET	LOCATION (Figure 5.23)	CLASS	CARRIAGEWAY AND NUMBER OF LANES	ROAD RESERVE WIDTH (m)	CHARACTERISTIC/ JURISDICTION
N4	North of proposed site	2	Dual (4 lanes)	75	SANRAL/TRAC
R35	West of proposed site	3	Single (2 lanes)	45	Provincial
Pienaardam Road	Tar road south of proposed site	4	Single (2 lanes)	24	Local Municipality (Right-of-Way servitude road to Pienaardam Leisure Resort)

ROAD/STREET	LOCATION (Figure 5.23)	CLASS	CARRIAGEWAY AND NUMBER OF LANES	ROAD RESERVE WIDTH (m)	CHARACTERISTIC/ JURISDICTION
Access Road/Colliery Access Road	Main access road to site	2	Single (2 lanes)	15	Private

Figure 5.23: Surrounding road network

5.16.3 Future road network

Roberts (2019) indicated that there are no future road network changes planned. The interchange is likely to be upgraded in the medium to longer term due to growing traffic demand. However, there are no formal plans in this regard.

5.16.4 Site access

5.16.4.1 Existing site access

Presently, the site is accessed from one central collector type gravel road (nearly opposite the existing Black Wattle Colliery access) linking on the R35 provincial road (Figure 5.3 and Photo 5.8). According to Roberts (2019), this access existed before the truck stop and distribution type businesses were established on site. The central access road was recently upgraded (Roberts, 2019) as indicated in Photo 5.8.

A separate access with security is provided to the Bulk Diesel/truck stop site (Figure 5.23; Photo 5.9).

Photo 5.8: Central collector access road extending from the R35 provincial road

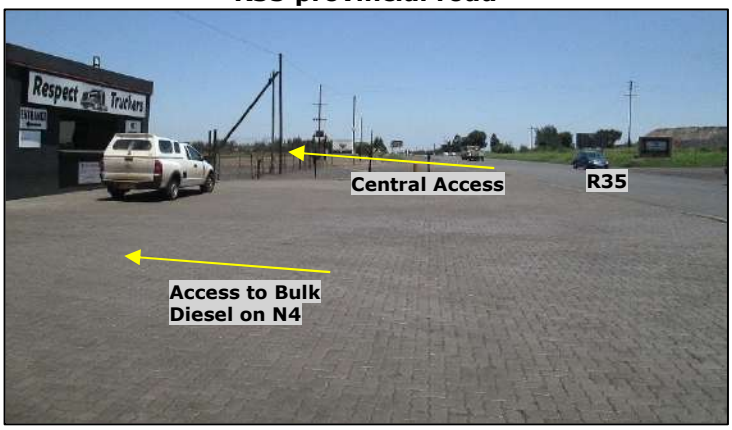


Photo 5.9: Access to Bulk Diesel on N4 and truck stop

5.16.5 Traffic data

Table 5.12 provides an indication of the link traffic flows based on classified manual traffic counts conducted by Trafsol.

Table 5.12: Link traffic flows (@ 5 November 2019) (taken from Roberts, 2019)

Road (Figure 5.3)	Direction	Peak hour		Capacity (vph)/ number of lanes required/existing	Percent (%) of capacity
		AM	PM		
R35 north of the Interchange/ at the Access Road	Northbound	540/**149**	731/**367**	1900/1/1	38/**19**
	Southbound	580/**331**	667/**240**	1900/1/1	35/**17**
Access Road	Eastbound	12	15	1200/1/1	2
	Westbound	14	16	1200/1/1	2
Colliery Access Road	Eastbound	12	21	1200/1/1	2
	Westbound	33	15	1200/1/1	2
Pienaardam Road	Eastbound	7	13	1800/1/1	3
	Westbound	16	8	1800/1/1	1

Based on the above-mentioned, Roberts (2019) indicated that the link capacities are more than adequate to meet the current traffic demand and that no additional links lanes are required.

Table 5.13 provides the modal split as derived from the 2019 traffic counts. According to Roberts (2019), a traffic growth rate of 3% per annum was adopted. For further information please refer to Annexure D of Appendix 9.

Table 5.13: Modal Split (as per traffic survey) 2019 (taken from Roberts, 2019)

MODE OF TRANSPORT	ALL SURVEYED HOURS AND INTERSECTIONS (5 November 2019)	
	NUMBER	PERCENTAGE (%)
Cars	33 083	78.9
Mini-bus taxis	1 289	3.1
Buses	94	0.2
Trucks*	7 445	17.8
TOTAL (all vehicles)	**41 911**	**100.0**

*Interlink coal distribution type trucks (ore carriers) use the R35 provincial road to deliver coal to the nearby Eskom power stations (Roberts, 2019).

The following queue lengths were recorded at the N4/R35 interchange:

- Northern terminal:
  - Off ramp, 4 and 9 vehicles between 09h00 and 13h30;
  - Southbound through lane more than 10 vehicles for most of the day.
- Southern terminal:
  - Northbound through lane more than 10 vehicles for most of the afternoon;
  - Westbound off-ramp more than 10 vehicles in the late afternoon;
  - Southbound right-turn lane between 4 and 9 vehicles for most of the day until 16h00 when it increases to 10 plus vehicles until 17h00.

5.16.6 Trip generation

Table 5.14 provides the surveyed and future trip generation rate (trips per hour) for the proposed site. Further details are provided in Annexure C of Appendix 9.

Table 5.14: Surveyed and future trip generation (trips per hour) (taken from Roberts, 2019)

PEAK HOUR	IN	OUT	TWO-WAY
Existing surveyed trips – 11 998m² GLA			
Weekday AM	12	14	26
Weekday PM	15	16	31
Saturday	276	214	490
Weekday AM	**0.29**	**0.34**	**0.63**
Weekday PM	**0.36**	**0.39**	**0.75**
Industrial trip generation rate (trips/100m²) (COTO code 130)			
Weekday AM	0.56	0.24	0.80
Weekday PM	0.56	0.24	0.80
Distribution trip generation rate (trips/100m²) (Used the survey results as the trip generation is higher than the COTO rate)			
Weekday AM	0.29	0.34	0.63
Weekday PM	0.36	0.39	0.75

Table 5.15 provides the trip generation rate (trips per hour) for the Industrial and Distribution land use scenarios. Further details are provided in Annexure C of Appendix 9.

Table 5.15: Trip generation (trips per hour) (2020) – peak hour trips for 17620m² (taken from Roberts, 2019)

PEAK HOUR	IN	OUT	TWO-WAY
Industrial			
Weekday AM	86	37	123
Weekday PM	31	92	123
Distribution			
Weekday AM	44	52	96
Weekday PM	56	59	115
Combined Industrial and Distribution			
Weekday AM	77	40	117
Weekday PM	80	132	212

5.16.7 Trip distribution

Table 5.16 provides the expected trip distribution based on the existing traffic flow situation. Further details are provided in Figure 11 and Figure 12 of Appendix 9.

Table 5.16: Trip distribution percentages (taken from Roberts, 2019)

DIRECTION	PERCENTAGE (%) (AM/PM peak periods)		ROUTE FOLLOWED
	From	To	
From/to the north	17/20	22/22	R35
From/to the west	25/34	32/35	N4 West
From/to the east	28/31	36/23	N4 East
Access south	30/15	10/20	R35 South
Total	**100/100**	**100/100**	

Based on the findings as indicated in Table 5.16, the following should be noted:

- The majority of additional trips are, as in the existing situation, expected to originate and return from and to the east and west along the N4 freeway.
- The northern area is secondary re-distribution.
- The south is more for local requirements.

5.16.8 Capacity analyses

The performance of intersections in urban road networks is defined by the level of service (LOS) for each approach to the intersection. During the peak hours, the road infrastructure capacity provided should ensure that the intersection approach level of service should ideally not exceed LOS D (see Table 8 of Appendix 9) as defined in the High Capacity Manual (HCM).

5.16.8.1 2019

Figure 10 of Appendix 9 provides the existing traffic flows from the surrounding road network for the AM and the PM peak hours while the results of the detailed capacity analyses are provided in Annexure C of Appendix 9.

Roberts (2019) indicated that the N4/R35 interchange is failing in terms of levels of service in the following ways:

- The all-way stop controls on both the northern and the southern terminals cause excessive delays on both north/south through movements.
- The existing Access Road/Colliery access road as well as the Pienaardam Road intersection are currently operating satisfactorily.

5.16.8.2 2020

Figure 13 and 14 of Appendix 9 provide the expected traffic flows from the surrounding road network for the AM and the PM peak hours while the results of the detailed capacity analyses are provided in Annexure C of Appendix 9

Roberts (2019) recommended the following without-development road upgrade:

- Additional through lane from the south as well as an additional right-turn lane from the west on the off-ramp (Road authority responsibility & Developer) – see Figure A1-3 of Appendix 9 for further details.

According to Roberts (2019), no further road upgrading will be required at the R35 intersections.

5.16.8.3 2025

Figure 15 and 16 of Appendix 9 provide the expected traffic flows for 2025 (i.e. from the surrounding road network for the AM and the PM peak hours) while the results of the detailed capacity analyses are provided in Annexure C of Appendix 9.

Roberts (2019) recommended the following without-development road upgrade:

- Additional left-turn lane from the south (Road Authority responsibility & Developer) – see Figure A2-3 & A3-3 of Appendix 9 for further details.
- No further road upgrading will be required at the R35 intersections.

5.16.9 Non-motorised transport

Paved sidewalks and separate bicycle lanes do not exist along the R35 provincial road (predominantly a rural type road) for traffic safety reasons and are proposed to remain that way.

Roberts (2019) indicated that pedestrian crossings are not required since all pedestrians are expected to cross at the intersections.

5.16.10 Public transport

Roberts (2019) indicated that the R35 route is characteristic of mini-bus taxis as indicated in Table 5.17. Local staff use mini-bus taxis as their main mode of transport to places of work (Roberts, 2019).

Table 5.17: Public transport along the R35 provincial road (taken from Roberts, 2019)

PEAK HOUR	SOUTHBOUND	NORTHBOUND
Mini-bus taxis		
Weekday AM	15	18
Weekday PM	10	10
Buses		
Weekday AM	2	4
Weekday PM	1	0

No lay byes or in-lane stops exist within/on the roads surrounding the proposed site (Roberts, 2019). Public transport makes use of in-lane stops whilst mini-bus taxis occasionally use the road's shoulder.

According to Roberts (2019), no further public transport facilities are proposed as the existing system is adequate to meet the demands of the local staff.

Roberts (2019) recommended that an additional 4 mini-bus taxis operate on the R35 provincial road in order to meet the additional public transport supply demands (further details provided in Section 9.3 of Appendix 9).

5.16.11 Conclusion

According to Roberts (2020), the local intersections around the proposed development site are operating at satisfactory levels of service, except for the N4/R35 interchange which fails mainly on:

- The southern and northern through lanes;
- The right-turn movement on the westbound off-ramp.

Roberts (2019) proposed additional lanes on the two-way priority-controlled intersections with an additional through lane from the south and an additional right-turn lane from the west on the eastbound off-ramp (i.e. in 2020). By 2025 and beyond, Roberts (2019) indicated that an additional northbound left-turn at the southern terminal would be required.

According to Roberts (2019), the developer will be required to upgrade the existing Access Road intersection with the R35. Here Roberts (2019) proposed a right-turn lane onto the R35 (for safety and not capacity reasons) - see Section 7 (Alternatives) of this report for further details regarding the proposed access road to the site.

From this Traffic Impact Assessment, Roberts (2019) concluded the following:

- That the proposed rezoning of Portion 58 of the farm Vaalbank 289 JS from agricultural to Industrial 2 be approved from a Traffic and Transportation point of view with road upgrading being required as depicted in Annexure 2.
- No additional sidewalks along the external roads be implemented, as paved sidewalks are currently not available for traffic safety reasons and is proposed to remain that way.
- An additional 4 Mini-bus Taxis be permitted to travel along the R35 route to service the needs of the future development.

5.17 Sense of place

The proposed development will be located on Portion 58 of the farm Vaalbank 289 JS, Middelburg. The said site is located adjacent to the R35 provincial road (Bethal Road) and in close proximity of the N4 national road, ±2.5km south of the Middelburg Mall (Figure 5.1).

The proposed site is located within an area already utilized for light industrial and mining activities as indicated in Figure 5.4. A truck stop, diesel depot (Bulk Diesel on N4) and food kiosk (WowChow) are already present in the western portion of the site (Erf 18; Figure 3.2). An Environmental Authorisation (dated: 24 April 2019; Ref: 1/3/1/16/1N-142; Appendix 10) was issued for the truck stop and aboveground diesel tanks on 2.7ha of the property. This area (and activity) is thus excluded from this application.

Two other companies (Shosholoza and Cornwill Construction) are also present in the western portion of the site (Erven 16 and 19; Figure 3.2), adjacent to Bulk Diesel on N4.

As previously indicated, the property will be rezoned from Agricultural to Industrial 2. The applicant intends to provide 20 erven on the property, which will be sold/rented to various businesses for light industrial activities. It is anticipated that the erven will be used for activities such as motor showrooms, workshops, earthmoving equipment, etc. The exact tenant mix has not been finalised and will depend on the market need at the point in time when all authorisations have been obtained.

Black Wattle Colliery is located towards the west and an abandoned, partly rehabilitated mine (Vaalbank Colliery Minipit) towards the south (Figure 5.3). Pienaardam Leisure Resort is located to the south east of the proposed site (Figure 5.4). This property is used for recreation and agricultural purposes. Four centre pivot irrigation areas are present on the said property (Pienaar, 2020).

The properties further south and south east of the site (Figure 5.4) are used for a variety of purposes e.g. coal trucking, residential, agriculture and business (e.g. a bar), etc.

The property borders onto the existing urban edge of Middelburg (Urban Dynamics, 2019). According to the current SDF (2015), the proposed site falls within a mixed land use area where a Precinct Plan must be developed (Figure 5.24). According to Urban Dynamics (2019), the aim of the Precinct Plan is to determine the appropriate land use composition of the area and whether the area should be included in the urban edge.

Based on the above-mentioned, the proposed light industrial area would not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

5.18 Concluding Remarks

From a geotechnical point of view, the said site is suitable for development purposes subject to the implementation of mitigation measures. In addition, the gradient of the site is also suitable for development purposes.

The proposed Light Industrial Park project area is located on natural soil forms (Hutton, Glencoe and Pinedene forms) as well as soils already affected by human activities (Anthrosols). The grazing capacity of the entire area is 5 (ha/LSU) and the site therefore has grazing available for 4 head of cattle. However, no evidence of cattle (or other livestock) was observed on site (Pienaar, 2020). From an agricultural point of view, the proposed Light Industrial Park is considered a viable land use option for an area where it is evident that all agricultural activities ceased for many years and located in close proximity to other businesses (2.5 km south of Middelburg Mall) (Pienaar, 2020).

The vegetation of the site is modified to transformed, with very low species diversity. Venter and Niemand (2020) indicated the site sensitivity for plant species as Low (and not Medium as indicated in the Screening Report) due to the highly modified state of the site vegetation, the low species diversity and the absence of habitat for the threatened species. In addition, a low overall

faunal richness was indicated for the said site in view of lack of habitat and past disturbances. Due to the level of disturbance on site, poor ecological connectivity of the site and the existing light industrial developments on site, this site is considered to be of low biodiversity sensitivity.

Venter and Niemand (2020) indicated that no wetlands were identified on site. Some ponding does take place in areas (e.g. where shallow canals direct runoff away from the development, excavations in weedy areas) but these areas do not represent wetland conditions. In addition, no hydromorphic soils were identified on site.

No sensitive landscapes (including rivers, streams, wetlands, etc.) were thus identified on site or adjacent to the site.

Van Vollenhoven (2020) identified no sites of cultural heritage significance within the proposed site. From a palaeontological point of view, Fourie (2020) raised no objection to the proposed development and indicated that the development may go ahead with caution.

Roberts (2019) indicated that the proposed rezoning of Portion 58 of the farm Vaalbank 289 JS from agricultural to Industrial 2 can be approved from a Traffic and Transportation point of view subject to the implementation of certain road upgrades.

In terms of sense of place, the proposed light industrial area would not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

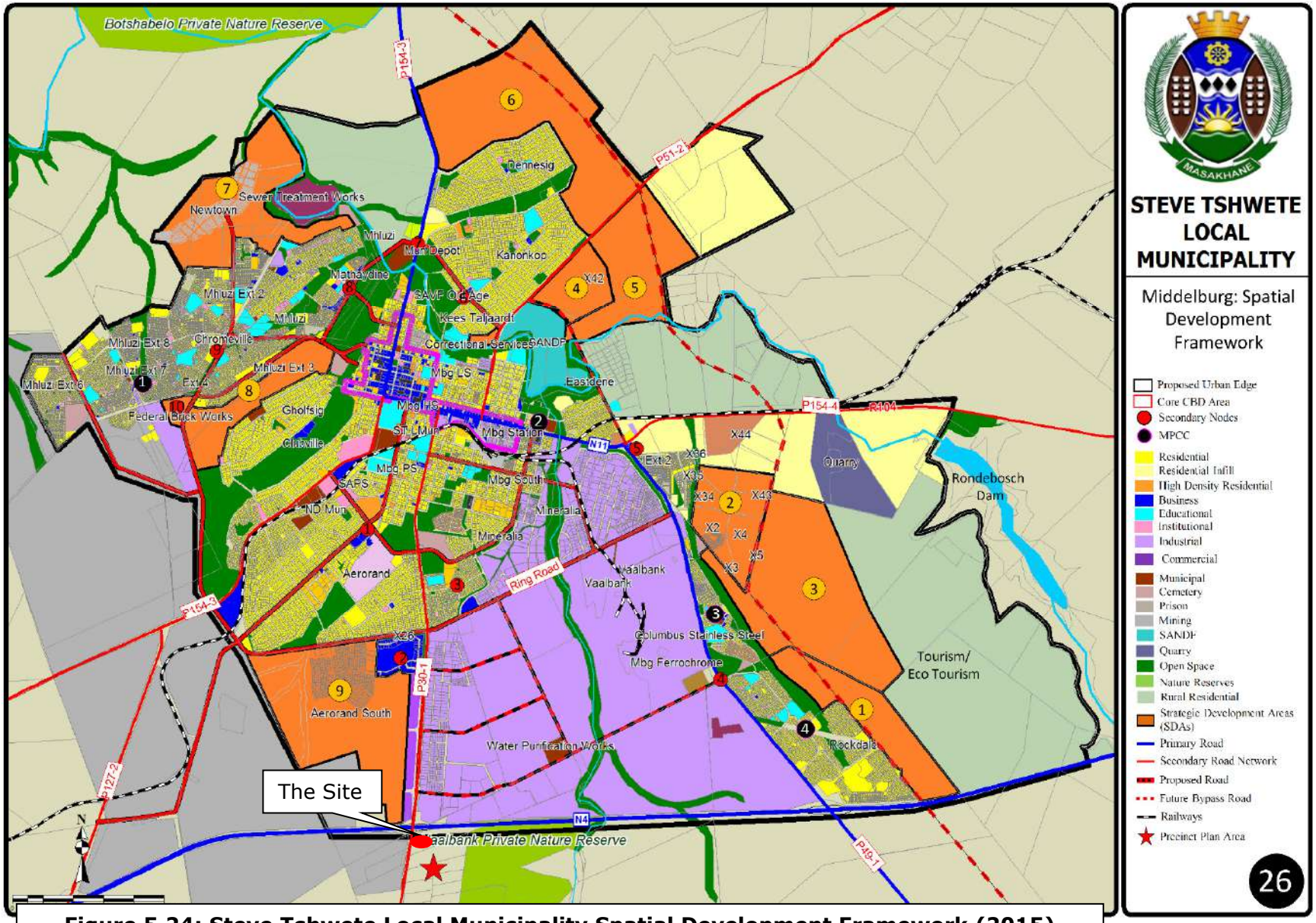


Figure 5.24: Steve Tshwete Local Municipality Spatial Development Framework (2015)

SECTION 6: DESCRIPTION OF THE PUBLIC PARTICIPATION PROCESS

The public participation process is defined in the Public Participation (PP) Guideline (2017) as *"a process by which potential interested and affected parties are given opportunity to comment on, or raise issues relevant to, the application.*"

According to the PP Guideline (2017), some characteristics of a comprehensive PP process include providing role-players with clear, accurate and understandable information about the activity, allowing them to voice their support, concerns and questions regarding the project and encouraging transparency and accountability in decision-making.

Interested and affected parties/role players also have a responsibility towards ensuring a successful public participation process and must ensure that:

a. *comments are submitted within the specified timeframes or any extension of a timeframe agreed to by the applicant or the EAP;*
b. *comments are submitted directly to the EAP; and*
c. *any direct business, financial, personal or other interest which the I&AP may have in the approval or refusal of the application is disclosed to the EAP.*

This section of the report provides an overview of the public participation process followed to date and represents the Comments and Response Report as required in terms of Section 44 of the EIA Regulations, 2014 (as amended) and the PP Guideline, 2017.

The public participation process was designed to satisfy the requirements of Chapter 6 and Appendix 1 of the EIA Regulations, 2014 (as amended) as well as the PP Guideline, 2017.

The following information is provided in this section of the report:

- Details regarding the advertising of the project (Section 6.1);
- Comment received in response to advertising and the distribution of the Background Information Document (Sections 6.2 to 6.4);
- A list of registered interested and affected parties, stakeholders and government departments (Section 6.3);
- A map indicating directly affected and adjacent landowners (Figure 6.2);
- A summary of the comments received from I&APs and a response from the EAP (Table 6.4).
- Supporting documentation e.g. copies of e-mails, notices, Background Information Document (BID), comment sheets, etc. (Appendices 11 to 14).

6.1 Advertising of the project

6.1.1 Press advertising

A block advert (150mm x 95mm), according to the Environmental Impact Assessment Regulations, 2014 (as amended), was placed in the local newspaper, Middelburg Observer, on Friday, 31 January 2020. A copy of the advert is provided in Appendix 11.

The Middelburg Observer is distributed in Middelburg, Belfast, Hendrina, eMalahleni, Groblersdal and surrounding areas to more than 285 distribution points with approximately 21 500 copies sold every Friday.

6.1.2 On-site advertising

Notices according to the Environmental Impact Assessment Regulations, 2014 (as amended), were displayed at the following locations:

- On the western fence at the entrance to the site (A1 size; Figure 6.1 – Photo 6.1);
- On the western fence adjacent to the R35 provincial road (A3 size; Figure 6.1 - Photo 6.2);
- On the southern boundary adjacent to the Pienaardam access road (A1 size; Figure 6.1 – Photo 6.3);
- On the notice board at the Gerard Sekoto Public Library (A3 size; Photo 6.4).

A copy of the notice was also loaded onto the company website: http://adienvironmental.co.za.

A copy of the notice is provided in Appendix 11.

It should be noted that the A1 notice was 594 mm x 841 mm and the A3 notices 416mm x 295mm (A3) in size.

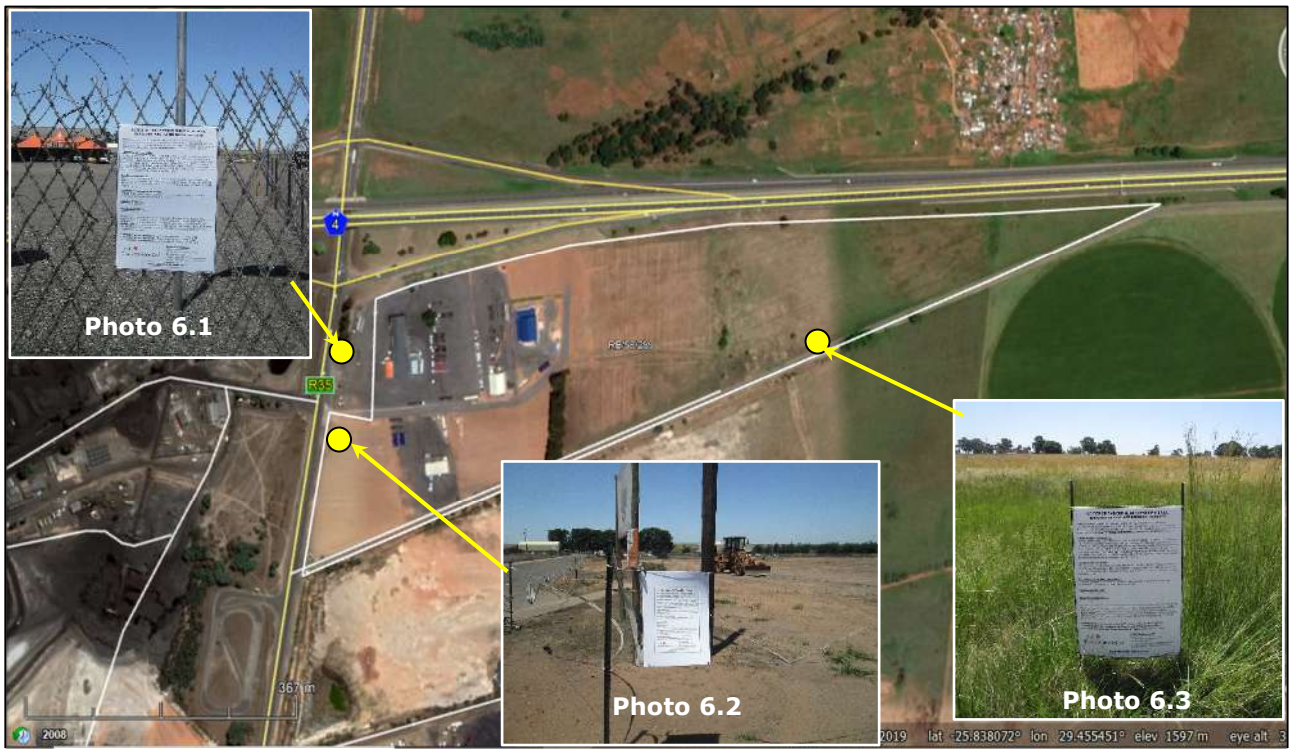


Figure 6.1: Aerial view of notice placements

Photo 6.4: A view of the notice displayed at the Gerard Sekoto Public Library

6.1.3 Informing I&APs via the internet

A copy of the following documentation was loaded onto the AdiEnvironmental cc. website (http://adienvironmental.co.za):

- Copy of the notice;
- Background Information Document (BID; Appendix 12).

This information was available on the website for the duration of the basic assessment phase.

A copy of the webpage printouts is provided in Appendix 11.

6.1.4 Feedback from the advertising process

Only one person (Ms. D. Wessels) registered as an interested and affected party (e-mail dated: 5 March 2020; Appendix 11) in terms of the advertising of the project.

Ms. Wessels represents the company Leads2Business and registered for possible future business opportunities.

There was thus no need for a public meeting.

6.2 Directly affected landowner/user

Bakkos Projects (Pty) Ltd

The proposed development site is located on Portion 58 of the farm Vaalbank 289 JS (Figure 6.1), which is owned by Bakkos Projects (Pty) Ltd. (i.e. the applicant for the proposed development). A copy of the Title Deed is provided in Appendix 1.

6.3 Identified local authorities/government departments and stakeholders

Table 6.1 provides an indication to which local authorities/government departments and stakeholders Background Information Documents (BIDs; Appendix 12) were forwarded in order to inform them of the proposed project and to obtain their issues of concern.

Table 6.1: Identified local authorities/government departments and stakeholders who received BIDs

AUTHORITY/ STAKEHOLDER	CONTACT PERSON	CORRESPONDENCE SENT	COMMENTS
Government Departments			
Department of Agriculture, Forestry and Fisheries (DAFF)	F. Mashabela	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) - Directorate: Land Use and Soil Management – Ermelo	J. Venter	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Department of Co-operative Governance and Traditional Affairs (COGTA)	M. Loock	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Department of Mineral Resources	S. Mathavela	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	T. Mkhonto	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Department of Water and Sanitation (DWS)	T. Ndlhovu	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	Yes. See Section 6.3.1
Stakeholders			
Distriks Landbou Unie Middelburg	J.P.J. Schmahl	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Eskom Distribution (Land & Rights)	T. Ludere	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Eskom Transmission	L. Motsisi	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Middelburg Chamber of Business and Commerce	M. Hanekom	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Mpumalanga Tourism and Parks Agency (MTPA) – Land Advisory Unit	K. Narasoo	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
South African Civil Aviation Authority (SACAA)	K. Mthapo	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
South African Heritage Resources Agency (SAHRA)	N. Khumalo (SAHRIS)	Loaded BID on SAHRA website on 13 February 2020 (Appendix 13).	Yes. See Section 6.3.2
Telkom	J. Smit	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Local Authorities			
Nkangala District Municipality	S. Links A. Thwala	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Steve Tshwete Local Municipality	M. Mahamba	E-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	None
Steve Tshwete Local	Councillor J.	Telephonic discussion and	None

AUTHORITY/ STAKEHOLDER	CONTACT PERSON	CORRESPONDENCE SENT	COMMENTS
Municipality	Michelle (Ward 8)	e-mail (dated: 13 February 2020; Appendix 13) with BID forwarded.	
Steve Tshwete Local Municipality	Councillor T. Motloung (Ward 6)	Telephonic discussion and e-mail (dated: 24 February 2020; Appendix 13) with BID forwarded.	None

6.3.1 Department of Water and Sanitation

An e-mail (dated: 13 February 2020; Appendix 13) was received from Ms. T. Ndlhovu of the Department of Water and Sanitation requesting a copy of the Basic Assessment Report.

Response from AdiEnvironmental

See Table 6.4.

6.3.2 South African Heritage Resources Agency (SAHRA)

A letter (dated: 21 March 2020; Ref: 14849; Appendix 13) was received from the South African Heritage Resources Agency (SAHRA) indicating the following:

In terms of the National Heritage Resources Act, no 25 of 1999 (NHRA), heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are generally protected. They may not be disturbed without a permit from the relevant heritage resources authority. In contexts of development applications, the developer must ensure that no heritage resources will be impacted by the proposed development, by lodging an application to SAHRA and submitting detailed development specifications as a notification of intent to develop. If the application is made in terms of s. 38 (8) of the NHRA then it is incumbent on the developer to ensure that a Heritage Impact Assessment (HIA) is undertaken, as s. 38(2)a does not apply. Such a study should follow the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports and section 38(3) of the NHRA.

