Maquassi Hills
Local Municipality

Maquassi Hills Local Municipality,
Dr Kenneth Kaunda District Municipality NW

LEEUDORINGSTAD CEMETERY ESTABLISHMENT

BASIC ASSESSMENT (EIA) PROCESS

Draft BAR **June, 2023**

Prepared for

Malepa

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FINAL BASIC ASSESSMENT REPORT

DETAILS OF THE EAP

REPORT CONTTROL			
Project Tittle	Establishment of Kgakala Cemetery, Leeudonringstad		
DEDECT REF			
NEAS REF			
Date	October 2023	**Report Version**	Draft BAR

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Brenda Makanza	PGC Professional Diploma in Geo-Informatics, UNIGIS, 2016 Environmental Sciences and Health (with Honours) , NUST, Zim, 2004	EPASA (2019) 1542	More than 10 years' experience (Please See Attached CV)
MacCarthy Honu-Siabi	MS Sc (Policy & Development Studies) Certs. Environmental Impact Assessments Management & Environmental Management & Control (Enforcement and Audit)	IAIASA SAMEA	9 years (in the field of Environmental Impact Assessment)
Sedzani Nemulodi	Bsc Environmental Science		2 Years of work in the Environmental Field and impact assessments

SECTION G: DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, **Brenda Makanza** declare that I –

(a) act as the independent environmental practitioner in this application;
(b) do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
(c) do not have and will not have a vested interest in the proposed activity proceeding.
(d) have no, and will not engage in, conflicting interests in the undertaking of the activity,
(e) undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006;
(f) will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
(g) will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the Department in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the Department may be attached to the report without further amendment to the report;
(h) will keep a register of all interested and affected parties that participated in a public participation process; and
(i) will provide the Department with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Environmental Assessment Practitioner:

Bizycon Environmental

Name of company:

Date

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/1542

Herewith certifies that

Shorai Brenda Makanza

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2023

Expires: 29 February 2024

Chairperson

Registrar

SAQA

Summary of where requirements of Section 22 of the 2014 NEMA EIA Regulations (GN R 983, as amended) are provided in this Basic Assessment Report

Regulation Requirements	YES/NO	SECTION IN BAR
Objective of the basic assessment process 1) The objective of the basic assessment process is to, through a consultative process- (a) Determine the policy and legislative context within which the proposed activity is located and how the 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 within sites and the risk impact of the proposed activity and technology alternatives on the these aspects to determine- (i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and (ii) 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; (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 alternatives; ii. Identify suitable measures to avoid, manage or mitigate identified impacts; and	YES	**Section 2** **Section 4.2** **Section 7** **Sections 9** **Section 10**

iii. Identify residual risks that need to be managed and monitored.		
Scope of assessment and content of basic assessment reports 2) (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 ii. The expertise of the EAP, including a curriculum vitae:	YES	**Pg. 3 -4** **CV on Last Page of report**
(b) The location of the activity , including: i. The 21 digit surveyor general code of ach cadastral land parcel; ii. Where available, the physical address and farm name; iii. Where the required information items i and ii is not available , the coordinates of the boundary of the property or properties;	YES	**Section 3**
(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 on land where the property has not been defined , the coordinates within which the activity is to be undertaken;	YES	**Section 4**
(d) A description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the activities to be undertaken associated structures and infrastructure;	YES	**Section 4.1**
(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	YES	**Section 4.2**

II. How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;		
(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;	YES	**Section 6**
(g) A motivation for the preferred site, activity and technology alternative;	YES	**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;	YES	**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	YES	**Section 8 (Full report Moved to appendixes)**
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;	YES	**Public Participation report**
iv. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	YES	**Section 9**
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) and (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated	YES	**Section 10**
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;	YES	**Section 10.1**
vii. Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be	YES	**Section 10**

affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;		
viii. The possible mitigation measures that could be applied and level of residual risk	YES	**Section 10**
ix. The outcomes of the site selection matrix;	YES	**Section 10, 11**
x. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	YES	**N/A**
xi. A concluding statement indicating the preferred alternatives, including preferred location of the activity.	YES	**Section 11**
(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 impacts 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;	YES	**Section 10 – 12** **Section 10.5-9**
(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; (v) The degree to which the impact and risk can be reversed; (vi) The degree to which 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;	YES	**Section 10**

(k) Where applicable, a summary of the findings and impacts managements 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;	YES	
(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 superimpose 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;	YES	**Section 11**
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;	YES	**Section 10**
(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 authorization;	YES	**Section 13**
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	YES	**Related to Section 13**
(p) a reasoned opinion as to whether the proposed activity should or should not be authorized, and if the opinion is that it should be authorized, any conditions that should be made in respect of that authorization;	YES	**Section 12 & 13**
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorization is required, the date on which the activity will	×	**N/A Includes Operation**

be concluded, and the post construction monitoring requirements finalized;		
(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 any responses by the EAP to comments or inputs made by interested and affected parties; and	YES	**Page 4**
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	×	**EMP Attached but not costed**
(t) any specific information that may be required by the competent authority; and	×	
(u) any other matters required in terms of section 24(4) (a) and (b) of the act.	×	

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1. INTRODUCTION

Maquassi Hills Local Municipality intends to undertake the construction of a cemetery to augment the severe needs of a functional cemetery to serve its population. This forms part of the Municipal critical services and infrastructure provision and commitment to service delivery as the municipality does not have a formal cemetery within its jurisdiction. The recent increase in death as a result of the corona virus outbreak further exerts pressure and also highlights the critical need for a working cemetery.

As part of the planning process, Malepa Planning was appointed engaged in association with Bizycon Pty Ltd and other specialists to critically assess suitable sites for the cemetery establishment. In terms of the Listing Notice 1 (GNR 983) of the EIA regulations as promulgated in 2017 and as amended , the establishment of any cemetery of extent of 2500 square meters or more is a listed activity for which an environmental authorisation should be obtained prior to the commencement of the activities identified as listed. For this Activity, GNR 982 prescribes a Basic Assessment Process (BA) towards obtaining environmental authorisation in Terms of Section 24D of the National Environmental Management Act, NEMA (Act 107 of 1998). Basic Assessment EIA Process is undertaken in such a manner that the environmental outcomes, impacts and residual risks of the proposed Listed Activity being applied for are noted in the BA Report and assessed accordingly as per the requirements of the BA process as noted in the Chapter 4 of GNR 982.EIA Regulations (2014), as amended.

The outcome of the BA process is to provide the Competent Authority, DEDECT with sufficient information to provide a decision on the application in terms of Environmental Authorization (EA).

2. NEED AND DESIRABILITY OF THE PROJECT

The preferred activity which is the proposed establishment of the cemetery constitutes the establishment of a public amenity to service the local community of Leeudoringstad and its surroundings. As Maquassi Hills Local Municipality has indicated on their Integrated Development Plan, there is an under-supply of cemeteries in the area, the development of new cemetery is one of the priorities of the municipality. Having sufficient burial space locally is considered to be required service that reduces the need for burial having to take place far from people's homes or town, and associated cost and inconvenience of having to travel long distances to visit the graves of families and friends. Therefore, the proposed cemetery is the only considered activity as it is an essential public amenity within Kgakala Community. The cemetery is also said to be critically needed because the old one is currently full, and las limited space for future needs.

3. OBJECTIVES OF THE EIA (BA) PROCESS

- To outline environmental issues which may be caused by the proposed development.
- To identify and register Interested and Affected Parties of the proposed development.
- To communicate the development to relevant Government institutions which have commenting responsibilities on developments of similar nature.
- To identify and address issues that have been raised by Interested and Affected Parties to the development.
- To comply with Environmental and any other relevant legislations on behalf of the proponent.

4. LOCATION OF THE ACTIVITY

The proposed cemetery is to be established on a piece of previously cultivated land located on the southwestern side of the Leeudonringstad Town, within Maquassi Hills Local Municipality within Dr Kenneth Kaunda District Municipality of North West Province. The GPS coordinates of the proposed development site, 27°13'4.39"S 26°15'43.34"E.

Property Description is **Portion of REM of PTN 50 Rochdale** and the 21-digit Surveyor General code of the proposed land parcel is: **T0HP00000000000004300000.** Figure 1 is an aerial photograph of the location of the site.

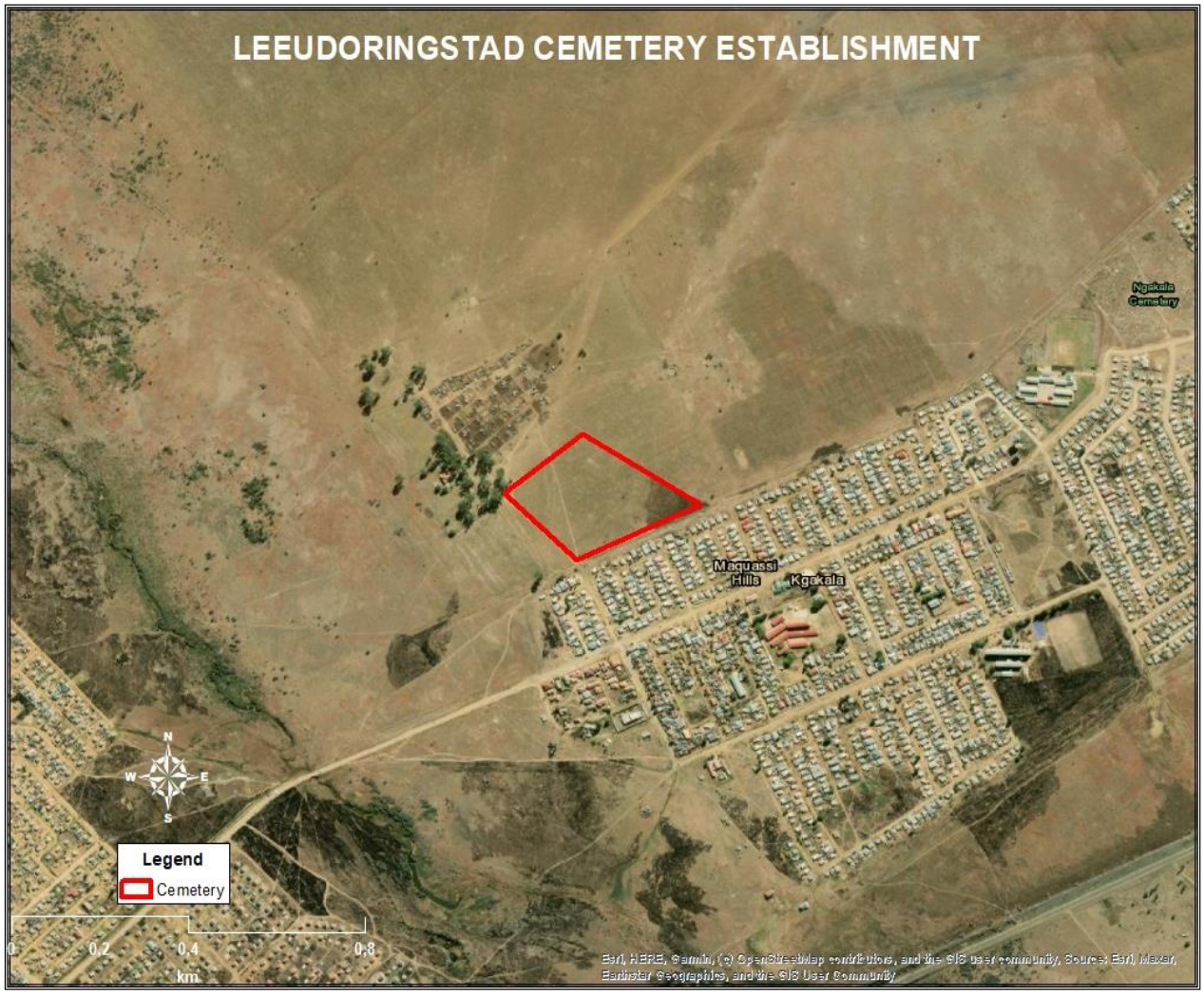


FIGURE 1 SITE LOCATION (AERIAL)

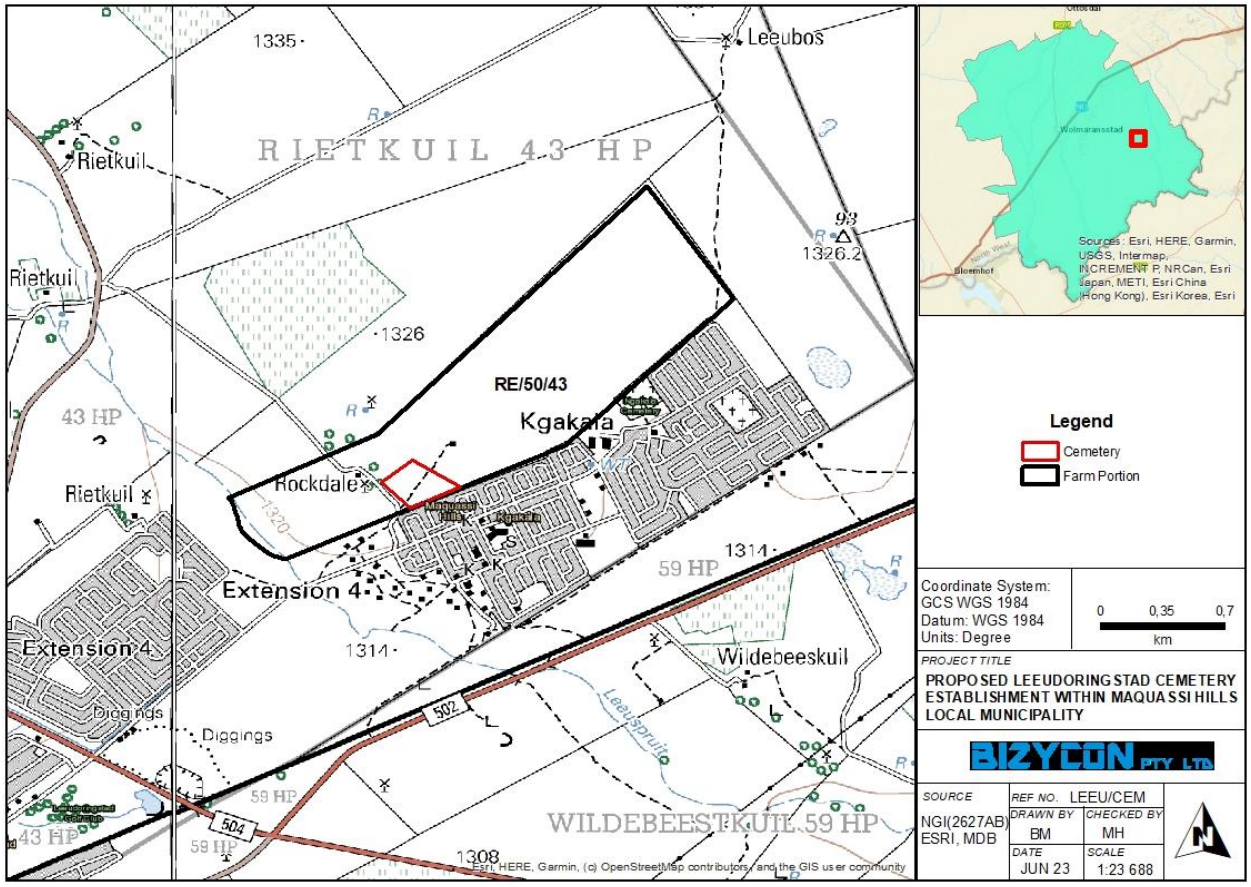


FIGURE 2 LOCALITY MAP

5. PROJECT DESCRIPTION

The proposed development entails the establishment of a public cemetery and associated infrastructure, including internal roads, ablution facilities. The area does not have a formal licensed cemetery site though there is growing demand for such a service for the town. This new proposal is situated on portion of REM of PTN 50 of Rochdale, Leeudoringstad.

Specifically, the development is to entail the following:

- The site proposed for the cemetery development is about 6.5ha in extent,
- The establishment of a cemetery with sections for about 917 children graves and about 4354 adult graves of which 225 will be demarcated for honoring Heroes. The total estimated grave sites is 5271 (refer to layout)
- 13m wide main internal road internal road loop will be established within the development footprint to allow movement through the site, and about 7.5m lanes around each block.
- The cemetery will be equipped also with ablution facilities, 10 bus Bays, 44 taxi bays and a prayer room.

- Access to the site is through Kgakala Ext 2 Settlement in Leeudoringstad. The current layout of the cemetery is presented in Figure 3.

FIGURE 3 PROPOSED CEMETERY LAYOUT

FIGURE 4 LOCATION OF SITE

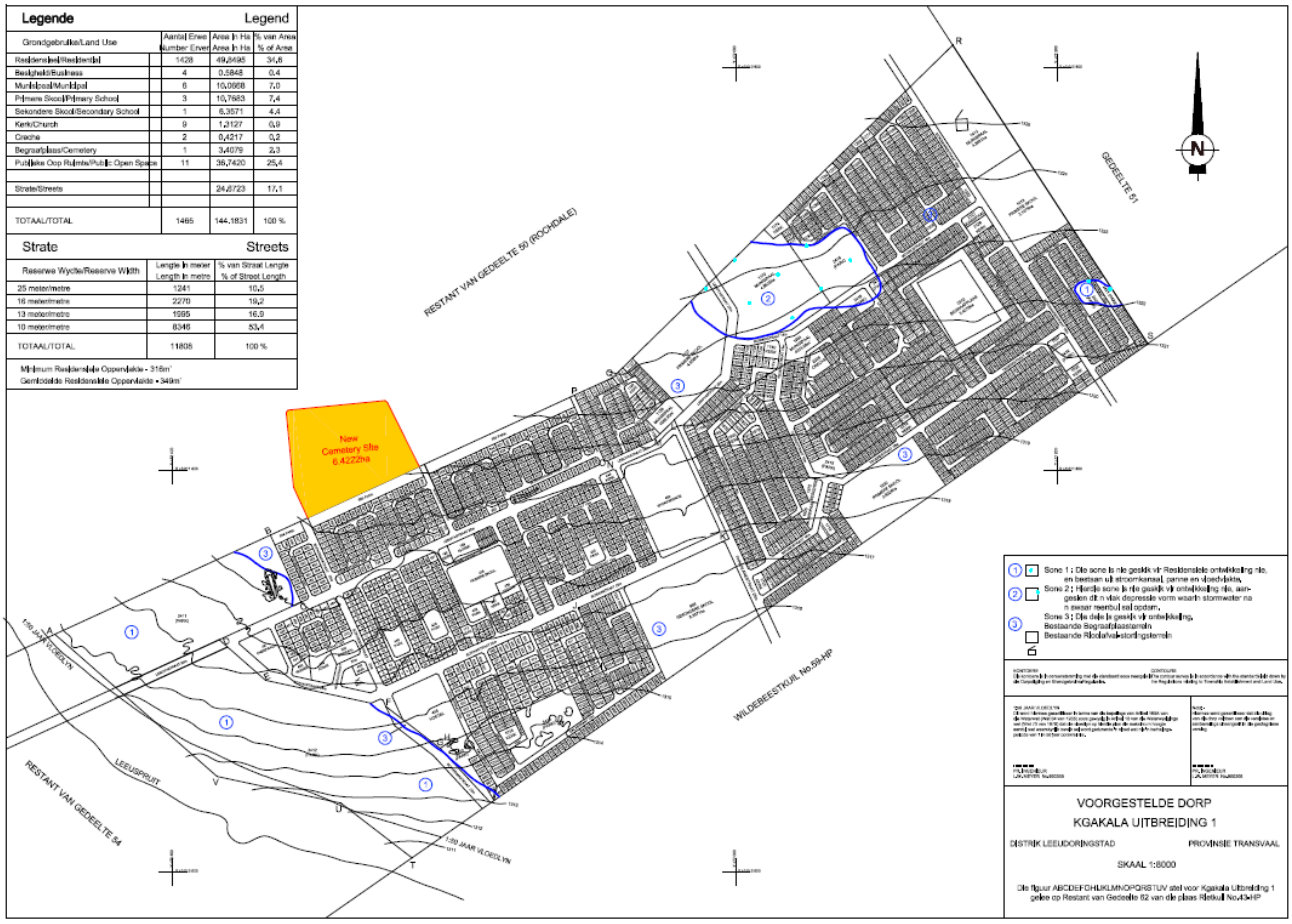


FIGURE 5 PROPOSED LAYOUT

6. APPLICABLE LISTED ACTIVITIES

The establishment of cemeteries fall under listed activity in terms of the EIA regulations (2014), as amended, and as promulgated in terms of the National Environmental Management Act, 1998 (NEMA). The table below provides a list of activities identified as triggered by the proposed development.

For an application for authorisation that involves more than one listed or specified activity that, together, make up one development proposal, all the listed activities pertaining to this application must be indicated.

Indicate the number and date of the relevant notice:	**Activity No (s)**	**and Activity Description (in terms of the relevant notice)**	**Describe each listed activity as per project description**
GN.R. 327, 4 December 2017	23:	The development of cemeteries of 2 500 square metres or more in size.	the site proposed for the cemetery is about 6.5 ha
	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—	The site is covered by indigenous vegetation classified as Val-Vet Sandy Grassland of about 6 .5ha that will be cleared for the development of the cemetery and associated infrastructure. The vegetation will be done gradually as the cemetery gets used. Site is not indigenous anymore as vegetation is transformed for agriculture
GN.R. 325, 4 December 2017	12		

7. APPLICABLE LEGISLATIONS

7.1 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The table below provides a list of all the applicable legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA Regulations.