The HIA must be undertaken by a suitably qualified archaeologist and if they assess the proposed development scope and determines that an exemption may be submitted. Once the report or letter is submitted to the case for commenting, SAHRA will provide further comments on this proposed development.

In addition to the HIA report, SAHRA also requires an assessment of palaeontological resources by a suitably qualified palaeontologist. The HIA and the Palaeontology Impact Assessment (PIA) or the respective exemption letters must be provided to SAHRA in the EIA phase of the NEMA application process.

Copies of the HIA and PIA were submitted to SAHRA via the SAHRIS system as requested (dated: 21 July 2020; Appendix 13). Another letter (dated: 17 August 2020; Ref: 14849; Appendix 13) was received from the South African Heritage Resources Agency (SAHRA) indicating the following:

To meet the requirements of the National Heritage Resources Act, Act 25 of 1999 (NHRA) a HIA report has been submitted to SAHRA for commenting.
Van Vollenhoven, A.C. and Viljoen, D. March 2020. A Report on a Heritage Impact Assessment for the Proposed Development of a Light Industrial Area on Portion 58ofthe Farm Vaalbank 289 JS, Middelburg, Mpumalanga Province.
The author undertook a field study of the proposed industrial area and did not identify any heritage resources that may be impacted by the proposed development. The author recommends chance finds procedures, whereby, the construction manager knows who to contact if any heritage resources are uncovered during construction.

Fourie, H. March 2020. The Development of a Light Industrial Area on Portion 58 of the Farm Vaalbank 289-JS, Middelburg Steve Tshwete Local Municipality, Nkangala District Municipality within the Mpumalanga Province Farm: Portion 58 Vaalbank 289-JS.

The study area is underlain by sandstone and shale rocks of the Permian aged rocks of the Vryheid Formation, Ecca Group, Karoo Supergroup. This has a very high sensitivity to the presence of, and occurrence of fossiliferous rocks. The potential impacts by the proposed development to the underlying shale and sandstone is Very High, as exposed in the cleared area on the west of the property. Therefore, author recommends the Fossil Chance Finds Procedure as detailed in Appendix A and monitoring by the EAP during construction.

Interim Comment
The South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Unit cannot comment on this application without the submission of the environmental reports to the case. The SAHRA awaits the submission of the draft BAR before commenting further on this proposed development.

Response from AdiEnvironmental
See Table 6.4.

6.4 Adjacent landowners/users and other interested and affected parties

Table 6.2 and Figure 6.2 provide an indication of the adjacent landowners who were consulted as part of the public participation process.

As indicated in Figure 6.2, the proposed site is located within an area already utilized for light industrial and mining activities. The N4 national road is located on the northern boundary of the site and the R35 provincial road is located on the western boundary.

Black Wattle Colliery is located towards the west and an abandoned mine towards the south (Figure 6.2). The properties further south and south east of the site are used for a variety of purposes e.g. coal trucking, residential, agriculture and business (e.g. a bar), etc.

The following strategy was employed to inform the adjacent landowners/users of the proposed development:

- In order to determine the registered owners of the various properties, a Deeds Search was conducted via the WinDeed system of the Deeds

Office of South Africa. The Deeds Search Template provides information pertaining to land ownership, size and land value of each of the properties.

- Contact details for the adjacent landowners/users were obtained and they were informed of the proposed development telephonically and via email as indicated in Table 6.2.

- Background Information Documents were also distributed by hand to adjacent landowners/users whose contact details could not be obtained as indicated in Table 6.2.

- The businesses currently present on the proposed development property (Bulk Diesel on N4, Corwill Construction, Heyneke Transport and Shosholoza) were informed telephonically and via email of the applicant's intentions (Table 6.2).

- The ward councillor (Ms. Michelle) was contacted telephonically and via email (Table 6.2) to obtain her comment on behalf of the wider community.

A copy of the Background Information Document is provided in Appendix 12. The Background Information Document included the following information:

- Project name and reference number;
- Applicant name;
- Legal requirements and list of activities to be authorised;
- Details of the EAP;
- Description of the public participation process;
- Responsibilities of I&APs;
- Date by which I&APs must register and forward comment;
- A link to the EAP website for an electronic copy of the Background Information Document and Basic Assessment Report;
- Project and property description;
- Locality map;
- Proposed layout plan.
- Short description of the process to be followed and proposed timeline;
- Comment sheet.

Comments received from the adjacent landowners/users in response to the advertising and distribution of the Background Information Document are indicated below.

Table 6.2: Identified adjacent landowners/users who received BIDs/flyers

PROPERTY (FIGURE 6.2)	LANDOWNER/ CONTACT PERSON	CORRESPONDENCE	COMMENTS
R35 provincial road	Department of Public Works, Roads and Transport (J. Mojapelo)	E-mail (dated: 29 June 2020; Appendix 14) with BID forwarded	Yes. See Section 6.4.1
N4 national road and Portions 24, 25, 49, 50, 52, 54	South African National Roads Agency (SANRAL) V. Bota K. Schmid I. van der Linde	E-mail (dated: 13 February 2020; Appendix 14) with BID forwarded.	Yes. See Section 6.4.2
N4 national road	Trans African Concessions (TRAC)	E-mail (dated: 13 February 2020; Appendix 14) with	None

PROPERTY (FIGURE 6.2)	LANDOWNER/ CONTACT PERSON	CORRESPONDENCE	COMMENTS
	C. Davis, W. Janse van Rensburg, R. Nkosi	BID forwarded.	
4 and 14/289	Black Wattle Colliery	E-mail (dated: 14 February 2020; Appendix 14) with BID forwarded.	None
13/289	Ubuhle Bemvelo Holdings – Vaalbank Colliery Minipit	E-mail (dated: 14 February 2020; Appendix 14) with BID forwarded.	None
5/289	Gerrie Gerrits - Pienaardam Resort	E-mail (dated: 13 February 2020; Appendix 14) with BID forwarded.	Yes. See Section 6.4.3
11/289	Carel Erasmus	Hand delivered BID on 14 February 2020 and e-mail (dated: 14 February 2020; Appendix 14) with BID forwarded.	Yes. See Section 6.4.4
11/289	Reggies Coal – renting portion of property from C. Erasmus	Hand delivered BID on 14 February 2020 and e-mail (dated: 14 February 2020; Appendix 14) with BID forwarded.	None
11/289	M. Bate – renting portion of property from C. Erasmus	E-mail (dated: 1 July 2020; Appendix 14) with BID forwarded.	None
20/289	Isambane Mining (Pty) Ltd	E-mail (dated: 13 February 2020; Appendix 14) with BID forwarded.	None
Existing businesses renting a portion of the property from the applicant			
58/289	Bulk Diesel on N4 (Yafa Trading (Pty) Ltd.)	Delivered BID on 14 February 2020 and email sent (dated: 13 and 17 February 2020; Appendix 14)	None
58/289	Corwill Construction	Telephonic discussion and e-mail (dated: 13 February 2020; Appendix 14) with BID forwarded.	None
58/289	Heyneke Transport	E-mail (dated: 17 February 2020; Appendix 14) with BID forwarded.	None
58/289	Shosholoza	E-mail (dated: 17 February 2020; Appendix 14) with BID forwarded.	None

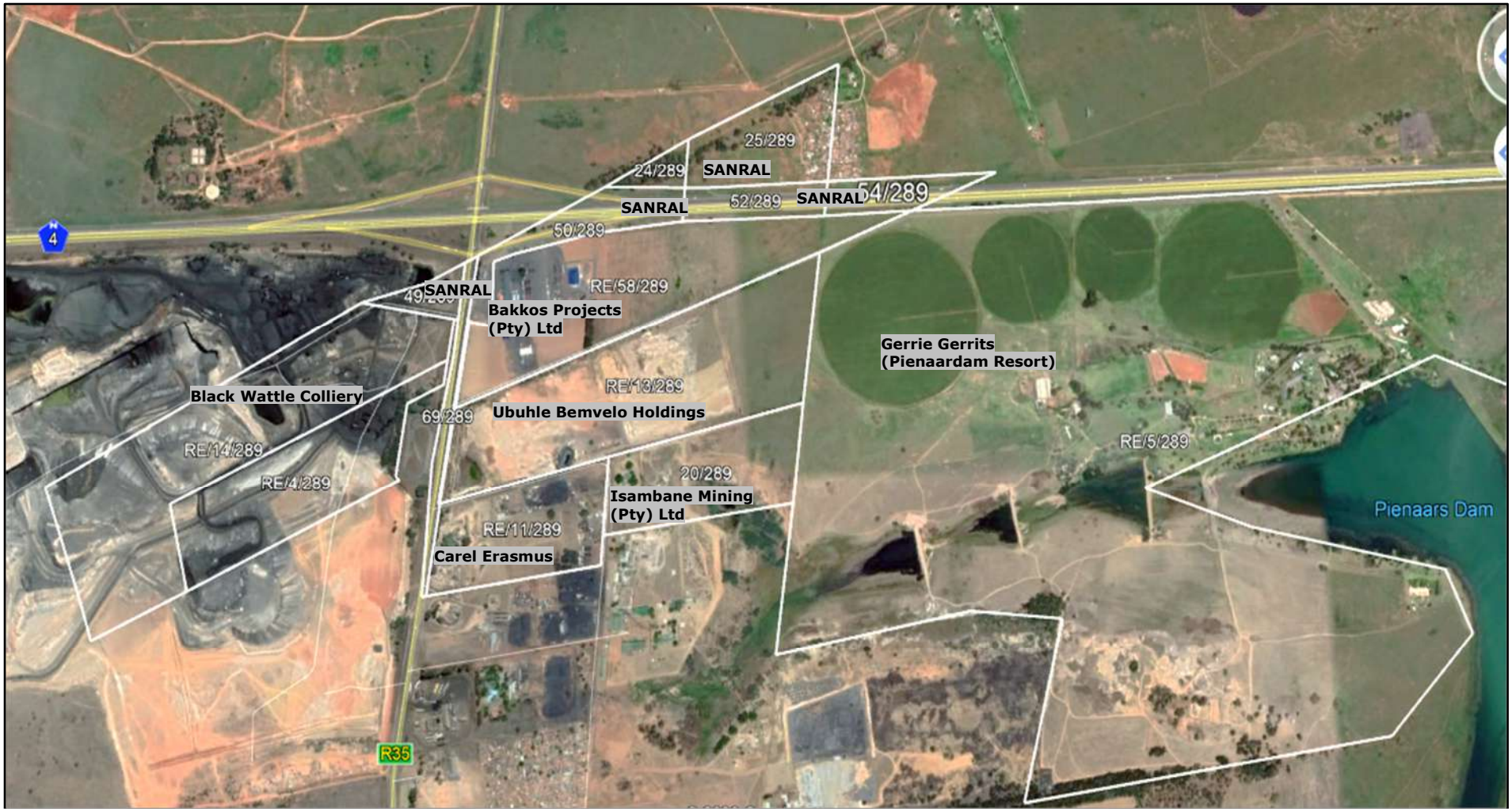


Figure 6.2: Aerial view indicating adjacent landowners/users

6.4.1 Department of Public Works, Roads and Transport

The R35 provincial road, which falls under the jurisdiction of the Department of Public Works, Roads and Transport, is located on the western boundary of the site (Figure 6.2).

A letter (dated: 30 June 2020; Ref: F09/11/1/1/3-289 JS; Appendix 14) was received from the Department of Public Works, Roads and Transport (Mr. J. Mojapelo) indicating the following:

> *We are at this stage, unable to give comprehensive comments as we presently do not know as yet what the final access(es) would be, with regard to our affected Provincial Roads. We will be able to give our comments after or towards the finalization of your EIA.*

Response from AdiEnvironmental

See Table 6.4.

6.4.2 South African National Roads Agency (SANRAL) (Figure 6.2)

The N11 national road, which falls under the jurisdiction of the South African National Roads Agency (SANRAL), is located on the northern boundary of the site (Figure 6.2).

An e-mail and completed comment sheet (dated: 13 February 2020; Appendix 14) was received from V. Bota requesting to be registered as an Interested and Affected Party. The following comment was provided:

> *Email - Please find attached registration form to register SANRAL as an interested and affected party. An access management plan and a traffic impact assessment need to be submitted to SANRAL. This is required to properly assess the application and provide comments/conditions.*

> *Comment sheet - Access to site may be required from the National Road, which might impede on building line restrictions.*

Another email (dated: 24 February 2020; Appendix 14) and letter (dated: 18 February 2020; Ref: N11/5/3-4/4-13; Appendix 14) was received from Ms. R. Barkhuizen and Mr. T. Mashele indicating the following:

> *The South African National Roads Agency SOC Limited (SANRAL) is an Interested and Affected Party and hereby objects to the above-mentioned application. Please submit a formal rezoning application together with an access management plan for further evaluation.*

Response from AdiEnvironmental

See Table 6.4.

6.4.3 Portion 5 of Vaalbank 289 JS – Gerrie Gerrits (Pienaardam Leisure Resort) (Figure 6.2)

An email (dated: 2 March 2020; Appendix 14), completed comment sheet and letter (dated: 1 March 2020; Appendix 14) were received from V. van Niekerk (representing Pienaardam Resort) in which the following was indicated:

The road leading to Pienaardam is a registered servitude road for Pienaardam Leisure Resort. Pienaardam Leisure Resort built and maintain this road.
Groundwater is one of our most important sources of water for drinking purposes and irrigation. Unfortunately, groundwater is susceptible to pollutants. Groundwater contamination occurs when man-made products such as gasoline, oil, road salts and chemicals get into the groundwater and cause it to become unsafe and unfit for human use. Considering most businesses and farmers in this area are using boreholes for domestic purposes.

Rainwater run off leads to the Coetzee Stream, Pienaardam irrigation dams and the Pienaardam dam which is the main source of drinking water for Middelburg Town. The above mentioned will be affected causing a negative impact on the topsoil which could lead to negatively impacting on our grazing and agricultural land.

Dust and Noise Controls – precautions need to be taken to limit the amount of dust and noise as this can have a negative impact on our business in the tourism industry as well as our grazing and agricultural activities. Dust and noise exposure to our farm animals has been identified as potentially stressful.

While busy preparing the ground for development the road to Pienaardam must always be kept clean and clear of any debris. Please note that this road is a main component for our tourism industry.

Due to Pienaardam mainly operating in Tourism industry, the R35 road is already heavily congested due to the new development taking place on portion 58 of the Farm Vaalbank 289 JS Middelburg. We would like to advice you to do discuss this matter with the Provincial Road Department, as this road is a high accident zoning area.

Response from AdiEnvironmental
See Table 6.4.

6.4.4 Portion 11 of Vaalbank 289 JS – Carel Erasmus

An email and completed comment sheet (dated: 2 March 2020; Appendix 14) were received from Mr. R. Erasmus and Mrs. E. Erasmus indicating the following:

How do you think the proposed activity will impact on you?
Traffic.

Any suggestions to mitigate potential impacts?
We want to know what businesses will be opened? Road?

Response from AdiEnvironmental
See Table 6.4.

6.5 Department of Agriculture, Rural Development, Land and Environmental Affairs

The project was registered with the Department of Agriculture, Rural Development, Land and Environmental Affairs on 11 December 2020 (see cover letter and application dated: 11 December 2020; Appendix 1). In addition, a date for a meeting and site visit was requested.

6.6 List of Interested and Affected Parties

From the above public participation process, the following list of Interested and Affected Parties was compiled:

Table 6.3: List of Interested and Affected Parties

INTERESTED AND AFFECTED PARTY LIST	
Organisation	**Name**
Government Departments	
Department of Agriculture, Forestry and Fisheries (DAFF)	F. Mashabela
Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) - Directorate: Land Use and Soil Management – Ermelo	J. Venter
Department of Co-operative Governance and Traditional Affairs (COGTA)	M. Loock
Department of Mineral Resources	S. Mathavela
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	T. Mkhonto
Department of Water and Sanitation (DWS)	T. Ndlhovu
Other Organisations/Stakeholders	
Distriks Landbou Unie Middelburg	J.P.J. Schmahl
Eskom Distribution (Land & Rights)	T. Ludere
Eskom Transmission	L. Motsisi
Middelburg Chamber of Business and Commerce	M. Hanekom
Mpumalanga Tourism and Parks Agency (MTPA) – Land Advisory Unit	P. Nkosi
South African Civil Aviation Authority	K. Mthapo
South African Heritage Resources Agency (SAHRA)	N. Khumalo (SAHRIS)
Local Municipality and Municipal Councillor	
Nkangala District Municipality	S. Links, A. Thwala
Steve Tshwete Local Municipality	M. Mahamba
Steve Tshwete Local Municipality	D. Lambrechts, A Masia
Steve Tshwete Local Municipality	Councillor J. Michelle (Ward 8)
Steve Tshwete Local Municipality	Councillor T. Motloung (Ward 6)
Surrounding Landowners	
Property (Figure 6.2)	**Landowner/Contact person**
R35 provincial road	Department of Public Works, Roads and Transport – J. Mojapelo
N4 national road and Portions 24, 25, 49, 50, 52, 54	South African National Roads Agency (SANRAL) V. Bota, I. van der Linde, R. Barkhuizen
N4 national road	Trans African Concessions (TRAC)

INTERESTED AND AFFECTED PARTY LIST	
	C. Davis, W. Janse van Rensburg, R. Nkosi
4 and 14/289	Black Wattle Colliery
13/289	Ubuhle Bemvelo Holdings – Vaalbank Colliery Minipit
5/289	Gerrie Gerrits - Pienaardam Resort
11/289	Carel Erasmus
11/289	Reggies Coal – renting portion of property from C. Erasmus
11/289	M. Bate – renting portion of property from C. Erasmus
20/289	Isambane Mining (Pty) Ltd
Existing businesses renting a portion of the property from the applicant	
58/289	Bulk Diesel on N4 (Yafa Trading (Pty) Ltd
58/289	Corwill Construction
58/289	Heyneke Transport
58/289	Shosholoza
Other	
Debbie Wessels	Leads to Business

6.7 Summary of issues and response

Appendix 1 (3)(h)(iii) of the EIA Regulations, 2014 (as amended) requires that a summary of the issues raised by interested and affected parties be provided in the Basic Assessment Report as well as an indication of the manner in which the issues were addressed.

Table 6.4 provides such a summary as well as the response from the EAP.

Table 6.4: Summary of issues of concern and response

Issue	I&AP, Stakeholders, Authority (Section of Report)	Response
Access to site		
We are at this stage, unable to give comprehensive comments as we presently do not know as yet what the final access(es) would be, with regard to our affected Provincial Roads. We will be able to give our comments after or towards the finalization of your EIA.	Department of Public Works, Roads and Transport (Section 6.4.1)	Noted. A new access road from Pienaardam road with an internal road system providing access to the 20 erven (Figure 7.3) is proposed. Please refer to Section 7.3 of this report for further information. A copy of the Draft Basic Assessment Report (DBAR) will be made available to the Department for review and input.
Access to site may be required from the National Road, which might impede on building line restrictions.	SANRAL (Section 6.4.2)	Access from the N4 national road will not be required – see Section 7.3.
Traffic impact assessment and access management plan		
An access management plan and a traffic impact assessment need to be submitted to SANRAL. This is required to properly assess the application and provide comments/conditions.	SANRAL (Section 6.4.2)	A Traffic Impact Assessment was conducted for the proposed development and submitted and discussed with SANRAL/TRAC (including access to the site; B. Roberts, pers. comm.). A copy of the Traffic Impact Assessment is provided in Appendix 9 of this report. The results of the Traffic Impact Assessment are summarized in Section 5.16 while details of access roads to the site investigated are provided in Section 7.3 and Table 7.2 of this report. According to the traffic engineer (B. Roberts, pers. comm), a revised Traffic Impact Assessment (including an access management plan) will be drafted and submitted to SANRAL/TRAC once discussions regarding the site access have been finalized. A copy of the DBAR will be made available to SANRAL for review and input.
Impact on Pienaardam Road		
The road leading to Pienaardam is a registered servitude road for Pienaardam Leisure Resort. Pienaardam Leisure Resort built and maintain this road.	Gerrie Gerrits (Section 6.4.3)	Noted. Pienaardam road is indicated as a Right-of-Way servitude road in Section 5.3.4 of this report. A new access road from Pienaardam road with an internal road system providing access to the 20 erven (Figure 7.3) is proposed. As indicated in Section 7.3 (Table 7.2), the new access road would impact on a portion (±150m) of the Right-of-Way servitude road providing access to the Pienaardam Leisure Resort (Figure 7.3). Permission to use this Right-of-Way servitude road might be required and needs to be confirmed. In addition, an agreement regarding the maintenance of this road must be drafted and agreed to between the various parties involved.
While busy preparing the ground for development the road to Pienaardam must always be kept clean and clear of any debris. Please note that this road is a main component for our tourism industry.	Gerrie Gerrits (Section 6.4.3)	Noted. Mitigation measures to ensure that the road is kept clean and clear of debris were included in the Environmental Management Programme (EMPr) (Section 9).
Impact on traffic		
Due to Pienaardam mainly operating in Tourism industry, the R35 road is already heavily congested due to the new development taking place on portion 58 of the Farm Vaalbank 289 JS Middelburg. We would like to advice you to do discuss this matter with the Provincial Road Department, as this road is a high accident zoning area.	Gerrie Gerrits (Section 6.4.3)	Noted. The traffic engineer (B. Roberts) has been in discussions with SANRAL/TRAC regarding the proposed access road to the site. SANRAL/TRAC requested that the Blackwattle Colliery, weighbridge, Pienaardam and proposed development's access roads be realigned. Upgrades to the R35 and the existing Pienaardam Road have been proposed in order to alleviate the existing traffic situation. A new access road from Pienaardam road with an internal road system providing access to the 20 erven (Figure 7.3) is proposed. It will form part of the proposed new Pienaardam intersection as discussed with SANRAL/TRAC (Roberts, pers. comm.). The proposed new Pienaardam intersection would result in improved traffic conditions. See Section 7.3 and Table 7.2 for further details.
How do you think the proposed activity will impact on you? *Traffic. Road?*	Carel Erasmus (Section 6.4.4)	A Traffic Impact Assessment (Appendix 9) was conducted for the proposed development. The results of the study are summarized in Section 5.16 of this report. A new access road from Pienaardam road with an internal road system providing access to the 20 erven (Figure 7.3) is proposed. It will form part of the proposed new Pienaardam intersection as discussed with SANRAL (Roberts, pers. comm.). The proposed new Pienaardam intersection would result in improved traffic conditions. See Section 7.3 and Table 7.2 for further details.
Impact on groundwater		
Groundwater is one of our most important sources of water for drinking purposes and irrigation. Unfortunately, groundwater is susceptible to pollutants. Groundwater contamination occurs when man-made products such as gasoline, oil, road salts and chemicals get into the groundwater and cause it to become unsafe and unfit for human use. Considering most businesses and farmers in this area are using boreholes for domestic purposes.	Gerrie Gerrits (Section 6.4.3)	Noted. It is not expected that the light industrial activities would have a negative impact on the groundwater of the area if each tenant leasing a stand implements the mitigation measures (especially the waste management measures) stipulated in the Environmental Management Programme (Section 9 of this report). The applicant must ensure that the stipulated mitigation measures are implemented by each tenant leasing a stand within the said light industrial area.
Impact of surface water runoff on soil/grazing/agricultural land		
Rainwater run off leads to the Coetzee Stream, Pienaardam irrigation dams and the Pienaardam dam which is the main source of drinking water for Middelburg Town. The above mentioned will be affected causing a negative impact on the topsoil which could lead to negatively impacting on our grazing and agricultural land.	Gerrie Gerrits (Section 6.4.3)	Stormwater runoff does flow in an easterly direction towards the Vaalbankspruit, which is located ±700m southeast of the site. The stormwater runoff will not flow directly onto agricultural land of Pienaardam Leisure Resort. The Pienaardam road provides a barrier between the light industrial development and the agricultural land (see Figure 5.2). Stormwater runoff from the site should thus not impact on the said agricultural lands in terms of loss of topsoil or erosion. Mitigation measures (e.g. soil, stormwater, waste management) indicated in the Environmental Management Programme (Section 9 of this report) must be implemented. It should be noted that a new stormwater system for the overall site must be developed incorporating the existing stormwater measures (Section 7.4). Stormwater must be controlled so that it does not impact (e.g. flooding, waterlogging, erosion, etc.) on the light industrial activities, the internal road network, the adjacent roads (Pienaardam road, N4, R35) or the adjacent agricultural activities of Pienaardam Leisure Resort. It is recommended that stormwater runoff from site be captured in an attenuation dam before being released to the natural environment.

Table 6.4: Summary of issues of concern and response

Issue	I&AP, Stakeholders, Authority (Section of Report)	Response
Impact of dust		
Dust and Noise Controls – precautions need to be taken to limit the amount of dust and noise as this can have a negative impact on our business in the tourism industry as well as our grazing and agricultural activities. Dust and noise exposure to our farm animals has been identified as potentially stressful.	Gerrie Gerrits (Section 6.4.3)	Noted. As indicated in Section 8.5.9, dust could be generated as a result of construction activities and use of heavy machinery and could impact on motorists travelling along the Pienaardam road to Pienaardam Leisure Resort as well as the agricultural activities (cultivated lands, livestock) of Pienaardam Leisure Resort. During the operational phase, dust could be generated if the internal road network is not paved or tarred. This could impact on motorists travelling along the Pienaardam road to Pienaardam Leisure Resort as well as the agricultural activities (cultivated lands, livestock) of Pienaardam Leisure Resort. The extent of the impact as a result of dust would depend on the time of year, wind direction (which is predominantly in a north westerly and south easterly direction), wind velocity and mitigation measures in place. Mitigation/management measures with regards to dust are indicated in the Environmental Management Programme (Section 9 of this report). These mitigation/management measures would have to be implemented by the applicant in order to ensure compliance with the Environmental Authorisation. In addition, all activities taking place on site as well as the overall light industrial development will have to comply with the National Dust Control Regulations, 2013 as well as any by-laws regarding dust/air quality of the Steve Tshwete Local Municipality.
Impact of noise		
Dust and Noise Controls – precautions need to be taken to limit the amount of dust and noise as this can have a negative impact on our business in the tourism industry as well as our grazing and agricultural activities. Dust and noise exposure to our farm animals has been identified as potentially stressful.	Gerrie Gerrits (Section 6.4.3)	Noted. The ambient noise level of the site is high since the site is located adjacent to the N4 national road and the R35 provincial road which both carry high volumes of traffic throughout the day. Noise is also generated by existing mining activities adjacent to the site as well as existing light industrial activities taking place on site. Pienaardam Leisure Resort is also located within this environment and therefore it is anticipated that the farm animals (livestock) are already used to the existing noise levels in the area. Section 8.5.10 provides an indication of the potential noise impact during the construction and operational phases of the light industrial area. Some operational noise would be created as a result of the light industrial activities taking place on site (e.g. increased numbers of people and vehicles visiting the various light industrial businesses, noise as a result of activities, etc.). The Pienaardam Leisure Resort accommodation facilities are located approximately 1km from the eastern end of the proposed light industrial development. It is therefore not anticipated that tourists visiting Pienaardam Leisure Resort would be directly impacted as a result of noise generated as a result of light industrial activities taking place on site. Mitigation/management measures with regards to noise are indicated in the Environmental Management Programme (Section 9 of this report). These mitigation/management measures would have to be implemented by the applicant in order to ensure compliance with the Environmental Authorisation. In addition, all activities taking place on site as well as the overall light industrial development will have to comply with the Noise Control Regulations as well as any by-laws regarding noise of the Steve Tshwete Local Municipality.
Heritage Impact Assessment (HIA) and Palaeontological Impact Assessment (PIA)		
The HIA or an exemption letter depending on the findings, must be undertaken by a suitably qualified archaeologist and it must comply with Section 38(3) of the National Heritage Resources Act, Act 25 of 1999 (NHRA). Once the report is submitted to the case for commenting, SAHRA will provide further comments on this proposed development	SAHRA (Section 6.3.2)	A Heritage Impact Assessment was conducted by a suitably qualified archaeologist (Prof. A. van Vollenhoven) as requested by SAHRA. A copy of the report is provided in Appendix 7. No sites of cultural or archaeological importance were found on site – see Section 5.13 of this report for more information.
In addition to the HIA report or exemption letter, SAHRA also requires an assessment of palaeontological resources by a suitably qualified palaeontologist.		A Palaeontological Impact Assessment (PIA) was conducted by a qualified palaeontologist (Dr. H. Fourie) as requested by SAHRA. A copy of the PIA is provided in Appendix 8. No surface fossils were found on site – see Section 5.13 of this report for more information.
The HIA and the Palaeontology Impact Assessment (PIA) must be provided to SAHRA for commenting prior to the submission of the final BAR to the competent authority. All these documents will be assessed by SAHRA, and the comment issued by SAHRA must be included in the final BAR.	SAHRA (Section 6.3.2)	Copies of the HIA and PIA were submitted to SAHRA via the SAHRIS system as requested (date of submission: 21 July 2020; Appendix 13).
The South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Unit cannot comment on this application without the submission of the environmental reports to the case. The SAHRA awaits the submission of the draft BAR before commenting further on this proposed development.	SAHRA (Section 6.3.2)	A copy of the DBAR will be loaded onto the SAHRIS system for comment.
Type of businesses to operate on property		
Any suggestions to mitigate potential impacts? *We want to know what businesses will be opened?*	Carel Erasmus (Section 6.4.4)	As indicated in Section 3.1, the applicant intends to provide 20 erven on the property (Figure 3.2), which will be sold/rented to various businesses for light industrial activities. It is anticipated that the erven will be used for activities such as motor showrooms, workshops, earthmoving equipment, etc. The exact tenant mix has not been finalised and will depend on the market need at the point in time when all authorisations have been obtained.
Registration as Interested and Affected Party (I&AP)		
Registered as Interested and Affected Party - Business opportunity	D. Wessels (Section 6.1.4)	Registered as an Interested and Affected Party.
Please find attached registration form to register SANRAL as an interested and affected party.	SANRAL (Section 6.4.2)	Registered as an Interested and Affected Party.
The South African National Roads Agency SOC Limited (SANRAL) is an Interested and Affected Party and hereby objects to the above-mentioned application.	SANRAL (Section 6.4.2)	Noted. SANRAL was registered as an Interested and Affected Party. Objection with regards to the application noted.

Table 6.4: Summary of issues of concern and response		
Issue	**I&AP, Stakeholders, Authority (Section of Report)**	**Response**
Requested copy of the Basic Assessment Report		
Please kindly submit the Basic Assessment report (BAr) to me in order to provide comment.	Department of Water and Sanitation (Section 6.3.1)	The following was indicated to Ms. Ndlovu (email dated: 13 February 2020; Appendix 13): "Your request is noted. We just commenced with the process. The Basic Assessment should be available for comment in March/April. I will make sure to send a hard copy to you for comment"
Rezoning application		
Please submit a formal rezoning application together with an access management plan for further evaluation.	SANRAL (Section 6.4.2)	Noted. The town planners (Hlukani Development Consultants) were informed that a copy of the rezoning application (including the access management plan) must be submitted to SANRAL. A copy of the DBAR will be made available to SANRAL for review and input.

6.8 Evaluation of Draft Basic Assessment Report

As indicated in Section 11, the Draft Basic Assessment Report (BAR) will be made available to I&APs, stakeholders and government departments for a 30-day review period.

Hard/soft copies of the document will be submitted to relevant authorities. A hard copy and electronic copy of the Draft BAR will be made available to the Interested and Affected Parties and stakeholders consulted and/or registered as part of the process (refer to Table 6.3).

The various departments, stakeholders and I&APs will be requested to forward any comments on the report to the consultant within the 30-day period provided. These comments will be included and addressed in:

- Section 11 (Evaluation of Draft Basic Assessment Report);
- Table 11.1 (Summary of Issues of Concern and Response); and
- Appendix 15;

of the Final Basic Assessment Report.

The Final BAR (incorporating comments from I&APs) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for final decision making.

An e-mail will be forwarded to the various departments, stakeholders and Interested and Affected Parties informing them of the comments received and the submission of the Final BAR for decision making.

SECTION 7: DESCRIPTION OF ALTERNATIVES

According to Appendix 1 of the EIA Regulations, 2014 (as amended), one of the objectives of the basic assessment process is to identify the alternatives considered for the proposed development and to rank these alternatives in terms of the potential impacts identified in order to identify the preferred alternatives.

The EIA Regulations (2014; as amended) defines alternatives as:
"different means of meeting the general purpose and requirements of the activity, which may include alternatives to the -

a. *property on which or location where the activity is proposed to be undertaken;*
b. *type of activity to be undertaken;*
c. *design or layout of the activity;*
d. *technology to be used in the activity; or*
e. *operational aspects of the activity;*

and includes the option of not implementing the activity."

In addition to the above-mentioned, Section 24O(1)(b)(iv) of NEMA requires that the competent authority must take into account *"where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment."*

This section therefore provides a detailed description o1f the various alternatives investigated and process followed to decide on the preferred alternatives to be implemented.

The following alternatives were investigated:

- 7.1: Alternative sites;
- 7.2: Alternative land uses;
- 7.3: Alternative layout plans;
- 7.4: Alternative service provision (water, electricity, sewage, waste management and storm water management);
- 7.5: No-go option.

7.1 Alternative sites

The proposed development will be located on Portion 58 of the farm Vaalbank 289 JS, Middelburg. The said site is located adjacent to the R35 provincial road (Bethal Road) and in close proximity of the N4 national road, ±2.5km south of the Middelburg Mall (Figure 5.1). The property is ±22 ha in extent.

The applicant intends to rezone the property from Agriculture to Light Industrial (Industrial 2). As indicated in Figure 3.2, the following businesses are already present on site: a truck stop, diesel depot (Bulk Diesel on N4), food kiosk (WowChow), Shosholoza and Cornwill Construction.

The applicant intends to provide 20 erven on the property, which will be sold/rented to various businesses for light industrial activities (e.g. motor showrooms, workshops, earthmoving equipment, etc.).

The applicant decided upon the development of the proposed site for the following reasons:

- The said site belongs to the applicant (Bakkos Projects (Pty) Ltd).
- Businesses/light industrial activities are already present on site.
- An Environmental Authorisation (dated: 24 April 2019; Ref: 1/3/1/16/1N-142; Appendix 10) has already been issued for the truck stop and aboveground diesel tanks on 2.5ha of the property.
- The intention is to develop the remainder of the site to reach its full potential by providing 20 erven for light industrial purposes.
- The site is located close to Middleburg and ideally situated adjacent to the N4 national road and the R35 provincial road and thus easily accessible.
- The site is located in an area already used for light industrial and mining activities. The Industrial Park will thus fit in with the other land uses in the area.

No alternative sites with regards to the proposed development were identified.

7.2 Alternative land uses

Three (3) alternative land uses for the proposed development site were investigated, namely:

- Alternative land use 1 (Agriculture)
- Alternative land use 2 (Mining)
- Alternative land use 3 (Residential)
- Alternative land use 4 (Light industrial)

Table 7.1 provides the advantages and disadvantages of the above-mentioned alternatives.

As indicated in Table 7.1, **the preferred option is Alternative land use 4 (Light Industrial).**

Table 7.1: Matrix for determining the preferred alternative in terms of land use

Alternative	Advantages	Disadvantages	Ranking	Option selected
Alternative land use				
Alternative 1 - agriculture	x The property would not have to be rezoned. x Agricultural land would not be lost. x An area of 9.35ha (Hutton, Pinedene, Glencoe; Figure 5.11) is highly suitable for both irrigated and rainfed crop production (Pienaar, 2020). x Shallower Glencoe soils (2.29 ha; Figure 5.11) present on site are suitable for rain-fed crop production (Pienaar, 2020). x In total, an area of 11.64 ha is available for crop production (Hutton, Glencoe, Pinedene; Figure 5.11). x The area classified as Anthrosols/Hutton (Figure 5.11) may still have arable land capability (including rain-fed crop production) – deep ripping would be required.	x Businesses/light industries are already present on site and have thus impacted on the soil of the site. x An area of approximately 10.5 ha has already been affected by human activities (Anthrosols and Anthrosols/Hutton; Figure 5.11). x The area classified as Anthrosols/Hutton (Figure 5.11) could only be used for crop production after compaction has been alleviated with deep-ripping techniques (Pienaar, 2020). x An area of 11.64 ha is available for crop production (Hutton, Glencoe, Pinedene; Figure 5.11). However, this is a relatively small area and may not be financially viable from an agricultural point of view especially if water for irrigation purposes is required. x A sustainable water source for irrigation purposes (surface water or groundwater) would have to be identified and the required water use licence (for irrigation) obtained from the Department of Water and Sanitation. x Proposed site and immediate surrounding area have a grazing capacity of 5ha/LSU – would allow 4 head of cattle or 16 head of sheep on the entire site (22 ha). This is not enough for an employment opportunity (Pienaar, 2020) and would not be financially viable from an agricultural point of view. x Livestock farming will only be possible if property fenced along the very busy roads (Pienaar, 2020). x The applicant has no qualifications or experience in the agricultural sector.	2 Second Option	No
Alternative 2 – mining	x Possible that coal could be present in view of the underlying geology of the site (Vryheid Formation underlain by tillite of the Dwyka Formation, Rooiberg Group) and the adjacent mining activities (e.g. Black Wattle Colliery, Vaalbank Colliery Minipit).	x Vryheid sediments and the underlying Dwyka tillite become progressively thinner eastwards, pinching out against the north-westward dipping basement rhyolite about 150m from the easterly corner against the N4 highway (Hansmeyer, 2020).	4 Fourth Option	No

Alternative	Advantages	Disadvantages	Ranking	Option selected
		x In view of above-mentioned and the small area available to mine (11ha where no existing light industrial activities are present), the coal reserve present might not be financially viable to mine. This area could further be reduced in view of the site being located adjacent to the N4 national road and the R35 provincial road. x The applicant is not in possession of a prospecting right or mining right. Applications in this regard would have to be submitted and approved by the Department of Mineral Resources before mining takes place.		
Alternative 3 – residential	x From a geotechnical point of view, the site is suitable for development purposes.	x Site currently zoned 'Agriculture' and may not be used for residential purposes without being rezoned to Residential. x Site borders onto the urban edge of Middelburg where municipal services (water, sewage, electricity, etc.) are not provided. x Municipal services (water, sewage, electricity, etc.) in accordance with the requirement of the STLM would have to be provided to each house – costly. x Businesses/light industrial activities already present on site would have to be decommissioned and site rehabilitated in order to build houses. x Residents could be impacted (e.g. dust, blasting, etc.) in terms of existing mining activities located adjacent to the site (e.g. Black Wattle Colliery, Vaalbank Colliery Minipit). x A residential development would not be compatible with the sense of place in the surrounding area. x An area of 11.64 ha suitable for crop production (Hutton, Glencoe, Pinedene; Figure 5.11) would no longer be available for agricultural purposes.	3 Third Option	**No**
Alternative 4 – light industrial	x *Businesses/light industries are already present on site and would be able to continue with their activities.* x *Developer will provide the required services (water, electricity, etc.) to the 20 erven.* x *A number of employment opportunities would be created.*	x *The site must be rezoned from 'Agriculture' to 'Industrial 2'.* x *Site borders onto the urban edge of Middelburg where municipal services (water, sewage, electricity, etc.) are not provided.*	*1 Preferred*	***Yes***

Alternative	Advantages	Disadvantages	Ranking	Option selected
	x *The development will fit in with the sense of place of the surrounding area.* x *Development will complement the existing surrounding land uses and the rezoning of the property will contribute to achieving the Development Objectives of the Spatial Planning and Land use Management Act (SPLUMA).* x *The businesses/light industries would be highly visible and easily accessible from the N4 national road.* x *Pienaar (2020) indicated that the proposed Light Industrial Park is a viable land use option for an area where it is evident that all agricultural activities ceased many years ago. The site is also located in close proximity to other businesses (2.5 km south of Middelburg Mall).*	x An area of 11.64 ha suitable for crop production (Hutton, Glencoe, Pinedene; Figure 5.11) would no longer be available for agricultural purposes. x Pienaardam Leisure Resort could be impacted in terms of their access road if mitigation measures are not implemented.		

Legend: 0 = Fatal Flaw; 1 = Preferred Option; 2 = Second Option; 3 = Third Option; 4 = Fourth Option

7.3 Alternative layout plans

Three (3) alternative layouts for the proposed development were investigated, namely:

- Alternative layout 1 (use existing access road directly from R35) – Figure 7.1.
- Alternative layout 2 (realign existing access road directly from R35) – Figure 7.2.
- Alternative layout 3 (new access road from Pienaar Dam road) – Figure 7.3.

Table 7.2 provides the advantages and disadvantages of the above-mentioned alternatives.

As indicated in Table 7.2, **the preferred option is Alternative layout 3 (new access road from Pienaar Dam road).**

Figure 7.1: Alternative layout 1 (use existing access road directly from R35) (taken from Roberts, 2019).

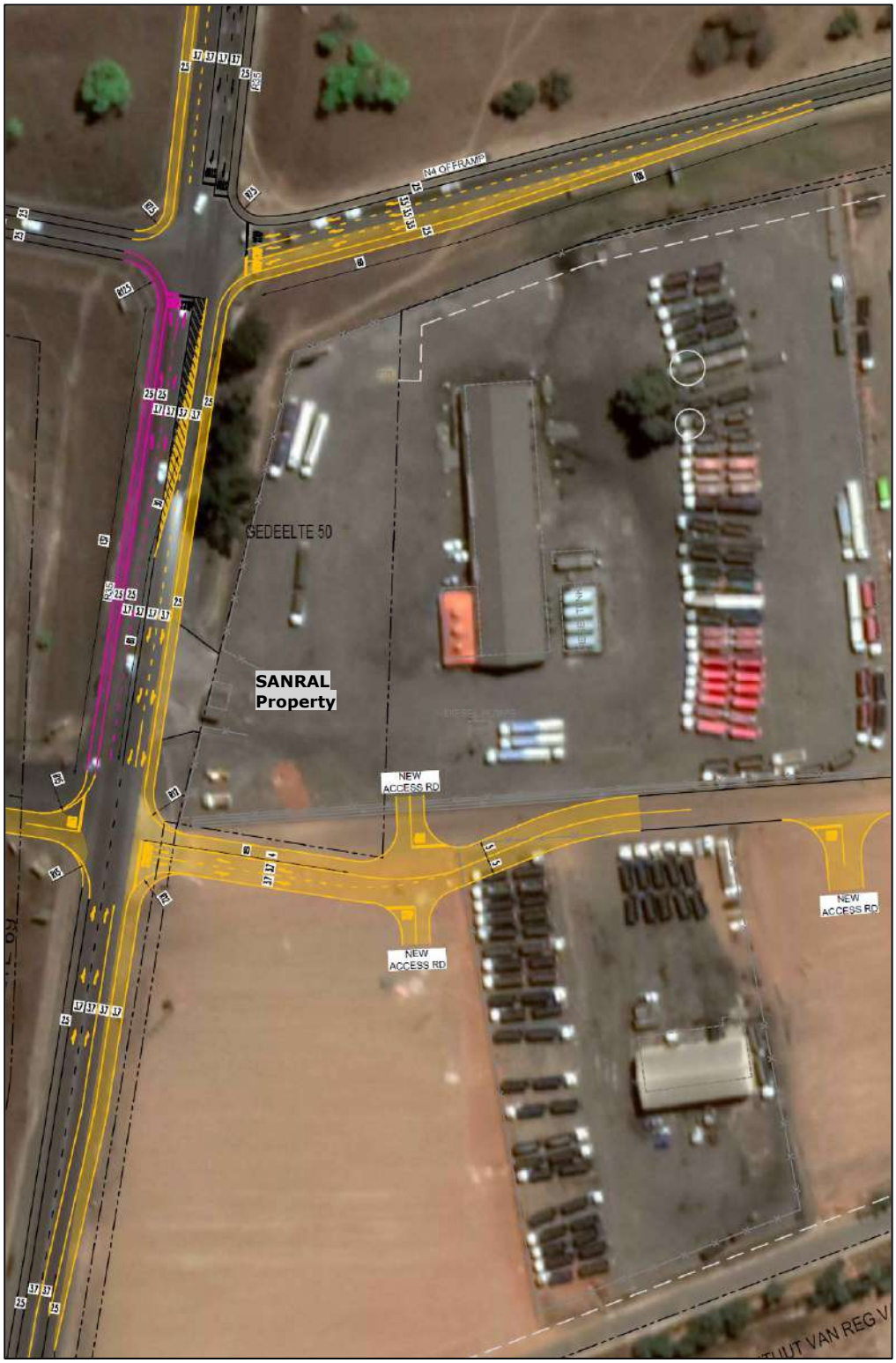


Figure 7.2: Alternative layout 2 (realign existing access road directly from R35) (taken from Roberts, 2019).

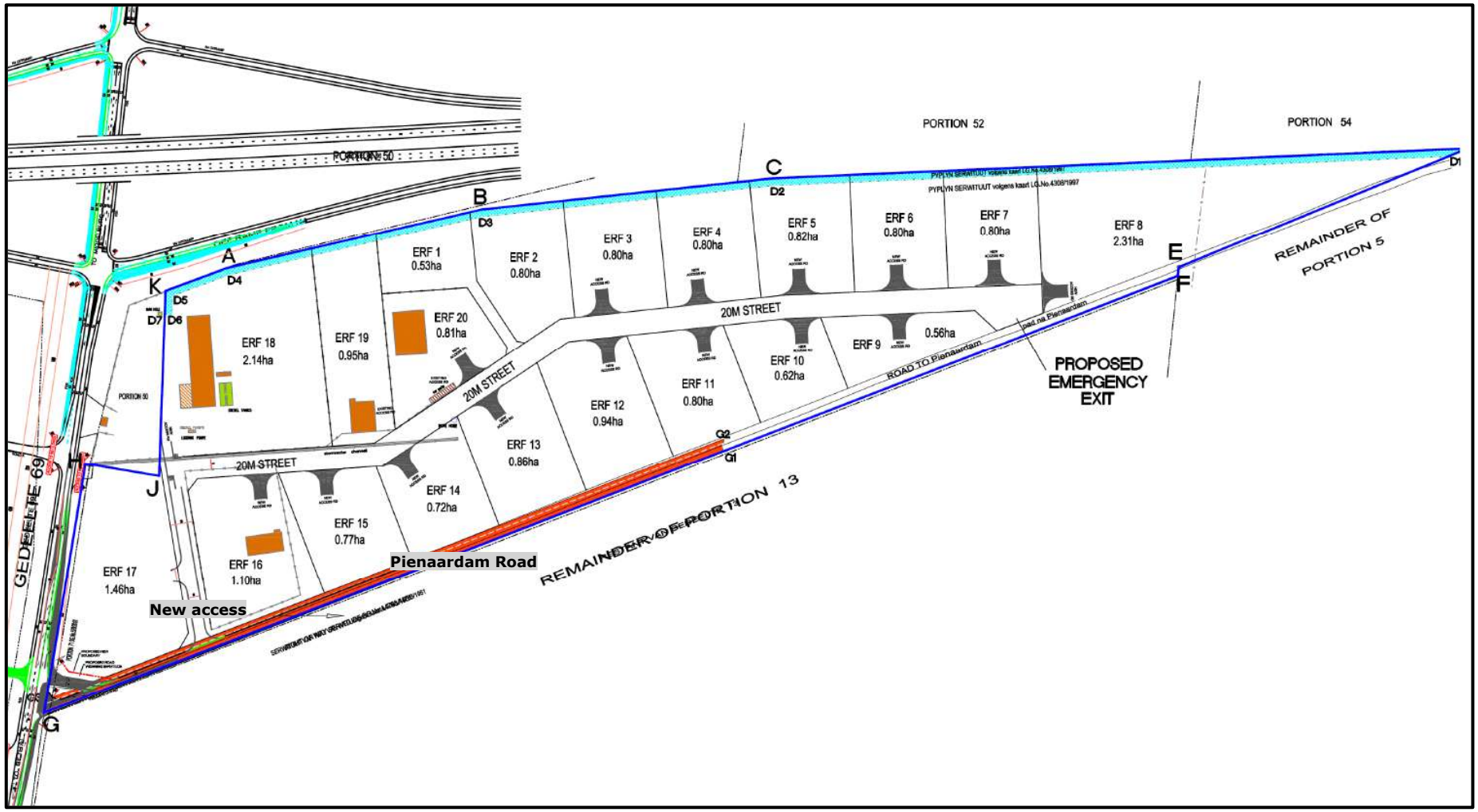


Figure 7.3a: Alternative layout 3 (new access road from Pienaardam Road)

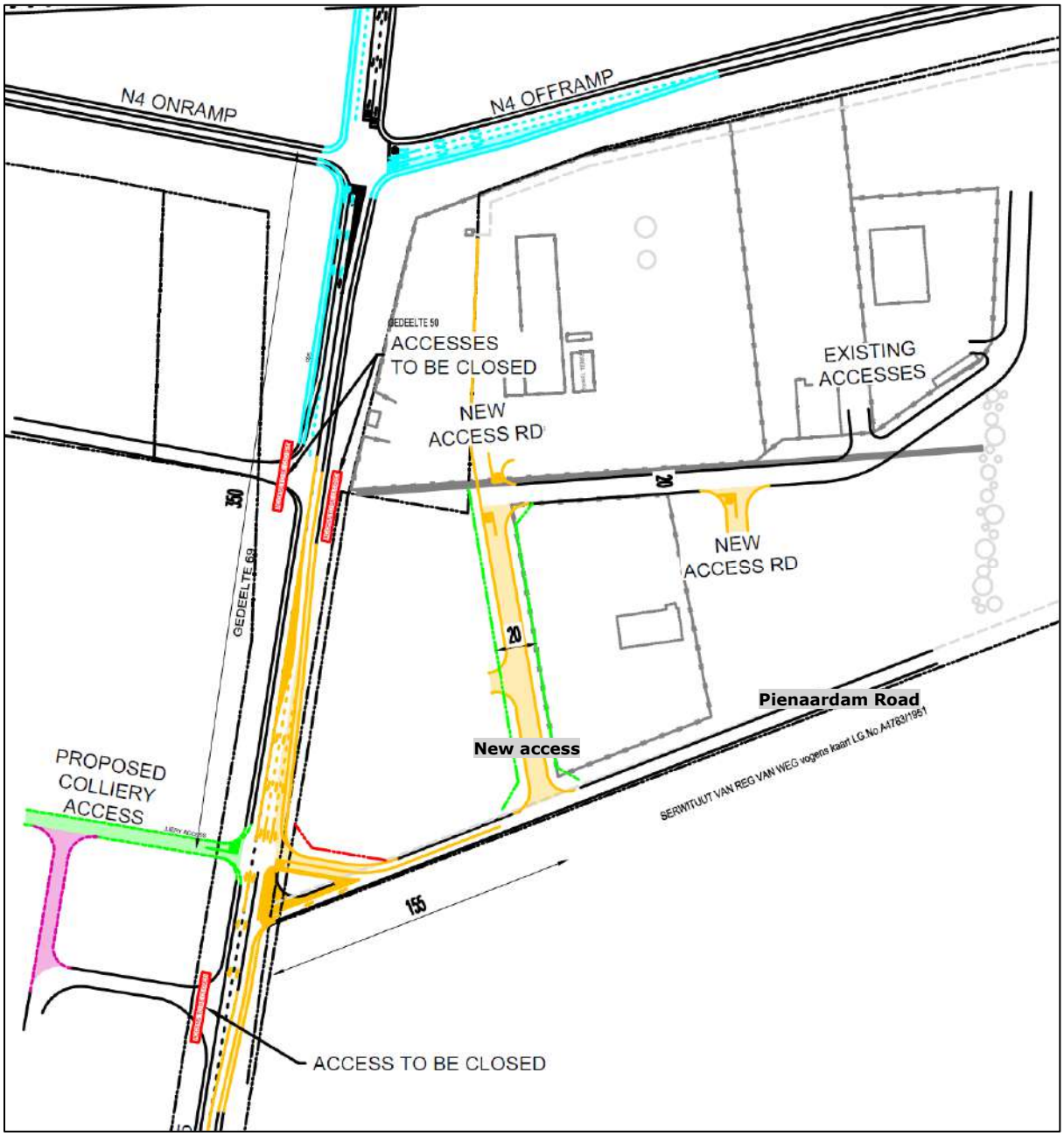


Figure 7.3b: Alternative layout 3 (new access road from Pienaardam Road)

Table 7.2: Matrix for determining the preferred alternative in terms of layout plan

Alternative	Advantages	Disadvantages	Ranking	Option selected
Alternative land use				
Alternative layout 1 (use existing access road directly from R35) – Figure 7.1.	x Presently, the site is accessed from one central collector type gravel road (nearly opposite the existing Black Wattle Colliery access) connecting to the R35 provincial road. x This access road was recently upgraded (Roberts, 2019). x From this access road, access to each stand is easily obtained for either side of the road (Roberts, 2019). x A separate access with security is provided to the Bulk Diesel/truck stop site.	x Roberts (2019) indicated that the Bulk Diesel/truck stop access is not an approved access and extends across property belonging to SANRAL (Figure 7.1). This access would have to be relocated since SANRAL is not in favour of this access road. x The central collector access road also extends across SANRAL property and would have to be realigned.	0 Fatal flaw	No
Alternative layout 2 (realign existing access road directly from R35) – Figure 7.2).	x The Bulk Diesel/truck stop access road will be closed (Figure 7.2). x The existing central collector access road would be realigned (as it was also impacting on the SANRAL property) and upgraded. x From this access road, an internal road network would be provided – providing access to the existing light industrial and the proposed light industrial stands. x Access to the Bulk Diesel/truck stop will be obtained from the realigned central access road (Figure 7.2).	x Roberts (pers. Comm) indicated that SANRAL is also not in favour of this realigned central access road to the development. SANRAL requested that the Blackwattle Colliery, weighbridge, Pienaardam and proposed development's access roads be realigned.	0 Fatal flaw	No
Alternative layout 3 (new access road from Pienaardam Road) – Figure 7.3a and 7.3b.	x *Access to the site will be obtained from the Pienaardam Road, connecting to the R35 provincial road (Figure 7.3). It will form part of the proposed new Pienaardam intersection as discussed with SANRAL (Roberts, pers.comm.).* x *The proposed new Pienaardam intersection would result in improved traffic conditions.* x *The existing access will be closed as per SANRAL requirements.* x *From the new access road, an internal road network will be provided – providing access to*	x *The new access road would impact on a portion (±150m) of the Right-of-Way servitude road providing access to the Pienaardam Leisure Resort (Figure 7.3).* x *Permission to use this Right-of-Way servitude road might be required.* x *The increased use of this road by heavy vehicles could impact on the said road (condition of the road) requiring more maintenance of the said road.* x *The increased use of this road by heavy vehicles could impact on the general public utilizing the road to gain access to Pienaardam Leisure Resort.*	*1* *Preferred*	***Yes***

Alternative	Advantages	Disadvantages	Ranking	Option selected
	the existing light industrial and the proposed light industrial stands (Figure 7.3). x *A total of 20 erven will be provided (Figure 7.3).* x *An emergency exit will be provided from the Pienaardam Road near the eastern boundary of the site (Figure 7.3).*			

Legend: 0 = Fatal Flaw; 1 = Preferred Option; 2 = Second Option; 3 = Third Option

7.4 Alternative service provision

The proposed development site borders onto the urban edge of Middelburg where municipal services (water, sewage, electricity, etc.) are not provided.

Table 7.3 provides an indication of the alternatives investigated with regards to service provision:

- Water provision;
- Electricity;
- Sewage disposal;
- Waste disposal;
- Storm water management.

As indicated in Table 7.3, **the preferred options with regards to service provision are as follows:**

Water provision	Alternative 1 - water from Steve Tshwete Local Municipality
Electricity	Alternative 2 - obtaining electricity from Eskom
Sewage disposal	Alternative 4 – conservancy tanks
Waste disposal	Alternative 4 – waste collection area per stand
Storm water management	Alternative 2 – new storm water system to be drafted and implemented as part of the overall development of the Industrial Park.

Table 7.3: Matrix for determining the preferred alternative in terms of service provision

Alternative	Advantages	Disadvantages	Ranking	Option selected
Alternative service provision				
Water provision				
Alternative 1 - water from Steve Tshwete Local Municipality	x *The proposed development will connect to the existing STLM water supply line via Black Wattle Colliery.* x *A letter from Black Wattle Colliery confirming that water is already provided to Portion 58 via the municipal water supply line is provided in Appendix 3.*		*1 Preferred*	***Yes***
Alternative 2 - surface water		x The closest river/stream is an unnamed tributary of the Vaalbankspruit, located ±700 m southeast of site. x The surface water could be polluted as a result of mining and agricultural activities taking place upstream of the site. x A water treatment plant would have to be installed. x A pipeline would have to be installed from the river to the site. x A pump would have to be installed in the stream, which would be risky in terms of theft. x A servitude would have to be registered across the adjacent properties. x A hydrological study would have to be conducted to determine if a sustainable volume of water is available from the tributary for the overall development. x A water use license would be required from the Department of Water and Sanitation.	3 Third Option	No
Alternative 3 – groundwater	√ A borehole is present on site, which can be used for emergency purposes.	x No information regarding the yield and the groundwater quality of the said borehole is available. x The groundwater quantity and quality of the site and immediate surrounding area could have been impacted in terms of mining activities taking place to the west (Black Wattle Colliery) and south of the site (Vaalbank Colliery Minipit). x A geohydrological study would have to be conducted to determine if a sustainable water supply could be	2 Second Option	No

Alternative	Advantages	Disadvantages	Ranking	Option selected
		provided from the existing borehole or if new boreholes would be required. x The groundwater quality (i.e. fit for human consumption) would also have to be determined. x A water use licence would be required from the Department of Water and Sanitation.		
Electricity				
Alternative 1 - electricity from the Steve Tshwete Local Municipality		x The said site is located just outside the Steve Tshwete Local Municipality (STLM) urban edge and is not serviced by the Steve Tshwete Local Municipality. x The proposed development site falls under the jurisdiction of Eskom. x Electricity can therefore not be provided by the STLM.	Fatal flaw	No
Alternative 2 - obtaining electricity from Eskom	√ *The proposed development site falls under the jurisdiction of Eskom.* √ *The site is already connected to the existing Eskom network.* √ *Eskom approved an increase in electricity supply from 100kVA to 315kVA (see Eskom acceptance letter dated: 28 February 2019; Appendix 3).*		*1 Preferred*	***Yes***
Sewage disposal				
Alternative 1 - connecting to the Steve Tshwete Local Municipality sewer system		x The said site is located just outside the Steve Tshwete Local Municipality (STLM) urban edge and is not serviced by the Steve Tshwete Local Municipality. x The development site can therefore not connect to an existing municipal outfall sewer.	Fatal flaw	No
Alternative 2 - sewage package plant		x The estimated wastewater treatment demand may not warrant the installation of a sewage treatment/package plant per stand. x One sewage package plant may be required for the overall development as well as a sewage reticulation network throughout the development site. x The sewage package plant would have to be placed on a separate stand specifically zoned for this purpose. x The management and maintenance of the sewage package plant would be the responsibility of the	2nd Option	No

Alternative	Advantages	Disadvantages	Ranking	Option selected
		developer and not the tenants resulting in additional costs for the developer. x If the sewage treatment/package plant is not functioning properly, it could impact on the tenants of the various light industrial stands in terms of odours. x Depending on the throughput capacity of the sewage package plant, an Environmental Authorisation (i.t.o. the EIA Regulations, 2014 (as amended)) from DARDLEA and a water use license from the Department of Water and Sanitation would be required.		
Alternative 3 - septic tank and French drain		x Septic tanks with French drains are no longer accepted by the Department of Water and Sanitation due to the potential groundwater pollution risks.	0 Fatal flaw	No
Alternative 4 – conservancy tanks	√ *Each tenant will be responsible for the installation of a conservancy tank on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.* √ *The size of the conservancy tanks will depend on the type of activity and the number of employees on site.* √ *Each tenant will be responsible for the management of the conservancy tank.* √ *Each tenant will have to ensure that a contractor is sourced to empty the conservancy tanks on a regular basis.*	x *For each individual erf, engineers would have to be appointed to determine the size and placing of conservancy tanks.* x *The conservancy tanks would have to be emptied on a regular basis by means of a honey sucker. This would result in additional costs as a service provider would have to be sourced by tenants.* x *The sewage would have to be disposed at the Boskrans Wastewater Treatment Plant, which could also result in additional costs for tenants.* x *There is a risk that the conservancy tank/tanks could overflow, resulting in soil and groundwater pollution as well as bad odours.*	*1* *Preferred*	***Yes***
Waste management				
Alternative 1 – waste collected by the Steve Tshwete Local Municipality		x The said site is located just outside the Steve Tshwete Local Municipality (STLM) urban edge and is not serviced by the Steve Tshwete Local Municipality. x The STLM therefore does not provide a waste removal service to the said site.	0 Fatal flaw	No
Alternative 2 – new onsite waste disposal site		x A suitable site (from a geotechnical and environmental perspective) for an onsite waste disposal site would have to be identified on site.	0 Fatal flaw	No

Alternative	Advantages	Disadvantages	Ranking	Option selected
		x A separate EIA, Waste Management Licence and Water Use Licence Application for a waste site would be required. x The identified suitable site would have to be zoned for this purpose. x Development of a new waste disposal site would be very costly. x An onsite waste disposal site would result in additional costs since the applicant would have to appoint a service provider to manage the site.		
Alternative 3 – provision of a waste transfer station as part of the overall development	√ All waste generated on site will be collected and managed at one central waste collection area.	x A suitable site (from an environmental perspective) for a waste transfer station would have to be identified on site. x A separate EIA and Waste Management Licence and Water Use Licence Application for a waste transfer station would be required. x The identified suitable site would have to be zoned for this purpose. x A waste transfer site would result in additional costs since the applicant would have to provide the required waste collection skips, appoint a service provider to manage the site and remove the waste to the registered Rietfontein Waste Disposal Site.	2 Second Option	No
Alternative 4 – waste collection area per stand	√ *Each tenant will be responsible for the provision of a waste collection area on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.* √ *Each tenant will be responsible for the management of the waste collection area.* √ *Each tenant will have to ensure that a contractor is sourced to remove the waste to the registered Rietfontein Waste Disposal Site on a regular basis.*	x *The applicant will have to monitor all stands to ensure that the correct waste management measures are implemented and that the waste is being removed to the registered Rietfontein Waste Disposal Site and not being dumped or buried on site or on adjacent properties.*	*1* *Preferred*	***Yes***
Storm water management				
Alternative 1 - connecting to an existing Steve Tshwete		x The said site is located just outside the Steve Tshwete Local Municipality (STLM) urban edge and is not serviced by the Steve Tshwete Local Municipality.	0 Fatal flaw	No

Alternative	Advantages	Disadvantages	Ranking	Option selected
Local Municipality storm water system		x The development site can therefore not connect to an existing municipal storm water system.		
Alternative 2 – new storm water system to be drafted and implemented as part of the overall development of the Industrial Park.	✓ *The site slopes towards the south east, towards a tributary of the Vaalbankspruit that flows into the Pienaardam.* ✓ *The east dipping topography supports good drainage and ponding is unlikely (Hansmeyer, 2020).* ✓ *The access and internal roads will be gravel/paved roads and the storm water will be drained on surface in earthen and concrete trenches.* ✓ *Some storm water measures (e.g. concrete channels) are already in place on site.*	x *A new storm water system for the overall site to be developed incorporating the existing storm water measures.* x *The cover soils are susceptible to erosion and a storm water management plan will have to be implemented (Hansmeyer, 2020).* x *If the release of storm water is not controlled it could impact (e.g. flooding) on the light industrial activities and roads on site as well as the adjacent roads. It could also result in waterlogging of area and erosion.* x *Polluted surface water from the various industries could impact on the adjacent Pienaardam property. Mitigation measures would have to be implemented.*	*1 Preferred*	***Yes***

Legend: 0 = Fatal Flaw; 1 = Preferred Option; 2 = Second Option; 3 = Third Option

7.5 The 'No Project Option'

The 'no project option' is the alternative of not going ahead with the proposed development. The 'no project option' is only considered if it is found that the development will have significant negative impacts on the environment, which cannot be mitigated or managed.