Title of legislation, policy or guideline:	**Applicability to the project**	**Administering authority:**	**Date:**
The Constitution of the Republic of South Africa Act No. 108 of 1996	The Constitution is the supreme law of the land and includes the Bill of rights which is the cornerstone of democracy in South Africa and enshrines the rights of people in the country. It includes the right to an environment which is not harmful to human health or well-being and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures	Constitutional Court of South Africa	1996
National Environmental Management Act 107 of 1998	It provides a legislative ground on which the regulations to ensure that adverse impacts on the environment can be investigated and mitigation measures to keep the adverse impacts of activities can be minimized and that arrangement for monitoring and managing impacts can be formulated	Department of Environmental Affairs (DEA)	1998
National Environmental Management Act (Act 107 of 1998): Environmental Impact Assessment Regulations (Listing Notices 1, 2, and 3), as amended	The application for Environmental Authorization for this activity is done in line with these regulations	DEA and Provincial Environmental Departments	2014

National Environmental Management: Biodiversity Act (Act 10 0f 2004)	It is applicable in terms of protected fauna and flora species which might occur on site of development. The Biodiversity Act also provides for listing of threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected (Government Gazette, 2011). The main purpose of listing threatened ecosystems is to reduce the rate of ecosystem and species extinction and includes the prevention of further degradation and loss of structure, function and composition of threatened ecosystems	DEA	2004
National Environmental Management: Waste Act (Act 59 of 2008)	The Act regulates the handling of various types of waste that will be generated during the different phases of the activity. Where listed waste activities are triggered, a waste management licence require to be applied for.	DEA	2008
National Environment Management: Air Quality Act (Act No. 39 of 2004)	Potential impact of air quality through dust generation from construction activity. Responsibility for regulatory control is divided between the Chief Air Pollution Control Officer (CAPCO) in the Directorate of Air pollution within DEA and local authorities are currently responsible for smoke, dust and vehicle emissions	DEA	2004
National Forest Act (Act No. 84 of 1998)	Several protected tree species may occur within the project area. Should the project requires the removal, relocation or pruning of any of these trees plants as a result of construction activities, a permit will be required.	Department of Agriculture, Forestry and Fisheries	1998
National Heritage Resources Act (Act No. 25 of 1999)	Potential impact on cultural heritage, paleontological or archaeological resources through excavation activities or disturbance. A permit is required per the National Heritage Resources Act (Act No. 25 of 1999)	South African Heritage Resources Agency	1999

National Water Act (Act 36 of 1998)	This act regulates uses of water in the water resources that might be available within the project site. Water use Authorizations must be obtained for relevant water use	Department of Water and Sanitation	1998
Conservation of Agricultural Resources Act (Act No. 43 of 1983	In terms of the amendments to the regulations under CARA, landowners are legally responsible for the control of alien species on their properties. This has relevance to the project as the developer will have to ensure that weeds and alien invasive species are removed from the rail reserve during construction and that the spread of these species is controlled and managed during construction and operations.	Department of Agriculture, Forestry and Fisheries	1983
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	Where borrow pits will be required, authorisation will be applied for.	Department of Mineral Resources	2002
Occupational Health and Safety Act (Act No. 85 of 1993)	This act regulates matters related to labour. Labour matters related to the proposed project will be in line with the requirements of this act.	Department of Labour	1993
National Health Act (Act 61 of 2003): GNR 363	This act regulates matters relating to the management of human remains.	Department of Health	2003
GN.R 363 REQUIREMENTS	The Department of Health has published Regulations relating to the management of human remains in the National Health Act, 2003 (Act No. 61 of 2003) through G.N. R 363. This Act states that all burial sites must comply with the following environmental requirements: Be located outside the 100 year flood plain Be located at least 350m from ground water sources used for drinking purposes For a preferred burial site with soil of sand-clay mix porosity and a small and fine-grain texture,		

	the water should be at least 2.5 m deep in order to allow traditional grave depth of six feet (1.8 m) For a preferred burial site with soil of sand-clay mix porosity and a small and fine-grain texture, the water should be at least 2.5 m deep in order to allow traditional grave depth of six feet (1.8 m)		

8. SERVICE AVAILABILITY

8.1 STORM WATER MANAGEMENT

As part of this scoping exercise, a review of the available existing support infrastructure from which the proposed development can be integrated was conducted. The site being proposed is currently vacant but is situated near the existing community where basic services are available.

According to the stormwater analysis stormwater can be discharged into these natural drainage lines around the site. There is sufficient vegetation around these drainage lines to serve also as flood attenuation, by reducing the velocity of the stormwater flow.

8.2 DOMESTIC WASTE

During both the construction and operational phase, the development will generate domestic waste. Waste generated during construction will be the responsibility of the contractor. This will be largely recycled and the remaining disposed of at the registered landfill site by the contractor. During operational phases, waste may result from the normal usage of the site as people come and go. Waste collections sites, and dust bins will be provided to collect such waste, from the ablution facilities provided in the layout. The weekly collection of this will need to be included in the current municipal waste collection stream. Given that the municipality is the developer, it is easier to integrate waste collection into the existing waste collection that occurs in the surrounding community.

8.3 WATER AND SANITATION

Water services and waterborne systems already exist in the settlements and will be extended to the establishment. Only the admin offices on the cemetery site are expected to be equipped with sanitation facilities for usage by those who are working therein. Ablution facilities will also be provided for public usage at the packing.

8.4ELECTRICITY SUPPLY

Electricity to the proposed development will be provided by the Municipality during both construction and operational phase of the development. Electricity infrastructure exists in the surrounding communities and can be easily extended to the site.

9.MOTIVATION FOR THE PREFERED SITE, ACTIVITY AND TECHNOLOGY ALTERNATIVE

9.1 ACTIVITY ALTERNATIVES

The preferred activity which is the proposed establishment of the cemetery constitutes the establishment of a public amenity to service the local community of Kgakala. The site was previously used for agricultural cultivation but is no longer being used for that purpose and is currently lying fallow. Few cows graze the area sometimes but is not said to not be a major activity considered for the site, given the vast open spaces around as alternative for grazing.

Having sufficient burial space locally is required service that reduces the need for burial having to take place far from people's homes, and associated cost and inconvenience of having to travel long distances to visit the graves of families and friends. Therefore, the proposed cemetery is the only considered activity as it is an essential public amenity for the municipality.

Alternative land uses for the site include agriculture and the construction of the cemetery. The previous land use on the site is agriculture. However, it is indicated by the municipality that agricultural activities have been discontinued on the site about few years ago, because the land was noted to longer be viable for crop production. Given the urgency of the establishment of the cemetery, the municipality prioritizes the cemetery which will be a suitable use for the land.

With cemeteries like this, sometimes crematoriums are alternative or complementary methods. However, for this crematorium is not considered within the scope of the project, perhaps due to the limited need for it in the area.

9.2 SITE ALTERNATIVES

This site was selected as the only site, by the municipality because is strategically situated for the purpose intended and was evaluated according to the DWS criteria for selection of cemeteries, critical of which include not falling within a flood line in the catchment and is geohydrological conducive. It is accessible and close to required services, thereby reducing spatial costs of establishment, and future operations.

It also has sufficient land available for future expansion if need be. Given that the site meets the requirements of the DWS criteria, and also considering that other surround pieces of land are currently of high agricultural potential and of high environmental sensitivity, this site is the only alternative considered. According to the local leadership, it is also conducive, as it may not require to be accessed through the community, as it is off the main road and behind the church where most funerals also take place.

9.3 PROCESS ALTERNATIVES

Two main alternative processes are usually possible in a cemetery, which includes burial and cremation. In this case, only burial is being considered, as no crematorium is considered as part of the cemetery establishment. This may largely be because the population mainly indulges in the culture of burial than cremation.

9.4 NO-GO ALTERNATIVE

The No-Go alternative would imply that no formal cemetery is established on the proposed site. Given the current pressure on the municipality to urgently provide the cemetery as part of the critical infrastructure and service required by the community, a no-go-alternative may have the possibility of causing conflicts and communal unrests as the need for cemetery has been lingering in the plans for some time now. The NO-GO alternative will involve no development of any infrastructure and will present both direct and indirect negative environmental and social/cultural impacts such as:

- The continual and growing demand for burial grounds in the Leeudonringstad community and its surroundings.
- Depriving the residents of Leeudonringstad and its surrounds of a necessary service delivery.
- Failure to adhere to the municipality's Integrated Development Plan for 2022/23, where developing a new cemetery in Leeudonringstad community is a priority project.
- Increasing possible informal/illegal burying in the community posing health and environmental threats and may continue or escalate if no formal cemetery is provided.

The potential negative impacts that could be associated with the establishment of a cemetery, such as vegetation removal and possibly pollution if care is not taken, may not occur if the cemetery is not established, but so will the positive impacts not also be realized. The positive impacts of the development are much more than the potential negative, and therefore the No-Go option is not preferred.

10. A DESCRIPTION OF THE RECEIVING ENVIRONMENT

10.1 TOPOGRAPHY, SLOPE, AND GEOLOGY

The general topography of the site consists of gently sloping terrain as the site is situated on the top of a hill, surrounded by valley system. The site consist of gentle sloping terrain, enough to allow natural storm water flows. According to the contours mapping the site is flatter than 1;10 (Figure 5) . It does not appear that slope on this site will restrict the proposed establishment of the cemetery. In terms of Geological Mapping the site is noted to be characterized mainly by Andesite formation (Figure 6).

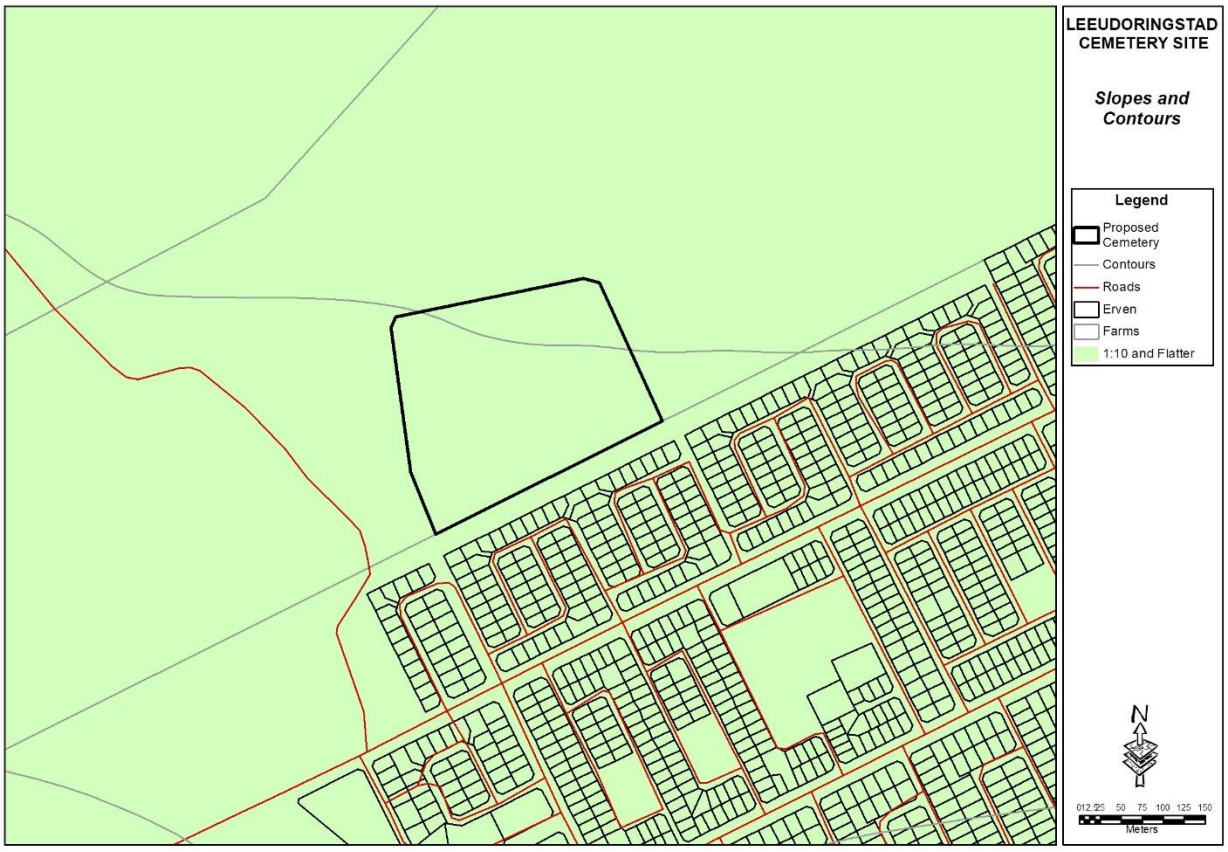


FIGURE 6 SLOPE MAPPING

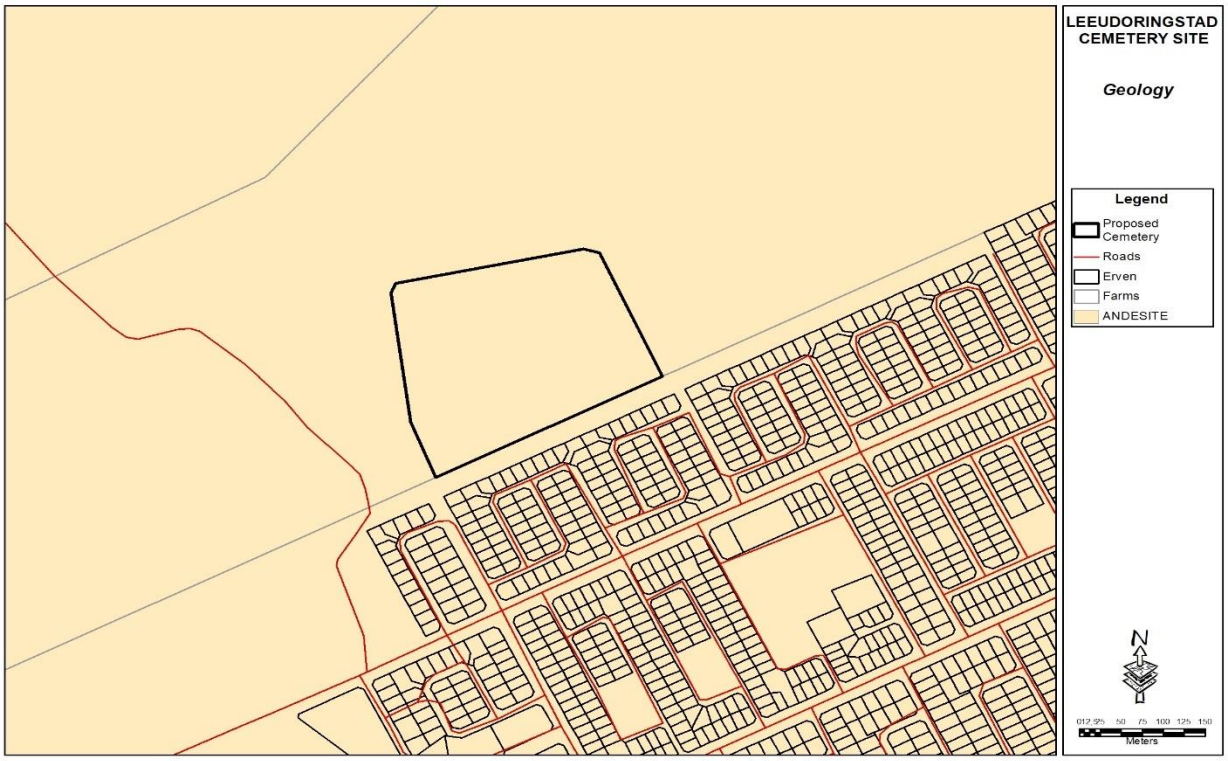


FIGURE 7 GEOLOGY

According to the geotechnical assessment and mapping, no dangerous geological formations such as dolomites were encountered. The site also does not pose any treats in terms of sink holes or any of the commonly known unstable grounds.

10.2 HYDROLOGY

The site is located on a gentle slope land, with no watercourses on site or within the immediate environment (32m). There is currently no river that runs on the proposed site. According to the Cemetery Geotechnical Study Report no groundwater seepage was encountered during trial pits put down during field work.

However, in mid-summer during periods of prolonged rainfall, an increase in the occurrence and magnitude of groundwater seepage flow can be anticipated.

With the gentle sloping nature of the site, it is possible that the stormwater will accelerate if ground cover is removed. This may necessitate the implementation of stormwater strategy that reduces surface runoff and acceleration. It is noted that the usage of the cemetery will involve gradual removal of groundcover, hence this may reduce the severity of the issue as vegetation may regrow within and around the grave sites.

10.3 VEGETATION CLASSIFICATION

The site is covered by vegetation type classified as the Val-Vet Sandy Grassland which falls within the Sourveld Grassland Bioregion [1]according to the Mucina and Rutherford 2018 and most of this vegetation in the province is hardly among the protected vegetation types. The vegetation types of according tot h review list of threatened ecosystems is listed as endangered. However, the site is already transformed hence the vegetation on the site is regrown from previous farming activities.

There is 215, 089ha of the vegetation coverage in the province, according to SANBI Vegetation Database It is noted that this site was previously cultivated for farming and hence, what is on the site now is regrown vegetation from the fallow period. The grassland on the site now is regrown vegetation from the previous usages. About 6.5 ha will be utilized for the cemetery establishment.

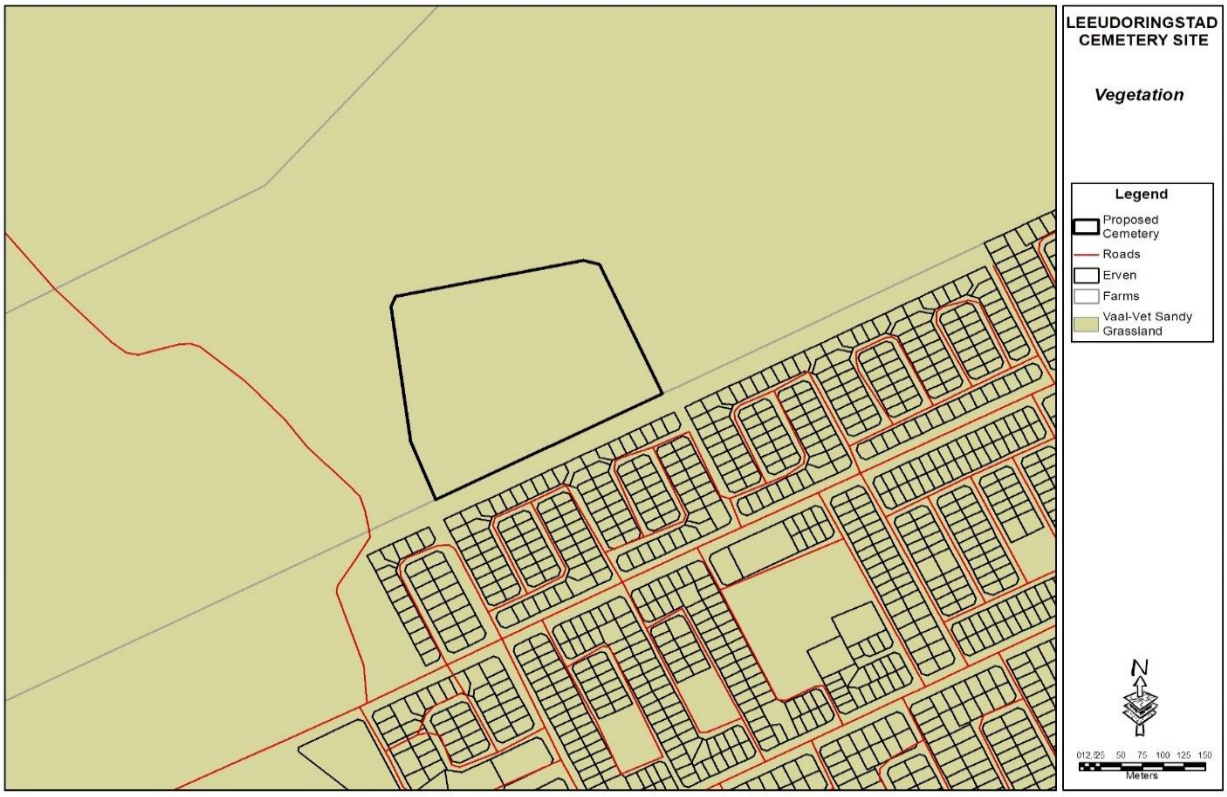


FIGURE 4 VEGETATION TYPE

[1] VT 13 (North West Sandstone Sourveld) biome has been changed from a savanna to a grassland.

10.4 BIODIVERSITY PRIORITY CLASSIFICATION

The general biodiversity information available on the site indicates that the area under consideration does fall within an endangered vegetation zoning within the greater Dr Kenneth Kaunda District area. The impact of this may be less, given the site was previously cultivated severally, which may result in the transformation of the indigenous vegetation the site.

Surrounding areas are also classified as vulnerable vegetation and biodiversity. The biodiversity priority mapping of the area and its surroundings. About half of the site also falls within the irreplaceable biodiversity classification, which covers most of the area. However, with the transformation that has taken place due to the previous cultivation, it is observed that most of the original or indigenous vegetation is already transformed.

10.5 CURRENT AND POTENTIAL LAND USE

The proposed site is currently vacant and mainly consist of grasslands regrown from previous agricultural activities. Most parts of the site fall within the high agricultural potential classification. With the piece of land lying fallow, it is only being used for occasional grazing. The proposed cemetery is the only land use earmarked for the site, other than being an open space. However, from some of the town planning mapping of the area, it is noted that the surrounding northern portions are earmarked for housing development.