If the 'no project option' in terms of the proposed development was exercised, it could mean that:

- The existing businesses/light industrial activities on site could be seen as illegal, required to be decommissioned and the site rehabilitated.
- The applicant would not be able to develop the property any further.
- Potential business opportunities and employment opportunities would be lost.
- There would still be a need for light industrial erven in the area.
- Other potential uses for the site would have to be investigated.
- The applicant could sell the property.

It is anticipated that this development will add to the development potential and economic growth of the area.

7.6 Concluding statement on alternatives

In summary, the following alternatives are deemed feasible and will be assessed in Section 8 of this document:

Section	Preferred Alternative	Description
7.1	Site	The development site will be located on Portion 58 of the farm Vaalbank, Middelburg (Figure 5.2).
7.2	Alternative land use 4 (Table 7.1)	Light industrial
7.3	Alternative layout 3 (Table 7.2)	A new access road from Pienaar Dam road with an internal road system providing access to the 20 erven (Figure 7.3).
7.4	Water provision Alternative 1 (Table 7.3)	The proposed development will connect to the existing STLM water supply line via Black Wattle Colliery.
7.4	Electricity Alternative 2 (Table 7.3)	Electricity will be obtained from Eskom. Eskom approved an increase in electricity supply from 100kVA to 315kVA.
7.4	Sewage disposal Alternative 4 (Table 7.3)	Each tenant will be responsible for the installation of a conservancy tank on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
7.4	Waste management Alternative 4 (Table 7.3)	Each tenant will be responsible for the provision of a waste collection area on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
7.4	Storm water management Alternative 2 (Table 7.3)	A new storm water management system to be developed for the overall site by the applicant.

Mitigation and management measures to reduce any potential negative impacts relating to any of these alternatives are provided in Section 9 of this report.

SECTION 8: ENVIRONMENTAL IMPACT DESCRIPTION AND EVALUATION

8.1 Introduction

As required in terms of Appendix 1 of the EIA Regulations (2014, as amended), this section of the report describes the impacts and risks identified (physical and social) as a result of the proposed project, including:

- an indication of the preferred alternatives;
- the methodology used in determining and ranking the potential impacts;
- the nature, significance, consequence, extent, duration and probability of the impacts during all phases of the development;
- the degree to which these impacts can be avoided, managed, mitigated, reversed or may cause irreplaceable damage;
- positive impacts;
- cumulative impacts;
- mitigation measures to be implemented.

The impacts presented in this section were identified through the status quo of the environment, specialist input, experience of the EAPs and comment from I&APs.

8.2 Description of the preferred alternatives

Section 7 provides a detailed description of all alternatives investigated with regards to this project. As indicated in Section 7.6, the following alternatives are deemed feasible and will be assessed in Section 8.5:

Aspect	Description of alternative
Site	The development site will be located on Portion 58 of the farm Vaalbank, Middelburg (Figure 8.1).
Land Use	Light industrial area consisting of 20 erven will be developed on site (Figure 8.1).
Layout)	A new access road from Pienaardam Road with an internal road system providing access to the 20 erven (Figure 8.1).
Services	Water: The proposed development will connect to the existing STLM water supply line via Black Wattle Colliery.
	Electricity: Electricity will be obtained from Eskom. Eskom approved an increase in electricity supply from 100kVA to 315kVA.
	Sewage disposal: Each tenant will be responsible for the installation of a conservancy tank on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
	Waste management: Each tenant will be responsible for the provision of a waste collection area on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
	Storm water management: A new storm water management system to be developed for the overall site by the applicant.

Figure 8.1: Proposed location and layout of the development

8.3 Development phases

The impact of the development has to be assessed in terms of the following development phases:

- **Planning and design phase**
- **Construction phase**
- **Operational phase**
- **Decommissioning phase**

8.3.1 Planning and design phase

The planning and design phase involved mostly office work and site surveys with regards to the design of the layout plan, the Basic Assessment Report and the specialist studies. It also involves obtaining the necessary authorisations for the said development.

8.3.2 Construction phase

The construction of the light industrial area and associated infrastructure (including road network) would involve the pegging of the stands, installation of services and construction of buildings (Figure 8.1).

This would involve the following:

- Clearing of vegetation and topsoil;
- Fencing of the demarcated stand;
- Levelling of the site (if required);
- Excavation of trenches for foundations and services;
- Installation and connection of services;
- Laying of the required foundations;
- Building of the outer structures;
- Installation of the required internal fittings;
- Construction of roads;
- Rehabilitation of the disturbed areas (i.e. landscaping).

Section 8.5 provides details with regards to potential impacts identified during the construction phase.

8.3.3 Operational phase

The operational phase would involve the utilisation of the various buildings and infrastructure (including road network) associated with the light industrial area.

Section 8.5 provides details with regards to potential impacts identified during the operational phase.

8.3.4 Decommissioning phase

It is anticipated that the infrastructure will remain on site and that there will be no decommissioning phase.

It is recommended that at the time of decommissioning, a specific Environmental Management Programme (EMPr) be compiled which specifically addresses this phase. This EMPr would have to address issues such as the removal of building rubble and the rehabilitation of the site. Soil conservation measures would also have to be implemented.

8.4 Approach and methodology

This section presents the proposed approach to assessing the potential impacts, with the aim of determining the significance of these impacts. The impact will be determined for each aspect of the environment with and without the implementation of mitigation measures. This allows for a prediction of how the impact can be managed or mitigated. The evaluation of impacts is conducted in terms of the following criteria:

- **Nature of impact (i.e. description of the impact)**

- **Extent (i.e. spatial scope or geographical extent of the impact to the receiving environment)**

Site	Effect limited to the site and its immediate surroundings
Local	Effect limited to within 3-5 km of the site
Regional	Effect will have an impact on a regional scale

- **Duration (i.e. length of permanence of the impact. In other words, how long will the impact last.)**

Short	Effect lasts for a period 0 to 5 years
Medium	Effect continues for a period between 5 and 10 years
Long	Effect will cease after the operational life of the activity either because of natural process or by human intervention
Permanent	Where 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

- **Probability (i.e. likelihood that the impact will occur)**

Improbable	Less than 33% chance of occurrence
Probable	Between 33 and 66% chance of occurrence
Highly probable	Greater than 66% chance of occurrence
Definite	Will occur regardless of any prevention measures

- **Significance/intensity of impact (i.e. degree of alteration to the affected receiving environment)**

Low	Where the impact will have a relatively small effect on the environment and will not have an influence on the decision
Medium	Where the impact can have an influence on the environment and the decision and should be mitigated
High	Where the impact definitely has an impact on the environment and the decision regardless of any possible mitigation

- **Status (i.e. whether the impact will have a positive (beneficial) or negative (detrimental) effect on the receiving environment)**

Positive	Impact will be beneficial to the environment
Negative	Impact will not be beneficial to the environment
Neutral	Positive and negative impact

- **Reversibility (i.e. whether the impact can be reversed or not)**

Reversible	Impact is reversible without incurring significant time and cost
Reversible (costly)	Impact is reversible only by incurring significant time and cost
Irreversible	Impact is irreversible

8.5 Description of potential impacts

The following section provides an indication of the environmental features that will be impacted (directly and indirectly) during the construction, operational and decommissioning phases of the proposed project.

It must be noted that many of the potential negative consequences can be mitigated successfully. It is however, necessary to make a thorough assessment of all possible impacts in order to ensure that environmental considerations are taken into account, in a balanced way, as far as possible, supporting the aim of creating a healthy and pleasant environment.

Please note: Only the most important mitigation measures associated with identified impacts are indicated in this section. The Environmental Management Programme Report (EMPr; included in Section 9 of this report) provides a comprehensive description of the various mitigation and management measures proposed to ensure minimal impact on the environment.

8.5.1 Topography

Construction phase
In general, the construction activities (e.g. removal of vegetation, sloping of the site and construction of buildings) on the 20 erven would have a direct impact on the topography as a result of the construction of the buildings (topographical highs). It should be noted that the topography of the site (e.g. existing light industrial activities, roads, etc.) and immediate surrounding area has already been impacted (e.g. mining, roads, etc.).

Operational phase
Direct impact on topography will continue in terms of the presence of the buildings (topographical highs) within an area where the topography has already been impacted (e.g. mining, roads, etc.).

IMPACT ON TOPOGRAPHY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Long	Definite	Low Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Definite	Low Negative	Low Negative	Reversible

8.5.2 Geology

Construction phase
The direct impact on the underlying geology (sandstone of the Vryheid Formation) will depend on the depth of the excavations required for the foundations and service trenches. According to Hansmeyer (2020), excavations deeper than 3.5m will require hard ripping and blasting. The possible impact on the underlying geology cannot be mitigated.

According to Hansmeyer (2020), the site is blanketed by soft excavatable cover soils with an estimated thickness of 2.5m. These soils usually comprise silt-sand mixes and are notoriously compressible, causing settlement of structures. Structures could thus experience settlement, cracking and possible misalignment if mitigation measures are not implemented during the construction phase.

The underlying residuum (usually only 0.5m thick and often partially to well ferruginised) is underlain by intermediate excavatable sandstone bedrock which is ideal founding medium with limited settlement (<5mm) (Hansmeyer, 2020). Structures could experience settlement, cracking and possible misalignment if mitigation measures are not implemented during the construction phase.

Operational phase
During the operational phase, the buildings and associated infrastructure could continue to be impacted if the geotechnical recommendations were not implemented during the construction phase.

IMPACT OF GEOLOGY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Highly Probable	Medium Negative	Low Negative	Irreversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *Geotechnical mitigation measures included in Section 9 (EMPr) to be implemented as part of the construction phase.*

8.5.3 Soil

A) Loss of current land capability

The soils of an area of 5.46ha (Anthrosols, Figure 5.11) have already been impacted in terms of the existing light industrial activities.

Construction and Operational phases
Once construction commences and soil is stripped, the current land capability of all areas where surface infrastructure will be constructed, will be lost. The areas that will be directly impacted include: 9.36ha of land with Moderate-High (Class 10) land capability, 2.61ha of land with Moderate (Class 8) land capability and 0.47ha of land with Low-Moderate (Class 6) land capability. Less than 1ha of land with Moderate-High (Class 9) land capability will be impacted upon (Pienaar, 2020). The impact will remain the same throughout the operational phase (Pienaar, 2020).

LOSS OF CURRENT LAND CAPABILITY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	High Negative	High Negative	Irreversible
OPERATIONAL PHASE					
Site	Permanent	Definite	High Negative	High Negative	Irreversible

B) Loss of agricultural production and agricultural-related employment

Construction and Operational phases
Although the field crop boundaries data indicates that the project area consists of several smallholdings, no evidence was found of any livestock farming activities. Also, no crops are produced on site and historical imagery indicates that there has been no active crop production for at least the past 9 years

(Pienaar, 2020). No direct impact on current agricultural activities will thus take place. The site will however, no longer be available for agricultural activities.
It is expected that the impact on agricultural production and agricultural-related employment will remain the same during the operational phase (Pienaar, 2020).

LOSS OF AGRICULTURAL PRODUCTION AND AGRICULTURAL-RELATED EMPLOYMENT					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Low Negative	Low Negative	N/A
OPERATIONAL PHASE					
Site	Permanent	Improbable	Low Negative	Low Negative	N/A

C) Disturbance of soil horizon organisation

Construction
Prior to construction, the available topsoil (a combination of all soil horizons above the underlying material such the hard plinthic subsoil-horizon of the Glencoe form) will be removed and stored elsewhere. Once the soil is stripped and transported from its original position, it becomes a new matrix with different physical and biological properties as a result of mixing of the soil horizons and storing it in stockpiles (Pienaar, 2020).

Operational phase
Direct impact on soil i.t.o. soil structure, nutritional and chemical values and soil compaction will continue due to the presence of the buildings, parking areas, etc.

DISTURBANCE OF SOIL HORIZON ORGANISATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	High Negative	High Negative	Irreversible
OPERATIONAL PHASE					
Site	Permanent	Definite	High Negative	High Negative	Irreversible

D) Soil erosion, soil compaction and surface sealing

According to Hansmeyer (2020), the cover soils are susceptible to erosion.

Construction phase
Once earthworks commence on site, vegetation will be removed from the surface and expose the soil surfaces underneath to soil erosion that can be caused by both wind and water movement. Soil erosion will result in removal of soil particles from site to areas where it is deposited as dust particles or as sediment in lower landscape positions (Pienaar, 2020).

Soil will also be compacted as part of civil engineering procedures to ensure the stability of the infrastructure. Soil compaction affects the soil porosity, thereby decreasing the water infiltration rate of soil. Compacted soil surfaces increase storm water runoff rates and can cause soil erosion in areas outside the site boundary (Pienaar, 2020).

Operational phase

Where permanent buildings and surface roads will be constructed, soil will become permanently sealed-off from rainwater infiltration. Soil compaction affects the soil porosity, thereby decreasing the water infiltration rate of soil. Compacted soil surfaces and sealed off areas increase storm water runoff rates and can cause soil erosion in areas outside the site boundary (Pienaar, 2020). This could impact on the new light industrial activities, internal road network, adjacent roads, agricultural activities associated with Pienaardam Leisure Resort, etc. if mitigation measures are not implemented.

SOIL EROSION, SOIL COMPACTION AND SURFACE SEALING					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Permanent	Highly probable	High Negative	High Negative	Reversible (at cost)

Proposed mitigation:

- *The mitigation measures in Section 9 (EMPr) with regards to soil management and storm water management must be implemented during all phases of the development.*
- *Monitor for erosion and intervene and/or rehabilitate where necessary.*

E) Soil contamination with hydrocarbons and solid waste

Construction phase

According to Pienaar (2020), the following construction activities could result in pollution of the soil with hydrocarbons and/or solid waste:

- Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the mechanical removal of vegetation during site clearing.
- Spills from vehicles transporting workers, equipment and construction material to and from the construction site.
- The generation of domestic waste by construction and operational workers.
- Spills from fuel storage tanks during construction.
- Polluted water from wash bays and workshops during the construction phase.
- Accidental spills of other hazardous chemicals used and stored on site.
- Pollution from concrete mixing.

Operational phase

Emissions from vehicles containing trace element particles as well as organic (carbon-containing) contaminants, will settle on surfaces outside of the site. Storm water runoff can also contain pollutants such as petroleum hydrocarbons that spilled on sealed surfaces inside of the site. Both dust and storm water runoff can result in elevated levels of soil contaminants in nearby soil, including the agricultural crop-fields (Pienaar, 2020)

Soil pollution could also occur if waste management measures are not implemented and if the conservancy tanks do not have sufficient capacity or were not installed properly resulting in sewage overflows.

SOIL CONTAMINATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Medium Negative	Low Negative	Reversible (at cost)
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible (at cost)

Proposed mitigation:

- *The waste management measures indicated in Section 9 (EMPr) to be implemented during all phases of the development.*

8.5.4 Land use and sense of place

Construction and Operational phases

Although the field crop boundaries data indicates that the project area consists of several smallholdings, no evidence was found of any livestock farming activities. Also, no crops are produced on site and historical imagery indicates that there has been no active crop production for at least the past 9 years (Pienaar, 2020).

The rezoning of the site from Agriculture to Industrial (Industrial 2) and the subsequent construction activities would thus not impact on any current agricultural activities.

As indicated in Section 5.3, the proposed site is located within an area already utilized for light industrial and mining activities. The proposed light industrial area would not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

IMPACT ON LAND USE AND SENSE OF PLACE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Definite	Low Negative	Low Negative	N/A
OPERATIONAL PHASE					
Site	Long	Definite	Low Neutral	Low Neutral	N/A

8.5.5 Natural vegetation and animal life

As indicated in Section 5.7, the vegetation of the site is modified to transformed, with very low species diversity. Venter and Niemand (2020) indicated the site sensitivity for plant species as Low due to the highly modified state of the site vegetation, the low species diversity and the absence of habitat for threatened species. In addition, a low overall faunal richness was indicated for the said site in view of lack of habitat and past disturbances. Due to the level of disturbance on site, poor ecological connectivity of the site and the existing light industrial developments on site, this site is considered to be of low biodiversity sensitivity.

Construction phase

Destruction/loss of of vegetation:

The construction activities would result in the removal of 9.95ha of the Planted Pasture vegetation unit (Figure 5.16), which has a Moderate Sensivity (Venter

and Niemand, 2020). In addition, 1.48ha of the Transformed vegetation unit (Old Gardens and Weedy; Figure 5.16) will be cleared which also has a Low Sensitivity (Venter and Niemand, 2020).

DESTRUCTION/LOSS OF VEGETATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	Low Negative	Low Negative	Irreversible

Loss of of primary/untransformed grassland/habitat:
None. In view of the transformed nature of the vegetation on site, primary/untransformed grassland habitat will not be impacted.

Loss of habitat for plant species of conservation importance and loss of protected species:
Venter and Niemand (2020) indicated that the site was previously cultivated and has a very low diversity of plant species (especially forb species). No threatened plant species were observed on site or is expected to occur on site.

LOSS OF HABITAT FOR PLANT SPECIES OF CONSERATION IMPORTANCE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Medium Negative	Low Negative	N/A

The orchid species *Habenaria epipactidea* is however present on site. All orchid species are protected under the Mpumalanga Nature Conservation Act. The species is however, fairly widespread and currently not threatened.

LOSS OF PROTECTED PLANT SPECIES					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Highly probable	Medium Negative	Low Negative	N/A

Erosion and sedimentation:
Clearing of vegetation from the site and increased runoff may result in erosion on site. This may potentially cause damage to the downslope area. An increased sediment load in the water on site may result in excess sedimentation in downstream areas, which will result in a change in the vegetation composition. Erosion may take place at any areas cleared of vegetation for any reason, including around storm water infrastructure and areas cleared of invasive plant species (Venter and Niemand, 2020).

EROSION AND SEDIMENTATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible

Loss of habitat for fauna species, including species of conservation importance:
According to Venter and Niemand (2020), the majority of all remaining natural habitat present on site has been modified or represent grassland seres at an early or secondary successional stage and support a fauna composition that is

of low richness. It is not possible to mitigate against the loss of habitat since it is assumed that the entire area will be cleared of vegetation during the construction phase (Venter and Niemand, 2020).

LOSS OF HABITAT FOR FAUNA SPECIES					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	Medium Negative	Medium Negative	Reversible

Although a number of threatened and near threatened animal species have been recorded in the study region, the probability for these to occur on site is low, with many regarded to be absent. Those species that could occur (e.g. Lanner Falcon *Falco biarmicus*) are regarded as occasional and/or irregular foraging visitors to the site and will remain low based on the modified ecological condition of the habitat units and the frequency of occurrence. It is not possible to mitigate against the loss of habitat since it is assumed that the entire area will be cleared of vegetation during the construction phase (Venter and Niemand, 2020).

LOSS OF HABITAT FOR FAUNA SPECIES OF CONSERVATION IMPORTANCE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Low Negative	Low Negative	Reversible

Loss of Ecological corridors and connectivity:

According to Venter and Niemand (2020), the site has very poor ecological connectivity and faunal dispersal ability is severely limited by the presence of road networks, mining activities and active agricultural activities (e.g. commercial and irrigation pivots). The N4 national road on the northern boundary of the site and the R35 provincial road on the western boundary with Black Wattle Colliery are barriers to species movement. Development on site is therefore unlikely to have a significant negative effect on the ecological connectivity in the area.

LOSS OF ECOLOGICAL CORRIDORS AND CONNECTIVITY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Probable	Low Negative	Low Negative	Reversible

<u>Operational phase</u>

No further direct impact on vegetation or animal life is expected as no further construction activities will take place.

Infestation by invasive plant species:

Invasive plant species tend to establish in and around disturbed areas. A few alien and invasive species were observed on site (Venter and Niemand, 2020). These species may become established on site and may spread to the surrounding area if disturbed areas are not properly rehabilitated during the construction phase or if alien plants are utilized in the gardens.

INFESTATION BY INVASIVE PLANT SPECIES					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Local	Long term	Probable	Medium Negative	Low Negative	Reversible

8.5.6 Surface water (including wetlands and sensitive landscapes)

A) Direct impact on surface water environments (including wetlands)

Construction and Operational phases

None. The development of the light industrial area will not impact directly on any surface water environments (including wetlands). The closest river/stream is an unnamed tributary of the Vaalbankspruit, located ±700 m southeast of site. No wetland is present on site or in close proximity thereof as indicated in Section 5.9.4.

B) Impact on surface water runoff velocity

Construction phase

Clearing of vegetation from the site and increased runoff on site may result in erosion on site. This may potentially cause damage to the downslope area. An increased sediment load in the water on site may result in excess sedimentation in downstream areas, which will result in a change in the vegetation composition. Erosion may take place at any areas cleared of vegetation for any reason, including around storm water infrastructure and areas cleared of invasive plant species (Venter and Niemand, 2020).

Operational phase

Where permanent buildings and surface roads will be constructed, soil will become permanently sealed-off from rainwater infiltration. Soil compaction affects the soil porosity, thereby decreasing the water infiltration rate of soil. Compacted soil surfaces and sealed off areas increase storm water runoff rates and can cause soil erosion in areas outside the site boundary (Pienaar, 2020).

This could impact on the new light industrial activities, the internal road network, adjacent roads, agricultural activities associated with Pienaardam Leisure Resort, etc. if mitigation measures are not implemented.

IMPACT ON SURFACE WATER RUNOFF VELOCITY (EROSION, SEDIMENTATION, FLOODING)					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *Monitor for erosion and intervene and/or rehabilitate where necessary.*
- *The mitigation measures in Section 9 (EMPr) with regards to storm water management must be implemented during all phases of the development.*

C) Impact on surface water runoff quality

Construction phase
According to Pienaar (2020), the following construction activities can result in the pollution of soil with hydrocarbons and/or solid waste which could impact on the surface water runoff quality:

- Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the mechanical removal of vegetation during site clearing.
- Spills from vehicles transporting workers, equipment and construction material to and from the construction site.
- The generation of domestic waste by construction and operational workers.
- Spills from fuel storage tanks during construction.
- Polluted water from wash bays and workshops during the construction phase.
- Accidental spills of other hazardous chemicals used and stored on site.
- Pollution from concrete mixing.

Operational phase
Storm water runoff can contain pollutants such as petroleum hydrocarbons that spilled on sealed surfaces inside of the site. Both dust and storm water runoff can result in elevated levels of soil contaminants in nearby soil, including the agricultural crop-fields (Pienaar, 2020)

Surface water runoff could also be polluted if waste management measures are not implemented and if the conservancy tanks do not have sufficient capacity or were not properly installed resulting in sewage overflows.

IMPACT ON SURFACE WATER RUNOFF QUALITY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Medium Negative	Low Negative	Reversible (cost)
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible (cost)

Proposed mitigation:

- *The waste management measures as indicated in Section 9 (EMPr) to be implemented during all phases of the development.*

8.5.7 Groundwater

A) Impact on groundwater

Construction and Operational phases
None. No direct impact on the groundwater is expected as a result of construction and operational activities since no signs indicating the presence of a shallow groundwater table (no seepage or wetlands) were noted on site.

B) Impact of groundwater abstraction

Construction and Operational phases
Groundwater will not be abstracted (using boreholes) to provide water for the overall development. The development will obtain water by connecting to an existing STLM water pipeline via Black Wattle Colliery.

As indicated in Section 5.10, a borehole is present on site but will only be used for emergency purposes.

IMPACT OF GROUNDWATER ABSTRACTION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Low Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Low Negative	Low Negative	Reversible

8.5.8 Sites of archaeological and cultural interest

A) Impact on archaeological/cultural sites

Construction and Operational phases
None. As indicated in Section 5.13.1, Van Vollenhoven (2020) identified no sites of cultural heritage significance within the proposed development area.

B) Impact on palaeontology
As indicated in Section 5.13.2, the site is directly underlain by the Vryheid Formation, which has a 'Very High' palaeontological sensitivity.

Construction phase
Fourie (2020) found no surface fossils on site during the walk through and therefore no direct impact on palaeontology is anticipated.

Any direct impact on the palaeontology during the construction phase (e.g. digging, drilling, blasting, excavating of foundations, removal of overburden, etc.) will depend on the depth of new excavations required for the building and services.

Operational phase
The operational activities will have no direct or indirect impact on the palaeontology of the site as no further construction will take place.

IMPACT ON PALAEONTOLOGY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Low Negative	Low Negative	Irreversible
OPERATIONAL PHASE					
None	None	None	None	None	N/A

8.5.9 Air quality

Construction phase
Dust generation and vehicle emissions due to construction activities and use of heavy machinery could impact on site workers, tenants of the existing light industrial stands/businesses, and motorists travelling along the N4 national road, R35 provincial road and the Pienaardam Road (to Pienaardam Leisure Resort). It could also impact on the agricultural activities (cultivated lands, livestock) of Pienaardam Leisure Resort. The extent of the impact would depend on the time of year, wind direction (which is predominantly in a north westerly and south easterly direction), wind velocity and mitigation measures in place.

The air quality of the site and surroundings could also be impacted in terms of odours if the chemical toilets used are not maintained and proper waste management measures are not implemented.

Operational phase
No noxious industries (scheduled processes) will be allowed on site.

The air quality of the site and surrounding area could however, be impacted by dust if the internal road network is not paved or tarred. This could impact on motorists travelling along the Pienaardam Road to Pienaardam Leisure Resort as well as the agricultural activities (cultivated lands, livestock) of Pienaardam Leisure Resort. The extent of the impact as a result of dust would depend on the time of year, wind direction (which is predominantly in a north westerly and south easterly direction), wind velocity and mitigation measures in place.

The accommodation facilities of the Pienaardam Leisure Resort are located approximately 1km from the eastern end of the proposed light industrial development. It is therefore not anticipated that tourists visiting Pienaardam Leisure Resort would be directly impacted by dust generated as a result of light industrial activities taking place on site.

A slight increase in vehicle emissions could also be anticipated in view of the increased number of vehicles present on site.

In addition, the air quality of the site and surroundings could be impacted if the conservancy tanks provided by tenants of each stand do not have sufficient capacity or were not installed properly resulting in sewage overflowing. The air quality could also be impacted if proper waste management measures are not implemented and the waste is not removed on a regular basis by service providers (appointed by tenants) and disposed of at the registered Rietfontein Waste Disposal Site.