10.6 CULTURAL/ HERITAGE ARCHAELOGICAL RESOURCES

Site assessment did not readily identify any significant heritage resources in the area. However, as per the regulatory requirements, the development of a vacant land of a may require input from the South African Heritage Authority (SAHRA) through the local provincial agency and SAHRIS. Given the site was previously used for cultivation, no structures currently exist on the site. SAHRIS and the Provincial Counterpart will need to be made a key stakeholder in the development.

11. SUMMARY OF THE KEY FINDINGS FOR THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

11.1 METHODOLOGY / IMPACT ASSESSMENT CRITERIA

The significance of the impacts was assessed considering the following descriptors:

Nature of the impact		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*). Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Very high	10	
Extent		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration		
Immediate	1	Effect occurs periodically throughout the life of the activity.

Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	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 of occurrence		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts was calculated using the following formula:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

The significance of the impacts is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the Table 1 below.

Table 1. Definition of significance rating

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

The impact section briefly describes and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

11.2 PRE-CONSTRUCTION AND CONSTRUCTION PHASE IMPACTS

11.2.1 Impacts on Vegetation

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Clearing of the vegetation during site establishment, fencing and construction.	Disturbance and loss of land cover	Negative		Pre-mitigation					
			1	4	6	1	5	60	Medium
				Mitigation Measures					
			•	• Given the nature of the development to be cemeteries, vegetation removal will be gradual; hence no unnecessary vegetation removal must be done. • Vegetation clearing in natural areas should be kept to a minimum and restricted to the proposed development footprint only, *i.e. the confirmed building areas, parking and roads;* • Exposed areas must be rehabilitated with indigenous plants to the project area as soon as construction is finished. Detailed rehabilitation plans need to be compiled for all primary natural vegetation areas to be affected during the construction activities. • The compacted areas (e.g. the camp site) which are no longer needed after construction may need to ripped or scarified to break up the compacted areas. These areas should then be sown with seed mix collected in the patches of indigenous vegetation on site. The appointed horticulturist must collect a locally indigenous seed mix from the natural vegetation on site (preferably by means of vacuum harvesting) and must store this for later use in areas in need of rehabilitation; and • The Environmental Control Officer (ECO) should liaise with Ecologist and Horticulturist after completion of main construction phase to identify main areas of compaction in need of ripping and discuss best methodology; ripping may need to be done by tractor, followed by immediate mulching and sowing of previously stockpiled local mulch containing indigenous seed, and possibly hydro seeding with selected local seed.			

				• Management of the topsoil in these primary natural vegetation areas are critical, as they contain the seedbed for re-establishing the vegetation post construction, where structures are going to be placed which will not allow light and water to penetrate the soils.					
				Post-mitigation					
			1	4	4	1	3	27	Low

11.2.2 Alien Plant Invasion

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Activities associated with construction such as clearing of indigenous vegetation, disturbances of soil, importing of soil material, transportation of plant to site and movement of workers to site	Removal of indigenous vegetation and disturbances on site and other construction related activities can increase the risk of the site to be invaded with alien plant	Negative		Pre-mitigation					
			1	4	6	1	5	60	Medium
				Mitigation Measures					
			•	• Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. (Particular attention must be paid to imported material such as building sand or dirty earth-moving equipment); • Colonization of disturbed areas and topsoil stockpiles by weeds and invasive plants on site must be monitored and controlled on an on-going basis. DWS approved methodology should be employed for all alien clearing operations. • Any eradicated exotic/invasive plant or weed vegetation must be removed from site and disposed of at an approved waste disposal facility. • No domestic and/or exotic plants may be planted on site; and • The Contractor must develop an Action Plan or the Weed Management Strategy that will assist in preventing the introduction of weeds to the site and the removal of alien invasive species from the site throughout the lifespan of the construction stage.					

	species and weeds.			Post-mitigation					
			1	4	4	1	3	30	Low

11.2.3 Impacts on Fauna

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Clearing of the vegetation during site establishment, construction and fencing; Interaction between construction workers and wild animals Construction activities	Habitat loss for faunal species. Noise disturbances to wild animals; Trapping of wild animals in open trenches;	Negative		Pre-mitigation					
			1	4	4	1	4	40	Medium
				Mitigation Measures					
			•	• Under no circumstances shall any animals be handled, removed, killed or be interfered with by the contractor, his employees, his subcontractors or their employees; • Do not disturb nests, breeding sites or young ones; • If not threatened, or causing a threat to anyone, the animals are to be left alone; • If threatened e.g. trapped in an excavation, in way of site clearing, or causing a threat e.g. a potentially venomous snake, the ECO is to be contacted to advice on the capture of the animal and release thereof into the surrounding area or a nearby reserve. Where required assistance/input from local conservation staff may be required. No untrained person shall attempt to capture a potentially venomous snake; • The contractor and his employees shall not bring any domesticated animals onto the site – Absolutely No Dogs! • Gates must be kept closed to prevent stock in the area from straying or from theft; • The contractor shall ensure the work site be kept clean, tidy and free of rubbish would attract rodents and other scavengers;			

				• The footprint of the disturbed area must be kept as minimum as possible to minimize possible loss of faunal habitats; • A low speed limit should be enforced on site to reduce wild animal-vehicle collisions; • Excavations must be checked on a daily basis for any signs of fauna which may have fallen in; • All the Contractor's equipment shall be fitted with effective exhaust silencers (where applicable) and shall comply with the South African Bureau of Standards recommended code of practice, SANS 10103:2004, for construction plant noise generation; and • All the Contractor's vehicles shall be fitted with effective exhaust silencers (where applicable) and shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road.					
				Post-mitigation						
			1	4	4	1	3	30	Low	

11.2.4 Impacts on Surface Water and Underground Water

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Clearing of the vegetation.	Effluent of chemicals such as fuels can contaminate surface and	Negative		Pre-mitigation					
			2	4	8	1	4	60	Medium
				Mitigation Measures					

Construction of the cemetery and associated infrastructure; Handling of chemicals on site; Handling of construction vehicles and plant on site The use of sanitation facilities Discharging of effluent from site	underground water Flow of sewage into the stream/river can also pollute groundwater Altered river flow characteristics Increased discharge as a result of increased impervious surfaces Increased sediment transport into the river		•	• Construction camp, storage, washing and maintenance of equipment, storage of construction materials or chemicals as well as any sanitation and waste management facilities must not be located within the distance of 100 m from any natural drainage line; • The pollution of surface or ground water shall be prevented. Such pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage, water from excavations, construction water, and water carrying soil particles or waste products; • Keep the Spill Kit on hand to handle any possible spillages to prevent pollution of surface and groundwater resources; • Clearing of vegetation should be kept to a minimum; • A storm water management plan must be developed and implemented prior to commencement of the construction phase; • Ablution facilities such as chemical toilets shall be used and sited on the project and camping site in such a way that they do not cause water or other pollution; • When these toilets are full, their contents (sewage waste) must be removed in a manner that will not cause any pollution and will be transported off the site and disposed of at an authorized sewage disposal facility; • Before environmental-friendly toilets are used, the permission to dispose the sewage waste at an authorized sewage facility must be obtained from the relevant service provider; • Discharge of any waste water containing pollutants, such as cements, lime, chemicals and oils and fuels into any drainage lines or onto any adjacent natural vegetation should be prevented; • All effluent water from site shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water courses (streams, rivers, pans dams etc.). Only domestic type wastewater shall be allowed to enter the designated system; • Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted; • Where practically possible, schedule vegetation clearing such that minimal vegetation is removed at a time to prevent increased sedimentation into the stream; • In setting up the infrastructure in the cemetery, where practical major earthworks should only be undertaken during the dry season (April to August); • Construct infiltration trenches to mitigate increases in runoff between the graves sites • Convert areas of existing or planned impervious paving to permeable paving products to allow stormwater runoff to filter through voids in the surface • Maximise the areas of vegetation and absorbent landscapes; and • Reduce parking and driveway areas where feasible. • Ensure there is sufficient vegetation at the edge of the hill, surrounding the entire cemetery, where possible. • Surrounding areas must not be degraded during construction; hence fencing of the site must be carried out at the beginning of the establishment.
				Post-mitigation

			2	4	4	2	3	36	Low

11.2.5 Soil Erosion

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Clearing of the vegetation; Excavation and stockpiling of soil;	Soil erosion	Negative		Pre-mitigation					
			2	4	6	2	5	70	Medium
				Mitigation Measures					
				Structural and non-structural (vegetative) erosion control measures will be designed, implemented, and properly maintained by the contractor in accordance with best management practices which will include the following: • Scheduling of activities to minimize the amount of disturbed area at any one time; • Implementation of re-vegetation as early as feasible; • Limiting construction traffic and/or avoidance thereof on access roads and areas to be graded to the extent feasible at drainage ditches. • Compacting loose soil as soon as possible after excavation, grading, or filling; • Using silt fences, geo-textiles, temporary rip-rap, soil stabilization with gravel, diversionary berms or swales, small sedimentation basins, and graveled roads to minimize transport of sediment; • Develop and implement the erosion and sedimentation control plan and ensuring that construction personnel are familiar with and adhere to it; and • Managing runoff during construction.					

				Post-mitigation					
			2	4	4	2	3	36	Low

11.2.6 Heritage Impacts

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Clearing of the vegetation. Excavations	Uncovering of artifacts of heritage from below the ground. Discovery of graves that were covered by vegetation/bush.	Negative		Pre-mitigation					
			1	1	6	2	2	20	Low
				Mitigation Measures					
				Should any graves or any artefacts of heritage significance be uncovered, construction activities must be stopped, and the area of impact is avoided, left undisturbed and demarcated with cautionary tape. The NW Department of Heritage Recourses / SAHRA should be notified immediately. Where necessary, A forensic archaeologist accredited with ASAPA (Association for Southern African Professional Archaeologist) must be contacted to do an *in situ* investigation of the find and to make all arrangements to obtain the necessary permits and permission to exhume, remove and to relocate the human remains, where applicable.					
				Post-mitigation					
			1	1	4	2	2	16	Low

11.2.7 Domestic Waste Impacts

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance

Domestic waste generation and handling	Littering and pollution of the environment	Negative		Pre-mitigation					
			1	3	6	0	3	30	Low
				Mitigation Measures					
			•	• Clearly marked waste bins are to be provided for the separation of waste; • Recyclable waste, including glass, paper and plastic must be separated at the construction camp, stored and recycled, where economically feasible; • Train and educate site personnel on the importance of using the bins provided; • Empty all full waste bins at a registered landfill site; • Nominate a site representative to monitor and ensure proper usage of waste bins by site personnel; • Use a licensed waste contractor to dispose of any waste generated on site; and • Do not bury or burn wastes on-site.					
				Post-mitigation					
			1	3	2	0	2	12	Low

11.2.8 Construction Waste Impacts

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Construction waste generation and handling	Pollution of the environment	Negative		Pre-mitigation					
			2	1	6	0	4	36	Medium
				Mitigation Measures					

			•	• The Waste Management Plan must be developed, implemented by the contractor and be adhered to at all times; • All construction waste shall be stored in waste skips located strategically on site. These skips shall be collected for removal to a licensed landfill site. No construction waste may be stored on site for longer than 90 days; • The separation and recovery of recyclable materials is required and as such the contractor is expected to obtain and label recycling containers for the following (whichever relevant) and locate them within temporary office building and trailers: - Aluminum; Steel; Ferrous Metals; Non-Ferrous Metals; Waste Timber; Paper; Plastics, etc.; • Surplus concrete may not be dumped indiscriminately on site, but shall be removed from site when nearing completion of the different stages of work; and • The contractor will provide documentary evidence of proper waste disposal of the construction waste.					
				Post-mitigation					
			2	1	2	0	2	10	Low

11.2.9 Hazardous Materials and Waste Impacts

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Hazardous waste generation and handling	Contamination of soil and groundwater	Negative		Pre-mitigation					
			3	3	8	1	4	60	Medium
				Mitigation Measures					

Handling of hazardous materials Concrete batching and cement use Storage and handling of fuels Maintenance of vehicles and plant			•	• All waste fuel and chemical contaminated rags must be stored in leak-proof containers and disposed of at an approved hazardous waste site; • Suitable Waste Disposal Contractor must be employed to remove waste oil. These wastes must only be disposed of at licensed landfill sites designed to handle hazardous waste. Appropriate weigh bills must be provided for all hazardous waste being disposed of; • Hazardous waste may only be stored on site (and in accordance to National Environmental Management: Waste Act), where after it must be disposed of at a registered hazardous waste disposal site; • Hazardous materials – such as paint, cement, fuels, bitumen, fuel, oil, herbicides, battery acid or detergents – must be stored in sealed, lockable containers when not in use; • All reasonable care must be taken to prevent spills of any hazardous material when in use; • Storage areas for combustible and hazardous materials shall display the required safety signs depicting "No Smoking", "No Naked Eyes" and "Danger". Containers shall be clearly marked to indicate contents as well as safety requirements; • Cement products in bags must be stored in storage containers to be provided at the construction camp and should only be opened when needed; • The cement storage facility and surrounding area must be swept and cleaned regularly as required to ensure that cement products do not the pollute the surrounding environment; • Empty cement bags are to be collected and stored in a closed waste skip/ bins which, once full, can be disposed of at a registered landfill site; • Cement bags are not to be burnt on site; • No concrete batching on bare soil. Batch plants/areas shall be located within the designated working area on an impermeable surface to prevent cement spillages from contaminating bare soil; • Care must be taken to prevent concrete spills; • All spills (minor and major) must be recorded, cleaned and remediated; • Concrete trucks shall not be washed on site unless adequate washing and concrete collection facilities are introduced to site; • The construction of the workshops, cleaning bays and fuel dispensing areas of the construction camps should be in such a way that no accidental spillages leave the site and where practically possible surface and storm water run-off be diverted through an oil/water separator before leaving the site; • The storage of chemicals such as oils and petrol on site should be avoided and in instances where the storage of chemicals on site is unavoidable, the storage areas for these chemicals will be surfaced, bounded sited in locations that pose low risk to surrounding surface water it must be done in a proper manner; • If the refueling of construction machines and vehicles is done on site, it should be done in designated area with proper signage and bounding; • An oil spill kit should always be kept on the project site for use in the cleaning of any accidental oil spillage from construction machines and vehicles. Workers must be properly trained on the use of the spill kit;

				• Drip trays will be put under all the construction machines and trucks and these drip trays will be checked regularly to see if there are leakages of chemicals. Leaking plant shall be repaired immediately or be removed from site to facilitate repairs; • If any servicing of the construction plant is to be done on site, it should be done in designated workshop area that is surfaced to avoid any leakage of oil into the ground; • The use of road unworthy construction machines and vehicles must be avoided to minimize possible leakages of oils from engines of these machines; and • Oil spillages together with the polluted soil must be removed from the site and disposed of at the nearest authorized/registered hazardous waste disposal site.					
				Post-mitigation					
			2	3	2	2	2	18	Low

11.2.10 Dust Impacts

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Excavation and stockpiling of soil	Generation of dust leading to air pollution	Negative		Pre-mitigation impact rating					
			2	1	6	0	5	45	Medium
				Mitigation Measures					

Movement of construction vehicles on site Transportation of soil material			•	• The speed of construction vehicles and machinery should be reduced, and signage to that effect always displayed on site; • If excessive dust is created due to excavations, stripping of topsoil, etc. continual wetting down of surfaces must be undertaken; • Material in transit should be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage onto the roads and the creation of dust clouds; • If necessary, the load bin of the vehicle shall be covered with a tarpaulin to prevent dust; • Construction material such as soil material being transported by trucks must be suitably moistened or covered to prevent dust generation; • Where possible haulage distances will be minimized; • Excessive dust is to be controlled on unpaved access roads and site roads using sprayed water; • Water used for dust control shall only be taken from approved sources; • Environmentally friendly soil stabilizers may be used as additional measures to control dust on internal gravel roads and construction areas; and • Minimize disturbance of natural vegetation.					
				Post-mitigation Impact rating					
			2	1	2	1	2	12	Low

11.2.11 Noise Impacts

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Construction activities involving the movement of construction	Generation of noise	Negative		Pre-mitigation					
			2	1	6	0	3	27	Low
				Mitigation Measures					

trucks/vehicles and machinery. Construction workers generating loud noise. Blasting activities (if applicable).			•	• The idling time must be controlled by switching the construction vehicles and machinery off when not in use; • Construction activities should be restricted within normal working hours (7H00-18H00); • Keep all equipment in good working order; • Operate equipment within its specification and capacity and don't overload machines; • Apply regular maintenance, particularly with regards to lubrication; • Immediate neighbours shall be notified of any excessive noise-generating activities that could affect them; • No noisy construction, especially blasting, must occur at night (if night work is required) without prior written consent from the nearby residents; • Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS 10103:2004, so that it will not produce excessive or undesirable noise when released; • All the Contractor's equipment shall be fitted with effective exhaust silencers (where applicable) and shall comply with the South African Bureau of Standards recommended code of practice, SANS 10103:2004, for construction plant noise generation; • All the Contractor's vehicles shall be fitted with effective exhaust silencers and shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road; • If on-site noise control is not effective, protect the victims of noise by ensuring that all noise-related occupational health provisions are met (Occupational Health and Safety Act, (Act 85 of 1993); and • Where possible, material stockpiles should be placed so as to protect the site boundaries from noise from individual operations.						
				Post-mitigation						
			1	1	4	0	3	18	Low	

11.2.12 Health and Safety Issues

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
		Negative		Pre-mitigation					

Construction activities in relation to the health and safety of workers	Health and safety risks associated with construction work		1	3	8	2	5	70	Medium to High
				Mitigation Measures					
			•	• The Contractor must adhere to the prescriptions of the relevant Health and Safety legislation and standards. The Contractor must familiarize himself and his employees with the contents of the afore-mentioned legislation; • The Contractor will keep the Health and Safety file on site and implement its contents; • The Contractor will appoint a qualified Health, Safety and Environment (SHE) Officer who will be available on site to deal with health and safety and environmental issues related to the construction; • First Aid kit/s must be on hand at all times; • The Contractor must implement adequate and mandatory safety precautions relating to all aspects of construction. Such safety measures and work procedures/instructions must be communicated to construction workers; • The wearing of Personal Protective Equipment (PPE) on site is mandatory for all personnel and construction team members. Minimum requirements must include the wearing of an approved safety helmet, safety boots, safety eyewear, safety reflective jackets and dust masks, ear plugs, etc. where appropriate; • PPE signs must be erected on site at the areas where it is required and the integrity and availability of the signs must be maintained; • No one must be allowed on site unless they are wearing approved safety equipment; • Casual visitors must be required to sign a register at the security checkpoint and undergo a site induction by the SHE Officer. The responsible person must then be contacted before the visitor is allowed access to site. No unauthorized visitors are to be allowed on site; • Workers' right to refuse work in unsafe conditions must be respected; • All personnel must be trained in basic site safety procedures; • The Contractor must design, test/exercise appropriate emergency preparedness programs (plans, schedules, procedures and methods) for addressing environmental accidents, incidents and events such as spills of fuel, oil or lubricants; fires etc.; and • Safe and clean drinking water must be provided to the workers.					
				Post-mitigation					
			1	2	6	2	3	33	Low

11.2.13 Construction-related Fire Hazards

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Construction-related activities such as making of fire handling of flammable and combustible materials on site	Fire hazard Loss of vegetation	Negative		Pre-mitigation					
			3	1	8	2	4	56	Medium
				Mitigation Measures					
			•	• Reasonable and active steps to avoid increasing the risk of fire on site should be taken; • Fires shall only be allowed in facilities or equipment specially constructed for this purpose. Fires for heating or cooking, e.g. a braai facility, shall only be permitted at an approved designated site at the site camp and shall be away from any flammable stores or combustible materials. Such fires shall be supervised at all times; a fire extinguisher shall be at hand as well as sufficient water to completely douse the fire after use; • Ensure that fires lit by construction staff are only ignited in designated areas and those safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to; • Construction workers must be made to be aware of the risks associated with starting fires on construction sites; • A firebreak shall be cleared and maintained around the perimeter of the camp and office sites; • All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented; and • There will be absolutely no burning of waste on site.				
				Post-mitigation					
			1	2	6	2	3	33	Low

11.2.14 Construction-related Public Safety Issues

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Construction activities involving the movement of construction trucks/vehicles and machinery	Accidents resulting from the movement of construction vehicles and machinery which may result in members of the nearby local community being injured or dying	Negative		Pre-mitigation					
			2	2	8	0	5	60	High
				Mitigation Measures					
			•	• The construction site must be fenced off and community members must not be allowed to loiter within the construction site; • The local community more especially the parents must be encouraged to get involved in making their kids aware of the dangers associated with the construction activities; • Ensure all construction equipment and vehicles are properly maintained at all times; • Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly; • The speed of construction vehicles and machinery must be kept low at 20km/h; and • All excavated areas/trenches must be barricaded to avoid humans and animals from falling into them.				
				Post-mitigation					
			1	2	6	1	2	20	Low

11.2.15 Construction-related Social Well-being Impacts

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Influx of construction workers and their interaction	Possible increase in social pathologies such as crime,	Negative		Pre-mitigation					
			3	3	8	1	3	45	Medium
				Mitigation Measures					

with the local community	HIV/AIDS infections, alcoholism, prostitution and drug use.		•	• Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing; • Fence off all construction sites and control access to these sites; • Liaise with the South African Police Services (SAPS) and existing local community safety structures/systems to ensure that criminal activities are monitored; • Encourage local people to report any suspicious activity associated with the construction sites; • Prevent loitering within the vicinity of the construction sites; • Ensure that an onsite HIV and AIDS policy is in place and that construction workers have easy access to condoms; • Implement HIV / AIDS and alcohol abuse campaigns in the communities; and • The contractor should develop employee wellness and public health programs in collaboration with local municipalities. These could include regular health surveys, educational programs and Voluntary Counseling and Testing (VCT) campaigns**.**					
				Post-mitigation					
			2	2	6	1	2	20	Low

11.2.16 Construction-triggered Loss of a Sense of Place

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Construction activities and the physical intrusion of the project into the	Loss of a sense of place.	Negative		Pre-mitigation					
			2	2	4	2	2	20	Low
				Mitigation Measures					

existing social environment			•	• Ensure that, at all times, people have access to their properties and access to roads is not unnecessarily impacted upon; • Liaise with immediate neighbors to ensure that any of their concerns are recognized and where reasonable are swiftly addressed. Where necessary always provide prompt and clear feedback to them; • In order to minimize visual intrusion paint the buildings in natural colours so that they blend with the surrounding community; • Fencing to the cemetery must be concrete palisade fencing, or something that closely match that in order to minimize visual intrusion of the Monumental Stones at the cemetery; • Soil stockpiles must not be kept too high to be visible from outside the construction site; • Ensure that local activities such as business are not affected negatively by construction activities; and • During construction regularly monitor the effect that the project has on existing infrastructure facilities within the area.						
				Post-mitigation						
			2	2	4	2	2	20	Low	

11.2.17 Construction–related Employment Opportunities

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Interaction of the Developer/Contractor with the local community	Creation of employment opportunities for local	Positive		Pre-mitigation					
			3	2	8	2	5	75	High
				Mitigation Measures					

	people and SMMEs Skills transfer from the contractor to the members of the local community		•	• Local residents from closest communities should be recruited to fill semi and unskilled jobs; • Women should be given equal employment opportunities and encouraged to participate as part of the local labor force; • A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction; • A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase; • Liaise with local community structures (e.g. civic structures) to identify local labor pool; • Prioritize sub-contracting to local SMMEs; and • Consultation with the local communities must ensure that the temporary nature of the employment opportunities is clearly communicated.					
				Post-mitigation					
			3	2	8	2	5	75	High

11.3OPERATIONAL PHASE IMPACTS SITE

11.3.1 Noise Impacts

Activity/Aspect	Impact	Nature	Extent	Duration	Irreplaceable Loss to natural resources	Magnitude	Probability	Significance Points (SP)	Significance
	Noise generated through singing and associated burial rites by mourners during funerals; Moving cars will also generate moderate noise levels.	Negative		Pre-mitigation					
			2	4	0	4	3	30	Low
				Mitigation Measures					
			•	• Funerals are normally held during the day and for a short period, normally not exceeding 3-4 hours, and noise generated is not anticipated to disturb the communities that much; • If funeral has to be held at night, the communities have to be informed, and noise levels have to be kept as low as possible; and • Observe the Municipal By-Laws on Noise at all times.					
				Post-mitigation					
			1	4	1	2	3	24	Low

Burials held at the new cemetery development									

11.3.2 Alien Plant Invasion Risk

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Landscaping and garden services operations Movement of machinery to dig graves brining seeds of alien invasive plants into the cemetery	Risk of alien invasive plants invading the new cemetery development.	Negative		Pre-mitigation					
			1	4	6	2	4	44	Medium
				Mitigation Measures					
			•	• A plan to control the spreading of invasive plants which will include the monitoring of the site and eradication of the invasive must be developed and implemented; • Under no circumstances should alien invasive plant species be planted in the gardens in the new cemetery development; and • Garden maintenance services should be such that it does not use manure and fertilizers that would aid the spread of invasive plant species.				
				Post-mitigation					
			1	4	2	2	3	27	Low

11.3.3 Impacts on Surface and Ground Water Resources

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Operation of the new cemetery development	Water quality may deteriorate as a result of erosion and sedimentation from the cemetery Contamination of watercourses in the catchment and groundwater by fuel and other chemicals from vehicles visiting the cemetery Pollution of surface and ground water resources due to decaying bodies and coffins buried in the cemetery.	Negative		Pre-mitigation					
			2	4	8	2	4	64	Medium
				Mitigation Measures					
			•	• Surface and ground water monitoring regime to be established and implemented to ensure possible water pollution is determined and abated early enough. • A storm water management plan must be developed and implemented at the operational phase on a continuous basis. • An erosion control plan must be developed and implemented at the operational phase on a continuous basis; and • No graves to be erected within a distance of 100 m from any natural drainage channel. • At least a distance of 100m should be mentioned from the fencing to the valley bottom				
				Post-mitigation					
			1	3	4		3	24	Low

11.3.4 Domestic Waste Impacts

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
		Negative		Pre-mitigation					

Behavior of mourners visiting the cemetery development	Littering resulting from throwing away of waste generated by mourners coming to the cemetery.		1	4	6	0	3	33	Medium
				Mitigation Measures					
			•	• Domestic waste generated by mourners should be collected into dedicated waste bins that will be placed all around the cemetery. • It is encouraged that separate colour-coded bins be placed on site to enable waste separate at source; and • All waste collected that cannot be recycled should be disposed of at an appropriately registered municipal landfill site.					
				Post-mitigation					
			1	4	2	1	2	16	Low

11.3.5 Loss of a Sense of Place

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Operation of the cemetery development	Loss of a sense of place. Loss of grazing land by communities	Negative		Pre-mitigation					
			2	4	6	2	3	42	Medium
				Mitigation Measures					
			•	• Buildings must have natural colours so that they blend in well with the surrounding environment; • Buildings to be maintained in good state so as not to result in negative visual impacts; • Ensure that, at all times, people have access to their properties and access to roads is not unnecessarily impacted upon as a consequence of the new cemetery development; • Municipality to allocate alternative grazing land for community members' livestock; and • During operation regularly monitor the effect that the project has on existing infrastructure facilities within the area.					
				Post-mitigation					
			2	2	2	2	2	16	Low

11.3.6 Air Quality Impacts

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance
Grave excavations and unmaintained graves opening up	Digging graves may result in dust, if there are other people in the cemetery at the same time, Also unmaintained graves opening up may lead to unpleasant air quality from decaying bodies	Negative		Pre-mitigation					
			2	4	8	2	4	64	Medium
				Mitigation Measures					
			•	• Proper dust control measures should be applied, where stockpiles of soil are dusty. • Appropriate cemetery maintenance plan should be prepared and enforced by the Local Municipality thought the existence of the facility. • Regular checks and maintenance of graves sites, should be done to prevent issues of possible breaks due to soils and land movements etc.				
				Post-mitigation					
			2	2	6	2	2	12	Low

11.3.7 Traffic Impacts

Activity/Aspect	Impact	Nature	Extent	Duration	Magnitude	Irreplaceable Loss to natural resources	Probability	Significance Points (SP)	Significance

Travelling of mourners to and from the cemetery for funeral services	Traffic Congestion. However, this will be for a short while during the funeral service; and it will mostly happen over weekends when most community members do not go to work, as it is norm in many communities. This could be more severe if more than one funerals is conducted on the same day.	Negative		Pre-mitigation					
			2	4	8	0	3	36	Medium
				Mitigation Measures					
			•	• Access road that is wide enough to ease flow of traffic should be designed and implemented so as not to create unbearable traffic congestion; • Under no circumstances should vehicles of mourners coming to the cemetery restrict access of any public road and use by other road users and immediate community members; • The municipality must schedule burials so as to avoid multiple burials at the same time, by allocating different time slots for different burials whenever possible.					
				Post-mitigation					
			2	2	6	2	2	24	Low

11.3.8 Increase in the Local Economy and Employment Opportunities

Activity/Aspect	**Impact**	**Nature**	**Extent**	**Duration**	**Magnitude**	**Irreplaceable Loss to natural resources**	**Probability**	**Significance Points (SP)**	**Significance**
Operation of the cemetery development	Operation of the cemetery will require workers in various areas such as gardens, security, etc., thereby creating employment opportunities at a local level, The cemetery development will also generate revenues from	Positive		Pre-mitigation					
			4	4	8	1	4		High
				Mitigation Measures					
				Not applicable					
				Post-mitigation					
			4	4	8	2	4	72	High

	sale of graves to communities by municipality, Operation of the cemetery will provide business opportunities to hawkers who could sell flowers to mourners at the cemetery entrance.								

IMPACT ASSESSMENT IMPACTS

Summary of rated impacts

			SITE 258				
			Before Mitigation		After Mitigation		
Activity /Aspect	**Impact**	**Nature**	**Significance Points**	**Sig. Rating**	**Significance Points**	**Sig. Rating**	
Construction Stage							
Impacts on Vegetation			60	Medium	27	Low	
Alien plant invasion			60	Medium	30	Low	
Impacts on Fauna			40	Medium	30	Low	
Impacts on the Stream (Surface Water) and Underground Water			60	Medium	33	Medium	
Soil Impact (Potential erosion)			70		36	Medium	
Heritage Impact			20	Low	16	Low	
Domestic waste impacts			30	Low	12	Low	
Construction waste impacts			36	Medium	10	Low	
Hazardous Materials and Waste Impacts			60	Medium	18	Low	
Dust Impacts			45	Medium	12	Low	
Noise Impacts			27	Low	18	Low	
Health and safety issues workers			70		33	Medium	
Construction related Fire hazards			56	Medium	33	Medium	

Construction related public safety Issues			60	Medium	22	Low	
construction related social well-being			45	Medium	20	Low	
Loss of Sense of space			20	Low	20	Low	
Employment opportunities			75		75		
			49,05882		**26,17647**		
Operational Stage							
Noise Impacts			30	Medium	24	Low	
Alien plant Invasion risks			44	Medium	27	Low	
Impacts on Surface and groundwater resources			64	Medium	33	Medium	
Domestic waste Impacts			33	Medium	16	Low	
Sense of place			42	Medium	16	Low	
Air Quality Impacts			64	Medium	24	Low	
Traffic Impacts			36	Medium	24	Low	
Local Economic Opportunities			64	Hish	72	High	
			47,875		**29,5**		
			0				

12. ENVIRONMENTAL MANAGEMENT STATEMENT

Below is a summary of the key issues discussed herein this report for the proposed site.

The Proposal /Preferred Site

Biophysical environment

The proposed development at the initial stages will result in the clearing of vegetation cover on sections of the proposed site for the construction of the internal roads, packing, and ablution facilities. The remaining sections of the site will be removed gradually during usage of the cemetery. Though the vegetation in the area is noted not to be pristine due to the usage of the site from previous cultivation has resulted in the transformation of the original vegetation, thereby reducing the severity of any potential loss of indigenous vegetation. The regrown grassland, however, still serves as good cover for the topsoil.

Generally, the clearing of vegetation or land cover is likely to result in the exposing of land and possible surface runoff pollution. This can be mitigated by implementing appropriate stormwater management strategies, including proper channelling of the stormwater during construction and operational phases.

Other impacts that were identified, for the construction phase are noted to be mitigatable. Noise and dust, and oil spillage can be mitigated by avoiding and managing the occurrences. Impacts during the construction stage may be short term and may end when construction is completed.

Operational stage impacts on the natural environment can also be mitigated if proper strategies are put in place. The possibility of mitigating these impacts reduces their significant levels considerably, and largely to low significance.

This therefore infers the need to take the recommendations made herein and in all applicable regulations and guidelines seriously. Impacts such as aesthetic views, will be altered and be irreversible in the long run as long as the cemetery remains, but given that no critical resources will be lost in the process, this impact is considered medium to low. In addition, the easy accessibility of the cemetery to all ages of people, especially the elderly makes the location more desired by the community.

A synoptic view of the environment in terms of biodiversity, on the physical site and relevant biodiversity literature and databases and as assessed herein, does not reveal any critical biodiversity features that are located within the development boundaries or environments. It is therefore concluded that the development as proposed can be implemented with necessary conditions and care.

Socio economic impacts during the construction stage will include employment opportunities, for both labours and suppliers of construction materials. The spiral effect of these will contribute to the improvement of economic activities during this period.

During operational stage, the municipality and the communities at large will benefit tremendously by having a place to bury their loved ones, without having to travel long distances. The municipality will also succeed in satisfying its service delivery mandate to its people, by providing a critical infrastructure such as a cemetery.

From this assessment, it is observed that most of the negative impacts can be readily mitigated. Also, the positive impacts from the proposed development far outweigh the identified negatives (if properly

mitigated). A no go alternative may therefore be unwarranted, given the absence of fatal flaws with the proposed development on this farm.

12.1 No-go alternative (compulsory)

The No-development option will mean that the anticipated effects or impacts of the development will not occur, and the status quo will remain or even worsen as the need for burial places increases. All the envisaged construction stage impacts, such as dust, noise and so forth will not occur as a result of the proposed development. Instead, the site will remain as it is, and the municipality will have to find another place to establish the cemetery or not establish a cemetery at all.

Given the criticality and urgency of the situation in Leeudonringstad, this no go option may result in delays and possibly social unrests as the community may be forced to demand this service from the municipality, to have a suitable burial site, if a suitable alternative is not found. Also, the no-go alternative also implies that, the land will continue to lie fallow, and at best be used for small scale grazing or whatever needs may be found for it.

The fact that there are informal settlements in proximity may also pose the treat of it being invaded. The proposed development is rather an opportunity to plan and properly protect the critical biodiversity corridors in the surrounding areas as per the CBA Mapping. Natural vegetation labeled as critically endangered still exists on the immediate outskirts of the development footprint and should be protected by not degrading any areas especially within the valley lines between the hills.

From a socio-economic perspective, the no-development option may rather avert the potential cultural and social economic benefits that were envisaged. From this perspective, it can be asserted that the potential positive impact far outweighs the envisaged negative impacts; hence a no-go alternative may not be necessary, given that no fatal flaws have been identified during this assessment.

13.CONCLUSIONS

13.1 The impact assessment and significance rating show that the construction state impacts and operational stage impacts are of medium significance. Construction stage impacts for the site total an overall mean of 47.88 prior to mitigation and can be further reduced to 29.5 out of 100. After mitigation measures are implemented.

13.2 The purpose of this report is to provide an overview of the assessment undertaken; taking potential impacts into account, to give an environmental impact statement in summarising what impact that the proposed activity and its alternatives may have on the environment. After taking into consideration management and mitigation of the potential impacts identified with specific

reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts, it is generally established that the proposed development of cemetery on Erf on the proposed site in Leeudonringstad is largely feasible. Impacts identified can be avoided in most cases or mitigated to reduce any negative effects.

13.3 It is therefore concluded that, the site be considered as the most suitable, provide the necessary precautionary measures are taken to safeguard the environment. If all recommendations and mitigation measures advised in this report and in the specialist, reports accompanying, the proposed development should yield more positive impacts compared to negative ones.

13. RECOMMENDATION OF EAP

Considering that the majority of the negative impacts that have been identified for the proposed Development of Cemetery in Leeudonringstad have been assessed to be of medium significance and can be reduced to low significance levels by implementing the mitigation measures of potential impacts identified and also the positive impacts that will arise from this project which is of socio-economic importance to the municipality and the broader North West outweigh the negative impacts, it is our opinion that the establishment of the cemetery be allowed to proceed.

It is therefore recommended that the application for the Environmental Authorization for the proposed Development of cemetery in Leeudonringstad in the Maquassi Hills Local Municipality can be granted subject to the following recommended general conditions:

a. Though vegetation on the site itself is transformed due to agricultural activities, site is surrounded pristine indigenous vegetation especially between the site boundary and the drainage lines within the valleys. Key mitigation measures proposed should be strictly adhered to, specifically,
b. At least 30m to 100m buffer of vegetation should be maintained around the fencing of the cemetery and the valley system to serve as stormwater attenuation mechanism.
c. Also, vegetation cover within the buffer zones should be left untouched so as to serve as flood attenuation mechanism during usage of the cemetery, when ground cover is being removed gradually.
d. In addition to the fencing recommended, trees are recommended to be planted at the edge of the cemetery, to reduce aesthetic and visual impacts of the graves, and make the facility look more like a garden set up.
e. Though a lined pit latrine (with Sock-away) is proposed as alternative sanitation to the existing sewer system in Leeudonringstad, The Maquassi HIlls Municipality should consider resolving the larger sanitation issue in consultation with Dr KK Municipality and other stakeholders, for a long-term sustainable solution to the sewage system issues, as indicated by the Department of Water and Sanitation.
f. A maintenance plan should be provided and to accompany the established cemetery in general.
g. Maquassi Hills Municipality should assume responsibility of overseeing the maintenance or appoint a suitable service provide to maintain the establishment, to ensure all environmental standards are complied with. Evidence of this commitment should be provided on acceptance of the EA.

h. All operational stage recommendations should be adhered to, as the municipality is expected to take responsibility of maintaining the cemetery and supervise the safe and acceptable operation, even if a service provider is appointed to do so, should there be no internal capacity.

i. The EMPr compiled for the proposed project must be implemented, prior to the commencement of any construction activity,

    j. An independent Environmental Control Officer (ECO) must be appointed to monitor the implementation of the conditions in the Environmental Authorization and the recommended mitigation measures in the EMPr during construction. The Compliance section of the competent authority will monitor the operational stage compliance issues.

14. REFERENCES

Aucamp, P J. (2010). *Environmental Impact Assessment: a practical guide for the discerning practitioner*. Van Shaik Publishers.

Mucina, L., & Rutherford, M. C. (2006). The Vegetation of South Africa, Lsotho and Swaziland. *Strelizia, South African National Biodiversity Institute*, *19*.

SANBI. (2016). North West Systmatic Conservation Plan (KZNSCP) : KZNSCP Vegetation types. Retrieved September 30, 2019, from http://bgis.sanbi.org/Projects/Detail/39