IMPACT IN TERMS OF DUST/ODOURS					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *Dust suppression measures to be implemented on site during the construction and operational phases (see Section 9 (EMPr) for details).*
- *The waste management measures as indicated in Section 9 (EMPr) to be implemented during all phases of the development.*

8.5.10 Noise

In general, the ambient noise level of the site is high since the site is located adjacent to the N4 national road and the R35 provincial road which both carry high volumes of traffic throughout the day. Noise is also generated by existing mining activities adjacent to the site as well as existing light industrial activities taking place on site.

Pienaardam Leisure Resort is also located within this environment and therefore it is anticipated that the farm animals (livestock) are already used to the existing noise levels in the area.

Construction phase
Heavy machinery used during the construction phase will contribute to increased ambient noise levels in the immediate area, which could impact on the construction workers and tenants of the existing businesses/light industrial activities. Construction noise cannot really be mitigated, but would be of short duration.

Operational phase
Some operational noise would be created as a result of the light industrial activities taking place on site (e.g. increased numbers of people and vehicles visiting the various light industrial businesses, noise as a result of activities, etc.). This could impact on the tenants renting/leasing the various light industrial stands on site.

The accommodation facilities of the Pienaardam Leisure Resort are located approximately 1km from the eastern end of the proposed light industrial development. It is therefore not anticipated that tourists visiting Pienaardam Leisure Resort would be directly impacted by noise generated as a result of light industrial activities taking place on site.

IMPACT IN TERMS OF NOISE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Medium Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Medium Negative	Reversible

8.5.11 Visual aspects

As indicated in Section 5.15, the visual aspects of the site have been impacted by the presence of existing light industrial activities on and adjacent to the site.

Construction phase
Construction activities would be highly visible from the existing light industrial activities taking place on site, the internal road network as well as the surrounding road network (i.e. the N4 national road, the R35 provincial road, Pienaardam Road). The said activities would also be visible from the adjacent properties; the property belonging to Pienaardam Leisure Resort; Black Wattle Colliery and Vaalbank Colliery Minipit.

Operational phase
General road users travelling on the surrounding network (i.e. the N4 national road, the R35 provincial road, Pienaardam Road) could be negatively impacted in terms of visual aspects if the light industrial area is not maintained and is not kept neat and tidy.

IMPACT IN TERMS OF VISUAL ASPECTS					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

8.5.12 Traffic

Construction phase
All construction activities will take place on site and will not directly impact on traffic utilising the surrounding road network ((i.e. the N4 national road, the R35 provincial road, Pienaardam Road) or the internal road network.

The delivery of building material during the construction period could lead to a slight increase in traffic on the R35 provincial road. The deliveries would however, not occur on a continuous basis.

The construction of the new access road to the light industrial development off the Pienaardam Road as well as the upgrading of a portion (150m) of the Pienaardam Road would impact on motorists using this road to gain access to Pienaardam Leisure Resort. General road users could also be impacted should the required safety measures not be in place.

Operational phase
The utilization of the new access road to the light industrial development off the Pienaardam Road as well as a portion (150m) of the Pienaardam Road could impact on motorists using this road to gain access to Pienaardam Leisure Resort. The use of the emergency exit would also impact on these motorists.

General road users along the R35 could also be impacted in terms of safety if the new access road was not constructed according to SANRAL/TRAC specifications.

The proposed development will generate additional traffic during the operational phase, which could impact on the traffic volumes and intersections in the area if the mitigation measures (upgrading of intersections and access roads) as recommended by Roberts (2019) are not implemented.

The realignment of the various access roads off the R35 and upgrading of the Pienaardam access could however, also have a positive impact on road users in terms of safety.

IMPACT IN TERMS OF TRAFFIC					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

8.5.13 Interested and affected parties

The proposed development site belongs to the project applicant and therefore no other landowner will be directly impacted in terms of the development of the said site (i.e. in the short term and/or long term).

A) Positive impacts on Interested and Affected Parties (I&APs)

Construction and Operational phases
The proposed development could have the following positive impacts on I&APs:

- The proposed development would lead to additional employment opportunities during the construction and operational phases.

- Business opportunities would be provided in the form of light industrial stands that can be developed.
- The new Pienaardam intersection (i.e. the realignment of the various access roads off the R35 and the upgrading of the Pienaardam access) would improve the current traffic situation in the area which would benefit all I&APs utilising the said roads.

POSITIVE IMPACTS ON I&APs					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Positive	Medium Positive	N/A
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Positive	Medium Positive	N/A

B) Potential negative impacts on Interested and Affected Parties (I&APs)

Construction and operational phases

The proposed development could have the following negative impacts on I&APs:

- During the construction phase, contractors working on site could be directly impacted upon if the necessary safety and occupational health measures are not adhered to.
- Eskom (and their customers) could be impacted should the Eskom powerline located on site be damaged during the construction and/or operational phases.
- SANRAL will continue to be impacted in terms of the activities of the Bulk Diesel/truck stop (i.e. activities extend onto SANRAL property).
- SANRAL/TRAC will continue to be impacted upon if the two existing access roads (i.e. to the Bulk Diesel/truck stop and the light industrial area) are not closed. This would also impact on the general motorists utilising the R35 provincial road
- SANRAL/TRAC could be impacted if the new Pienaardam intersection is not constructed according to the approved designs.
- The owner of Pienaardam Leisure Resort (Mr. G. Gerrits) would be directly impacted in terms of the access road if an agreement with regards to the access, use and maintenance of the Right-of-Way servitude road is not in place before construction commences.
- Pienaardam Leisure Resort could be impacted in terms of loss of tourism should the development not be managed properly resulting in dust, noise and visual impacts.
- Other impacts in terms of the natural environment, noise, odours, visual, traffic, etc. are indicated in the preceding sections.

NEGATIVE IMPACTS ON I&APs					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *All phases of development to be managed according to the Environmental Management Plan (Section 9 of this report).*

8.6 Cumulative impacts

Soil and agricultural potential
Businesses/light industries are already present on site and an area of approximately 10.5 ha has already been affected by human activities (Anthrosols and Anthrosols/Hutton; Figure 5.11).

According to Pienaar (2020), an area of 9.35ha (Hutton, Pinedene, Glencoe; Figure 5.11) is highly suitable for both irrigated and rainfed crop production while the shallower Glencoe soils (2.29 ha; Figure 5.11) are suitable for rain-fed crop production (Pienaar, 2020). In total, an area of 11.64 ha (with a Moderate to High land capability) is available for crop production (Hutton, Glencoe, Pinedene; Figure 5.11) and would be lost to agriculture. However, this is a relatively small area and may not be financially viable from an agricultural point of view especially if water for irrigation purposes is required.

In terms of livestock farming, the proposed site and immediate surrounding area have a grazing capacity of 5ha/LSU and would allow 4 head of cattle or 16 head of sheep on the entire site (22 ha). This is not enough for an employment opportunity (Pienaar, 2020) and would not be financially viable from an agricultural point of view.

In view of the above-mentioned, the development of the light industrial area would thus have a low cumulative impact on soils and agricultural land.

Natural vegetation
The site falls within the Rand Highveld Grassland vegetation type, which is a Vulnerable vegetation type. The Rand Highveld Grassland vegetation unit has a high species diversity, especially of forbs and geophytes. In view of this, all remaining portions of primary Rand Highveld Grassland, including areas affected by high grazing pressure, should be considered to be of high conservation importance (Venter and Niemand, 2020).

The proposed site was previously cultivated and the vegetation no longer represents the Rand Highveld Grassland vegetation type (see Section 5.7). The vegetation units on site are all modified or transformed by past disturbances and represent secondary grassland in the very early successional stages. The species present in these units are common and widespread and of little conservation importance (Venter and Niemand, 2020).

The only protected plant species present on site is the orchid species *Habenaria epipactidea*, which is one of the common orchid species. This species can be transplanted to similar modified habitat in the area without resulting a significant loss in diversity. The site is therefore not very sensitive (Venter and Niemand, 2020).

Disturbed areas may however occasionally serve as ecological corridors for plants species and therefore help to sustain biodiversity in surrounding areas. The site is located at the intersection between the N4, the R35 and Black Wattle Colliery. These serve as effective barriers to the movement of plant and small

fauna species. In addition, the portion to the south is a rehabilitated mine and has very poor vegetation cover. The areas to the south-east are used for cultivation of crops and is poor in biodiversity. The site is therefore not considered to serve as an ecological corridor and contributes very little to biodiversity in surrounding areas (Venter and Niemand, 2020).

The development of the proposed site will therefore not contribute to the cumulative impact on primary/untransformed Rocky Highveld vegetation.

Animal life/fauna

Venter and Niemand (2020) indicated a low overall faunal richness for the said site in view of lack of habitat and past disturbances. Venter and Niemand (2020) indicated that the Planted Pastures vegetation units have a moderate conservation value, since some widespread and generalist faunal species persist in the secondary grassland associated with these units. Specialists and species with small and localised distribution ranges appear to be absent or already displaced by the transformed state of the grassland units (Venter and Niemand, 2020).

Venter and Niemand (2020) indicated that the animal habitat units identified are fragmented and isolated from adjacent natural habitat by road networks, existing infrastructure and active agricultural activities. This has compromised the ecological connectivity of the said units, thereby rendering the site as an ecological "cul-de-sac" for medium to large terrestrial fauna species. In fact, some widespread mammal species (e.g. African Savanna Hare *Lepus cf. victoriae*, Highveld Gerbil *Gerbilliscus brantsii* and Highveld Mole-rat *Cryptomys cf. pretoriae*) that are generally present in modified habitat units were virtually absent from the site.

Due to the level of disturbance on site, poor ecological connectivity of the site and the existing light industrial developments on site, this site is considered to be of low biodiversity sensitivity.

In view of the above-mentioned, the development of the light industrial area would thus have a low cumulative impact on animal life/fauna.

Land use and sense of place

Although the field crop boundaries data indicates that the project area consists of several smallholdings, no evidence was found of any livestock farming activities. Also, no crops are produced on site and historical imagery indicates that there has been no active crop production for at least the past 9 years (Pienaar, 2020).

The rezoning of the site from Agriculture to Industrial (Industrial 2) and the subsequent construction activities would thus not impact on any current agricultural activities.

As indicated in Section 5.3, the proposed site is located within an area already utilized for light industrial and mining activities. The proposed light industrial area would not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

In view of the above-mentioned, the development of the light industrial area would thus have a low cumulative impact on land use and sense of place.

Traffic
The proposed development will generate additional traffic during the operational phase, which could impact on the traffic volumes and intersections in the area if the mitigation measures (upgrading of intersections and access roads) as recommended by Roberts (2019) are not implemented.

The realignment of the various access roads off the R35 and upgrading of the Pienaardam access could however, also have a positive impact on road users in terms of safety.

Municipal services
The proposed development site borders onto the urban edge of Middelburg where municipal services (water, sewage, electricity, etc.) are not provided.

Only water will be provided to the site by the Steve Tshwete Local Municipality via a water supply line extending from Black Wattle Colliery. Other services will have to be provided by the applicant/tenants as indicated in Table 7.6.

In view of the above-mentioned, the development will not result in cumulative pressure on municipal service infrastructure.

8.7 'No project' impacts

The 'no project option' is the alternative of not going ahead with the proposed development. The 'no project option' is only considered if it is found that the development will have significant negative impacts on the environment, which cannot be mitigated or managed.

If the 'no project option' in terms of the proposed development was exercised, it could mean that:

- The existing businesses/light industrial activities on site could be seen as illegal, required to be decommissioned and the site rehabilitated.
- The applicant would not be able to develop the property any further.
- Potential business opportunities and employment opportunities would be lost.
- There would still be a need for light industrial erven in the area.
- Other potential uses for the site would have to be investigated.
- The applicant could sell the property.

It is anticipated that this development will add to the development potential and economic growth of the area.

8.8 Concluding remarks

The rezoning of the site from Agriculture to Industrial (Industrial 2) and the subsequent construction activities would not impact on any current agricultural activities or sensitive landscapes (river/stream/wetlands).

The proposed site is located within an area already utilized for light industrial and mining activities with light industrial activities already taking place on site.

The proposed light industrial area would thus not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

SECTION 8: ENVIRONMENTAL IMPACT DESCRIPTION AND EVALUATION

8.1 Introduction

As required in terms of Appendix 1 of the EIA Regulations (2014, as amended), this section of the report describes the impacts and risks identified (physical and social) as a result of the proposed project, including:

- an indication of the preferred alternatives;
- the methodology used in determining and ranking the potential impacts;
- the nature, significance, consequence, extent, duration and probability of the impacts during all phases of the development;
- the degree to which these impacts can be avoided, managed, mitigated, reversed or may cause irreplaceable damage;
- positive impacts;
- cumulative impacts;
- mitigation measures to be implemented.

The impacts presented in this section were identified through the status quo of the environment, specialist input, experience of the EAPs and comment from I&APs.

8.2 Description of the preferred alternatives

Section 7 provides a detailed description of all alternatives investigated with regards to this project. As indicated in Section 7.6, the following alternatives are deemed feasible and will be assessed in Section 8.5:

Aspect	Description of alternative
Site	The development site will be located on Portion 58 of the farm Vaalbank, Middelburg (Figure 8.1).
Land Use	Light industrial area consisting of 20 erven will be developed on site (Figure 8.1).
Layout)	A new access road from Pienaardam Road with an internal road system providing access to the 20 erven (Figure 8.1).
Services	Water: The proposed development will connect to the existing STLM water supply line via Black Wattle Colliery.
	Electricity: Electricity will be obtained from Eskom. Eskom approved an increase in electricity supply from 100kVA to 315kVA.
	Sewage disposal: Each tenant will be responsible for the installation of a conservancy tank on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
	Waste management: Each tenant will be responsible for the provision of a waste collection area on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
	Storm water management: A new storm water management system to be developed for the overall site by the applicant.

Figure 8.1: Proposed location and layout of the development

8.3 Development phases

The impact of the development has to be assessed in terms of the following development phases:

- **Planning and design phase**
- **Construction phase**
- **Operational phase**
- **Decommissioning phase**

8.3.1 Planning and design phase

The planning and design phase involved mostly office work and site surveys with regards to the design of the layout plan, the Basic Assessment Report and the specialist studies. It also involves obtaining the necessary authorisations for the said development.

8.3.2 Construction phase

The construction of the light industrial area and associated infrastructure (including road network) would involve the pegging of the stands, installation of services and construction of buildings (Figure 8.1).

This would involve the following:

- Clearing of vegetation and topsoil;
- Fencing of the demarcated stand;
- Levelling of the site (if required);
- Excavation of trenches for foundations and services;
- Installation and connection of services;
- Laying of the required foundations;
- Building of the outer structures;
- Installation of the required internal fittings;
- Construction of roads;
- Rehabilitation of the disturbed areas (i.e. landscaping).

Section 8.5 provides details with regards to potential impacts identified during the construction phase.

8.3.3 Operational phase

The operational phase would involve the utilisation of the various buildings and infrastructure (including road network) associated with the light industrial area.

Section 8.5 provides details with regards to potential impacts identified during the operational phase.

8.3.4 Decommissioning phase

It is anticipated that the infrastructure will remain on site and that there will be no decommissioning phase.

It is recommended that at the time of decommissioning, a specific Environmental Management Programme (EMPr) be compiled which specifically addresses this phase. This EMPr would have to address issues such as the removal of building rubble and the rehabilitation of the site. Soil conservation measures would also have to be implemented.

8.4 Approach and methodology

This section presents the proposed approach to assessing the potential impacts, with the aim of determining the significance of these impacts. The impact will be determined for each aspect of the environment with and without the implementation of mitigation measures. This allows for a prediction of how the impact can be managed or mitigated. The evaluation of impacts is conducted in terms of the following criteria:

- **Nature of impact (i.e. description of the impact)**

- **Extent (i.e. spatial scope or geographical extent of the impact to the receiving environment)**

Site	Effect limited to the site and its immediate surroundings
Local	Effect limited to within 3-5 km of the site
Regional	Effect will have an impact on a regional scale

- **Duration (i.e. length of permanence of the impact. In other words, how long will the impact last.)**

Short	Effect lasts for a period 0 to 5 years
Medium	Effect continues for a period between 5 and 10 years
Long	Effect will cease after the operational life of the activity either because of natural process or by human intervention
Permanent	Where 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

- **Probability (i.e. likelihood that the impact will occur)**

Improbable	Less than 33% chance of occurrence
Probable	Between 33 and 66% chance of occurrence
Highly probable	Greater than 66% chance of occurrence
Definite	Will occur regardless of any prevention measures

- **Significance/intensity of impact (i.e. degree of alteration to the affected receiving environment)**

Low	Where the impact will have a relatively small effect on the environment and will not have an influence on the decision
Medium	Where the impact can have an influence on the environment and the decision and should be mitigated
High	Where the impact definitely has an impact on the environment and the decision regardless of any possible mitigation

- **Status (i.e. whether the impact will have a positive (beneficial) or negative (detrimental) effect on the receiving environment)**

Positive	Impact will be beneficial to the environment
Negative	Impact will not be beneficial to the environment
Neutral	Positive and negative impact

- **Reversibility (i.e. whether the impact can be reversed or not)**

Reversible	Impact is reversible without incurring significant time and cost
Reversible (costly)	Impact is reversible only by incurring significant time and cost
Irreversible	Impact is irreversible

8.5 Description of potential impacts

The following section provides an indication of the environmental features that will be impacted (directly and indirectly) during the construction, operational and decommissioning phases of the proposed project.

It must be noted that many of the potential negative consequences can be mitigated successfully. It is however, necessary to make a thorough assessment of all possible impacts in order to ensure that environmental considerations are taken into account, in a balanced way, as far as possible, supporting the aim of creating a healthy and pleasant environment.

Please note: Only the most important mitigation measures associated with identified impacts are indicated in this section. The Environmental Management Programme Report (EMPr; included in Section 9 of this report) provides a comprehensive description of the various mitigation and management measures proposed to ensure minimal impact on the environment.

8.5.1 Topography

Construction phase
In general, the construction activities (e.g. removal of vegetation, sloping of the site and construction of buildings) on the 20 erven would have a direct impact on the topography as a result of the construction of the buildings (topographical highs). It should be noted that the topography of the site (e.g. existing light industrial activities, roads, etc.) and immediate surrounding area has already been impacted (e.g. mining, roads, etc.).

Operational phase
Direct impact on topography will continue in terms of the presence of the buildings (topographical highs) within an area where the topography has already been impacted (e.g. mining, roads, etc.).

IMPACT ON TOPOGRAPHY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Long	Definite	Low Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Definite	Low Negative	Low Negative	Reversible

8.5.2 Geology

Construction phase
The direct impact on the underlying geology (sandstone of the Vryheid Formation) will depend on the depth of the excavations required for the foundations and service trenches. According to Hansmeyer (2020), excavations deeper than 3.5m will require hard ripping and blasting. The possible impact on the underlying geology cannot be mitigated.

According to Hansmeyer (2020), the site is blanketed by soft excavatable cover soils with an estimated thickness of 2.5m. These soils usually comprise silt-sand mixes and are notoriously compressible, causing settlement of structures. Structures could thus experience settlement, cracking and possible misalignment if mitigation measures are not implemented during the construction phase.

The underlying residuum (usually only 0.5m thick and often partially to well ferruginised) is underlain by intermediate excavatable sandstone bedrock which is ideal founding medium with limited settlement (<5mm) (Hansmeyer, 2020). Structures could experience settlement, cracking and possible misalignment if mitigation measures are not implemented during the construction phase.

Operational phase
During the operational phase, the buildings and associated infrastructure could continue to be impacted if the geotechnical recommendations were not implemented during the construction phase.

IMPACT OF GEOLOGY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Highly Probable	Medium Negative	Low Negative	Irreversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *Geotechnical mitigation measures included in Section 9 (EMPr) to be implemented as part of the construction phase.*

8.5.3 Soil

A) Loss of current land capability

The soils of an area of 5.46ha (Anthrosols, Figure 5.11) have already been impacted in terms of the existing light industrial activities.

Construction and Operational phases
Once construction commences and soil is stripped, the current land capability of all areas where surface infrastructure will be constructed, will be lost. The areas that will be directly impacted include: 9.36ha of land with Moderate-High (Class 10) land capability, 2.61ha of land with Moderate (Class 8) land capability and 0.47ha of land with Low-Moderate (Class 6) land capability. Less than 1ha of land with Moderate-High (Class 9) land capability will be impacted upon (Pienaar, 2020). The impact will remain the same throughout the operational phase (Pienaar, 2020).

LOSS OF CURRENT LAND CAPABILITY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	High Negative	High Negative	Irreversible
OPERATIONAL PHASE					
Site	Permanent	Definite	High Negative	High Negative	Irreversible

B) Loss of agricultural production and agricultural-related employment

Construction and Operational phases
Although the field crop boundaries data indicates that the project area consists of several smallholdings, no evidence was found of any livestock farming activities. Also, no crops are produced on site and historical imagery indicates that there has been no active crop production for at least the past 9 years

(Pienaar, 2020). No direct impact on current agricultural activities will thus take place. The site will however, no longer be available for agricultural activities.
It is expected that the impact on agricultural production and agricultural-related employment will remain the same during the operational phase (Pienaar, 2020).

LOSS OF AGRICULTURAL PRODUCTION AND AGRICULTURAL-RELATED EMPLOYMENT					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Low Negative	Low Negative	N/A
OPERATIONAL PHASE					
Site	Permanent	Improbable	Low Negative	Low Negative	N/A

C) Disturbance of soil horizon organisation

Construction
Prior to construction, the available topsoil (a combination of all soil horizons above the underlying material such the hard plinthic subsoil-horizon of the Glencoe form) will be removed and stored elsewhere. Once the soil is stripped and transported from its original position, it becomes a new matrix with different physical and biological properties as a result of mixing of the soil horizons and storing it in stockpiles (Pienaar, 2020).

Operational phase
Direct impact on soil i.t.o. soil structure, nutritional and chemical values and soil compaction will continue due to the presence of the buildings, parking areas, etc.

DISTURBANCE OF SOIL HORIZON ORGANISATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	High Negative	High Negative	Irreversible
OPERATIONAL PHASE					
Site	Permanent	Definite	High Negative	High Negative	Irreversible

D) Soil erosion, soil compaction and surface sealing

According to Hansmeyer (2020), the cover soils are susceptible to erosion.

Construction phase
Once earthworks commence on site, vegetation will be removed from the surface and expose the soil surfaces underneath to soil erosion that can be caused by both wind and water movement. Soil erosion will result in removal of soil particles from site to areas where it is deposited as dust particles or as sediment in lower landscape positions (Pienaar, 2020).

Soil will also be compacted as part of civil engineering procedures to ensure the stability of the infrastructure. Soil compaction affects the soil porosity, thereby decreasing the water infiltration rate of soil. Compacted soil surfaces increase storm water runoff rates and can cause soil erosion in areas outside the site boundary (Pienaar, 2020).

Operational phase

Where permanent buildings and surface roads will be constructed, soil will become permanently sealed-off from rainwater infiltration. Soil compaction affects the soil porosity, thereby decreasing the water infiltration rate of soil. Compacted soil surfaces and sealed off areas increase storm water runoff rates and can cause soil erosion in areas outside the site boundary (Pienaar, 2020). This could impact on the new light industrial activities, internal road network, adjacent roads, agricultural activities associated with Pienaardam Leisure Resort, etc. if mitigation measures are not implemented.

SOIL EROSION, SOIL COMPACTION AND SURFACE SEALING					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Permanent	Highly probable	High Negative	High Negative	Reversible (at cost)

Proposed mitigation:

- *The mitigation measures in Section 9 (EMPr) with regards to soil management and storm water management must be implemented during all phases of the development.*
- *Monitor for erosion and intervene and/or rehabilitate where necessary.*

E) Soil contamination with hydrocarbons and solid waste

Construction phase

According to Pienaar (2020), the following construction activities could result in pollution of the soil with hydrocarbons and/or solid waste:

- Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the mechanical removal of vegetation during site clearing.
- Spills from vehicles transporting workers, equipment and construction material to and from the construction site.
- The generation of domestic waste by construction and operational workers.
- Spills from fuel storage tanks during construction.
- Polluted water from wash bays and workshops during the construction phase.
- Accidental spills of other hazardous chemicals used and stored on site.
- Pollution from concrete mixing.

Operational phase

Emissions from vehicles containing trace element particles as well as organic (carbon-containing) contaminants, will settle on surfaces outside of the site. Storm water runoff can also contain pollutants such as petroleum hydrocarbons that spilled on sealed surfaces inside of the site. Both dust and storm water runoff can result in elevated levels of soil contaminants in nearby soil, including the agricultural crop-fields (Pienaar, 2020)

Soil pollution could also occur if waste management measures are not implemented and if the conservancy tanks do not have sufficient capacity or were not installed properly resulting in sewage overflows.

SOIL CONTAMINATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Medium Negative	Low Negative	Reversible (at cost)
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible (at cost)

Proposed mitigation:

- *The waste management measures indicated in Section 9 (EMPr) to be implemented during all phases of the development.*

8.5.4 Land use and sense of place

Construction and Operational phases

Although the field crop boundaries data indicates that the project area consists of several smallholdings, no evidence was found of any livestock farming activities. Also, no crops are produced on site and historical imagery indicates that there has been no active crop production for at least the past 9 years (Pienaar, 2020).

The rezoning of the site from Agriculture to Industrial (Industrial 2) and the subsequent construction activities would thus not impact on any current agricultural activities.

As indicated in Section 5.3, the proposed site is located within an area already utilized for light industrial and mining activities. The proposed light industrial area would not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

IMPACT ON LAND USE AND SENSE OF PLACE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Definite	Low Negative	Low Negative	N/A
OPERATIONAL PHASE					
Site	Long	Definite	Low Neutral	Low Neutral	N/A

8.5.5 Natural vegetation and animal life

As indicated in Section 5.7, the vegetation of the site is modified to transformed, with very low species diversity. Venter and Niemand (2020) indicated the site sensitivity for plant species as Low due to the highly modified state of the site vegetation, the low species diversity and the absence of habitat for threatened species. In addition, a low overall faunal richness was indicated for the said site in view of lack of habitat and past disturbances. Due to the level of disturbance on site, poor ecological connectivity of the site and the existing light industrial developments on site, this site is considered to be of low biodiversity sensitivity.

Construction phase

Destruction/loss of of vegetation:

The construction activities would result in the removal of 9.95ha of the Planted Pasture vegetation unit (Figure 5.16), which has a Moderate Sensivity (Venter

and Niemand, 2020). In addition, 1.48ha of the Transformed vegetation unit (Old Gardens and Weedy; Figure 5.16) will be cleared which also has a Low Sensitivity (Venter and Niemand, 2020).

DESTRUCTION/LOSS OF VEGETATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	Low Negative	Low Negative	Irreversible

Loss of of primary/untransformed grassland/habitat:
None. In view of the transformed nature of the vegetation on site, primary/untransformed grassland habitat will not be impacted.

Loss of habitat for plant species of conservation importance and loss of protected species:
Venter and Niemand (2020) indicated that the site was previously cultivated and has a very low diversity of plant species (especially forb species). No threatened plant species were observed on site or is expected to occur on site.

LOSS OF HABITAT FOR PLANT SPECIES OF CONSERATION IMPORTANCE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Medium Negative	Low Negative	N/A

The orchid species *Habenaria epipactidea* is however present on site. All orchid species are protected under the Mpumalanga Nature Conservation Act. The species is however, fairly widespread and currently not threatened.

LOSS OF PROTECTED PLANT SPECIES					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Highly probable	Medium Negative	Low Negative	N/A

Erosion and sedimentation:
Clearing of vegetation from the site and increased runoff may result in erosion on site. This may potentially cause damage to the downslope area. An increased sediment load in the water on site may result in excess sedimentation in downstream areas, which will result in a change in the vegetation composition. Erosion may take place at any areas cleared of vegetation for any reason, including around storm water infrastructure and areas cleared of invasive plant species (Venter and Niemand, 2020).

EROSION AND SEDIMENTATION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible

Loss of habitat for fauna species, including species of conservation importance:
According to Venter and Niemand (2020), the majority of all remaining natural habitat present on site has been modified or represent grassland seres at an early or secondary successional stage and support a fauna composition that is

of low richness. It is not possible to mitigate against the loss of habitat since it is assumed that the entire area will be cleared of vegetation during the construction phase (Venter and Niemand, 2020).

LOSS OF HABITAT FOR FAUNA SPECIES					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Definite	Medium Negative	Medium Negative	Reversible

Although a number of threatened and near threatened animal species have been recorded in the study region, the probability for these to occur on site is low, with many regarded to be absent. Those species that could occur (e.g. Lanner Falcon *Falco biarmicus*) are regarded as occasional and/or irregular foraging visitors to the site and will remain low based on the modified ecological condition of the habitat units and the frequency of occurrence. It is not possible to mitigate against the loss of habitat since it is assumed that the entire area will be cleared of vegetation during the construction phase (Venter and Niemand, 2020).

LOSS OF HABITAT FOR FAUNA SPECIES OF CONSERVATION IMPORTANCE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Low Negative	Low Negative	Reversible

Loss of Ecological corridors and connectivity:

According to Venter and Niemand (2020), the site has very poor ecological connectivity and faunal dispersal ability is severely limited by the presence of road networks, mining activities and active agricultural activities (e.g. commercial and irrigation pivots). The N4 national road on the northern boundary of the site and the R35 provincial road on the western boundary with Black Wattle Colliery are barriers to species movement. Development on site is therefore unlikely to have a significant negative effect on the ecological connectivity in the area.

LOSS OF ECOLOGICAL CORRIDORS AND CONNECTIVITY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Probable	Low Negative	Low Negative	Reversible

<u>Operational phase</u>

No further direct impact on vegetation or animal life is expected as no further construction activities will take place.

Infestation by invasive plant species:

Invasive plant species tend to establish in and around disturbed areas. A few alien and invasive species were observed on site (Venter and Niemand, 2020). These species may become established on site and may spread to the surrounding area if disturbed areas are not properly rehabilitated during the construction phase or if alien plants are utilized in the gardens.