15. APPENDIXES

APPENDIX A- SITE PLANS AND LOCALITY MAPS

APPENDIX B-SITE PHOTOGRAPHS

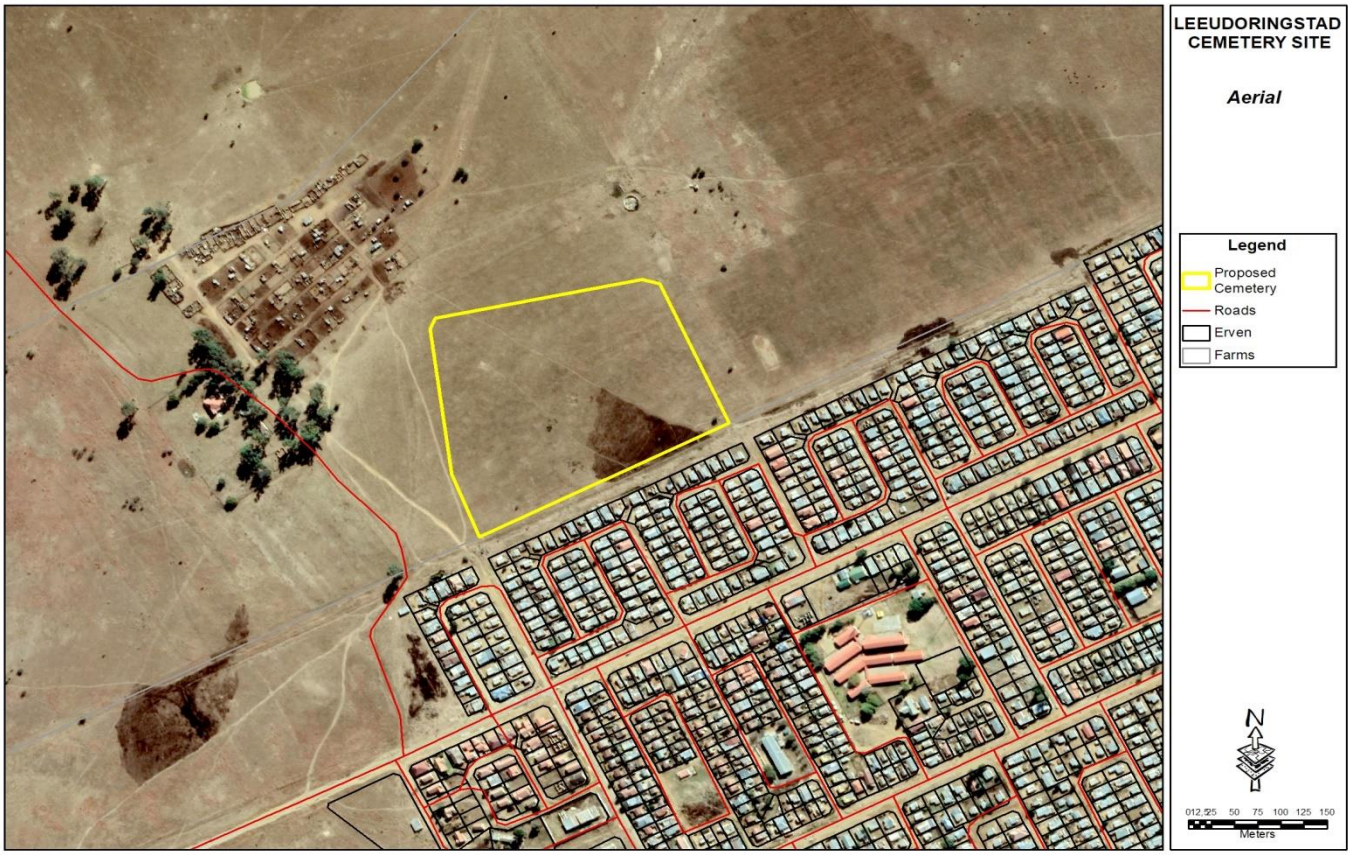
APPENDIX C- FACILITY ILLUSTRATIONS

APPENDIX D- PUBLIC PARTICIPATION INFORMATION

APPENDIX E: SPECIALIST REPORTS

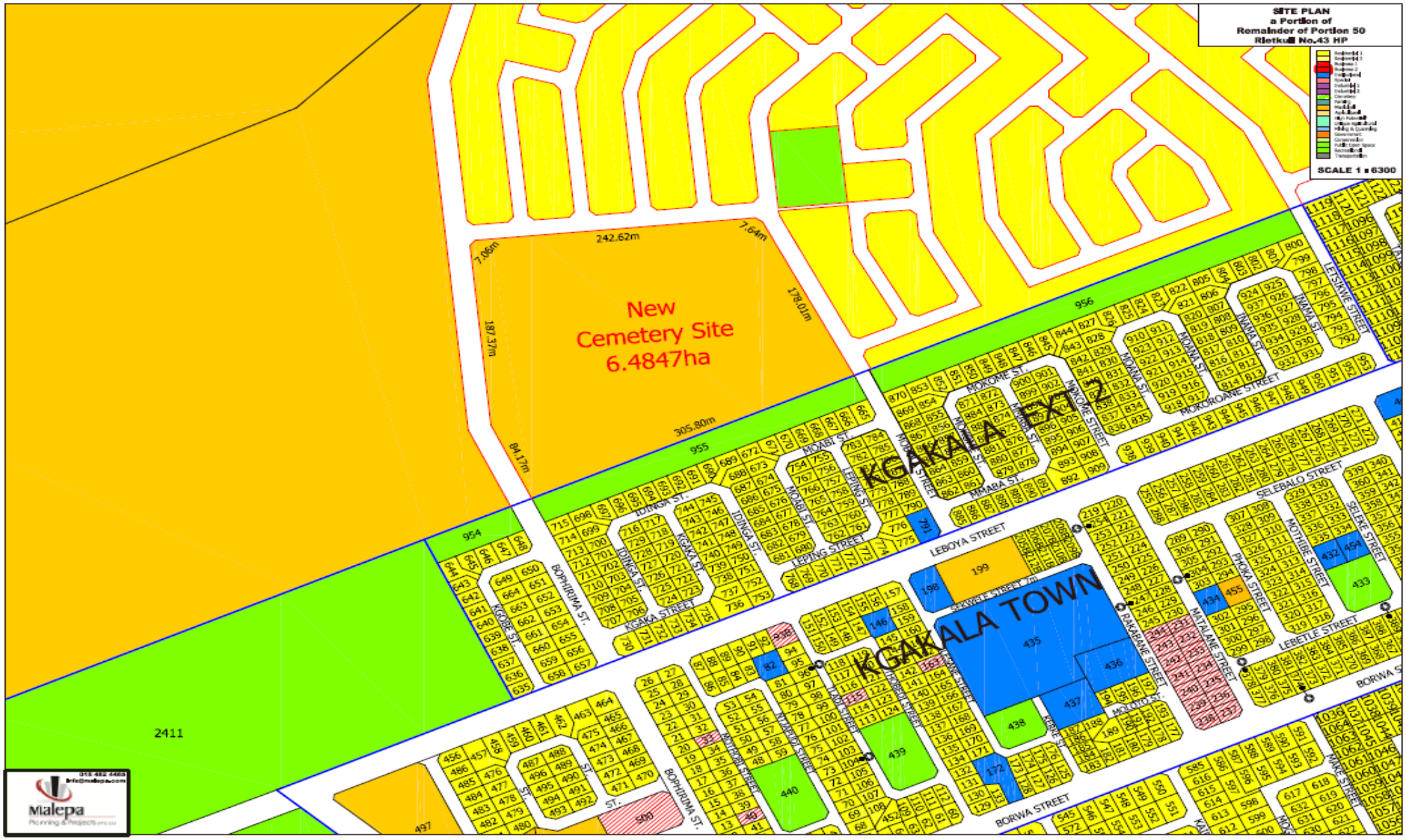
APPENDIX F: EMP

Access road to the site

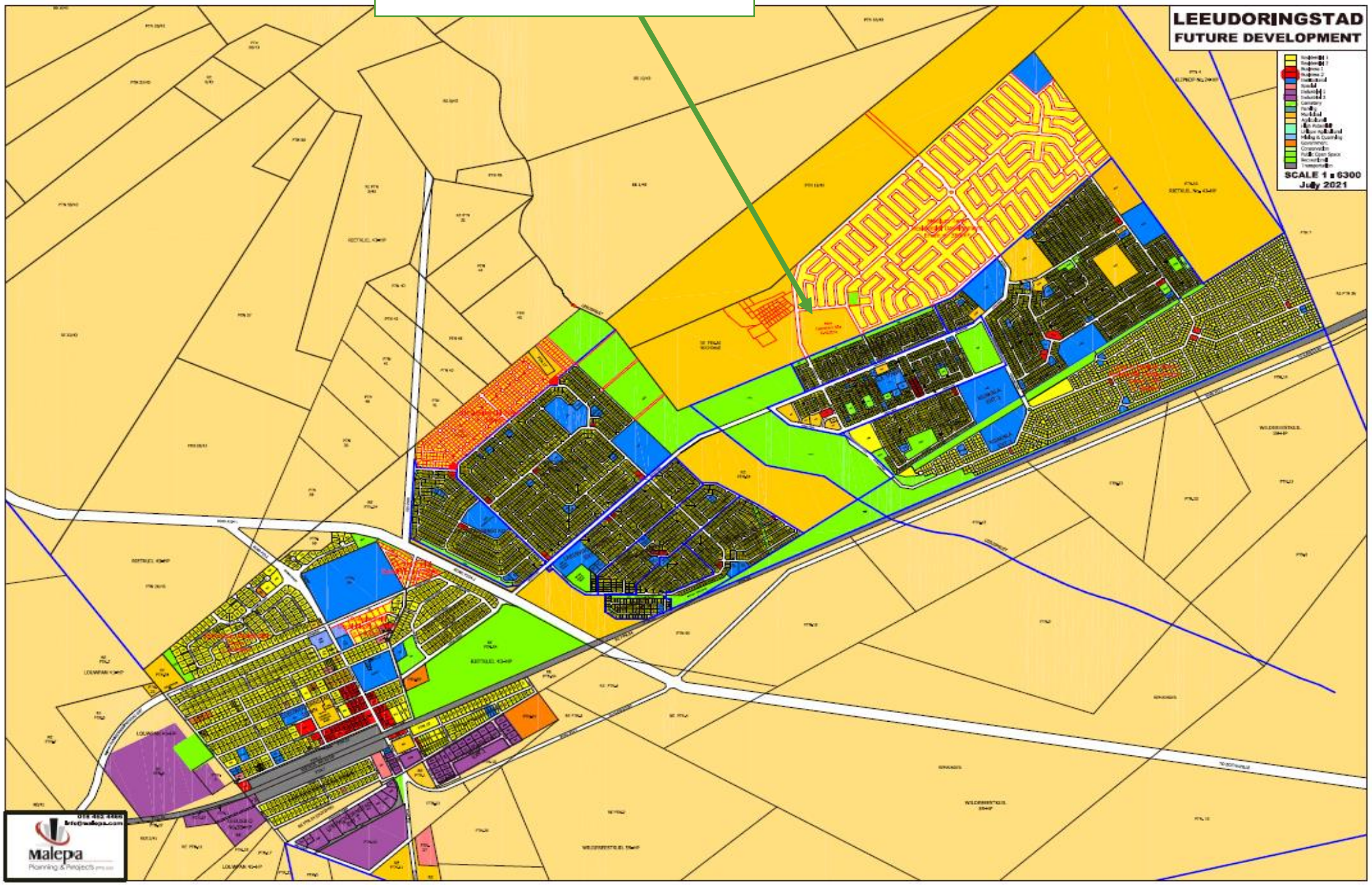


16. Site Plans (Locality Map)

17. Facility Illustration



SITE within the Leeurodingstad master Development Plan



18. Site Photographs

Public Participation Report

Basic Assessment Process for
Leeudonringstad Cemetery Establishment

Appendix 1: Public Participation report

19. PUBLIC PARTICIPATION

This section is a summary of the public participation process and activities undertaken so far for the basic assessment process. The public participation process undertaken was for the gathering of relevant information and identification of issues at preliminary stages, to enable the compilation of this draft report. Initial soliciting of community input was done through direct engagements with local communities in various wards within Leeudonringstad. Further public participation will be undertaken now where the draft report and all the findings of the specialist studies, and issues identified and assessed and mitigation measures proposed will be made available for public comments by all registered interested and affected parties, and government stakeholders. The details of each process are elaborated in this section.

19.1 PUBLIC ADVERTISEMENT

19.1.1 Site notices

Site notices were placed on the site. Also, public notices were placed on the municipality public notice board to inform the community further and solicit for any comments. Photographs of the site notices are shown in Figure 1.

19.1.2 Newspaper advertisement

Newspaper advertisement is being placed in the local newspaper in Leeudonringstad about the proposed development as part of the 30-day public participation upon the submission of the application. The copy of this advert and any comments received will be incorporated into the final report before submission.

19.1.4 Community Engagement

Background Information was prepared and forms the basis of the presentations to the community. The BID was distributed to the households door to door who live close to the proposed site. The distribution list is attached to appendix E3. No issues were raised by the community from this process. Verbal interaction with community members indicates general consensus and agreement to the need for a new cemetery in the area. No further issues were received from the community.

19.1.5 Comments from stakeholders

Draft report will be circulated to key stakeholders and comments received will be included there in the final BAR.

PUBLIC PARTICIPATION ATTACHMENTS

i. Site Notice and site notice photographs

ii. Newspaper advertisement

Iii. Background Information Document (BID), and Distribution List

i.

PUBLIC NOTICE

LEEUDORINGSTAD CEMETERY ESTABLISHMENT

Dr Kenneth Kaunda District Municipality NW

Maquassi Hills Local Municipality.

ENVIRONMENTAL SCOPING AND IMPACT ASSESSMENT PROCESS (EIA)

INTRODUCTION

Maquassi Hills Local Municipality intends to undertake the construction of a cemetery to argument the severe needs of a functional cemetery to serve its population. This forms part of its critical infrastructure provision and commitment to service delivery as the municipality does not have a formal cemetery within its jurisdiction. The recent increase in death as a result of the corona virus outbreak further exerts pressure and also highlights the critical need for a working cemetery.

As part of the planning process, Malepa Planning is appointed engaged in association with Bizycon Pty Ltd and other specialists to critically assess suitable sites for the cemetery establishment. In terms of the Listing Notice 1 (GNR 983) of the EIA regulations as promulgated in December 2014 and as subsequently amended 2017, the establishment of any cemetery of extent of 2500 square meters or more is a listed activity for which an environmental authorisation should be obtained prior to the commencement of the activities identified as listed. For this Activity, GNR 982 prescribes a Basic Assessment Process (BA) towards obtaining environmental authorisation in Terms of Section 24D of the National Environmental Management Act, NEMA (Act 107 of 1998). Basic Assessment EIA Process is undertaken in such a manner that the environmental outcomes, impacts and residual risks of the proposed Listed Activity being applied for are noted in the BA Report and assessed accordingly as per the requirements of the BA process as noted in the Chapter 4 of GNR 982.EIA Regulations (2014), as amended.

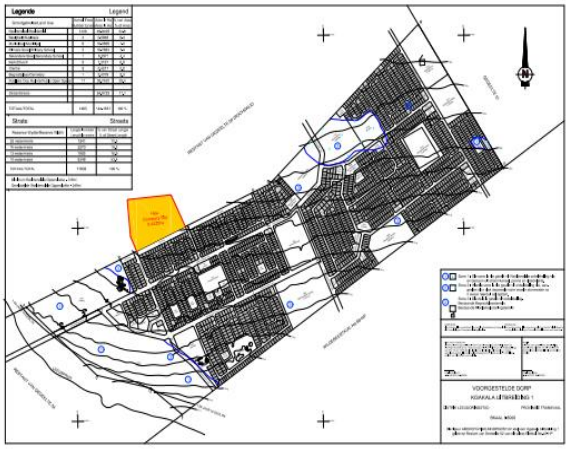
All Interested and Affected Parties (I&APs) may submit their names, contact details and written interest or comments relating to the above development to the contact persons given below within 30 days of the date of publication of this advertisement.

Openbare kennisgewing

Die Basiese Assesseringsproses (OIE) word deur Bizycon (Edms) BPK uitgevoer en die aansoek om goedkeuring vir die projek sal aan die Departement van Ekonomiese Ontwikkeling, Toerisme en Omgewing by DEDECT gestuur word. Alle relevante en relevante entiteite (I &aPs) kan binne 30 dae hul name, kontakbesonderhede en skriftelike belangstelling of kommentaar rakende bogenoemde ontwikkelings aan die onderstaande kontakte stuur.

Tsebiso ya Setjhaba

ya Tshebetso ya Tekolo ya Motheo (EIA) e etswa ke Bizycon (PTY) LTD mme kopo ya tumello bakeng sa porojeke e tla romelwa Lefapheng la Ntshetsopele ya Moruo, Bojanala le Tikoloho NW DEDECT. Ditheo tsotlhe tse di maleba le tse di maleba (I&aPs) di ka romela maina a tsona, dintlha tsa kgokagano le dikgatlhego tse di kwadilweng kgotsa ditshwaelo tebang le ditlhabololo tse di fa godimo mo dikopanyi tse di tlhalositsweng fa tlase mo sebakeng sa malatsi a le 30.



CONTACT DETAILS:

BIZYCON PTY LTD **Tel:** 0724641197 **Fax** 086 7763325 Email: bizycon@live.co.za Mr MacCarthy Honu-Siabi:

Figure 1.1 Site notice with a local participant

Figure 1.2 site notice

ii.Newspaper Advertisement

Swemmers maak Klerksdorp trots

Klerksdorp Rekord, Klerksdorp - Klerksdorpse swemmers met verstandelike gestremdheid het gedurende die Paasvakansie aan die 2023 SASAII Kortbad Ope Swemkampioenskappe in Rustenburg deelgeneem.

Die swemmers, almal kliënte van Triest Opleidingsentrum en Daphne Lee Sentrum, oefen in die swembad by Curro Klerksdorp.

Volgens Igna Steyn, afrigter, het die Noordwesters besonders goed gevaar in die kompetisie en tweede geëindig. Die mans aflosspan en die gemengde aflosspan het hul items gewen.

Die Noordwes span het 58 medaljes ingesamel waarvan 26 deur Klerksdorp swemmers verower is.

Die swemmers van Klerksdorp was: Shaun Combrink (Daphne Lee) met 2 silwer en een brons medalje, Lourette Seyffert (Triest) met 3 goue, 3 silwer en 1 brons medalje, Leanette Nortje (Triest) met 2 silwer medaljes, Annemarie Flemming (Triest) met 4 silwer en 3 brons medaljes en Jade Plescia (Triest) met 4 silwer en 3 brons medaljes.

"Dit was 'n groot voorreg om met hierdie groepie swemmers te werk en saam met hulle die goeie resultate te vier. Sonder die toestemming van Riaan van Rensburg om die Curro swembad gereeld te gebruik sou ons swemmers nooit die podium bereik het nie," sê Igna.

Lourette Seyffert ontvang 'n goue medalje vir 200m rugslag.

Jade Plescia, Leanette Nortje, Lourette Seyffert, Annemarie Flemming en Shaun Combrink met hulle medaljes en die twee trofeë wat die NW span ontvang het.

GEREGTELIKE KENNISGEWINGS

LEGAL NOTICES

(VERVOLG VAN P16)

PUBLIC NOTICE: MAQUASSI HILLS LOCAL MUNICIPALITY TOWNSHIP ESTABLISHMENT FOR EXT 21 HOUSING PROJECT ON PORTION 2 OF WOLMARANSSTAD TOWN AND TOWNLANDS, 184HO AND EIA FOR ESTABLISHMENT OF NEW CEMETRY IN KGAKALA EXT 2 SETTLEMENT IN LEEUDORINNGSTAD ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (EIA)- BASIC ASSESSMENT PROCESS

NOTICE is hereby given in terms of the regulations published in Government Notice No. GNR 38282 of June 2017 as amended, under the National Environmental Management Act (Act No. 107 of 1998) of the intent to carry out the following activities:

1. Maquassi Hills Local Municipality intends to undertake a housing development on Per-tien 2 of the Townland Wolmaransstad. This will include the establishment of about 30 medium to high income serviced stands for qualifying beneficiaries. The site is about 1.6ha in extent, is occupied, undeveloped, but degraded indigeneous grassland. This falls within listed activity of removing 1 or more ha of indigeneous vegetation, for which Basic Assessment EIA process is required according to Activity 27 of GNR 327 of 2017.

Potential impacts include removal of vegetation and loss of land cover, dust and noise during construction, all of which can be fully mitigated. Positive impacts include availability of additional housing infrastructure to citizens, and a step to use the site for illegal dumping of waste, robbery and petty crimes committed on the site, because it is vacant and bushy. The development will also generate temporal employment for locals during construction.

2. The Municipality also intends to undertake establishment of a new cemetery and associated infrastructure, including internal roads, ablusen facilities in Kgakala Ext 2 in Leeudoringstad to augment the currently full existing cemeteries in the area. This also triggers Activity 23, the development of Cemetery of 2500m2 or more, and 27, the clearance of indigeneous vegetation of more than 1ha but less than 20ha.

The site is about 6.5ha. Positive benefits will include availability of cemetery to the community as part of critical infrastructure and service delivery. Local suppliers will also gain some business during the establishment. Potential negative impacts include loss of grassland and aesthetic view obstruction which can be mitigated by fencing and planting of trees around the cemetery.

All Interested and Affected Parties (I&APs) may submit their names, contact details and written interest or comments relating to any of the above developments to the contact persons given below within 30 days of the date of this advertisement.

BiZYCON (PTY) LTD. Mr MacCarthy Henu-Siabi. Tel: 072 484 1197. Fax: 086 776 3325. Email: maccarthy@developmentimpact.co.za.

K13 21/04

LOST TITLE DEED

NOTICE is hereby given in terms of Regulation 68 of the Deeds Registries Act, 1937, of the intention to apply for the issue of a certified copy of Deed of Transfer T37472/2010, passed by LITTLE SWIFT INVESTMENTS 1000 PROPRIETARY LIMITED, Registration Number 2005/002384/07, in respect of Erf 25, Stilfontein Township, Registration Division I.P., Province North West, measuring 901 (nine hundred and one) square metres, which has been lost or destroyed.

All interested persons having objections to the issue of such copy are hereby required to lodge the same in writing with the Registrar of Deeds, Pretoria within two weeks from the date of the publication of the notice.

JASSAT MITCHELL ATTORNEYS. Ref: RJETTE/AC5384.

K14 21/04

Vacancies

PUBLIC NOTICE

MAQUASSI HILLS LOCAL MUNICIPALITY

TOWNSHIP ESTABLISHEMENT FOR EXT 21 HOUSING PROJECT ON PORTION 2 OF WOLMARANSSTAD TOWNSAND TOWNLANDS, 184HO AND EIA FOR **ESTABLISHMENT OF NEW CEMETERY IN KGAKALA EXT 2 SETTLEMENT IN LEEUDORINGSTAD**.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (EIA)- BASIC ASSESSMENT PROCESS

Notice is hereby given in terms of the regulations published in Government Notice No GNR 38282 of June 2017 as amended, under the National Environmental Management Act (Act No. 107 of 1998) of the intent to carry out the following activities:

1. Maquassi Hills Local Municipality intends to undertake a housing development on Portion 2 of the Townland Wolmaransstad. This will include the establishment of about 30 medium to high income serviced stands for qualifying beneficiaries. The site is about 1.6ha in extent, is occupied undeveloped but degraded indigenous grassland. This falls within listed activity of removing 1 or more ha of indigenous vegetation, for which Basic Assessment EIA process is required, according to Activity 27 of GNR 327 of 2017. Potential impacts include removal of vegetation and loss of land cover, dust and noise during construction, all of which can be fully mitigated. Positive impacts include availability of additional housing infrastructure to citizens, and a stop to using the site for illegal dumping of waste, robbery and petty crimes, committed on the site because it is vacant and bushy. The development will also generate temporal employment for locals during construction.

2. The Municipality also intend to undertake establishment of a new cemetery and associated infrastructure, including internal roads, ablution facilities in Kgakala Ext 2 in Leeudoringstad, to augment the currently full existing cemeteries in the area. This also triggers Activity 23, the development of Cemetery of 2500m2 or more, and 27, the clearance of indigenous vegetation of more than 1ha but less than 20ha. The site is about 6.5ha. Positive benefits will include availability of cemetery to the community as part of critical infrastructure and service delivery. Local suppliers will also gain some business during the establishment. Potential negative impacts include loss of grassland and aesthetic view obstruction which can be mitigated by fencing and planning of trees around the cemetery.

All Interested and Affected Parties (I&APs) may submit their names, contact details and written interest or comments relating to any of the above developments to the contact persons given below within 30 days of the date of this advertisement.

BIZYCON PTY LTD Mr MacCarthy Honu-Siabi: **Tel:** 0724641197 **Fax** 086 7763325 Email: maccarthy@developmentimpact.co.za

LEEUDORINGSTAD CEMETERY ESTABLISHMENT

MAQUASSI HILLS LOCAL MUNICIPALITY **Dr Kenneth Kaunda District Municipality NW**

BASIC ASSESSMENT PROCESS

BACKGROUND INFORMATION DOCUMENT (BID)

BACKGROUND

Maquassi Hills Local Municipality intends to undertake the construction of a cemetery to argument the severe needs of a functional cemetery to serve its population. This forms part of its critical infrastructure provision and commitment to service delivery as the municipality does not have a formal cemetery within its jurisdiction. The recent increase in death as a result of the corona virus outbreak further exerts pressure and also highlights the critical need for a working cemetery.

As part of the planning process, Malepa Planning is appointed engaged in association with Bizycon Pty Ltd and other specialists to critically assess suitable sites for the cemetery establishment. In terms of the Listing Notice 1 (GNR 983) of the EIA regulations as promulgated in December 2014 and as subsequently amended 2017, the establishment of any cemetery of extent of 2500 square meters or more is a listed activity for which an environmental authorisation should be obtained prior to the commencement of the activities identified as listed. For this Activity, GNR 982 prescribes a Basic Assessment Process (BA) towards obtaining environmental authorisation in Terms of Section 24D of the National Environmental Management Act, NEMA (Act 107 of 1998). Basic Assessment EIA Process is undertaken in such a manner that the environmental outcomes, impacts and residual risks of the proposed Listed Activity being applied for are noted in the BA Report and assessed accordingly as per the requirements of the BA process as noted in the Chapter 4 of GNR 982.EIA Regulations (2014), as amended.

The outcome of the BA process is to provide the Competent Authority, DEDECT with sufficient information to provide a decision on the application in terms of Environmental Authorization (EA).

DESCRIPTION OF THE PROPOSED PROJECT SITE

The proposed development entails the establishment of a public cemetery and associated infrastructure, including internal roads, ablution facilities. The area is said to not have a formal licensed cemetery site though there is growing demand for such a service for the town.
Specifically, the development is to entail the following:

- the establishment of a cemetery with sections for children and adult graves
- The site proposed for the cemetery development is about 6.5ha in extent,
- 10m wide internal road loop will be established within the development footprint to allow movement through the site.
- Access to the site is through Kgakala Ext 2 Settlement in Leeudoringstad. As per the current layout of the cemetery, (Figure 2), the facility dimensions are illustrated in table 1.

The Cemetery and associated infrastructure will include:

- Adult and child grave sites
- Parking for vehicles.
- Boundary fencing.
- Entrance gate.
- Guard house.
- Ablution facilities.
- Paved internal roads and walkways within the section demarcations and
- Within the section demarcations and
- Storm water management infrastructure

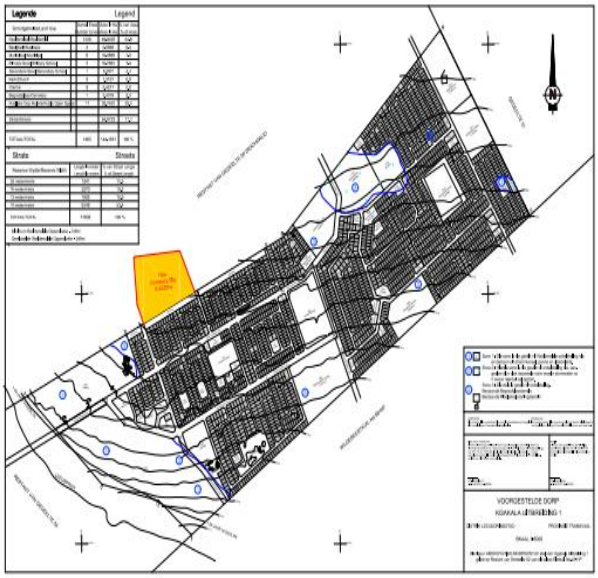
Environmental Process & Considerations

This triggers activities within Listing Notice 1 of GNR 983, of the National Environmental Management Act (Act 107 of 1998) for which environmental authorisation is required. A full Environmental Impact Assessment (EIA) process is being undertaken by Bizycon (PTY) LTD and an application for authorisation for this project will be submitted to the North West Department of Economic Development, Tourism & Environmental Affairs (EDTEA).

All Interested and Affected Parties (I&APs) may submit their names, contact details and written interests or comments relating to the above development to the contact persons given below within 30 days of the date of publication of this advertisement.

Your involvement

Environmental Assessment plays a vital role to ensure that it provides the necessary and adequate information on which to base the decision of whether to grant environmental authorisation on the anticipated project. This environmental approval will also give information on whether and if yes under which conditions the authorisation will be granted. There are numerous stakeholders that are involved from entirely different sectors, and each contributes towards a desirable conclusion. Your remarks, if any, will enhance all appropriate concerns or appraisals that are assessed in the EIA. You are therefore encouraged to fill in the enclosed registration/comment form or write a letter, call, and email or send a fax to the EAP on the following contacts **in case you want to comment** on the proposed development. If you have no comments, then you do not need to do anything. After 30 days, if no comments are received, we shall take it you do not have any



Openbare kennisgewing

Die Basiese Assesseringsproses (OIE) word deur Bizycon (Edms) BPK uitgevoer en die aansoek om goedkeuring vir die projek sal aan die Departement van Ekonomiese Ontwikkeling, Toerisme en Omgewing by NW DEDECT gestuur word. Alle relevante en relevante entiteite (I &aPs) kan binne 30 dae hul name, kontakbesonderhede en skriftelike belangstelling of kommentaar rakende bogenoemde ontwikkelings aan die onderstaande kontakte stuur.

Tsebiso ya Setjhaba

ya Tshebetso ya Tekolo ya Motheo (EIA) e etswa ke Bizycon (PTY) LTD mme kopo ya tumello bakeng sa porojeke e tla romelwa Lefapheng la Ntshetsopele ya Moruo, Bojanala le Tikoloho NW DEDECT. Ditheo tsotlhe tse di maleba le tse di maleba (I&aPs) di ka romela maina a tsona, dintlha tsa kgokagano le dikgatlhego tse di kwadilweng kgotsa ditshwaelo tebang le ditlhabololo tse di fa godimo mo dikopanyi tse di tlhalositsweng fa tlase mo sebakeng sa malatsi a le 30.

REGISTRATION AND COMMENT FORM

Accompanying Background Information Document

Should you have any comments regarding the proposed project, please complete and send the attached comments sheet to either of the following contact person?

Mr Maccarthy Honu-Siabi

Tel: Cell: 081 047 0096, Fax: 086 776 33 25
Email: bizycon@live.co.za maccarthy@developmentimpact.co.za

TITLE		**FIRST NAME**	
INITIALS		**SURNAME**	
ORGANISATION/TOWN		**E MAIL**	
POSTAL ADDRESS			
TEL NO.		**POSTAL CODE**	
CELL		**FAX NO.**	

REGISTRATION AS AN INTERESTED OR AFFECTED PARTY (I&AP) (Please circle applicable box)

Please formally register me as an interested and affected party so that I may receive further information and notifications during the EIA process	YES	NO
I would like my notification by	Letter (mail)	
	E Mail	
	Fax	
	Telephone	
In terms of the **GNR 982 (EIA process regulations)** I disclose below any direct business, financial, personal or other interest that I may have in the approval or refusal of the application.		

COMMENTS (you may use a separate sheet if you so wish)

I have no objections to the proposed development. My reasons are

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I support the proposed development. My reasons are:

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I object to the proposed development. My reasons are:

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Other I&APs to be contacted are:

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.....
.....

iv. Signed Attendance registers from community engagements /meetings

v. Interested and affected parties register

BID DISTRIBUTION LIST

LEEUDORINGSTAD CEMETERY ESTABLISHMENT

MAQUASSI HILLS LOCAL MUNICIPALITY Dr Kenneth Kaunda District Municipality NW

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

(Basic Assessment)

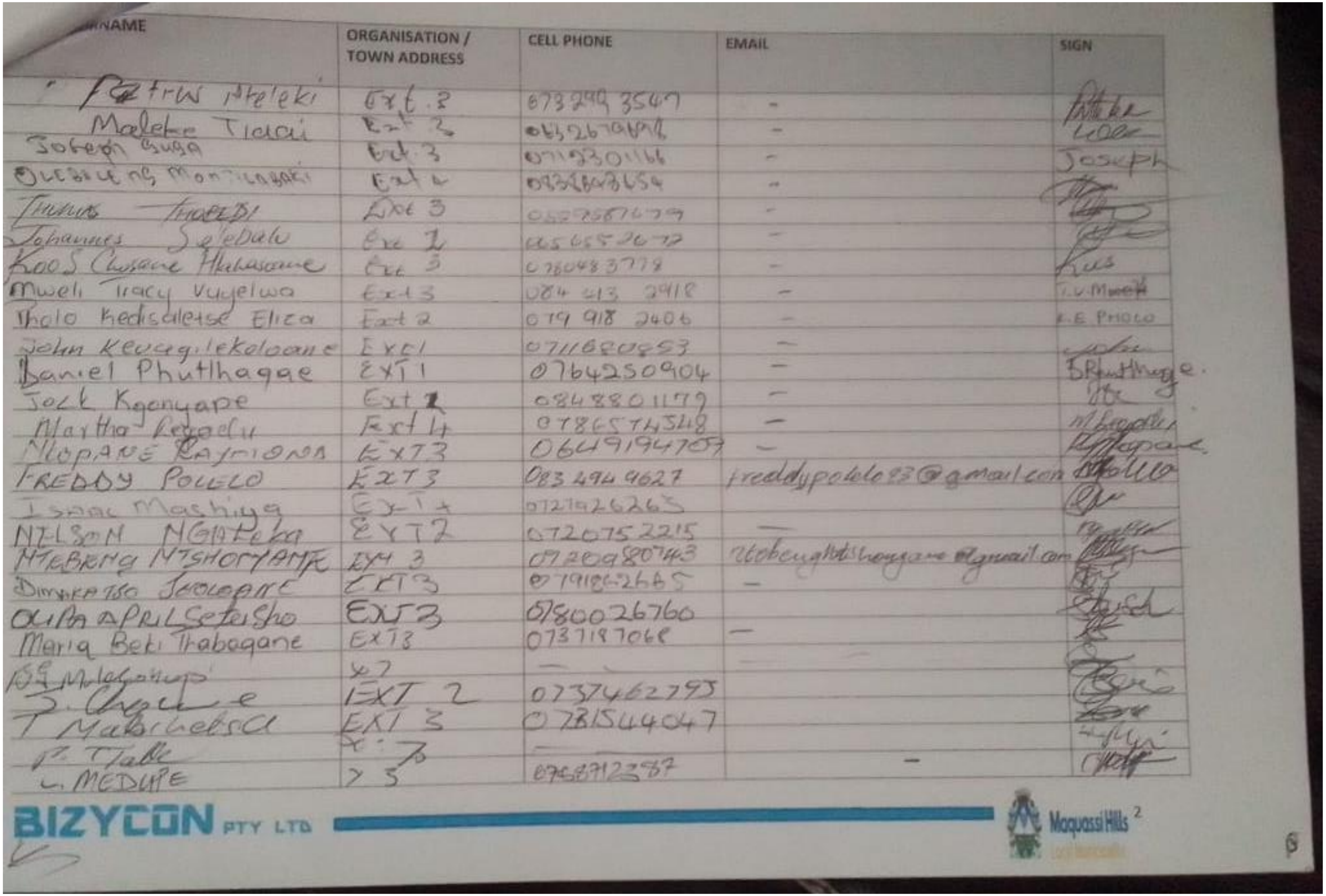
BACKGROUND INFORMATION DOCUMENT (BID)

BID DISTRIBUTION LIST

NAME & SURNAME	ORGANISATION / TOWN ADDRESS	CELL PHONE	EMAIL	SIGN
Outata Selebalo	ward committee Leeudoring	0767957706	—	[signature]
Thabo Z Mokgele	ward councillor Bgabela	079 798 7292	—	[signature]
Martha Mongale	Ext 1	0765815775	—	G.M. Mongale
Boitumelo Sekhele	Ext 1	0822671357	—	[signature]
Sarah Mongale	Ext 1	0725506769	—	SARAH
Mike Pitso	Ext 1	—	—	[signature]
Olerato Mongale	Ext 1	071 0660822	—	[signature]
Kutlego Malebadi	Ext 1	0810793978	—	K.S Malebadi
Mampho Mualefe	Ext 1	063 554 5212	—	M. Mualefe
Gabriel Sizani Sehuma	Ext 1	0765290660	—	[signature]
Sabane B. Menyatso	Ext 1	0855067490	—	SB Menyatso
Babili Maleshane	Ext 1	0655393085	—	[signature]
Lebogang Diphoko	Ext 1	0783506087	—	[signature]
Sello Kgo'angyane	Ext 1	0756123396	—	[signature]
Martha Mthombeni	Ext 1	0762636263975	—	Martha
Kedumetse Selete	Ext 1	0717657866	—	[signature]

BIZYCON PTY LTD

Maquassi Hills Local Municipality 1



NAME & SURNAME	ORGANISATION / TOWN ADDRESS	CELL PHONE	EMAIL	SIGN
Patrw Ateleki	Ext. 3	073 299 3547	-	
Maleke Tiaai	Ext 3	0632679498	-	
Joseph Guga	Ext 3	0719330166	-	Joseph
Olebileng Montlabaki	Ext 4	0832848654	-	
Thomas Thaedi	Ext 3	0527587679	-	
Johannes Selebalo	Ext 1	0656552672	-	
Koos Cusane Hlahasome	Ext 3	0780483778	-	
Mweli Tracy Vuyelwa	Ext 3	084 413 2918	-	T.V. Mweli
Tholo Kedisaletse Eliza	Ext 2	079 918 2406	-	K.E. Tholo
John Keuagilekoloane	Ext 1	0711680853	-	
Daniel Phuthhagae	EXT 1	0764250904	-	B Phuthhagae
Jock Kganyape	Ext 2	0848801179	-	
Martha Regadu	Ext 4	0786574548	-	
Mlopane Raymond	EXT 3	0649194707	-	
Freddy Polelo	EXT 3	083 494 9627	freddypolelo93@gmail.com	
Isaac Mashiya	Ext 4	0727926263		
Nelson Ngateka	EXT 2	0720752215	-	
Ntebeng Ntshonyane	Ext 3	0720980743	ntebenghutshonyane@gmail.com	
Dimakatso Seoloane	EXT 3	0791862685	-	
Ouma April Setlaisho	EXT 3	0780026760		
Maria Beki Thabagane	EXT 3	0737187068	-	
BE Molefatsup	x7	—		
S. Chache	EXT 2	0737462795		
T Mabchetsa	EXT 3	0781544047		
P. Tjale	x 7	—	-	
L. MEDUPE	x 5	0768712387		

BIZYCON PTY LTD — Maquassi Hills Local Municipality 2

NAME	ORGANISATION / TOWN ADDRESS	CELL PHONE	EMAIL	SIGN
Patrw Ateleki	Ext 3	073 299 3547	-	[signature]
Maleke Tiaai	Ext 3	0632679494	-	[signature]
Joseph Buga	Ext 3	0719301166	-	Joseph
Olebileng Montlabaki	Ext 4	0832803654	-	[signature]
Thomas Thabedi	Ext 3	0829587479	-	[signature]
Johannes Selebalo	Ext 1	0656552677	-	[signature]
Koos Chusane Hlahasoane	Ext 3	0780483778	-	[signature]
Mweli Tracy Vuyelwa	Ext 3	084 413 2918	-	T.V.Mweli
Tholo Kedisaletse Eliza	Ext 2	079 918 2406	-	K.E PHOLO
John Keuagilekoloane	Ext 1	0711680853	-	[signature]
Daniel Phuthhagae	EXT 1	0764250904	-	D.Phuthhage.
Jock Kgenyape	Ext 1	0848801179	-	[signature]
Martha Regadu	Ext 4	0786574548	-	[signature]
Mlopane Rayriona	EXT 3	0649194709	-	[signature]
FREDDY POLELO	EXT 3	083 494 9627	freddypolelo93@gmail.com	[signature]
Isaac Mashiya	EXT 1	0727926263		[signature]
NELSON NGATEKA	EXT 2	0720752215	—	[signature]
NTEBENG NTSHORYAME	Ext 3	0720980743	ntebengntshoryame@gmail.com	[signature]
Dimakatso Jeoleape	EXT 3	0791862645	—	[signature]
Olipa April Setaisho	EXT 3	0780026760		[signature]
Maria Beti Thabagane	EXT 3	0737187068	—	[signature]
BS Molefatsup	x 7	—		[signature]
S. Chache	EXT 2	0737462793		[signature]
T Mabhelesa	EXT 3	0781544047		[signature]
P. Tlale	x 7	—		[signature]
L. MEDUPE	x 5	0768712387	—	[signature]

BIZYCON PTY LTD

Maquassi Hills

Government Stakeholder comments

(Will be attached when received)

Appendix 2: SPECIALIST STUDIES

2.1 Ecological Studies

ECOLOGICAL FAUNA AND FLORA HABITAT SURVEY

Portion of the Remainder of a Portion 50 of Rietkuil No. 43 HP, Kgakala, Leeudoringstad, North West Province

View of part of the site.

Photo: Reinier F. Terblanche.

SEPTEMBER 2023

Compiled by:

Reinier F Terblanche

(M.Sc Ecology, *Cum Laude*; Pr.Sci.Nat, Reg. No. 400244/05)

ANTHENE ECOLOGICAL CC

TABLE OF CONTENTS

I) SPECIALIST EXPERTISE

SYNOPTIC CV: REINIER. F. TERBLANCHE

Reinier is an ecologist and in particular a habitat specialist with an exceptional combination of botanical and zoological expertise which he keeps fostering, updating and improving. He is busy with a PhD for which he registered at the Department of Conservation Ecology at the University of Stellenbosch. The PhD research focuses on the landscape ecology of selected terrestrial and wetland butterflies in South Africa. Reinier's experience includes being a lecturer in ecology and zoology at the North West University, Potchefstroom Campus (1998-2008). Reinier collaborates with a number of institutes, organizations and universities on animal, plant and habitat research.

Qualifications:

Qualification	Main subject matter	University
M.Sc *Cum Laude*, **1998:** Botany: Ecology	Quantitative study of invertebrate assemblages and plant assemblages of rangelands in grasslands.	North-West University, Potchefstroom
B.Sc Honns *Cum Laude*, **1992** Botany: Taxonomy	Distinctions in all subjects: Plant Anatomy, Taxonomy, Modern Systematics, System Modelling, Plant Ecology, Taxonomy Project, Statistics Attendance Course.	North-West University, Potchefstroom
B.Sc Botany, Zoology	Main subjects: Botany, Zoology.	North-West University, Potchefstroom
Higher Education Diploma, 1990	Numerous subjects aimed at holistic training of teachers.	North-West University, Potchefstroom

In research Reinier specializes in conservation biology, threatened butterfly species, vegetation dynamics and ant assemblages at terrestrial and wetland butterfly habitats as well as enhancing quantitative studies on butterflies of Africa. He has published extensively in the fields of taxonomy, biogeography and ecology in popular journals, peer-reviewed scientific journals and as co-author and co-editor of books (see 10 examples beneath).

Reinier practices as an ecological consultant and has been registered as a Professional Natural Scientist by SACNASP since 2005: Reg. No. 400244/05. His experience in consultation includes: Flora and fauna habitat surveys, Threatened species assessments, Riparian vegetation index surveys, Compilation of Ecological Management Plans, Biodiversity Action Plans and Status quo of biodiversity for Environmental Management Frameworks, Wetland Assessments, Management of Rare Wetland Species.

Recent activities/ awards: Best Poster Award at Oppenheimer De Beers Group Research Conference 2015, Johannesburg. One of the co-authors of Guidelines for Standardised Global Butterfly Monitoring, 2015, Group on Earth Observations Biodiversity Observation Network, Leipzig, Germany (UNEP-WCMC), GEO BON Technical Series 1. Awarded the prestigious Torben Larsen Memorial Tankard in October 2017; one is awarded annually to the person responsible for the most outstanding written account on Afrotropical Lepidoptera. Lectured as Conservationist-in-Residence in the Wildlife Conservation Programme of the African Leadership University, Kigali, Rwanda, 9-23 February 2019. Reinier won a photographic competition which resulted his photograph of the Critically Endangered *Erikssonia edgei* (Waterberg Copper) being on the front cover of the Synthesis Report of the National Biodiversity Assessment (2018) prepared by SANBI.