INFESTATION BY INVASIVE PLANT SPECIES					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Local	Long term	Probable	Medium Negative	Low Negative	Reversible

8.5.6 Surface water (including wetlands and sensitive landscapes)

A) Direct impact on surface water environments (including wetlands)

Construction and Operational phases

None. The development of the light industrial area will not impact directly on any surface water environments (including wetlands). The closest river/stream is an unnamed tributary of the Vaalbankspruit, located ±700 m southeast of site. No wetland is present on site or in close proximity thereof as indicated in Section 5.9.4.

B) Impact on surface water runoff velocity

Construction phase

Clearing of vegetation from the site and increased runoff on site may result in erosion on site. This may potentially cause damage to the downslope area. An increased sediment load in the water on site may result in excess sedimentation in downstream areas, which will result in a change in the vegetation composition. Erosion may take place at any areas cleared of vegetation for any reason, including around storm water infrastructure and areas cleared of invasive plant species (Venter and Niemand, 2020).

Operational phase

Where permanent buildings and surface roads will be constructed, soil will become permanently sealed-off from rainwater infiltration. Soil compaction affects the soil porosity, thereby decreasing the water infiltration rate of soil. Compacted soil surfaces and sealed off areas increase storm water runoff rates and can cause soil erosion in areas outside the site boundary (Pienaar, 2020).

This could impact on the new light industrial activities, the internal road network, adjacent roads, agricultural activities associated with Pienaardam Leisure Resort, etc. if mitigation measures are not implemented.

IMPACT ON SURFACE WATER RUNOFF VELOCITY (EROSION, SEDIMENTATION, FLOODING)					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *Monitor for erosion and intervene and/or rehabilitate where necessary.*
- *The mitigation measures in Section 9 (EMPr) with regards to storm water management must be implemented during all phases of the development.*

C) Impact on surface water runoff quality

Construction phase
According to Pienaar (2020), the following construction activities can result in the pollution of soil with hydrocarbons and/or solid waste which could impact on the surface water runoff quality:

- Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the mechanical removal of vegetation during site clearing.
- Spills from vehicles transporting workers, equipment and construction material to and from the construction site.
- The generation of domestic waste by construction and operational workers.
- Spills from fuel storage tanks during construction.
- Polluted water from wash bays and workshops during the construction phase.
- Accidental spills of other hazardous chemicals used and stored on site.
- Pollution from concrete mixing.

Operational phase
Storm water runoff can contain pollutants such as petroleum hydrocarbons that spilled on sealed surfaces inside of the site. Both dust and storm water runoff can result in elevated levels of soil contaminants in nearby soil, including the agricultural crop-fields (Pienaar, 2020)

Surface water runoff could also be polluted if waste management measures are not implemented and if the conservancy tanks do not have sufficient capacity or were not properly installed resulting in sewage overflows.

IMPACT ON SURFACE WATER RUNOFF QUALITY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly Probable	Medium Negative	Low Negative	Reversible (cost)
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible (cost)

Proposed mitigation:

- *The waste management measures as indicated in Section 9 (EMPr) to be implemented during all phases of the development.*

8.5.7 Groundwater

A) Impact on groundwater

Construction and Operational phases
None. No direct impact on the groundwater is expected as a result of construction and operational activities since no signs indicating the presence of a shallow groundwater table (no seepage or wetlands) were noted on site.

B) Impact of groundwater abstraction

Construction and Operational phases
Groundwater will not be abstracted (using boreholes) to provide water for the overall development. The development will obtain water by connecting to an existing STLM water pipeline via Black Wattle Colliery.

As indicated in Section 5.10, a borehole is present on site but will only be used for emergency purposes.

IMPACT OF GROUNDWATER ABSTRACTION					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Low Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Low Negative	Low Negative	Reversible

8.5.8 Sites of archaeological and cultural interest

A) Impact on archaeological/cultural sites

Construction and Operational phases
None. As indicated in Section 5.13.1, Van Vollenhoven (2020) identified no sites of cultural heritage significance within the proposed development area.

B) Impact on palaeontology
As indicated in Section 5.13.2, the site is directly underlain by the Vryheid Formation, which has a 'Very High' palaeontological sensitivity.

Construction phase
Fourie (2020) found no surface fossils on site during the walk through and therefore no direct impact on palaeontology is anticipated.

Any direct impact on the palaeontology during the construction phase (e.g. digging, drilling, blasting, excavating of foundations, removal of overburden, etc.) will depend on the depth of new excavations required for the building and services.

Operational phase
The operational activities will have no direct or indirect impact on the palaeontology of the site as no further construction will take place.

IMPACT ON PALAEONTOLOGY					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Permanent	Improbable	Low Negative	Low Negative	Irreversible
OPERATIONAL PHASE					
None	None	None	None	None	N/A

8.5.9 Air quality

Construction phase
Dust generation and vehicle emissions due to construction activities and use of heavy machinery could impact on site workers, tenants of the existing light industrial stands/businesses, and motorists travelling along the N4 national road, R35 provincial road and the Pienaardam Road (to Pienaardam Leisure Resort). It could also impact on the agricultural activities (cultivated lands, livestock) of Pienaardam Leisure Resort. The extent of the impact would depend on the time of year, wind direction (which is predominantly in a north westerly and south easterly direction), wind velocity and mitigation measures in place.

The air quality of the site and surroundings could also be impacted in terms of odours if the chemical toilets used are not maintained and proper waste management measures are not implemented.

Operational phase
No noxious industries (scheduled processes) will be allowed on site.

The air quality of the site and surrounding area could however, be impacted by dust if the internal road network is not paved or tarred. This could impact on motorists travelling along the Pienaardam Road to Pienaardam Leisure Resort as well as the agricultural activities (cultivated lands, livestock) of Pienaardam Leisure Resort. The extent of the impact as a result of dust would depend on the time of year, wind direction (which is predominantly in a north westerly and south easterly direction), wind velocity and mitigation measures in place.

The accommodation facilities of the Pienaardam Leisure Resort are located approximately 1km from the eastern end of the proposed light industrial development. It is therefore not anticipated that tourists visiting Pienaardam Leisure Resort would be directly impacted by dust generated as a result of light industrial activities taking place on site.

A slight increase in vehicle emissions could also be anticipated in view of the increased number of vehicles present on site.

In addition, the air quality of the site and surroundings could be impacted if the conservancy tanks provided by tenants of each stand do not have sufficient capacity or were not installed properly resulting in sewage overflowing. The air quality could also be impacted if proper waste management measures are not implemented and the waste is not removed on a regular basis by service providers (appointed by tenants) and disposed of at the registered Rietfontein Waste Disposal Site.

IMPACT IN TERMS OF DUST/ODOURS					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *Dust suppression measures to be implemented on site during the construction and operational phases (see Section 9 (EMPr) for details).*
- *The waste management measures as indicated in Section 9 (EMPr) to be implemented during all phases of the development.*

8.5.10 Noise

In general, the ambient noise level of the site is high since the site is located adjacent to the N4 national road and the R35 provincial road which both carry high volumes of traffic throughout the day. Noise is also generated by existing mining activities adjacent to the site as well as existing light industrial activities taking place on site.

Pienaardam Leisure Resort is also located within this environment and therefore it is anticipated that the farm animals (livestock) are already used to the existing noise levels in the area.

Construction phase
Heavy machinery used during the construction phase will contribute to increased ambient noise levels in the immediate area, which could impact on the construction workers and tenants of the existing businesses/light industrial activities. Construction noise cannot really be mitigated, but would be of short duration.

Operational phase
Some operational noise would be created as a result of the light industrial activities taking place on site (e.g. increased numbers of people and vehicles visiting the various light industrial businesses, noise as a result of activities, etc.). This could impact on the tenants renting/leasing the various light industrial stands on site.

The accommodation facilities of the Pienaardam Leisure Resort are located approximately 1km from the eastern end of the proposed light industrial development. It is therefore not anticipated that tourists visiting Pienaardam Leisure Resort would be directly impacted by noise generated as a result of light industrial activities taking place on site.

IMPACT IN TERMS OF NOISE					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Medium Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Medium Negative	Reversible

8.5.11 Visual aspects

As indicated in Section 5.15, the visual aspects of the site have been impacted by the presence of existing light industrial activities on and adjacent to the site.

Construction phase
Construction activities would be highly visible from the existing light industrial activities taking place on site, the internal road network as well as the surrounding road network (i.e. the N4 national road, the R35 provincial road, Pienaardam Road). The said activities would also be visible from the adjacent properties; the property belonging to Pienaardam Leisure Resort; Black Wattle Colliery and Vaalbank Colliery Minipit.

Operational phase
General road users travelling on the surrounding network (i.e. the N4 national road, the R35 provincial road, Pienaardam Road) could be negatively impacted in terms of visual aspects if the light industrial area is not maintained and is not kept neat and tidy.

IMPACT IN TERMS OF VISUAL ASPECTS					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Probable	Medium Negative	Low Negative	Reversible

8.5.12 Traffic

Construction phase
All construction activities will take place on site and will not directly impact on traffic utilising the surrounding road network ((i.e. the N4 national road, the R35 provincial road, Pienaardam Road) or the internal road network.

The delivery of building material during the construction period could lead to a slight increase in traffic on the R35 provincial road. The deliveries would however, not occur on a continuous basis.

The construction of the new access road to the light industrial development off the Pienaardam Road as well as the upgrading of a portion (150m) of the Pienaardam Road would impact on motorists using this road to gain access to Pienaardam Leisure Resort. General road users could also be impacted should the required safety measures not be in place.

Operational phase
The utilization of the new access road to the light industrial development off the Pienaardam Road as well as a portion (150m) of the Pienaardam Road could impact on motorists using this road to gain access to Pienaardam Leisure Resort. The use of the emergency exit would also impact on these motorists.

General road users along the R35 could also be impacted in terms of safety if the new access road was not constructed according to SANRAL/TRAC specifications.

The proposed development will generate additional traffic during the operational phase, which could impact on the traffic volumes and intersections in the area if the mitigation measures (upgrading of intersections and access roads) as recommended by Roberts (2019) are not implemented.

The realignment of the various access roads off the R35 and upgrading of the Pienaardam access could however, also have a positive impact on road users in terms of safety.

IMPACT IN TERMS OF TRAFFIC					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

8.5.13 Interested and affected parties

The proposed development site belongs to the project applicant and therefore no other landowner will be directly impacted in terms of the development of the said site (i.e. in the short term and/or long term).

A) Positive impacts on Interested and Affected Parties (I&APs)

Construction and Operational phases
The proposed development could have the following positive impacts on I&APs:

- The proposed development would lead to additional employment opportunities during the construction and operational phases.

- Business opportunities would be provided in the form of light industrial stands that can be developed.
- The new Pienaardam intersection (i.e. the realignment of the various access roads off the R35 and the upgrading of the Pienaardam access) would improve the current traffic situation in the area which would benefit all I&APs utilising the said roads.

POSITIVE IMPACTS ON I&APs					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Positive	Medium Positive	N/A
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Positive	Medium Positive	N/A

B) Potential negative impacts on Interested and Affected Parties (I&APs)

Construction and operational phases

The proposed development could have the following negative impacts on I&APs:

- During the construction phase, contractors working on site could be directly impacted upon if the necessary safety and occupational health measures are not adhered to.
- Eskom (and their customers) could be impacted should the Eskom powerline located on site be damaged during the construction and/or operational phases.
- SANRAL will continue to be impacted in terms of the activities of the Bulk Diesel/truck stop (i.e. activities extend onto SANRAL property).
- SANRAL/TRAC will continue to be impacted upon if the two existing access roads (i.e. to the Bulk Diesel/truck stop and the light industrial area) are not closed. This would also impact on the general motorists utilising the R35 provincial road
- SANRAL/TRAC could be impacted if the new Pienaardam intersection is not constructed according to the approved designs.
- The owner of Pienaardam Leisure Resort (Mr. G. Gerrits) would be directly impacted in terms of the access road if an agreement with regards to the access, use and maintenance of the Right-of-Way servitude road is not in place before construction commences.
- Pienaardam Leisure Resort could be impacted in terms of loss of tourism should the development not be managed properly resulting in dust, noise and visual impacts.
- Other impacts in terms of the natural environment, noise, odours, visual, traffic, etc. are indicated in the preceding sections.

NEGATIVE IMPACTS ON I&APs					
CONSTRUCTION PHASE					
Extent	**Duration**	**Probability**	**Significance pre-mitigation**	**Significance post-mitigation**	**Reversibility**
Site	Short	Highly probable	Medium Negative	Low Negative	Reversible
OPERATIONAL PHASE					
Site	Long	Highly probable	Medium Negative	Low Negative	Reversible

Proposed mitigation:

- *All phases of development to be managed according to the Environmental Management Plan (Section 9 of this report).*

8.6 Cumulative impacts

Soil and agricultural potential
Businesses/light industries are already present on site and an area of approximately 10.5 ha has already been affected by human activities (Anthrosols and Anthrosols/Hutton; Figure 5.11).

According to Pienaar (2020), an area of 9.35ha (Hutton, Pinedene, Glencoe; Figure 5.11) is highly suitable for both irrigated and rainfed crop production while the shallower Glencoe soils (2.29 ha; Figure 5.11) are suitable for rain-fed crop production (Pienaar, 2020). In total, an area of 11.64 ha (with a Moderate to High land capability) is available for crop production (Hutton, Glencoe, Pinedene; Figure 5.11) and would be lost to agriculture. However, this is a relatively small area and may not be financially viable from an agricultural point of view especially if water for irrigation purposes is required.

In terms of livestock farming, the proposed site and immediate surrounding area have a grazing capacity of 5ha/LSU and would allow 4 head of cattle or 16 head of sheep on the entire site (22 ha). This is not enough for an employment opportunity (Pienaar, 2020) and would not be financially viable from an agricultural point of view.

In view of the above-mentioned, the development of the light industrial area would thus have a low cumulative impact on soils and agricultural land.

Natural vegetation
The site falls within the Rand Highveld Grassland vegetation type, which is a Vulnerable vegetation type. The Rand Highveld Grassland vegetation unit has a high species diversity, especially of forbs and geophytes. In view of this, all remaining portions of primary Rand Highveld Grassland, including areas affected by high grazing pressure, should be considered to be of high conservation importance (Venter and Niemand, 2020).

The proposed site was previously cultivated and the vegetation no longer represents the Rand Highveld Grassland vegetation type (see Section 5.7). The vegetation units on site are all modified or transformed by past disturbances and represent secondary grassland in the very early successional stages. The species present in these units are common and widespread and of little conservation importance (Venter and Niemand, 2020).

The only protected plant species present on site is the orchid species *Habenaria epipactidea*, which is one of the common orchid species. This species can be transplanted to similar modified habitat in the area without resulting a significant loss in diversity. The site is therefore not very sensitive (Venter and Niemand, 2020).

Disturbed areas may however occasionally serve as ecological corridors for plants species and therefore help to sustain biodiversity in surrounding areas. The site is located at the intersection between the N4, the R35 and Black Wattle Colliery. These serve as effective barriers to the movement of plant and small

fauna species. In addition, the portion to the south is a rehabilitated mine and has very poor vegetation cover. The areas to the south-east are used for cultivation of crops and is poor in biodiversity. The site is therefore not considered to serve as an ecological corridor and contributes very little to biodiversity in surrounding areas (Venter and Niemand, 2020).

The development of the proposed site will therefore not contribute to the cumulative impact on primary/untransformed Rocky Highveld vegetation.

Animal life/fauna

Venter and Niemand (2020) indicated a low overall faunal richness for the said site in view of lack of habitat and past disturbances. Venter and Niemand (2020) indicated that the Planted Pastures vegetation units have a moderate conservation value, since some widespread and generalist faunal species persist in the secondary grassland associated with these units. Specialists and species with small and localised distribution ranges appear to be absent or already displaced by the transformed state of the grassland units (Venter and Niemand, 2020).

Venter and Niemand (2020) indicated that the animal habitat units identified are fragmented and isolated from adjacent natural habitat by road networks, existing infrastructure and active agricultural activities. This has compromised the ecological connectivity of the said units, thereby rendering the site as an ecological "cul-de-sac" for medium to large terrestrial fauna species. In fact, some widespread mammal species (e.g. African Savanna Hare *Lepus cf. victoriae*, Highveld Gerbil *Gerbilliscus brantsii* and Highveld Mole-rat *Cryptomys cf. pretoriae*) that are generally present in modified habitat units were virtually absent from the site.

Due to the level of disturbance on site, poor ecological connectivity of the site and the existing light industrial developments on site, this site is considered to be of low biodiversity sensitivity.

In view of the above-mentioned, the development of the light industrial area would thus have a low cumulative impact on animal life/fauna.

Land use and sense of place

Although the field crop boundaries data indicates that the project area consists of several smallholdings, no evidence was found of any livestock farming activities. Also, no crops are produced on site and historical imagery indicates that there has been no active crop production for at least the past 9 years (Pienaar, 2020).

The rezoning of the site from Agriculture to Industrial (Industrial 2) and the subsequent construction activities would thus not impact on any current agricultural activities.

As indicated in Section 5.3, the proposed site is located within an area already utilized for light industrial and mining activities. The proposed light industrial area would not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

In view of the above-mentioned, the development of the light industrial area would thus have a low cumulative impact on land use and sense of place.

Traffic
The proposed development will generate additional traffic during the operational phase, which could impact on the traffic volumes and intersections in the area if the mitigation measures (upgrading of intersections and access roads) as recommended by Roberts (2019) are not implemented.

The realignment of the various access roads off the R35 and upgrading of the Pienaardam access could however, also have a positive impact on road users in terms of safety.

Municipal services
The proposed development site borders onto the urban edge of Middelburg where municipal services (water, sewage, electricity, etc.) are not provided.

Only water will be provided to the site by the Steve Tshwete Local Municipality via a water supply line extending from Black Wattle Colliery. Other services will have to be provided by the applicant/tenants as indicated in Table 7.6.

In view of the above-mentioned, the development will not result in cumulative pressure on municipal service infrastructure.

8.7 'No project' impacts

The 'no project option' is the alternative of not going ahead with the proposed development. The 'no project option' is only considered if it is found that the development will have significant negative impacts on the environment, which cannot be mitigated or managed.

If the 'no project option' in terms of the proposed development was exercised, it could mean that:

- The existing businesses/light industrial activities on site could be seen as illegal, required to be decommissioned and the site rehabilitated.
- The applicant would not be able to develop the property any further.
- Potential business opportunities and employment opportunities would be lost.
- There would still be a need for light industrial erven in the area.
- Other potential uses for the site would have to be investigated.
- The applicant could sell the property.

It is anticipated that this development will add to the development potential and economic growth of the area.

8.8 Concluding remarks

The rezoning of the site from Agriculture to Industrial (Industrial 2) and the subsequent construction activities would not impact on any current agricultural activities or sensitive landscapes (river/stream/wetlands).

The proposed site is located within an area already utilized for light industrial and mining activities with light industrial activities already taking place on site.

The proposed light industrial area would thus not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

SECTION 9: ENVIRONMENTAL MANAGEMENT PROGRAMME

9.1 Definition and objectives

As indicated in Regulation 19(4) of the EIA Regulations, 2014 (as amended), an Environmental Management Programme (EMPr) must form part of the Basic Assessment Report.

The EMPr was compiled in accordance with Appendix 4 of the EIA Regulations, 2014 (as amended) as well as the Western Cape Guideline for Environmental Management Plans (Lochner, 2005).

According to the Western Cape Guideline, an Environmental Management Programme (EMPr) can be defined as:

> *An environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced.*

According to the EIA Regulations, 2014 (as amended), an EMPr must include-
(d) A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed or mitigated as identified through the environmental impact assessment process for all phases of the development including -
(i) planning and design;
(ii) pre-construction and construction activities;
(iii) operation or undertaking of the activity;
(iv) rehabilitation of the environment; and
(v) closure, where relevant.

This section therefore provides an indication of the mitigation measures to be implemented by the site operator (and site workers) in order to reduce the potential impacts identified (see Section 8).

9.2 Contact details of Environmental Assessment Practitioner

An EMPr must include -
(a) details of-
(i) the EAP who prepared the environmental management programme; and
(ii) the expertise of that person to prepare an environmental management programme, including a curriculum vitae.

The contact details and expertise of the Environmental Assessment Practitioner who prepared the EMPr are provided in Section 2 of this Basic Assessment Report.

The applicant will be responsible for the implementation of the EMPr. The contact details are provided in Section 2 of this Basic Assessment Report.

9.3 Description of the proposed project

An EMPr must provide -
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.

A detailed description of the proposed development and aspects covered by the EMPr is provided in Section 3 and Section 7 of this Basic Assessment Report. Section 5 of this Basic Assessment Report provides a description of the biophysical environment of the site.

In summary, the following alternatives as indicated in Section 7.6 will be implemented:

Aspect	Description of alternative
Site	The development site will be located on Portion 58 of the farm Vaalbank, Middelburg (Figure 8.1).
Land use	A light industrial area will be developed comprising of 20 erven (Figure 8.1).
Layout	A new access road from Pienaar Dam road with an internal road system providing access to the 20 erven (Figure 8.1).
Services	Water: The proposed development will connect to the existing STLM water supply line via Black Wattle Colliery.
	Electricity: Electricity will be obtained from Eskom. Eskom approved an increase in electricity supply from 100kVA to 315kVA.
	Sewage disposal: Each tenant will be responsible for the installation of a conservancy tank on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
	Waste management: Each tenant will be responsible for the provision of a waste collection area on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
	Storm water management: A new stormwater management system to be developed for the overall site by the applicant.

Mitigation and management measures with regards to these alternatives are provided in Section 9.5.

9.4 Sensitivity mapping

An EMPr must provide -
(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.

Section 5 of this Basic Assessment Report provides a description of the biophysical environment of the site. Venter and Niemand (2020) indicated that no wetlands were identified on site. Some ponding does take place in areas (e.g. where shallow canals direct runoff away from the development, excavations in weedy areas) but these areas do not represent wetland conditions. In addition, no hydromorphic soils were identified on site. No sensitive landscapes (including rivers, streams, wetlands, etc.) were thus identified on site or adjacent to the site.

The orchid species *Habenaria epipactidea (*a protected species under the Mpumalanga Nature Conservation Act) is present in the areas dominated by *Paspalum* or *Digitaria* (Figure 5.16). Venter and Niemand (2020) indicated that these plants can be relocated as indicated in Section 9.5.2.

9.5 Mitigation and management measures to be implemented

An EMPr must include -
(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
(ii) comply with any prescribed environmental management standards or practices;
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.

Before any construction can commence, the following permissions will be required:
- Environmental Authorisation in terms of the Environmental Impact Assessment Regulations, 2014 (as amended);
- Approval of the rezoning application (from Agricultural to Industrial) in terms of the Steve Tshwete Local Municipality Spatial Planning and Land Use Management By-Laws 2016.
- A permit from the Mpumalanga Tourism and Parks Agency (MTPA) to be obtained prior to relocating the orchid species *Habenaria epipactidea (*a protected species under the Mpumalanga Nature Conservation Act) is present in the areas dominated by *Paspalum* or *Digitaria* (Figure 5.16). See Section 9.5.2 for further details.

Please note the following:
- No noxious industries (scheduled processes) to be allowed on site. Only light industrial activities to be permitted.
- If a tenant plans to undertake an activity that requires an environmental approval (Environmental Authorisation, Water Use Licence, etc.), then the tenant must ensure that they are in possession of the required environmental approval(s) prior to commencing with the activity on site.
- The applicant will be responsible to monitor all tenants and their activities on site and ensure that they adhere to the EMPr (Section 9 of this report) and the conditions stipulated in the Environmental Authorisation.

9.5.1 Construction site office

Impact management outcome:

1) *To ensure that an appropriate site is selected for the construction site office and that the construction site office is managed in an environmentally responsible manner with the least impact on the natural environment, site workers and adjacent landowners/users.*

Mitigation and management measures:

a. A suitable area must be selected, demarcated and fenced for the construction site office (i.e. within the specified stand to be developed).

b. No overnight accommodation may be provided at the construction site office.
c. Chemical toilets must be provided for use by the site workers. These must be serviced on a regular basis. No long drop toilets may be allowed.
d. Potable water must be made available to site workers.
e. Proper waste management facilities must be provided as part of the construction site office.
f. No dumping of any kind of waste (domestic, general, building rubble, etc.) may take place in the surrounding area. All waste must be removed to the licensed Rietfontein Waste Disposal Site.
g. No servicing of vehicles may take place on site.

9.5.2 Construction activities

Impact management outcome:

1) To ensure that the activities that occur during the construction phase have the least impact on the natural environment, site workers and adjacent landowners/users

General

a. The applicant must comply with the conditions of the issued Environmental Authorisation.
b. Site Environmental Control Officer (SECO): Before construction commences, the applicant must appoint a person who will be responsible for the day-to-day implementation of the EMPr (including Environmental Awareness Training) and who will report to the site manager.
c. Environmental Control Officer/Auditor (ECO): The applicant must also appoint an ECO who will have the responsibility of monitoring and reporting on compliance (on a monthly basis) with the conditions of the Environmental Authorisation as well as monitoring and reporting on the implementation of the EMPr.
d. All construction activities must be limited to the said site or the specific stand being developed. The said site must be properly demarcated/fenced and the footprint kept as small as possible.
e. Commence with clearing of vegetation from the western side and progressively continue in an easterly direction to provide larger and more mobile fauna (e.g. birds and bovids, when present) with an opportunity to leave the site without becoming isolated or threatened (e.g. mortalities) by earthmoving equipment (Venter and Niemand, 2020).
f. Area to be cleared of vegetation at any one time must be limited in order to reduce the potential for dust generation during the windy months and erosion during the rainy season.
g. No removal of vegetation may take place outside of the site boundaries (i.e. on adjacent properties).
h. The orchid species *Habenaria epipactidea (*a protected species under the Mpumalanga Nature Conservation Act) is present in the areas dominated by *Paspalum* or *Digitaria* (Figure 5.16)*.* Relocate individuals of *Habenaria epipactidea* to modified grassland in the area before any construction in these areas take place. The individuals can be transplanted to any secondary grassland area with similar soil. Do not transplant to primary grassland or grassland that represent the Rand Highveld Grassland vegetation type. The translocations to be carried out in a way to ensure that no ecological degradation occur on the target habitat (where the plant will be planted), and it is recommended that this area be evaluated by an ecologist. Where relocation is not possible, the orchids can be

rescued and donated to appropriate conservation and research institutions such as SANBI's Walter Sisulu National Botanical Garden or the Pretoria National Botanical Garden (Venter and Niemand, 2020).

i. All site workers/contractors must be informed that no poaching/trapping of animals will be allowed on site or on the adjacent properties. Any person found deliberately harassing any animal species (in any way) will face disciplinary measures (even dismissal from site) (Venter and Niemand, 2020).
j. If any subterranean/fossorial animal (e.g. reptile, scorpion, amphibian or mammal species) is found during the construction phase, this species must be relocated to the nearest area or natural open space with suitable habitat for the particular species to continue its life history (Venter and Niemand, 2020). If necessary, a specialist should be contacted to ensure the safe removal of the specimen.
k. Dust suppression measures must be implemented during dry and windy periods. Dust can be suppressed by either using clean water or water containing dust suppressants during the construction phase (Pienaar, 2020).
l. For safety purposes, excavations must not be undertaken until such time as all required materials are available and services can be laid.
m. Excavations should be closed as soon as is practically possible.
n. The adjacent landowners/users must be provided with contact numbers with whom complaints or concerns can be discussed.
o. If any archaeological remains or historical material are exposed during the construction phase, construction at the affected area must cease immediately and the Provincial Heritage Resources Authority and SAHRA's APM Unit must be notified.
p. The area should be demarcated in order to prevent any further work there until an investigation has been completed.
q. An archaeologist should be contacted immediately to provide advice on the matter. Should it be a minor issue, the archaeologist will decide on future action. Depending on the nature of the find, it may include a site visit.
r. If needed the necessary permit from SAHRA must be applied for. This must be done in conjunction with the appointed archaeologist.
s. The removal of the archaeological material may only be done by the archaeologist once approval has been granted by SAHRA and in accordance with any conditions stipulated by SAHRA.
t. Work on site will only continue after the archaeologist/SAHRA has agreed to such a matter.
u. If any graves are discovered during construction, the discovery must be reported to the SA Police Service and/or SAHRA or an archaeologist must be called in to handle the matter.
v. The appointed Site ECO must familiarise him- or herself with the Vryheid Formation and its fossils. Alternatively, a palaeontologist to be involved during the digging and excavation (ground breaking) phase of the development. If any palaeontological material is exposed (during digging, excavating, drilling or blasting) SAHRA must be notified, all construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist called to determine proper mitigation measures. A protocol for finds and management plan are provided in Appendix 2 of Appendix 8 of the Basic Assessment Report.

Geotechnical recommendations

Impact management outcome:

1) *To ensure that the buildings are not impacted upon by taking into account the geotechnical constraints of the site (i.e. loose cover soils susceptible to settlement, hard excavation within sandstone bedrock >3.5m, etc.).*

a. The cover soils, residuum and decomposed bedrock layers that underlie the site (to an approximate depth of 3.5m below natural ground surface) are soft to intermediate in terms of their excavatability. A TLB or excavator (e.g. CAT 225/Hitachi L200) to be used to excavate the overburden (Hansmeyer, 2020).
b. Deeper excavations within fresh bedrock (>3.5m) will require hard ripping and blasting (Hansmeyer, 2020).
c. Excavated materials are to be stockpiled for future use and should be thoroughly tested for their intended applications (e.g. impermeable backfill/pavement layers for the access and internal roads, etc.).
d. The pavement layers of the internal and access roads and foundation trenches of buildings are to be wetted up and compacted to prevent undue settlement (Hansmeyer, 2020).
e. At the time of construction, a competent person must inspect all foundation excavations to ensure that the materials are adequate for the proposed structures and that they adhere to the geotechnical recommendations (Hansmeyer, 2020).
f. The placement of engineered fill must be controlled with suitable field tests to ensure that the required densities are achieved during compaction, and that the quality of the fill material (soil or rock) is within specification (Hansmeyer, 2020).

Management measures in terms of soil

Impact management outcome:

1) *To ensure that the activities that occur during the construction phase have the least impact on the soils in terms of soil quality, structure and erosion potential.*
2) *To reduce the potential impact of storm water drainage from the site (during the construction and operational phases) on the adjacent roads and adjacent landowners/users in terms of soil erosion, sedimentation and flooding.*

a. A new storm water system for the overall site must thus be developed (incorporating the existing storm water measures) during the construction phase of the development. Storm water runoff from site must be captured in an attenuation dam (to be located on Stand 8, located at the eastern boundary of the site, Figure 3.2) being released to the natural environment.
b. Appropriate soil conservation and storm water management measures to be provided in order to prevent soil erosion and loss of topsoil. Increased run-off during construction must be managed using contour berms and other suitable structures (e.g. geo-textile silt fences, gabions, placement of bales or the use of sandbags) to ensure flow velocities are reduced
c. Only remove vegetation prior to construction in an area (Pienaar, 2020).
d. Avoid stripping vegetation and stockpiling of topsoil during periods of heavy rain or periods with excessive wind (e.g. August) (Pienaar, 2020).
e. Any topsoil stockpiles must be protected against wind and water erosion until vegetation has established on the exposed topsoil surfaces (Pienaar, 2020).
f. If it is observed that topsoil stockpile surfaces remain bare, natural vegetation must be established on the topsoil stockpiles (Pienaar, 2020).

g. Topsoil must be used in the rehabilitation of open areas after construction and/or for gardens onsite (Pienaar, 2020).
h. Monitor the entire site for signs of erosion throughout the construction and operational phases of the project.
i. All erosion features must be rehabilitated as soon as possible.
j. Implement erosion control measures where necessary.
k. Implement sediment fences around erosion prone areas.
l. Restrict traffic and vehicle movement to access roads and within the site boundaries (Pienaar, 2020).
m. Demarcate parking areas and monitor that vehicles and equipment are not parked outside of these areas to prevent disturbance of vegetation during the construction phase (Pienaar, 2020).
n. Permeable paving blocks should be used as far as possible for the parking areas to promote the infiltration of water into the soil and to reduce stormwater runoff from the site (Venter and Niemand, 2020).
o. Stabilise and re-vegetate all areas bare of vegetation as soon as possible.
p. The following additional measures should be implemented to ensure that the storm water management measures are functional and not causing flooding of the surrounding roads or properties: debri and rubbish to be removed from kerb inlets and conduits during routine inspections; sediment to be removed especially after the first couple of months of installation as un-surfaced areas contribute a lot of sand/debri; stone pitching or gabion work to be repaired after major flooding; check on structural integrity of kerb inlets; damaged kerb inlets could lead to uncontrolled erosion downstream.

<u>Management measures in terms of waste</u>
Impact management outcome:
1) *To ensure the proper storage, management and disposal of waste during the construction phase.*
2) *To reduce potential soil, surface water and groundwater pollution as a result of waste management activities during construction.*

a. Proper waste management measures to be implemented on site.
b. Waste skips/bins to be provided for placement of general waste, building rubble, etc.
c. Waste skips to be covered with a net to prevent windblown waste.
d. Hazardous waste to be separated from general waste, stored separately in appropriate containers and disposed of at a licensed hazardous waste disposal facility or certified recycling facility. No hazardous substance to be disposed of on site or in the surrounding area.
e. The waste collection area must be kept clean and tidy at all times. This area should not be littered with waste lying outside of the waste bins/skips. Site workers to be instructed on a daily basis (at end of the day) to collect windblown rubbish which may collect on site and in the adjacent area. This will assist with the overall visual appearance of the site.
f. No waste to be burnt, buried or dumped on site or the surrounding area.
g. Waste skips/bins to be emptied on a regular basis and the waste disposed of at the licensed Rietfontein Waste Disposal Site.
h. Waste (including building rubble) not to be placed on the soil stockpiles or disposed in a haphazard way in the surrounding area resulting in the contamination of the soil and the environment.
i. During the construction phase, cement/concrete should be mixed in either demarcated areas or on metal sheeting or conveyor belts. If mixed in demarcated areas, these areas must be ripped and the cement/concrete removed on completion of construction activities.

j. The applicant/contractor must ensure that all site workers receive appropriate training with regards to waste management measures to be implemented for the said site.

Management measures in terms of waste

Impact management outcome:

3) To reduce potential soil, surface water and groundwater pollution as a result of the use of hydrocarbons (oils, fuels, etc.) on site.

a. High level maintenance must be undertaken on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills (Pienaar, 2020).
b. Proper bunded (impermeable) storage facilities must be provided for the storage of oils, grease, fuels, etc. to be used during the construction phase.
c. Collection containers (e.g. drip trays) must be placed under all dispensing mechanisms for hydrocarbons or hazardous liquid substances to ensure that potential contamination from leaks/spillage is reduced. All spills of chemicals or hydrocarbons (oil, grease, diesel, petrol, etc.) should be cleaned with the use of suitable absorbent materials (e.g. drizit or oclanzorb). Appropriate soil remediation measures should be implemented where soil has been contaminated with oil.
d. Site surface water and wash water must be contained and treated before reuse or discharge from site (Pienaar, 2020).
e. Spills of fuel and lubricants from vehicles and equipment must be contained using a drip tray with plastic sheeting filled with absorbent material (Pienaar, 2020).
f. Spill kits must be available on site and should be serviced regularly (Pienaar, 2020).
g. Potentially contaminating fluids and other wastes must be contained in containers stored on hard surface levels in bunded locations (Pienaar, 2020).
h. Accidental spillage of potentially contaminating liquids and solids must be cleaned up immediately by trained staff with the correct equipment and protocols (Pienaar, 2020).
i. If any soil or surface water contamination is noted, appropriate remediation measures must be implemented immediately.
j. Contaminated soil generated as a result of fuel, oil, etc. spills to be disposed of in a specially marked drum located at the construction site office. An approved waste contracting firm to collect the drum and dispose of the contaminated soil at an appropriate waste disposal site.
k. An environmental incident report must be completed indicating the date of the incident, description of incident and action taken.
l. The Department of Agriculture, Rural Development, Land and Environmental Affairs (DARLEA) and the Department of Water and Sanitation (DWS) must be informed of the event within 24 hours.
m. A copy of the environmental incident report must be kept on file at the construction site office(s).

Example of Environmental Incident Register:

ENVIRONMENTAL INCIDENT REGISTER				
DATE AND TIME	INCIDENT REPORTED BY	CONTACT DETAILS (telephone/cell number; address)	DETAILED DESCRIPTION OF ENVIRONMENTAL INCIDENT REPORTED	RESPONSE FROM ECO

9.5.3 Rehabilitation of the environment after construction

Impact management outcome:

1) *To ensure that any disturbed areas not developed are properly rehabilitated and maintained.*
2) *To control the growth of declared weeds and/or invader plants.*

Mitigation and management measures:

a. Before construction, the remaining topsoil must be removed and stockpiled in a demarcated area within the site for rehabilitation of disturbed areas and/or landscaping.
b. The topsoil should not be compacted.
c. Once construction has been completed, all temporary structures, excess materials, equipment and waste must be removed from site.
d. All residual stockpiles must be removed to spoil or spread on site as directed by the Site ECO.
e. Any undeveloped disturbed areas (i.e. areas to be developed at a later stage or to be used for landscaping) must be top soiled and re-vegetated (i.e. rehabilitated) as soon as possible in order to prevent soil erosion and the establishment of alien vegetation.
f. Proper storm water control measures and erosion control must be implemented to prevent erosion of the newly rehabilitated areas during heavy rainfall.
g. Temporary erosion control measures (e.g. geo-textile silt fences, diversion ditches, sediment traps, sandbags, etc.) to be kept in place to control erosion until the long-term erosion control methods are established and functioning.

h. The planting of any alien invader plant species as part of landscaping should be prohibited in order to prevent the spread of invasive species from the site.
i. Plant species indigenous to the area (including trees) should be used in the landscaping of the communal areas (if applicable) (Venter and Niemand, 2020).
j. The regulations in terms of Alien Invasive Species and the Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998) with regards to declared alien species must be noted and complied with.
k. Regular site inspections to be conducted to identify any declared weeds and/or invader plants. If identified, the plants to be eradicated using appropriate methods.
l. It is advisable to consult the latest edition of 'A guide to the use of herbicides' or contact the National Department of Agriculture, Forestry and Fisheries with regards to the latest information pertaining to the application of herbicides. If pesticides or herbicides are to be used, the product should be chosen responsibly. Storage, administering and disposal must be done according to the prescribed methods.
m. A post-construction audit by the Site ECO must be conducted to ensure that any shortcomings are identified and addressed.

9.5.4 Interested and Affected Parties (I&APs)

Impact management outcome:

1) *To ensure that the site workers are not impacted in terms of the construction work being performed.*

Mitigation and management measures to be implemented:

a. The applicant/contractor must adhere (at all times) to the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) (as amended), the Construction Regulations, 2003 (as amended) and any other applicable legislation (including applicable bylaws of the Steve Tshwete Local Municipality).
b. The applicant/contractors must ensure that the necessary protective gear (PPE) is worn at all times and that signs are erected to warn workers to use hearing protection as well as any other hazards.
c. All machinery used on site must be properly muffled and maintained so as to reduce noise generation to a minimum.
d. If blasting is required, the requirements of the Explosives Act, 2003 (Act 15 of 2003) must be put in place in order to prevent any impact on site workers.

Impact management outcome:

2) *To ensure that adjacent landowners/users are not impacted in terms of the construction work performed.*

Mitigation and management measures to be implemented:

a. Landowners/users to be notified in advance that construction will commence.
b. Landowners/users to be provided with contact numbers (e.g. cell numbers, email, etc.) with whom complaints can be lodged.
c. Landowners/users to be informed in advance that blasting will take place (if required). Mitigation measures to be implemented to limit the impact of blasting on residents, property, domestic animals, etc.
d. The waste management measures as indicated in Section 9.5.2 to be implemented in order to keep the site neat and tidy at all times.

e. All machinery used on site to be properly muffled and maintained so as to reduce noise generation to a minimum.
f. Site workers must be instructed to keep noise to a minimum.
g. Construction activities to be limited to daylight hours (7am - 6pm) and weekdays (Monday to Friday) in order to minimize the impact on residents in terms of noise and dust.

Impact management outcome:

3) To ensure that general road users utilizing the R35 provincial road and the Pienaardam Road are not impacted as a result of the construction and operation of the light industrial development (especially in terms of the upgrading of roads).

Mitigation and management measures to be implemented:

a. The general construction principles indicated in Section 9.5.2 to be implemented.
b. Presently, the site is accessed from one central collector type gravel road (nearly opposite the existing Black Wattle Colliery access) connecting to the R35 provincial road. A separate access is provided to the Bulk Diesel/truck stop. SANRAL/TRAC indicated that both these access roads are not approved accesses and must be closed (B. Roberts, pers. comm.).
c. Blackwattle Colliery, weighbridge, Pienaardam and proposed development's access roads be realigned and a new intersection (Pienaardam intersection) be constructed as indicated by SANRAL/TRAC (Roberts, pers. comm.).
d. A new access road from Pienaardam Road with an internal road system providing access to the 20 erven (Figure 7.3) to be constructed.
e. Permission to use the Right-of-Way servitude road (i.e. Pienaardam Road) might be required and needs to be confirmed. In addition, an agreement regarding the upgrading and maintenance of this road must be drafted and agreed to between the various parties involved. Further consultation with the owner of Pienaardam Leisure Resort (Mr. G. Gerrits) by the applicant is thus required before any road construction takes place.
f. An emergency exit to be provided towards the eastern boundary of the site and only to be used during emergency situations.
g. Proper signage, warning signals, etc. (i.e. required safety measures) must be provided to warn road users that road construction is taking place.

Impact management outcome:

4) To ensure good relations with all Interested and Affected Parties (I&APs) by creating open channels of communication to address matters of concern that may arise.

Mitigation and management measures to be implemented:

a. The adjacent landowners/users to be provided with contact numbers (cell numbers, email, etc.) with whom complaints can be lodged.
b. A Complaints Register to be kept at the construction site office(s).
c. All complaints received to be recorded in the Complaints Register. The following to be recorded:
    - Date when complaint/concern was received;
    - Name of person to whom the complaint/concern was reported;
    - Nature of the complaint/concern reported;
    - Way in which the complaint/concern was addressed (date to be

included).

d. The Complaints Register to be kept up to date for inspection by members of the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) and the Steve Tshwete Local Municipality (STLM).

An example of a complaints register is provided below.

COMPLAINTS REGISTER				
DATE AND TIME	NAME	CONTACT DETAILS (telephone/cell number; address)	DETAILED DESCRIPTION OF COMPLAINT	RESPONSE FROM ECO

9.5.5 Operational activities

a. The applicant must comply with the conditions of the issued Environmental Authorisation.
b. All operational activities must be limited to the said site.
c. The following **energy saving** initiatives should be implemented, where possible, in order to reduce the carbon footprint of the development.
   - *Energy efficient lighting (e.g. LED lighting) to be installed where possible;*
   - *Designing the buildings in such a way as to maximize the use of daylight (e.g. skylights, large windows, etc.);*
   - *Solar geysers to be installed where feasible.*
d. The following measures to minimize **water use** during the operational phase must be implemented:
   - *Regular maintenance of the water infrastructure to minimize water wastage;*
   - *Harvested storm water to be used where possible;*
   - *Water usage to be monitored;*
   - *Waterwise signage to be displayed in restrooms;*
   - *Waterwise taps (e.g. taps with infra-red sensors/low-flow taps) to be installed in restrooms.*

e. The water and sewer infrastructure should be inspected on a regular basis to ensure that there are no blockages/leakages or spillage.
f. Each tenant will be responsible for the provision of a waste collection area on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
g. Each tenant will be responsible for the management of the waste collection area.
h. Each tenant will have to ensure that a contractor is sourced to remove the waste to the registered Rietfontein Waste Disposal Site on a regular basis.
i. The applicant will have to monitor all stands to ensure that the correct waste management measures are implemented and that the waste is being removed to the registered Rietfontein Waste Disposal Site and not being dumped or buried on site or on adjacent properties.
j. Each tenant will be responsible for the installation of a conservancy tank on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
k. The size of the conservancy tanks will depend on the type of activity and the number of employees on site. For each individual erf, engineers would have to be appointed to determine the size and placing of conservancy tanks.
l. Each tenant will be responsible for the management of the conservancy tank. There is a risk that the conservancy tank/tanks could overflow, resulting in soil and groundwater pollution as well as bad odours.
m. Each tenant will have to ensure that a contractor is sourced to empty the conservancy tanks on a regular basis. The conservancy tanks will have to be emptied on a regular basis by means of a honey sucker. The sewage will have to be disposed at the Boskrans Wastewater Treatment Plant.
n. The applicant will be responsible to monitor all tenants and their activities on site and ensure that they adhere to the EMPr (Section 9 of this report) and the conditions stipulated in the Environmental Authorisation.
o. The overall management of the site and associated infrastructure will be of utmost importance and therefore the implementation of these mitigation measures must be monitored and audited on a regular basis.

9.6 Implementation and monitoring of the EMPr

An EMPr must include -
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.

The implementation of the Environmental Management Programme (EMPr) as part of the daily construction and operational activities is crucial and requires commitment from all levels of management and the on-site workers. The successful implementation of an EMPr has the following advantages:

- Meeting legal obligations;
- Contributes to environmental awareness;
- Can facilitate the prevention of environmental degradation;
- Can minimize impacts when they are unavoidable;
- Can ensure good environmental performance and improve community relations.

An approved contractor should be appointed to do the necessary construction on the said site. The contractor and site workers must be aware of their environmental responsibilities. Penalty clauses, in terms of the environment, must be built into the contracts and must be implemented. Monitoring of the environmental management programme must take place on a regular basis in order to ensure compliance.

The contractor must inform all site workers of their environmental responsibility during the construction phase. Measures to protect the environment and mitigation measures formulated in this EMPr must be implemented by the contractor and the site workers. The contractor must thus ensure that the site workers are aware of the Environmental Authorisation and this EMPr and understand the contents thereof.

In order to achieve the above-mentioned, the contractor and site workers should undergo basic environmental awareness training with regards to the contents of this EMPr. Environmental awareness training is critical for the contractor and site workers to understand how they can play a role in achieving the objectives specified in the EMPr. The contractor must ensure that the site workers undergo the necessary environmental awareness training (see Section 9.6.1) before commencing with activities on the site.

This section must be completed on acceptance of the appointment.

MANAGEMENT ACCOUNTABILITY		
Accountability	**Title**	**Name**

MANAGEMENT DECLARATION

I, the undersigned in my capacity as designated above hereby undertake to ensure that the conditions and recommendations in terms of the Environmental Authorisation and Environmental Management Plan (EMPr) are implemented and assume responsibility and accountability in this respect.

I further understand that officials from the Steve Tshwete Local Municipality, Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) and Department of Water and Sanitation (DWS) may (at any time) conduct an inspection of the project in order to ensure compliance with the conditions and recommendations in the EMPr.

CONTRACTOR

……
Name and Designation

……
Signature:

……
Date:

EMPLOYER

……
Name and Designation:

……
Signature:

……
Date:

9.6.1 Environmental Awareness Plan (EAP)

An EMPr must include -
(m) An environmental awareness plan describing the manner in which-
(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.

It is recommended that the employees receive basic environmental awareness training. In order to ensure proper training, the applicant must develop and implement an Environmental Awareness Plan (EAP). This section provides an overview of what the proposed EAP will contain and how it will be implemented.

The following components would form an essential part of an Environmental Awareness Plan (EAP): -

- Development of an environmental policy;
- Identification of environmental impacts/risks and mitigation measures;
- Environmental training, awareness and competence;
- Environmental communication and reporting.

Development of an environmental policy

The applicant would have to compile an Environmental Policy (if they do not have one already), which is a one page statement setting out certain principles in terms of their environmental performance.

The environmental policy should indicate the following:
- The applicant's commitments in terms of the environment;
- Identify environmental impacts as a result of the activities taking place on site;
- Actions to be taken to minimize/mitigate the environmental impacts.
- Signature of management.

In order to ensure effective environmental management, it is important that the Environmental Policy is known and understood by all employees. It should thus be displayed at the construction site office.

An Environmental Policy Template is provided to assist the applicant in the compilation of their Environmental Policy. A number of templates are also available on the internet.

Environmental Policy Template (taken from Richmond upon Thames, 2012)

*[*Insert company name here*] believe that we have a responsibility to care for and protect the environment in which we operate. We are fully committed to improving environmental performance across all of our business activities, and will encourage our business partners and members of the wider community to join us in this effort.*

*[*Insert company name here*] recognises our key impacts to be in the areas of [for example]:*

- *energy use*
- *raw material use*
- *waste generation*
- *emissions to air/water*
- *water use*
- *transport*
- *procurement*

We will strive to:

- *Adopt the highest environmental standards in all areas of operation, meeting and exceeding all relevant legislative requirements.*
- *Assess our organisational activities and identify areas where we can minimise impacts.*
- *Minimise waste through careful and efficient use of all materials and energy.*
- *Purchase sustainable products wherever feasible [e.g. recycled, FSC or low environmental impact products and energy from renewable sources].*
- *Train employees in good environmental practice and encourage employee involvement in environmental action.*
- *Reduce risks from environmental, health or safety hazards for employees and others in the vicinity of our operations.*
- *Adopt an environmentally sound transport strategy.*
- *Aim to include environmental and ethical considerations in investment decisions where appropriate.*
- *Assist in developing solutions to environmental problems.*
- *Continually assess the environmental impact of all our operations.*

*[*Insert company name here*] have developed a series of action plans to supplement each of our environmental policy objectives. These can be found* [in an appropriate place*].*

*[*Insert company name here*] will periodically review performance and publish these results [*in an appropriate manner*].*

Signed _____

Identification of environmental impacts / risks and mitigation measures

Environmental impacts/risks in terms of the development are indicated in Section 8 of this document while mitigation measures to be implemented are provided in Section 9.

Activities or work procedures that could have a significant impact on the environment have thus been identified and mitigation measures proposed in order to avoid pollution or the degradation of the environment.

This information must be communicated to the employees and thus forms the basis for developing an Environmental Awareness Plan (EAP) in order to ensure effective environmental management.

Environmental training, awareness and competence

Training is necessary in order to advance the competency of employees in implementing the Environmental Policy and the EMPr and to ensure effective overall environmental management.

The applicant (including appointed contractor) must inform all his employees of their environmental responsibilities in terms of this Environmental Management Programme (EMPr). Measures to protect the environment and mitigation measures formulated in this EMPr must thus be implemented by the applicant and employees (including appointed contractor).

In addition, job specific training must be conducted that will be appropriate to the activity and the responsibility of the individual employees. Ad-hoc training will be undertaken as required.

Through training/awareness, the applicant will also make his employees aware of:

- the importance of conformance with the environmental policy and the requirements of the EMPr;
- the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;
- their roles and responsibilities in achieving conformance with the environmental policy and the requirements of the EMPr, including emergency preparedness and response requirements; and
- the potential consequences of departure from the specific operating procedures and/or mitigation measures specified in the EMPr.

Environmental training and development needs of employees will be identified on a regular basis through:

- Identification of significant environmental impacts;
- Analysis of non-conformance and incident reports;
- Audit reports.

Environmental communication and reporting

Environmental communication and reporting form an integral part of an Environmental Awareness Plan. It is important to maintain effective communication internally and to ensure that external communication (e.g. with government departments or adjacent landowners) is maintained.

In general, environmental communication and reporting will aim to:

- Ensure that employees understand the environmental policy and objectives;
- Ensure that information is communicated and readily accessible to the relevant parties;
- Improve feedback of operational and environmental performance to management;
- Ensure effective and constructive communication with relevant government departments and adjacent landowners (if applicable);
- Ensure that records are kept of environmental communication and interaction.

The following are some of the topics that should be discussed with new employees:

- Time of commencement and completion of duties;
- Cleaning of workplace and the importance thereof;
- Safety clothing and its importance and correct use;
- Procedure to follow in case of illness and injury;
- Annual leave and when due;
- Importance of instructions;
- Late for work and leaving workplace without permission;
- Emergency procedures;
- Environmental awareness;
- Training and its importance;
- Alcohol and drug abuse;
- Medical fitness;
- Disciplinary procedures.

The following topics should form part of the environmental awareness discussions to be held with the employees:

- NO-GO areas;
- Water;
- Fauna and flora;
- Smoking and fires;
- Dust;
- Noise;
- Waste management.

Various signs (including the Environmental Policy) should be displayed on site to remind site workers of the basic environmental principles and inform them of the 'DO'S' and 'DON'TS'.

The applicant must conduct regular inspections to check on site conditions and to provide training when necessary to ensure that the mitigation measures are being implemented and that the environment is carefully looked after.

9.6.2 Site documentation and record keeping

The following documentation must be available (at all times) at the construction site office:

- A copy of the Basic Assessment Report (BAR) and Environmental Management Programme;
- A copy of the Environmental Authorisation;
- A copy of the Environmental Policy;
- A copy of site audit reports;
- A copy of any other permits/approvals and/or service agreements from other authorities/landowners/etc.

The documents should be kept as hard copies as well as in electronic format.

Complaints Register

A complaints register must be kept at the construction site office. Any complaints received with regards to the project must be recorded in the complaints register. The following information must be recorded:

- Date complaint recorded;

- Nature of complaint;
- Details of complainant (name, address, telephone number, etc.);
- Manner in which complaint was dealt with;
- Date when complaint was reported to the Department of Agriculture, Rural Development, Land and Environmental Affairs and the Department of Water and Sanitation.

Emergency numbers
Emergency numbers (e.g. manager, police, fire department, ambulance, etc.) must be prominently displayed at the construction site office.

Contact details of affected landowners/users must also be kept on file.

Other legislation
The following should also be displayed at the construction site office:

- Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended;
- Basic Conditions of Employment Act, 1997;
- Summary of the Employment Equity Act.

Supplementary documentation
The following supplementary documentation should be kept at the construction site office:

- Site instructions;
- Emergency preparedness and response procedures;
- Incident reports;
- Training records;
- Site inspection, monitoring and auditing reports.

During the course of the development, the applicant and employees must also comply with all other relevant legislation.

9.6.3 Auditing and corrective action

Environmental audits identify existing and potential environmental problems and determine what action is needed to comply with legal requirements and the Environmental Management Programme (EMPr). Subsequent audits then confirm that corrective actions have been taken and assess the effectiveness of such actions.

Construction phase:
Site Environmental Control Officer (SECO): The applicant must appoint a person who will be responsible for the day-to-day implementation of the EMPr (including Environmental Awareness Training) and will report to the site manager.

Environmental Control Officer/Auditor (ECO): The applicant must appoint an ECO who will have the responsibility of monitoring and reporting on compliance with the conditions of the Environmental Authorisation as well as monitoring and reporting on the implementation of the EMPr.

The ECO must be appointed before the commencement of construction and must remain employed until all rehabilitation measures as well as site clean-up are completed.

The ECO will be responsible to:

- Monitor and audit the construction activities on a monthly basis;
- Keep a record of each site inspection and the findings thereof;

- Make a register of the environmental monitoring and auditing results available for inspection at the construction site office;
- Keep records relating to the compliance and non-compliance with the conditions of the Environmental Authorization;
- Make these records available to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) within seven (7) working days of the date of the written request by the Department for such records.

A good approach to facilitate legal enforceability of the EMPr during the construction phase is to integrate the EMPr into the tender and contract document (i.e. between the project applicant and the contractors) as a set of environmental specifications. The contractor will thus be informed prior to being appointed of his environmental responsibilities.

Penalties in terms of the environment should be implemented upon non-compliance. This will ensure that the project applicant does not sit with an environmental liability at the end of the contract.

A post-construction audit should be conducted prior to the contractors leaving site. There are several levels at which corrective action can be affected, namely verbal instructions, written instructions and contract notices.

Level 1: The problem is discussed with the contractor and a solution is worked out together. The discussion is minuted for record purposes and the solution implemented.

Level 2: When a more serious infringement is observed, the contractor is notified in writing and given a deadline by which the issue must be rectified. Costs to be borne by the contractor.

Level 3: The contractor will be ordered to suspend all or part of the work until such time as the problem is rectified or remedial measures put in place. Costs to be borne by the contractor and no extension of time will be granted.

Level 4: Breach of contract and/or termination of employment. The applicant may also institute legal proceedings against the contractor.

An example of a penalty schedule is provided below.

PENALTY SCHEDULE

Level	Description	Penalty	Offences
1	Minor offence	R1000 first offence R2000 second offence And R1000/per day that offence continues beyond notification of offence	• Littering; inadequate or inappropriate on-site waste management or sanitation • Uncontrolled noise and dust nuisance Poaching on site • Inadequate soil / water protection controls for fuel storage & dispensing areas, vehicle parking areas
2	Moderate offence	R5000 first offence R10 000 second offence And R5000 per day that the offence continues beyond notification of offence	• Trespassing onto neighbours properties • Removal of indigenous trees marked for conservation purposes without the permission of the ECO, or trees in demarcated sensitive environmental zones • Disposal of any form of waste to a non-approved dump site • Any illegal /non-permitted abstraction or use of water from a natural resource • The withholding of pertinent information or provision of false information to the ECO or Project Manager
3	Significant offence	R30 000 first offence R50 000 second offence And R30 000 per day that the offence continues beyond notification of offence	• Non-compliance with any risk or safety management requirements • Significant spillage of hazardous materials • Use of natural materials not sourced from a legally permitted source • Construction or use of roads/access across rivers, streams or wetlands that has not been authorized by the Project Manager and ECO
4	Serious offence	Up to R500 000 or total cost of rehabilitating damaged environment	• Any serious pollution event or accident • Any serious encroachment into demarcated sensitive environmental zones, by accident or on purpose • Any serious stormwater damage that could have been avoided through appropriate management interventions

In addition to the schedule of penalties, a portion of the Retention on all contracts could be apportioned to compliance with the EMPr.

<u>Operational phase:</u>
The applicant will be responsible for auditing and corrective action during the operational phase of the development.

SECTION 10: ENVIRONMENTAL IMPACT STATEMENT

10.1 Introduction

The proposed development will be located on Portion 58 of the farm Vaalbank 289 JS, Middelburg. The said site is located adjacent to the R35 provincial road (Bethal Road) and in close proximity of the N4 national road, ±2.5km south of the Middelburg Mall (Figure 5.1). The property is ±22 ha in extent.

The applicant intends to rezone the property from Agriculture to Light Industrial (Industrial 2). The following businesses are already present on site: a truck stop, diesel depot (Bulk Diesel on N4), food kiosk (WowChow), Shosholoza and Cornwill Construction.

The applicant intends to provide 20 erven on the property, which will be sold/rented to various businesses for light industrial activities (e.g. motor showrooms, workshops, earthmoving equipment, etc.). No noxious industries (scheduled processes) will be allowed on site.

The applicant decided upon the development of the proposed site for the following reasons:

- The said site belongs to the applicant (Bakkos Projects (Pty) Ltd).
- Businesses/light industrial activities are already present on site.
- An Environmental Authorisation (dated: 24 April 2019; Ref: 1/3/1/16/1N-142; Appendix 10) has already been issued for the truck stop and aboveground diesel tanks on 2.7ha of the property.
- The intention is to develop the remainder of the site to reach its full potential by providing 20 erven for light industrial purposes.
- The site is located close to Middleburg and ideally situated adjacent to the N4 national road and the R35 provincial road and thus easily accessible.
- The site is located in an area already used for light industrial and mining activities. The Industrial Park will thus fit in with the other land uses in the area.

No alternative sites with regards to the proposed development were identified.

10.2 Alternatives

Section 7 provides a detailed description of all alternatives investigated with regards to this project. As indicated in Section 7.6, the following alternatives were deemed feasible and were assessed in Section 8.5:

Preferred Alternative	Description
Site	The development site will be located on Portion 58 of the farm Vaalbank, Middelburg (Figure 5.2).
Alternative land use 4	Light industrial
Alternative layout 3	A new access road from Pienaardam Road with an internal road system providing access to the 20 erven (Figure 7.3).
Water provision Alternative 1	The proposed development will connect to the existing STLM water supply line via Black Wattle Colliery.

Preferred Alternative	Description
Electricity Alternative 2	Electricity will be obtained from Eskom. Eskom approved an increase in electricity supply from 100kVA to 315kVA.
Sewage disposal Alternative 4	Each tenant will be responsible for the installation of a conservancy tank on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
Waste management Alternative 4	Each tenant will be responsible for the provision of a waste collection area on the specific stand. This will be specified in the rental/lease agreements signed by the tenants.
Storm water management Alternative 2	A new storm water management system to be developed for the overall site by the applicant.