EXPERIENCE

Lecturer: Zoology 1998-2008	**Main subject matter and level**	**Organization**
Lectured subjects	- 3rd year level Ecology, Plantparasitology - 2nd year level Ethology - *Master's degree* Evolutionary Ethology, Systematics in Practice, Morphology and Taxonomy of Insect Pests, Wetlands.	North-West University, Potchefstroom and University of South Africa
Co-promoter	PhD: Edge, D.A. 2005. Ecological factors that influence the survival of the Brenton Blue butterfly	North-West University, Potchefstroom
Study leader/ assistant study leader	Six MSc students, One BSc Honn student: Various quantitative biodiversity studies (terrestrial and aquatic).	North-West University, Potchefstroom
Teacher 1994-1998	Biology and Science, Secondary School	Afrikaans Hoër Seunskool, Pretoria
Owned Anthene Ecological CC 2008 – present	- Flora and Fauna habitat surveys - Highly specialized ecological surveys - Riparian vegetation index surveys - Ecological Management Plans - Biodiversity Action Plans - Biodiversity section of Environmental Management Frameworks - Wetland assessments	Private Closed Corporation that has been subcontracted by many companies
Herbarium assistant 1988-1991	- Part-time assistant at the A.P. Goossens herbarium, Botany Department, North-West University, 1988, 1989, 1990 and 1991 (as a student).	North-West University, Potchefstroom

10 EXAMPLES OF PUBLICATIONS OF WHICH R.F. TERBLANCHE IS AUTHOR/ CO-AUTHOR
(Three books, two chapters in books and five articles are listed here as examples)

1. HENNING, G.A., **TERBLANCHE, R.F.** & BALL, J.B. (eds) **2009.** *South African Red Data Book: butterflies*. *SANBI Biodiversity Series* 13. South African National Biodiversity Institute, Pretoria. 158p. ISBN 978-1-919976-51-8
2. MECENERO, S., BALL, J.B., EDGE, D.A., HAMER, M.L., HENNING, G.A., KRÜGER, M, PRINGLE, E.L., **TERBLANCHE, R.F.** & WILLIAMS, M.C. (eds). 2013. *Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and atlas.* Saftronics (Pty) Ltd., Johannesburg & Animal Demography Unit, Cape Town.
3. VAN SWAAY, C., REGAN, E., LING, M., BOZHINOVSKA, E., FERNANDEZ, M., MARINI-FILHO, O.J., HUERTAS, B., PHON, C.-K., KŐRÖSI, A., MEERMAN, J., PE'ER, G., UEHARA-PRADO, M., SÁFIÁN, S., SAM, L., SHUEY, J., TARON, D., **TERBLANCHE, R.F**. & UNDERHILL, L. 2015. Guidelines for Standardised Global Butterfly Monitoring. Group on Earth Observations Biodiversity Observation Network, Leipzig, Germany. GEO BON Technical Series 1.
4. **TERBLANCHE, R.F.** & HENNING, G.A. **2009.** *A framework for conservation management of South African butterflies in practice.* In: Henning, G.A., Terblanche, R.F. & Ball, J.B. (eds). *South African Red Data Book: Butterflies. SANBI Biodiversity Series 13.* South African National Biodiversity Institute, Pretoria. p. 68 – 71.
5. EDGE, D.A., **TERBLANCHE, R.F**., HENNING, G.A., MECENERO, S. & NAVARRO, R.A. 2013. Butterfly conservation in southern Africa: Analysis of the Red List and threats. In: Mecenero, S., Ball, J.B., Edge, D.A., Hamer, M.L., Henning, G.A., Krüger, M., Pringle, E.L., Terblanche, R.F. & Williams, M.C. (eds). *Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas.* pp. 13-33. Saftronics (Pty) Ltd., Johannesburg & Animal Demography Unit, Cape Town.
6. **TERBLANCHE, R.F.**, SMITH, G.F. & THEUNISSEN, J.D. **1993.** Did Scott typify names in *Haworthia* (Asphodelaceae: Alooideae)? *Taxon* **42**(1): 91–95. (International Journal of Plant Taxonomy).
7. **TERBLANCHE, R.F.**, MORGENTHAL, T.L. & CILLIERS, S.S. **2003.** The vegetation of three localities of the threatened butterfly species *Chrysoritis aureus* (Lepidoptera: Lycaenidae). *Koedoe* **46**(1): 73-90.
8. EDGE, D.A., CILLIERS, S.S. & **TERBLANCHE, R.F. 2008**. Vegetation associated with the occurrence of the Brenton blue butterfly. *South African Journal of Science* **104**: 505 - 510.
9. GARDINER, A.J. & **TERBLANCHE, R.F. 2010.** Taxonomy, biology, biogeography, evolution and conservation of the genus *Erikssonia* Trimen (Lepidoptera: Lycaenidae) *African Entomology* **18**(1): 171-191.

10. **TERBLANCHE, R.F.** 2016. *Acraea trimeni* Aurivillius, [1899], *Acraea stenobea* Wallengren, 1860 and *Acraea neobule* Doubleday, [1847] on host-plant *Adenia repanda* (Burch.) Engl. at Tswalu Kalahari Reserve, South Africa. *Metamorphosis* 27: 92-102.

* A detailed CV with more complete publication list is available.

II) SPECIALIST DECLARATION

I, Reinier F. Terblanche, as the appointed independent specialist, in terms of the 2014 EIA Regulations (as amended), hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 (as amended) and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Name of Specialist: Reinier F. Terblanche

Signature of the specialist
Date: 21 September 2023

1 INTRODUCTION

An ecological habitat survey is required for a proposed development at a Portion of the Remainder of Portion 50 of Rietkuil No. 43, Kgakala, Leeudoringstad, North West Province, South Africa (elsewhere referred to as the site). Survey focused on the possibility that threatened fauna or flora known to occur in North West Province are likely to occur within the proposed development. Species of known high conservation priority that do not qualify for threatened status also received attention in the survey.

1.1 Objectives of the habitat study

- Surveys to investigate key elements of habitats on the site, relevant to the conservation of fauna and flora.
- Recording of any sightings and/or evidence of existing fauna and flora.
- The selective and careful collecting of voucher specimens of invertebrates where deemed necessary.
- An evaluation of the conservation importance and significance of the site with special emphasis on the current status of threatened species.
- Recording of possible host plants or foodplants of fauna such as butterflies.
- Literature investigation of possible species that might occur on site.
- Integration of the literature investigation and field observations to identify potential ecological impacts that could occur as a result of the development.
- Integration of literature investigation and field observations to make recommendations to reduce or minimise impacts, should the development be approved.

2 STUDY AREA

Figure 1 Map with an indication of the location of the site (yellow marker).

Map information were analysed and depicted on Google images with the aid of Google Earth Pro (US Dept. of State Geographer, MapLink/ Tele Atlas, Google, 2023).

The study area is at a Portion of the Remainder of a Portion 50 of Rietkuil No., Kgakala, Leeudoringstad, North West Province, South Africa (elsewhere referred to as the site). Grassland at the site is represented by the Vaal-Vet Sandy Grassland (Gh 10) vegetation type (Mucina & Rutherford, 2006).

Gh 10 Vaal-Vet Sandy Grassland

Distribution: In South Africa the Vaal-Vet Sandy Grassland is present in the North-West Province and Free State Province. Vaal-Vet Sandy Grassland ranges from south of Lichtenburgand Ventersdorp to Klerksdorp, Leeudoringstad, Bothaville and to the Brandfort areas north of Bloemfontein. Altitude ranges from 1 220 – 1560 m for the entire vegetation type (Mucina & Rutherford 2006).

Vegetation and landscape features: Plains-dominated landscape with some scattered, slightly undulating plains and hills. Mainly low-tussock grasslands with an abundant karroid element are present. Dominance of *Themeda triandra* is an important feature of this vegetation unit. Locally low cover of *Themeda triandra* and the associated increase in *Elionurus muticus*, *Cymbopogon pospischilii* and *Aristida congesta* is attributed to heavy grazing and/or erratic rainfall. Geology and soils: Aeolian and colluvial sand overlying sandstone, mudstone, and shale of the Karoo Supergroup (mostly the Ecca group) as well as older Ventersdorp Supergroup and basement gneiss in the north (Mucina & Rutherford 2006).

Climate: Warm-temperate, summer-rainfall climate, with overall mean annual precipitation of 530 mm. High summer temperatures. Severe frost (37 days per year on average) occurs in winter (Mucina & Rutherford 2006).

Important taxa of the Vaal-Vet Sandy Grassland listed by Mucina & Rutherford (2006): Graminoids: *Anthephora pubescens, Aristida congesta, Chloris virgata, Cymbopogon caesius, Cynodon dactylon, Digitaria argyrograpta, Elionurus muticus, Eragrostis chloromelas, Eragrostis lehmanniana, Eragrostis plana, Eragrostis trichophora, Heteropogon contortus, Panicum gilvum, Setaria sphacelata, Themeda triandra, Tragus berteronianus, Brachiaria serrata, Cymbopogon pospischilii, Digitaria eriantha, Eragrostis curvula, Eragrostis obtusa, Eragrostis superba, Panicum coloratum, Pogonarthria squarrosa, Trichoneura grandiglumis, Triraphis andropogonoides.* Herbs: *Stachys spathulata, Barleria macrostegia, Berkheya onopordifolia* var. *onopordifolia, Chamaesyce inaequilatera, Geigeria aspera* var. *aspera, Helichrysum caespititium, Hermannia depressa, Hibiscus pusillus, Monsonia burkeana, Rhynchosia adenodes, Selago densiflora, Vernonia oligocephala.* Geophytic Herbs: *Bulbine narcissifolia*, *Ledebouria marginata*. Succulent Herb: *Tripteris aghillana* var. *integrifolia.* Low shrubs: *Felicia muricata, Pentzia globosa, Anthospermum*

rigidum subsp. pumilum, Helichrysum dregeanum, Helichrysum paronychioides, Ziziphus zeyheriana.

Note: Not all the plant species listed for the vegetation type necessarily occur at the site.

3 METHODS

A desktop study comprised not only an initial phase, but also it was used throughout the study to accommodate and integrate all the data that become available during the field observations.
Surveys by R.F. Terblanche during September 2023 were conducted to note key elements of habitats on the site, relevant to the conservation of fauna and flora. The main purpose of the site visits was ultimately to serve as a habitat survey that concentrated on the possible presence or not of threatened species and other species of high conservation priority.

The following sections highlight the materials and methods applicable to different aspects or signs that were observed.

3.1 Habitat characteristics and vegetation

The habitat was investigated by noting habitat structure (rockiness, slope, plant structure/ physiognymy) as well as floristic composition. Voucher specimens of plant species were only taken where the taxonomy was in doubt and where the plant specimens were of significant relevance for invertebrate conservation. In this case no plant specimens were needed to be collected as voucher specimens or to be send to a herbarium for identification. A wealth of guides and detailed works of plant identifications, ecology and conservation is fortunately available and very useful. Field guides, biogeographic works, species lists, diagnostic outlines, conservation statuses and detail on specific plant groups were sourced from Boon (2010), Court (2010), Germishuizen (2003), Germishuizen, Meyer & Steenkamp (2006), Goldblatt (1986), Goldblatt & Manning (1998), Jacobsen (1983), Manning (2003), Manning (2009), McMurtry, Grobler, Grobler & Burns (2008), Pooley (1998), Retief & Herman (1997), Smit (2008), Van Ginkel, Glen, Gordon-Gray, Cilliers, Muasya & Van Deventer (2011), Van Jaarsveld (2006), Van Oudtshoorn (1999), Van Wyk (2000), Van Wyk & Smith (2001), Van Wyk & Smith (2003), Van Wyk & Malan (1998) and Van Wyk & Van Wyk (1997). Lists of species, species names and the conservation status of species were mainly sourced from Raimondo, von Staden, Victor, Helme, Turner, Kamundi & Manyama (2009) and updated versions of red lists and species from the Threatened Species Programme of SANBI and the Red List of South African Plants (sanbi.org.za).

3.2 Mammals

Mammals were noted as sight records by day. For the identification of species and observation of diagnostic characteristics Smithers (1986), Skinner & Chimimba (2005), Cillié, Oberprieler and Joubert (2004) and Apps (2000) are consulted. Sites have been walked, covering as many habitats as possible. Signs of the presence of mammal species, such as calls of animals, animal tracks (spoor), burrows, runways, nests and faeces were recorded. Walker (1996), Stuart & Stuart (2000)

and Liebenberg (1990) were consulted for additional information and for the identification of spoor and signs. Trapping was not done since it proved not necessary in the case of this study. Habitat characteristics were also surveyed to note potential occurrences of mammals. Many mammals can be identified from field sightings but, with a few exceptions, bats, rodents and shrews can only be reliably identified in the hand, and then some species need examination of skulls, or even chromosomes (Apps, 2000).

3.3 Birds

Birds were noted as sight records, mainly with the aid of binoculars (10x30). Nearby bird calls of which the observer was sure of the identity were also recorded. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques Ryan (2001) is followed. For information on identification, biogeography and ecology Barnes (2000), Hockey, Dean & Ryan, P.G. (2005), Cillié, Oberprieler & Joubert (2004), Tarboton & Erasmus (1998) and Chittenden, Davies & Weiersbye (2016) were consulted. Ringing of birds fell beyond the scope of this survey and was not deemed necessary. Sites have been walked, covering as many habitats as possible. Signs of the presence of bird species such as spoor and nests have additionally been recorded. Habitat characteristics were surveyed to note potential occurrences of birds.

3.4 Reptiles

Reptiles were noted as sight records in the field. Binoculars (10x30) can also be used for identifying reptiles of which some are wary. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques, Branch (1998), Marais (2004), Alexander & Marais (2007) and Cillié, Oberprieler and Joubert (2004) were followed. Sites were walked, covering as many habitats as possible. Smaller reptiles are sometimes collected for identification, but this practice was not necessary in the case of this study. Habitat characteristics are surveyed to note potential occurrences of reptiles.

3.5 Amphibians

Frogs and toads are noted as sight records in the field or by their calls. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques Carruthers (2001), Du Preez (1996), Conradie, Du Preez, Smith & Weldon (2006) and the recent complete guide by Du Preez & Carruthers (2009) are consulted. CD's with frog calls by Carruthers (2001) and Du Preez & Carruthers (2009) are used to identify species by their calls when applicable. Sites are walked, covering as many habitats as possible. Smaller frogs are often collected by pitfall traps put

out for epigeal invertebrates (on the soil), but this practice falls beyond the scope of this survey. Habitat characteristics are also surveyed to note potential occurrences of amphibians.

3.6 Butterflies

Butterflies were noted as sight records or voucher specimens. Voucher specimens are mostly taken of those species of which the taxa warrant collecting due to taxonomic difficulties or in the cases where species can look similar in the veldt. Many butterflies use only one species or a limited number of plant species as host plants for their larvae. Myrmecophilous (ant-loving) butterflies such as the *Aloeides*, *Chrysoritis*, *Erikssonia, Lepidochrysops* and *Orachrysops* species (Lepidoptera: Lycaenidae), which live in association with a specific ant species, require a unique ecosystem for their survival (Deutschländer & Bredenkamp, 1999; Terblanche, Morgenthal & Cilliers, 2003; Edge, Cilliers & Terblanche, 2008; Gardiner & Terblanche, 2010). Known food plants of butterflies were therefore also recorded. After the visits to the site and the identification of the butterflies found there, a list was also compiled of butterflies that will most probably be found in the area in all the other seasons because of suitable habitat. The emphasis is on a habitat survey.

3.7 Fruit chafer beetles

Different habitat types in the areas were explored for any sensitive or special fruit chafer species. Selection of methods to find fruit chafers depends on the different types of habitat present and the species that may be present. Fruit bait traps would probably not be successful for capturing *Ichnestoma* species in a grassland patch (Holm & Marais 1992). Possible chafer beetles of high conservation priority were noted as sight records accompanied by the collecting of voucher specimens with grass nets or containers where deemed necessary.

3.8 Rock scorpions

Relatively homogenous habitat / vegetation areas were identified and explored to identify any sensitive or special species. Selected stones that were lifted to search for Arachnids were put back very carefully resulting in the least disturbance possible. All the above actions were accompanied by the least disturbance possible.

3.9 Limitations

For each site visited, it should be emphasized that surveys can by no means result in an exhaustive list of the plants and animals present on the site, because of the time constraint. Surveys were conducted during September 2023 which include an optimal time of the year to find signs of animals such as invertebrates, signs of habitat sensitive plant species and vertebrate animal species high

conservation priority. Weather conditions during the surveys were favourable for recording fauna and flora. The focus of the survey remains a habitat survey that concentrates on the possibility that species of particular conservation priority occur on the site or not. It is unlikely that any more visits would reveal information that would change the outcome of this assessment both in terms of ecosystems of special conservation concern or suitable habitats of species of particular conservation concern. Visits that were conducted therefore appear to be sufficient to address the objectives of this study.

4 RESULTS

Table 4.1 Outline of main landscape and habitat characteristics of the site.

HABITAT FEATURE	DESCRIPTION
Topography	The area proposed for the development is on gentle slopes (flat).
Rockiness	Rocky ridges are absent at the site.
Presence of wetlands	Wetlands and riparian zones are absent at the site.
Vegetation	Vegetation at the site is a visibly degraded grassland. Very few trees or shrubs are found at the grassland at the site. Indigenous grass species at the site include *Cynodon dactylon, Aristida congesta*, *Elionurus muticus, Eragrostis lehmanniana, Eragrostis curvula, Tragus berteronianus, Eragrostis superba* and *Pogonarthria squarrosa.* Indigenous herbaceous plant species at the site include *Helichrysum caespititium, Barleria macrostegia, Berkheya onopordifolia* var. *onopordifolia, Chamaesyce inaequilatera, Hibiscus pusillus* and *Osteospermum scariosum*. The geophytic herb *Bulbine narcissifolia* and the dwarf-shrubs *Ziziphus zeyheriana* and *Felicia muricata* are present at the site. Alien invasive herbaceous weeds at the site include *Schkuhria pinnata*, *Verbena aristigera, Conyza bonariensis*, *Tagetes minuta*, *Bidens pilosa*, *Gomphrena celosioides*, *Chenopodium album*, *Guileminea densa*, *Argemone ochroleuca* and *Alternanthera pungens.*
Signs of disturbances	Grassland at the site appears visibly degraded and modified. Trampling and numerous paths are noticeable at the site. Negative urban edge effects such as informal dumping are present. Site has residential areas close to its northern and at the southern boundaries and are partly isolated. Alien invasive herbaceous weeds are conspicuous at the site, especially at hitherto cleared areas.
Connectivity	There is little scope for the site to be part of a corridor of particular conservation importance.

Photo 1 View of part of the site towards the east.
Photo: R.F. Terblanche.

Photo 2 View of part of the site that borders on residential area.
Photo: R.F. Terblanche

Photo 3 View of part of the site towards the residential area at the southern boundary of the site.
Photo: R.F. Terblanche.

Photo 4 View of part of the site and the residential area that borders on the site.
Photo: R.F. Terblanche

Photo 5 The pioneer grass species, *Cynodon dactylon*, at the site.

Photo: R.F. Terblanche.

Photo 6 The alien invasive herbaceous weed *Schkuhria pinnata*, at the site.

Photo: R.F. Terblanche

4.2 ASSESSMENT OF PLANT SPECIES OF PARTICULAR CONSERVATION PRIORITY

4.2.1 Plant species of particular conservation concern according to the red list of plants

Table 4.2 Threatened plant species of the North West Province which are listed in the **Critically Endangered** category. The list here follows the most recent updated red list of South African plant species (Raimondo *et al*. 2009). No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.

Species	**Status:** Global status or national status indicated	**Resident at the site**
Brachystelma canum	Critically Endangered	No
Brachystelma gracillimum	Critically Endangered	No

Table 4.3 Threatened plant species of the North West Province which are listed in the **Endangered** category. The list here follows the most recent updated red list of South African plant species (Raimondo *et al*. 2009). No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.

Species	**Status:** Global status or national status indicated	**Resident at the site**
Aloe peglerae	Endangered	No
Brachystelma discoideum	Endangered	No

Table 4.4 Threatened plant species of the North West Province which are listed in the **Vulnerable** category. The list here follows the most recent updated red list of South African plant species (Raimondo *et al*. 2009). No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.

Species	**Status:** Global status or national status indicated	**Resident at the site**
Brachycorythis conica subsp. ***transvaalensis***	Vulnerable	No
Brachystelma incanum	Vulnerable	No
Ceropegia decidua subsp. ***pretoriensis***	Vulnerable	No
Ceropegia stentiae	Vulnerable	No
Ledebouria atrobrunnea	Vulnerable	No
Marsilea farinosa	Vulnerable	No
Melolobium subspicatum	Vulnerable	No
Prunus africana	Vulnerable	No
Rennera stellata	Vulnerable	No
Searsia maricoan	Vulnerable	No

Table 4.5 Near Threatened plant species of the North West Province. The list here follows the most recent updated red list of South African plant species (Raimondo *et al*. 2009). No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.

Species	Status: Global status or national status indicated	Resident at the site
Adromischus umbraticola subsp**. *Umbraticola***	Near Threatened	No
Ceropegia turricula	Near Threatened	No
Cineraria austrotransvaalensis	Near Threatened	No
Cleome conrathii	Near Threatened	No
Delosperma leendertziae	Near Threatened	No
Drimia sanguinea	Near Threatened	No
Elaeodendron transvaalense	Near Threatened	No
Kniphofia typhoides	Near Threatened	No
Lithops leslei subsp. ***leslei***	Near Threatened	No
Nerine gracilis	Near Threatened	No
Sporobolus oxyphyllus	Near Threatened	No
Stenostelma umbelluliferum	Near Threatened	No

Table 4.6 Plant species of the North West Province which are not threatened and not near threatened but which are of particular conservation concern and listed in the **Critically Rare** category (Raimondo *et al.* 2009). The list here follows the most recent red list of South African plant species (Raimondo *et al*. 2009). No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.

Species	Conservation status	Resident at the site
Gladiolus filiformis	Critically Rare	No

Table 4.7 Plant species of the North West Province which are not threatened and not near threatened but of which are of particular conservation concern and listed in the **Rare** category (Raimondo *et al*. 2009). The list here follows the most recent red list of South African plant species (Raimondo *et al*. 2009). No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.