The said site is located just outside the Steve Tshwete Local Municipality (STLM) urban edge and is not serviced by the municipality. Therefore, the applicant/tenants must provide services (water, sewage, electricity, etc.) as indicated above.

10.3 Potential impacts identified

The environmental features of the site and surrounding area are described in Section 5 of this report. Potential impacts on the environment (both positive and negative) that could take place are detailed in Section 8 while Section 9 provides mitigation measures to be implemented in order to reduce the said impacts.

From a geotechnical point of view, the said site is suitable for development purposes subject to the implementation of mitigation measures (Hansmeyer, 2020). In addition, the gradient of the site is also suitable for development purposes.

The proposed site is located on natural soil forms (Hutton, Glencoe and Pinedene forms) as well as soils already affected (approximately 10.5 ha) by human activities (Anthrosols).

According to Pienaar (2020), an area of 9.35ha (Hutton, Pinedene, Glencoe; Figure 5.11) is highly suitable for both irrigated and rainfed crop production while the shallower Glencoe soils (2.29 ha; Figure 5.11) are suitable for rain-fed crop production (Pienaar, 2020). In total, an area of 11.64 ha (with a Moderate to High land capability) is available for crop production (Hutton, Glencoe, Pinedene; Figure 5.11) and would be lost to agriculture. However, this is a relatively small area and may not be financially viable from an agricultural point of view especially if water for irrigation purposes is required.

In terms of livestock farming, the proposed site and immediate surrounding area have a grazing capacity of 5ha/LSU and would allow 4 head of cattle or 16 head of sheep on the entire site (22 ha). This is not enough for an employment opportunity (Pienaar, 2020) and would not be financially viable from an agricultural point of view. No evidence of cattle (or other livestock) was observed on site (Pienaar, 2020).

From an agricultural point of view, the proposed light industrial development is considered a viable land use option for an area where it is evident that all agricultural activities ceased many years ago and is located in close proximity to other businesses (2.5 km south of Middelburg Mall) (Pienaar, 2020).

The rezoning of the site from Agriculture to Industrial (Industrial 2) and the subsequent construction activities would thus not impact on any current agricultural activities.

As indicated in Section 5.3, the proposed site is located within an area already utilized for light industrial and mining activities. The proposed light industrial area would not impact on the existing sense of place and should in fact, improve the current situation (i.e. providing correctly zoned stands for light industrial purposes).

The vegetation of the site is modified to transformed, with very low species diversity. Venter and Niemand (2020) indicated the site sensitivity for plant species as Low (and not Medium as indicated in the Screening Report) due to the highly modified state of the site vegetation, the low species diversity and the absence of habitat for the threatened species. In addition, a low overall faunal richness was indicated for the said site in view of lack of habitat and past disturbances. Due to the level of disturbance on site, poor ecological connectivity of the site and the existing light industrial developments on site, this site is considered to be of low biodiversity sensitivity.

Disturbed areas may however occasionally serve as ecological corridors for plants species and therefore help to sustain biodiversity in surrounding areas. The site is located at the intersection between the N4, the R35 and Black Wattle Colliery. These serve as effective barriers to the movement of plant and small fauna species. In addition, the portion to the south is a rehabilitated mine and has very poor vegetation cover. The areas to the south-east are used for cultivation of crops and is poor in biodiversity. The site is therefore not considered to serve as an ecological corridor and contributes very little to biodiversity in surrounding areas (Venter and Niemand, 2020).

Venter and Niemand (2020) indicated that no wetlands were identified on site. Some ponding does take place in areas (e.g. where shallow canals direct runoff away from the development, excavations in weedy areas) but these areas do not represent wetland conditions. In addition, no hydromorphic soils were identified on site. No sensitive landscapes (including rivers, streams, wetlands, etc.) were thus identified on site or adjacent to the site.

As indicated in Section 5.9, storm water runoff flows in an easterly direction towards the Vaalbankspruit, which is located ±700m southeast of the site. The east dipping topography supports good drainage and ponding is unlikely (Hansmeyer, 2020). The cover soils are however, susceptible to erosion and a storm water management plan will have to be implemented (Hansmeyer, 2020) so that storm water does not impact (e.g. flooding, waterlogging, erosion, etc.) on the light industrial activities, the internal road network, the adjacent roads (Pienaardam Road, N4, R35) or the adjacent agricultural activities of Pienaardam Leisure Resort.

The storm water runoff will not flow directly onto agricultural land of Pienaardam Leisure Resort. The Pienaardam Road provides a barrier between the light industrial development and the agricultural land (see Figure 5.2). Storm water runoff from the site should thus not impact on the said agricultural lands in terms of loss of topsoil or erosion. Mitigation measures (e.g. soil, storm

water, waste management) indicated in Section 9 (EMPr) must be implemented.

A new storm water system for the overall site must thus be developed incorporating the existing storm water measures (Section 7.4). It is recommended that storm water runoff from site be captured in an attenuation dam before being released to the natural environment. A possible site for this attenuation dam is Stand 8, located at the eastern boundary of the site (Figure 3.2).

Waste management measures as indicated in Section 9 (EMPr) must be implemented by each tenant in order to prevent any impact on soil, surface water or groundwater.

Van Vollenhoven (2020) identified no sites of cultural heritage significance within the proposed site. From a palaeontological point of view, Fourie (2020) raised no objection to the proposed development and indicated that the development may go ahead with caution.

Roberts (2019) indicated that the proposed rezoning of Portion 58 of the farm Vaalbank 289 JS from Agricultural to Industrial 2 can be approved from a Traffic and Transportation point of view subject to the implementation of certain road upgrades.

Presently, the site is accessed from one central collector type gravel road (nearly opposite the existing Black Wattle Colliery access) connecting to the R35 provincial road. A separate access is provided to the Bulk Diesel/truck stop. SANRAL/TRAC indicated that both these access roads are not approved accesses and must be closed (B. Roberts, pers. comm.).

SANRAL/TRAC requested that the Blackwattle Colliery, weighbridge, Pienaardam and proposed development's access roads be realigned and that a new intersection (Pienaardam intersection) be constructed (Roberts, pers. comm.).

A new access road from Pienaardam Road with an internal road system providing access to the 20 erven (Figure 7.3) is proposed. An emergency exist is provided towards the eastern boundary of the site and will only be used during emergency situations. As indicated in Section 7.3 (Table 7.2), the new access road would impact on a portion (±150m) of the Right-of-Way servitude road providing access to the Pienaardam Leisure Resort (Figure 7.3). The increased use of this road by heavy vehicles would impact on the said road (condition of the road) requiring more maintenance of the said road.

Permission to use this Right-of-Way servitude road (i.e. Pienaardam Road) might be required and needs to be confirmed. In addition, an agreement regarding the upgrading and maintenance of this road must be drafted and agreed to between the various parties involved. Consultation with the owner of Pienaardam Leisure Resort (Mr. G. Gerrits) is thus required.

The proposed development will generate additional traffic during the operational phase, which could impact on the traffic volumes and intersections in the area if the mitigation measures (upgrading of intersections and access roads) as recommended by Roberts (2020) are not implemented.

The realignment of the various access roads off the R35 and upgrading of the Pienaardam access could however, also have a positive impact on road users in terms of safety.

10.4 Public participation

The public participation process followed is described in Section 6 of this report.

The proposed development site belongs to the project applicant and the development of the said site will thus not impact directly on any other interested and affected party.

Issues of concern received through this public participation process and the way in which these issues were addressed are detailed in Section 6 and Table 6.4. As indicated, correspondence was received from:

- South African Heritage Resources Agency,
- Department of Water and Sanitation,
- Department of Public Works, Roads and Transport,
- South African National Roads Agency (SANRAL),
- Leads2Business,
- two adjacent landowners (Carel Erasmus; Gerrie Gerrits).

As indicated in Table 6.4, comment was received and a response provided with regards to:

- Access to the site;
- Traffic Impact Assessment and access management plan;
- Impact on traffic;
- Impact on Pienaardam Road;
- Impact on groundwater;
- Impact of surface water runoff on soil/grazing/agricultural land;
- Impact of dust;
- Impact of noise;
- Heritage Impact Assessment (HIA) and Palaeontological Impact Assessment (PIA).

The South African National Roads Agency (SANRAL) objected in terms of the proposed development (Table 6.4) and requested the applicant to 'submit a formal rezoning application together with an access management plan for further evaluation'. The appointed town planner (Hlukani Development Consultants) was requested to forward the formal rezoning application and the access management plan to SANRAL as requested. Section 5.16 and Section 7.3 of this report provides information regarding access to the said site. A copy of the Basic Assessment will also be provided to SANRAL for evaluation purposes.

As already indicated, permission to use the Right-of-Way servitude road (i.e. Pienaardam Road) might be required and needs to be confirmed. In addition, an agreement regarding the upgrading and maintenance of this road must be drafted and agreed to between the various parties involved. Further consultation with the owner of Pienaardam Leisure Resort (Mr. G. Gerrits) by the applicant is thus required.

10.5 Assumptions, uncertainties and gaps in knowledge

The following assumptions and limitations are applicable to this report:

- The report is based on project information provided by the applicant.
- In determining the significance of impacts after mitigation, it is assumed that the proposed mitigation measures will be implemented by the applicant during the construction and operational phases of the development.
- Due to the subterranean nature of fossils and heritage resources, objects or features may be uncovered during the construction phase.
- The data presented in the specialist reports are based on single site visits, which are deemed sufficient for the purposes of this BA process.

10.6 Reasoned opinion as to whether the proposed activity should be authorised (or not)

Based on the findings of this Basic Assessment Report, it is felt that the proposed project could be approved subject to the implementation of the mitigation measures proposed in the Environmental Management Programme (EMPr) provided in Section 9 of this report.

Regular monitoring and auditing of the activities should take place during both the construction and operational phases to ensure that the mitigation measures are implemented. The development must be managed in such a way that it is environmentally sustainable, acceptable to the community and complies with the objectives of the National Environmental Management Act, 1998 (Act 107 of 1998).

In view of the findings of this Basic Assessment, the following listed activities can be approved:

Listing	Activity
Listing Notice 1 Listed Activity 27	*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except 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.*
Listing Notice 1 Listed Activity 28	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*

The following listed activity was included in the original newspaper notice (Appendix 11) and Background Information Document (Appendix 12):

Listing Notice 3, Listed Activity 10: *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. f. Mpumalanga i. Outside urban areas: (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, where such areas comprise indigenous vegetation.*

However, through the process it was determined that an Environmental Authorisation (dated: 24 April 2019; Ref: 1/3/1/16/1N-142; Appendix 10) was obtained for the truck stop and aboveground diesel tanks located on ±2.5ha of site. The above-mentioned listed activity was thus excluded from this application.

As indicated, the applicant intends to provide 20 erven on the property, which will be sold/rented to various businesses for light industrial activities (e.g. motor showrooms, workshops, earthmoving equipment, etc.). No noxious industries (scheduled processes) will be allowed on site. Only light industrial activities will be permitted. If a tenant plans to undertake an activity that requires an environmental approval (Environmental Authorisation, Water Use Licence, etc.), then the tenant must ensure that they are in possession of the required environmental approval(s) prior to commencing with the activity on site. The applicant will be responsible to monitor all tenants and their activities on site and ensure that they adhere to the EMPr (Section 9 of this report) and the conditions stipulated in the Environmental Authorisation.

10.7 Reasons why the activity should be authorised (or not)

It is recommended that the activity be authorised for the following reasons:

- √ The proposed development site belongs to the project applicant.
- √ Businesses/light industrial activities are already present on site.
- √ An Environmental Authorisation (dated: 24 April 2019; Ref: 1/3/1/16/1N-142; Appendix 10) has already been issued for the truck stop and aboveground diesel tanks on 2.5ha of the property.
- √ The site is located in an area already used for light industrial and mining activities. The Industrial Park will thus fit in with the other land uses in the area.
- √ The intention is to develop the remainder of the site to reach its full potential by providing 20 erven for light industrial purposes.
- √ The proposed development would lead to additional employment opportunities during the construction and operational phases.
- √ The proposed development will NOT impact on any sensitive natural or cultural areas.
- √ No surface water environments (e.g. rivers, streams, wetlands, etc.) are present on site.
- √ The proposed project will not have any negative impacts on the environment that cannot be mitigated and managed.
- √ The development can connect to an existing STLM municipal water pipeline extending from Black Wattle Colliery.
- √ Eskom can provide the required electricity.
- √ Each tenant will be responsible for the installation and management of a conservancy tank on the specific stand.
- √ Each tenant will be responsible for the provision and management of a waste collection area on the specific stand.
- √ New access from Pienaardam Road to be constructed together with other road upgrades recommended by Roberts (2019) which will improve traffic conditions and have a positive impact on road users in terms of safety.

Based on the above-mentioned, it is evident that:

- the proposed development is necessary (need);
- the proposed development will be located on an appropriate site (desirability);
- the development will benefit the local/regional community.

Therefore the need and desirability of the said project was determined through the Basic Assessment process.

10.8 Period for which the EA is required

Construction should commence as soon as all the relevant authorisations have been obtained.

It is therefore estimated that the period for which the EA is required is 10 years.

10.9 Conditions to be included in the EA

The following conditions should be included in the Environmental Authorisation:

- *No noxious industries (scheduled processes) to be allowed on site. Only light industrial activities will be permitted.*
- *If a tenant plans to undertake an activity that requires an environmental approval (Environmental Authorisation, Water Use Licence, etc.), then the tenant must ensure that they are in possession of the required environmental approval(s) prior to commencing with the activity on site.*
- *Two existing accesses from the R35 provincial road to be closed.*
- *New access from Pienaardam Road to be constructed together with other road upgrades recommended by Roberts (2019).*
- *An agreement regarding the upgrading, use and maintenance of the Pienaardam Road (Right-of-Way Servitude Road) to be reached with the Pienaardam Leisure Resort owner prior to commencing with any construction activities in this regard.*
- *The management and monitoring measures as indicated in Section 9 (EMPr) of the Basic Assessment Report must be implemented by the applicant as well as all tenants on site.*

SECTION 11: EVALUATION OF DRAFT BASIC ASSESSMENT REPORT

11.1 Availability of Basic Assessment Report

The Draft Basic Assessment Report (dated: November 2020) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for evaluation purposes. A hard/soft copy of the document will also be forwarded to the following authorities for evaluation (30-day period):

- Department of Water and Sanitation;
- Steve Tshwete Local Municipality;
- Mpumalanga Tourism and Parks Agency.

A hard copy and electronic copy of the Draft Basic Assessment Report will be made available during the above-mentioned period to Interested and Affected Parties (I&APs) and stakeholders consulted and/or registered as part of the Basic Assessment Process (refer to Section 11.2).

A hard copy of the Draft BAR will be provided at the Gerard Sekoto Public Library and an electronic version will be made available on the company website (www.adienvironmental.co.za). An advertisement in this regard will be placed in the Middelburg Observer in order to inform surrounding landowners/users.

The various departments, stakeholders and I&APs will be requested to forward any comments on the report to the consultant within the 30-day period provided. These comments will be included and addressed in:

- Section 11 (Evaluation of Draft Basic Assessment Report);
- Table 11.1 (Summary of Issues of Concern and Response); and
- Appendix 15;

of the Final Basic Assessment Report.

An e-mail will be forwarded to the various departments, stakeholders and interested and affected parties informing them of the comments received and the submission of the Final BAR for decision making.

The Final BAR (incorporating comments from I&APs) will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs for final decision making.

11.2 Informing Interested and Affected Parties

The following interested and affected parties and stakeholders will be notified by means of facsimile, email, etc. of the availability of the reports for evaluation:

INTERESTED AND AFFECTED PARTY LIST	
Organisation	**Name**
Government Departments	
Department of Agriculture, Forestry and Fisheries (DAFF)	F. Mashabela
Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) - Directorate: Land Use and Soil Management – Ermelo	J. Venter
Department of Co-operative Governance and Traditional Affairs (COGTA)	M. Loock
Department of Mineral Resources	S. Mathavela
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	T. Mkhonto
Department of Water and Sanitation (DWS)	T. Ndlhovu
Other Organisations/Stakeholders	
Distriks Landbou Unie Middelburg	J.P.J. Schmahl
Eskom Distribution (Land & Rights)	T. Ludere
Eskom Transmission	L. Motsisi
Middelburg Chamber of Business and Commerce	M. Hanekom
Mpumalanga Tourism and Parks Agency (MTPA) – Land Advisory Unit	P. Nkosi
South African Civil Aviation Authority	K. Mthapo
South African Heritage Resources Agency (SAHRA)	N. Khumalo (SAHRIS)
Local Municipality and Municipal Councillor	
Nkangala District Municipality	S. Links, A. Thwala
Steve Tshwete Local Municipality	M. Mahamba
Steve Tshwete Local Municipality	D. Lambrechts, A Masia
Steve Tshwete Local Municipality	Councillor J. Michelle (Ward 8)
Steve Tshwete Local Municipality	Councillor T. Motloung (Ward 6)
Surrounding Landowners	
Property (Figure 6.2)	**Landowner/Contact person**
R35 provincial road	Department of Public Works, Roads and Transport – J. Mojapelo
N4 national road and Portions 24, 25, 49, 50, 52, 54	South African National Roads Agency (SANRAL) V. Bota, I. van der Linde, R. Barkhuizen
N4 national road	Trans African Concessions (TRAC) C. Davis, W. Janse van Rensburg, R. Nkosi
4 and 14/289	Black Wattle Colliery
13/289	Ubuhle Bemvelo Holdings – Vaalbank Colliery Minipit
5/289	Gerrie Gerrits - Pienaardam Leisure Resort
11/289	Carel Erasmus
11/289	Reggies Coal – renting portion of property from C. Erasmus

INTERESTED AND AFFECTED PARTY LIST	
11/289	M. Bate – renting portion of property from C. Erasmus
20/289	Isambane Mining (Pty) Ltd
Existing businesses renting a portion of the property from the applicant	
58/289	Bulk Diesel on N4 (Yafa Trading (Pty) Ltd
58/289	Corwill Construction
58/289	Heyneke Transport
58/289	Shosholoza
Other	
Debbie Wessels	Leads to Business

11.3 Comments received

This section will be completed after the completion of the above-mentioned evaluation period.

REFERENCES

- Council for Geoscience. **1: 250 000 Geological Series Map, 2528 Pretoria**.
- DEA (Department of Environmental Affairs). 2017. **Guideline on Need and Desirability.**
- Fourie, H. 2020. **The Development of a Light Industrial Area on Portion 58 of the Farm Vaalbank 289-JS, Middelburg. Palaeontological Impact Assessment: Phase 1 Field Study.** Report prepared by: Heidi Fourie Consulting. Report dated: 11 March 2020.
- Hansmeyer, P.G. 2020. **Factual Report on a Reconnaissance Investigation on Vaalbank Industrial.** Report prepared by: Engeolab (Pty) Ltd. Report dated: 25 July 2020. Report number: LL3597.
- Hlukani Development Consultants (Pty) Ltd. 2019. **Application for Rezoning of Portion 58 of the Farm Vaalbank 289JS.** Report prepared by: Hlukani Development Consultants (Pty) Ltd. Report dated: 2019.
- **List of Ecosystems that are Threatened and in Need of Protection**. (General Notice No. 1002 of 2011). *Government Gazette* 34809: 3-541, 9 December 2011. Government Printing Works, Pretoria.
- Lotter, M.C., Lechmere-Oertel, R. & Cadman, M. 2014. **Mpumalanga Biodiversity Sector Plan Handbook.** Mpumalanga Tourism & Parks Agency, Nelspruit.
- Mpumalanga Tourism and Parks Agency. 2013. **Mpumalanga Biodiversity Sector Plan Map, 2013.**
- Mucina, L. & Rutherford, M. C. (eds). 2006. **The Vegetation of South Africa, Lesotho and Swaziland.** *Strelitzia 19*. South African National Biodiversity Institute, Pretoria.
- Mucina, L., Rutherford, M.C. & Powrie, L.W. (eds). 2005. **Vegetation Map of South Africa, Lesotho and Swaziland, 1: 1 000 000 scale sheet maps.** South African National Biodiversity Institute, Pretoria.
- **National Environmental Management Act 1998 (Act No. 107).** Republic of South Africa, Cape Town.
- **National List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998)**. (General Notice No. 734 of 2011). *Government Gazette* 34595: 13-15, 16 September 2011. Government Printing Works, Pretoria.
- **National Water Act, 1998 (Act No 36 of 1998).** Republic of South Africa, Cape Town.
- Pienaar, M. 2020. **Agricultural Agro-Ecosystem Specialist Assessment for the Development of a Light Industrial Area on Portion 58 of the Farm Vaalbank 289 JS, Middelburg.** Report prepared by: TerraAfrica Consult cc. Report dated: July 2020.

- Roberts, B. 2019. **N4/R35 Truck Stop and Industrial Development: Traffic Impact Assessment (TIA) for rezoning purposes (Agricultural to Industrial 2).** Report compiled by: Moyeni Professional Engineering (Pty) Ltd. Report dated: December 2019. Report number: MPE0282/TIA.

- **South African Heritage Resources Information System (SAHRIS).** 2015. [www.sahra.org.za/sahris].

- **South African Air Quality Information System**. 2020. [www. saaqis.environment.gov.za].

- Venter, I and L. Niemand. 2020. **Ecological Assessment for the Proposed Development on Portion 58 of the Farm Vaalbank 289 JS, Middelburg.** Report compiled by: Kyllinga Consulting and Pachnoda Consulting. Report dated: March 2020.

- Van Vollenhoven, A.C., J. Smit and D. Viljoen. 2020. **A Report on a Heritage Impact Assessment for the Proposed Development of a Light Industrial Area on Portion 58 of the Farm Vaalbank 289 JS, Middelburg, Mpumalanga.** Report compiled by: Archaetnos Culture & Cultural Resource Consultants. Report dated: 5 March 2020.

APPENDIX 1:

APPLICATION FORM

- Cover letter from AdiEnvironmental cc (dated: 11 December 2020; Ref: BA 2020/01) to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) regarding submission of application form.
- Copy of the application form.

APPENDIX 2:

CURRICULUM VITAE

- A. Erasmus *Pr. Sci. Nat; Registered EAP*
- R. Janse van Rensburg *Registered EAP*
- List of projects completed by A. Erasmus and R. Janse van Rensburg
- M. Pienaar *Accredited soil scientist*
- I. Venter *Accredited ecologist*
- L. Niemand *Accredited ecologist*
- A. van Vollenhoven *Accredited archaeologist*
- H. Fourie *Accredited palaeontologist*

APPENDIX 3:

TOWNPLANNING MEMORANDUM

- Hlukani Development Consultants (Pty) Ltd. 2019. **Application for Rezoning of Portion 58 of the Farm Vaalbank 289JS.** Report prepared by: Hlukani Development Consultants (Pty) Ltd. Report dated: 2019.
- Letter (dated: 20 May 2020) from Black Wattle Colliery (Pty) Ltd. regarding the water supply line.
- Letter (dated: 28 February 2019) from Eskom Holdings SOC Ltd. regarding the electrical supply line.

APPENDIX 4:

GEOTECHNICAL STUDY

- Hansmeyer, P.G. 2020. **Factual Report on a Reconnaissance Investigation on Vaalbank Industrial.** Report prepared by: Engeolab (Pty) Ltd. Report dated: 25 July 2020. Report number: LL3597.

APPENDIX 5:

SOIL STUDY

- Pienaar, M. 2020. **Agricultural Agro-Ecosystem Specialist Assessment for the Development of a Light Industrial Area on Portion 58 of the Farm Vaalbank 289 JS, Middelburg.** Report prepared by: TerraAfrica Consult cc. Report dated: July 2020.

APPENDIX 6:

ECOLOGICAL ASSESSMENT

- Venter, I and L. Niemand. 2020. **Ecological Assessment for the Proposed Development on Portion 58 of the Farm Vaalbank 289 JS, Middelburg.** Report compiled by: Kyllinga Consulting and Pachnoda Consulting. Report dated: March 2020.

APPENDIX 7:

HERITAGE REPORT

- Van Vollenhoven, A.C., J. Smit and D. Viljoen. 2020. **A Report on a Heritage Impact Assessment for the Proposed Development of a Light Industrial Area on Portion 58 of the Farm Vaalbank 289 JS, Middelburg, Mpumalanga.** Report compiled by: Archaetnos Culture & Cultural Resource Consultants. Report dated: 5 March 2020.

APPENDIX 8:

PALAEONTOLOGICAL REPORT

- Fourie, H. 2020. **The Development of a Light Industrial Area on Portion 58 of the Farm Vaalbank 289-JS, Middelburg. Palaeontological Impact Assessment: Phase 1 Field Study.** Report prepared by: Heidi Fourie Consulting. Report dated: 11 March 2020.

APPENDIX 9:

TRAFFIC IMPACT ASSESSMENT

- Roberts, B. 2019. **N4/R35 Truck Stop and Industrial Development: Portion 58 of the Farm Vaalbank 289 JS - Traffic Impact Assessment (TIA) for rezoning purposes (Agricultural to Industrial 2).** Report prepared by: Moyeni Professional Engineering (Pty) Ltd. Report dated: December 2019. Report number: MPE0282/TIA.

APPENDIX 10:

ENVIRONMENTAL AUTHORISATION

- Environmental Authorisation: The proposed expansion of YAFA Trading Truck-stop on Portion 58 of the farm Vaalbank 289 JS, within Steve Tshwete Local Municipality, Mpumalanga Province (Ref: 1/3/1/16/1N-142; MPP/EIA/0000470/2018)

APPENDIX 11:

ADVERTISING OF THE PROJECT

- A copy of the advertisement published in the Middelburg Observer, 31 January 2020.
- A copy of the on-site notice
- Printout of company website page www.adienvironmental.co.za – Document Downloads.
- E-mail from D. Wessels (Leads2Business) (dated: 5 March 2020) to AdiEnvironmental cc.

APPENDIX 12:

BACKGROUND INFORMATION DOCUMENT

APPENDIX 13:

CORRESPONDENCE WITH AUTHORITIES

- E-mail from AdiEnvironmental cc (AdiEnv) (dated: 13 February 2020) to:

AUTHORITY/ STAKEHOLDER	CONTACT PERSON
Department of Agriculture, Forestry and Fisheries	Mashabela, F
Department of Agriculture, Rural Development, Land and Environmental Affairs - Directorate: Land Use and Soil Management – Ermelo	Venter, J
Department of Co-Operative Governance and Traditional Affairs	Loock, M
Department of Mineral Resources	Mathavhela, S
Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)	Mkhonto, T
Department of Water and Sanitation	Ndlhovu, T
Mpumalanga Tourism and Parks Agency	Narasoo, K

- E-mail from AdiEnv (dated: 13 February 2020) to:

Distriks Landbou Unie Middelburg	Schmahl, JPJ
Eskom Distribution	Ludere, T
Eskom Transmission	Motsisi, L
Middelburg Chamber of Business and Commerce	Hanekom, M
South African Civil Aviation Authority (SACAA)	Mthapo, K
Telkom	Smit, J

- E-mail from AdiEnv (dated: 13 February 2020) to:

Nkangala District Municipality	Links, S Thwala, A
Steve Tshwete Local Municipality	Mahamba, M
Councillor Ward 8	Michelle, J

- E-mail from AdiEnv (dated: 24 February 2019) to Councillor Motloung (Ward 6).
- Email from the Department of Water and Sanitation (T. Ndlhovu) (dated: 13 February 2020).
- Email from AdiEnv (dated: 13 February 2020) to T. Ndlhovu.
- Webpage printout (dated: 13 February 2020): South African Heritage Resources Information System (SAHRIS).
- Letter from the South African Heritage Resources Agency (SAHRA) (dated: 18 March 2020; Ref: 14849) to AdiEnv.
- Webpage printout (dated: 21 July 2020): SAHRIS.
- Letter from SAHRA (dated: 17 August 2020; Ref: 14849) to AdiEnv.

APPENDIX 14:

CORRESPONDENCE WITH INTERESTED AND AFFECTED PARTIES

- E-mail from AdiEnvironmental cc (AdiEnv) (dated: 29 June 2020) to Department of Public Works, Road and Transport (J. Mojapelo).
- E-mail from AdiEnv (dated: 13 February 2020) to:

Property	Landowner/Contact person
N4 national road	South African National Roads Agency (SANRAL) V. Bota K. Schmid I. van der Linde
N4 national road	Trans African Concessions (TRAC) C. Davis, W. Janse van Rensburg, R. Nkosi
20/289	Isambane Mining (Pty) Ltd.
58/289	Corwill Construction
5/289	Gerrie Gerrits – Pienaardam Resort

- E-mail from AdiEnv (dated: 14 February 2020) to:

Property	Landowner/Contact person
13/289	Ubuhle Bemvelo Holdings (Vaalbank Colliery Minipit)
11/289	Reggies Coal
11/289	Carel Erasmus
4&14/289	Black Wattle Colliery

- E-mail from AdiEnv (dated: 1 July 2020) to R. Bate.
- E-mail from AdiEnv (dated: 13 February 2020) to Bulk Diesel on N4.
- E-mail from AdiEnv (dated: 17 February 2020) to Heyneke Transport, Yafa Trading (Pty) Ltd. and Shosholoza.
- Letter from Department of Public Works, Roads and Transport (J. Mojapelo) (dated: 30 June 2020; Ref: F09/11/1/1/3-289JS) to AdiEnv.
- E-mail and completed comment sheet from South African National Roads Agency (SANRAL) (V. Bota) (dated: 13 February 2020) to AdiEnv.
- E-mail from AdiEnv (dated: 14 February 2020) to SANRAL (V. Bota).
- E-mail (dated: 24 February 2020) and letter (dated: 18 February 2020; Ref: N11/5/3-4/4-13) from SANRAL (R. Barkhuizen and T. Mashele).
- E-mail (dated: 2 March 2020), comment sheet and letter (dated: 1 March 2020) from Pienaardam Resort (V. van Niekerk) to AdiEnv.
- E-mail from AdiEnv to V. van Niekerk.
- E-mail and comment sheet from C. Erasmus and E. Erasmus (dated: 2 March 2020).