Species	Status: Global status or national status indicated	Resident at the site
Brachystelma dimorphum susbp. ***gratum***	Rare	No
Ceropegia insignis	Rare	No
Frithia pulchra	Rare	No
Gnaphalium nelsonii	Rare	No
Habenaria culveri	Rare	No

Table 4.8 Plant species of the North West Province which are not threatened and not near threatened but which are of particular conservation concern and listed in the **Declining** category (Raimondo *et al.* 2009). The list here follows the most recent red list of South African plant species (Raimondo *et al*. 2009). No = Plant species is unlikely to be a resident at the site; Yes = Plant species is a resident at the site.

Species	Status: Global status or national status indicated	Resident at the site
Boophone disticha	Declining	No
Crinum bulbispermum	Declining	No
Crinum macowanii	Declining	No
Drimia altissima	Declining	No
Eucomis autumnalis	Declining	No
Gunnera perpensa	Declining	No
Hypoxis hemerocallidea	Declining	No
Ilex mitis	Declining	No
Pelargonium sidoides	Declining	No

4.2.2 Plant species of particular conservation concern: protected species

Table 4.9 Tree species of the North West Province which are listed as **Protected Species** under the National Forests Act No. 84 of 1998, Section 15(1)**.** No = Plant species is not a resident on the site; Yes = Plant species is a resident at the site.

Species	Conservation status	Resident at the site
Boscia albitrunca (Sheppard's tree)	Protected	No
Combretum imberbe (Leadwood)	Protected	No
Sclerocarya birrea (Marula)	Protected	No
Securidaca longepedunculata (Violet Tree)	Protected	No
Vachellia erioloba (Camel Thorn Tree)	Protected	No

4.3 ASSESSMENT OF VERTEBRATE SPECIES OF PARTICULAR HIGH CONSERVATION PRIORITY

4.3.1 Mammals of particular high conservation priority

Table 4.10 Threatened mammal species of the North West Province. Literature sources: Friedman & Daly, (2004), Skinner & Chimimba (2005), Wilson & Reeder (2005). With mammal species which normally needs a large range their residential status does not implicate that they are exclusively dependent on the site or use the site as important shelter or for reproduction. No = Not recorded at site/ Unlikely to be resident at the site. Yes: Recorded at the site/ Likely to be resident at the site.

Species	Threatened Status	Recorded at site during survey	Likely to be found based on habitat assessment
Chrysospalax villosus Rough-haired golden mole	Vulnerable	No	No

Cloeotis percivali Short-eared Trident Bat	Vulnerable/ Near-threatened	No	No
Diceros bicornis Black rhinoceros	Critically Endangered	No	No
Lycaon pictus African wild dog	Endangered	No	No
Loxodonta africana African elephant	Vulnerable	No	No
Mystromys albicaudatus White-tailed mouse	Endangered	No	No
Neamblysomus julianae Juliana's Golden Mole	Critically Endangered	No	No
Panthera leo Lion	Vulnerable	No	No
Rhinolophus blasii Blasi's Horseshoe Bat	Vulnerable	No	No
Smutsia temminckii Ground Pangolin	Vulnerable	No	No

Table 4.11 Near threatened mammal species known to occur in the North West Province. Literature sources: Skinner & Chimimba (2005). No = Not recorded at site/ unlikely to be resident at the site. Yes: Recorded at the site/ Likely to be resident at the site.

Species	Threatened Status	Recorded at site during survey	Likely to be found based on habitat assessment
Ceratotherium simum White Rhinoceros	Near threatened	No	No

Table 4.12 Data deficient (or uncertain) mammal species of the North West Province. Literature sources: Skinner & Chimimba (2005). No = Not recorded at site/ unlikely to be resident at the site. Yes: Recorded at the site/ Likely to be resident at the site.

Species	Threatened Status	Recorded at site during survey	Likely be a resident at the site
Myosorex varius Forest shrew	Uncertain	No	No

4.3.2 Birds of particular high conservation priority

Table 4.13 Threatened bird species of the North West Province. Literature sources Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). No = Not recorded at site/ Unlikely to use site as breeding area or particular habitat on which the species depends. Yes = Recorded at site/ Likely to use site as breeding area or particular habitat on which the species depends.

Species	Common name	Threatened Status	Recorded at site during survey	Likely to use site as breeding area or habitat
Aegypius tracheliotos	**Lappet-faced Vulture**	Vulnerable	No	No
Anthropoides paradiseus	**Blue Crane**	Vulnerable	No	No
Aquila rapax	**Tawny Eagle**	Vulnerable	No	No
Ardeotis kori	**Kori Bustard**	Vulnerable	No	No
Balearica regulorum	**Grey Crowned Crane (Mahem)**	Vulnerable	No	No
Botaurus stellaris	**Eurasian Bittern**	Critically Endangered	No	No
Circus ranivorus	**African Marsh-Harrier**	Vulnerable	No	No
Crex crex	**Corn Crake**	Vulnerable	No	No
Eupodotis senegalensis	**White-bellied Korhaan**	Vulnerable	No	No
Falco naumanni	**Lesser Kestrel**	Vulnerable	No	No
Geronticus calvus	**Southern Bald Ibis**	Vulnerable	No	No
Gorsachius leuconotus	**White-backed Night-heron**	Vulnerable	No	No
Gypaetus barbatus	**Bearded Vulture**	Endangered	No	No
Gypaetus barbatus	**Bearded Vulture**	Endangered	No	No
Gyps africanus	**White-backed Vulture**	Vulnerable	No	No
Gyps coprotheres	**Cape Vulture**	Vulnerable	No	No
Pelecanus rufescens	**Pink-backed Pelican**	Vulnerable	No	No
Polemaetus bellicosus	**Martial Eagle**	Vulnerable	No	No
Rhynchops flavirostris	**African Skimmer**	Endangered	No	No
Sagittarius serpentarius	**Secretarybird**	Vulnerable	No	No
Sarothrura ayresi	**White-winged Flufftail**	Critically Endangered	No	No
Tyto capensis	**African Grass-Owl**	Vulnerable	No	No

* Though some of the above bird species that roam over large areas may ocassionally be found at the site, the site does not appear to be a habitat of particular importance to these birds, and these birds also do not use the site as breeding area.

Table 4.14 Near threatened bird species of the North West Province. Literature sources Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). No = Not recorded at site/ Unlikely to be particularly dependent on the site as breeding area or habitat. Yes = Recorded at site/ Likely to be particularly dependant on the site as breeding area or habitat.

Species	Common name	Threatened Status	Recorded at site during survey	Likely to use site breeding area or habitat
Certhilauda chuana	**Short-clawed Lark**	Near threatened	No	No
Charadrius pallidus	**Chestnut-banded Plover**	Near threatened	No	No
Ciconia nigra	**Black Stork**	Near threatened	No	No
Circus macrourus	**Pallid Harrier**	Near threatened	No	No
Eupodotis caerulescens	**Blue Korhaan**	Near threatened	No	No
Falco biarmicus	**Lanner Falcon**	Near threatened	No	No
Falco peregrinus	**Peregrine Falcon**	Near threatened	No	No
Glareola nordmanni	**Black-winged Pratincole**	Near threatened	No	No
Leptoptilos crumeniferus	**Marabou Stork**	Near threatened	No	No
Mirafra cheniana	**Melodious lark**	Near threatened	No	No
Mycteria ibis	**Yellow-billed Stork**	Near threatened	No	No
Phoenicopterus minor	**Lesser Flamingo**	Near threatened	No	No
Phoenicopterus ruber	**Greater Flamingo**	Near threatened	No	No
Rostratula benghalensis	**Greater Painted-snipe**	Near threatened	No	No
Sternia caspia	**Caspian Tern**	Near threatened	No	No

* Though some of the above bird species that roams over large areas may ocassionally be found at the site, the site does not appear to be a habitat of particular importance to these birds, and these birds also do not use the site as breeding area.

4.3.3 Reptiles of particular high conservation priority

The following tables list possible presence or absence of threatened reptile or near threatened reptile species in the study area. The Atlas and Red List of Reptiles of South Africa, Lesotho and South

Africa (Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers, 2014) has been used as the main source to compile the list for assessment.

Table 4.15 Threatened reptile species in North West Province. Main Source: (Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers, 2014). No = Reptile species is not a resident on the site; Yes = Reptile species is found to be resident on the site.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
Crocodylus niloticus Nile Crocodile	Vulnerable	No	No	No

Table 4.16 Near threatened reptile species in North West Province. Main Source: Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers (2014). Though *Homoroselaps dorsalis* has not yet been recorded from the North West Province, its presence in some areas or the Province is anticipated. No = Reptile species is not a resident on the site; Yes = Reptile species is found to be resident on the site.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
Homoroselaps dorsalis Striped Harlequin Snake	Near threatened	No	No	No

4.3.4 Amphibian species of particular high conservation priority

Table 4.17 Near threatened amphibian species in North West Province. No = Amphibian species is not a resident on the site; Yes = Amphibian species is found to be resident on the site.

Species	Threatened Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
Pyxicephalus adspersus Giant Bullfrog	**Least Concern (IUCN)**	No	No	No

4.4 ASSESSMENT OF INVERTEBRATE SPECIES OF PARTICULAR CONSERVATION PRIORITY

4.4.1 Butterflies of particular conservation priority

Table 4.18 Threatened butterfly species in North West Province and Gauteng Province (Mecenero *et. al.* 2020). Sources of information: Henning, Terblanche & Ball (2009), Mecenero *et al*. (2013), Mecenero *et.al.* (2020). Invertebrates such as threatened butterfly species are often very habitat specific and residential status imply a unique ecosystem that is at stake.

Species	Threatened Status	Recorded at site during survey	Residential status at the site: Yes confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
Aloeides dentatis dentatis Roodepoort Toothed Russet	Endangered	No	Highly unlikely
Chrysoritis aureus Golden Opal/ Heidelberg Copper	Endangered	No	Highly unlikely
Lepidochrysops praeterita Highveld Giant Cupid/ Highveld Blue	Endangered	No	Highly unlikely
Orachrysops mijburghi Heilbron Cupid	Endangered	No	Highly unlikely

Table 4.19 Butterfly species of the North West Province and Gauteng Province that are Near Threatened (Mecenero *et al.*, 2020). No = Butterfly species is unlikely to be a resident at the study area; Yes = Butterfly species is a resident at the study area. Sources of information Henning, Terblanche & Ball (2009), Mecenero *et. al.* (2013), Mecenero *et. al.* (2020).

Species	Threatened Status	Recorded at site during survey	Residential status at the site: Yes confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
Metisella meninx Marsh Sylph	**Near Threatened**	No	Highly unlikely

4.4.2 Beetles of particular conservation priority

Table 4.20 Fruit chafer species (Coleoptera: Scarabaeidae: Cetoninae) in the Gauteng Province and North-West Province which are of known high conservation priority.

Species	Threatened Status	Recorded at site during survey	Likely to be resident based on habitat assessment
Ichnestoma stobbiai	Uncertain	No	No
Trichocephala brincki	Uncertain	No	No

4.4.3 Scorpion species of particular conservation priority

Table 4.21 Rock scorpion species (Scorpiones: Ischnuridae) species that are of known high conservation priority in the Gauteng Province and North-West Province.

Species	Threatened Status	Recorded at site during survey	Likely to be resident at site based on habitat assessment
Hadogenes gracilis	Uncertain	No	No
Hadogenes gunningi	Uncertain	No	No

4.4.2 Beetles of particular conservation priority

Table 4.20 Fruit chafer species (Coleoptera: Scarabaeidae: Cetoninae) in the Gauteng Province and North-West Province which are of known high conservation priority.

Species	Threatened Status	Recorded at site during survey	Likely to be resident based on habitat assessment
Ichnestoma stobbiai	Uncertain	No	No
Trichocephala brincki	Uncertain	No	No

4.4.3 Scorpion species of particular conservation priority

Table 4.21 Rock scorpion species (Scorpiones: Ischnuridae) species that are of known high conservation priority in the Gauteng Province and North-West Province.

Species	Threatened Status	Recorded at site during survey	Likely to be resident at site based on habitat assessment
Hadogenes gracilis	Uncertain	No	No
Hadogenes gunningi	Uncertain	No	No

5 DISCUSSION

5.1 Habitat and vegetation characteristics

An outline of the habitat and vegetation characteristics is given in Table 4.1.

5.2 Plants

Extinct, threatened, near threatened and other plant species of high conservation priority in North West Province are listed in Tables 4.2 – 4.8. Protected tree species are listed in Table 4.9. The presence or not of all the species listed in the tables were investigated during the survey. None of the Threatened and Near Threatened plant species are likely to occur on the site. No other plant species of particular conservation concern appears to be present at the site.

5.3 Vertebrates

5.3.1 Mammals

Table 4.10, Table 4.11 and Table 4.12 list the possible presence or absence of threatened mammal species, near threatened mammal species and mammal species of which the status is uncertain, respectively, at the site. Literature sources that were used are Friedman & Daly (2004), Skinner & Chimimba (2005) and Wilson & Reeder (2005). Since the site falls outside reserves, threatened species such as the black rhinoceros (*Diceros bicornis*) and the African wild dog (*Lycaon pictus*) are obviously not present. No smaller mammals of particular high conservation significance are likely to be found on the site as well.

5.3.2 Birds

Table 4.13 and Table 4.14 list the possible presence or absence of threatened bird species and near threatened bird species at the site. With bird species which often have a large distributional range, their presence does not imply that they are particularly dependent on a site as breeding location. Therefore, the emphasis in the right-hand columns of Table 4.12 and Table 4.13 are on the particular likely dependence or not of bird species on the site. Literature sources that were mainly consulted are Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). No threat to any threatened bird species or any bird species of particular conservation importance are foreseen.

5.3.3 Reptiles

Table 4.15 and Table 4.16 list the possible presence or absence of Threatened and Near Threatened reptile species on the site. Main Source used for the conservation status and identification of reptiles are Bates, Branch, Bauer, Burger, Marais, Alexander & de Villiers (2014). Alexander & Marais (2007) as well as Tolley & Burger 2007) give useful indications of distributions, habitats and identification of the reptile species. There appears to be no threat to any reptile species of particular high conservation importance if the site is developed.

5.3.4 Amphibians

No frog species that occur in the North West are listed as Threatened species (Vulnerable, Endangered or Critically Endangered) or Near Threatened species according to IUCN Amphibian Specialist Group (2013). Table 4.17 lists *Pyxicephalus adspersus* (Giant Bullfrog) as Least Concern globally. According to the Biodiversity Management Directorate of GDARD (Gauteng Department of Agriculture and Rural Development) (2014) there are no amphibians in Gauteng that qualify for red listed status (red listed here indicates a catecory of special conservation concern such as threatened or near threatened). Suitable habitat for Giant Bullfrog at site appears to be absent.

5.4 Invertebrates

5.4.1 Butterflies

Studies about the vegetation and habitat of threatened butterfly species in South Africa showed that ecosystems with a unique combination of features are selected by these often localised threatened butterfly species (Deutschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Threatened butterfly species in South Africa can then be regarded as bio-indicators of rare ecosystems.

Four species of butterfly in Gauteng Province and North West Province combined are listed as threatened in the recent butterfly conservation assessment of South Africa (Mecenero *et al*., 2013). The expected presence or not of these threatened butterfly species as well as species of high conservation priority that are not threatened, at the site (Table 4.18 and Table 4.19) follows.

5.4.1.1 Assessment of threatened butterfly species

***Aloeides dentatis dentatis (*Roodepoort Toothed Russet)**

The proposed global red list status for *Aloeides dentatis dentatis* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.,* 2020). *Aloeides dentatis dentatis* colonies are found where one of its host plants *Hermannia depressa* or *Lotononis eriantha* is present. Larval ant association is with *Lepisiota capensis* (S.F. Henning 1983; S.F. Henning & G.A. Henning 1989). The habitat requirements of *Aloeides dentatis dentatis* are complex and not fully understood yet. See Deutschländer and Bredenkamp (1999) for the description of the vegetation and habitat characteristics of one locality of *Aloeides dentatis* subsp. *dentatis* at Ruimsig, Roodepoort, Gauteng Province. There is not an ideal habitat of *Aloeides dentatis* subsp. *dentatis* on the site and it is unlikely that the butterfly is present at the site.

Chrysoritis aureus (Golden Opal/ Heidelberg Copper)

The proposed global red list status for *Chrysoritis aureus* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.,* 2020) *Chrysoritis aureus* (Golden Opal/ Heidelberg Copper) is a resident where the larval host plant, *Clutia pulchella* is present. However, the distribution of the butterfly is much more restricted than that of the larval host plant (S.F. Henning 1983; Terblanche, Morgenthal & Cilliers 2003). One of the reasons for the localised distribution of *Chrysoritis aureus* is that a specific host ant *Crematogaster liengmei* must also be present at the habitat. Fire appears to be an essential factor for the maintenance of suitable habitat (Terblanche, Morgenthal & Cilliers 2003). Research revealed that *Chrysorits aureus* (Golden Opal/ Heidelberg Copper) has very specific habitat requirements, which include rocky ridges with a steep slope and a southern aspect (Terblanche, Morgenthal & Cilliers 2003). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon is highly unlikely.

Lepidochrysops praeterita **(Highveld Blue)**

The proposed global red list status for *Lepidochrysops praeterita* according to the most recent IUCN criteria and categories is Endangered (G.A. Henning, Terblanche & Ball, 2009; Mecenero *et al.,* 2020). *Lepidochrysops praeterita* is a butterfly that occurs where the larval host plant *Ocimum obovatum* (= *Becium obovatum*) is present (Pringle, Henning & Ball, 1994), but the distribution of the butterfly is much more restricted than the distribution of the host plant. *Lepidochrysops praeterita* is found on selected rocky ridges and rocky hillsides in parts of Gauteng, the extreme northern Free State and the south-eastern Gauteng Province. No ideal habitat appears to be present for the butterfly on the site. It is unlikely that *Lepidochrysops praeterita* would be present at the site.

Orachrysops mijburghi **(Mijburgh's Blue)**

The proposed global red status for *Orachrysops mijburghi* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.,* 2020). *Orachrysops mijburghi* favours grassland depressions where specific *Indigofera* plant species occur (Terblanche & Edge 2007). The Heilbron population of *Orachrysops mijburghi* in the Free State uses *Indigofera evansiana* as a larval host plant (Edge, 2005) while the Suikerbosrand population in Gauteng uses *Indigofera dimidiata* as a larval host plant (Terblanche & Edge 2007). There is no suitable habitat for *Orachrysops mijburghi* on the site and it is unlikely that *Orachrysops mijburghi* would be present on the site.

Conclusion on threatened butterfly species

There appears to be no threat to any threatened butterfly species if the site is developed.

5.4.1.2 Assessment of butterfly species that are Near Threatened

Metisella meninx (Marsh Sylph)

Henning and Henning (1989) in the first South African Red Data Book of Butterflies, listed *Metisella meninx* as threatened under the former IUCN category Indeterminate. Even earlier in the 20th century Swanepoel (1953) raised concern about vanishing wetlands leading to habitat loss and loss of populations of *Metisella meninx*. According to the second South African Red Data Book of butterflies (Henning, Terblanche & Ball, 2009) the proposed global red list status of *Metisella meninx* has been Vulnerable. During a recent large scale atlassing project the *Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas* (Mecenero *et al.,* 2013) it was found that more *Metisella meninx* populations are present than thought before. Based on this valid new information, the conservation status of *Metisella meninx* is now regarded as Near Threatened (Mecenero *et al.,* 2020). Though *Metisella meninx* is more widespread and less threatened than perceived before, it should be regarded as a localised rare habitat specialist of conservation priority, which is dependent on wetlands with suitable patches of grass at wetlands (Terblanche In prep.). Another important factor to keep in mind for the conservation of *Metisella meninx* is that based on very recent discoveries of new taxa in the group the present *Metisella meninx* is species complex consisting of at least three taxa (Terblanche In prep., Terblanche & Henning In prep.). The ideal habitat of *Metisella meninx* is treeless marshy areas where *Leersia hexandra* (rice grass) is abundant (Terblanche *In prep.*). The larval host plant of *Metisella meninx* is wild rice grass, *Leersia hexandra* (G.A. Henning & Roos, 2001). There is no suitable habitat for the species at the site.

5.4.2 Fruit chafer beetles

Table 4.20 lists the fruit chafer beetle species (Coleoptera: Scarabaeidae: Cetoninae) that are of known high conservation priority in the North West Province. No *Ichnestoma stobbiai* or *Trichocephala*

brincki were found during the surveys. There appears to be no suitable habitat for *Ichnestoma stobbiai* or *Trichocephala brincki* at the site. There appears to be no threat to any of the fruit chafer beetles of particular high conservation priority if the site were developed.

5.4.3 Scorpions

Table 4.21 lists the rock scorpion species (Scorpiones: Ischnuridae) that are of known high conservation priority in the North West Province. None of these rock scorpions have been found at the site and the habitat does not appear to be optimal.

5.5 Ecological Sensitivity at the site

Ecological sensitivity at the site is low (Figure 2). There are no Threatened or Near Threatened animal- or plant species at the site, the vegetation has been degraded and modified, the site is partly isolated and there are no wetlands or rocky ridges at the site.

Figure 2 Indications of ecological sensitivity at the site.

———	Red outline	Boundaries of the site
———	Light yellow shading	Low sensitivity

Grid references and altitudes were taken at site with a GPS Garmin E-trex 10 ® instrument. Map information were analysed and depicted on Google images with the aid of Google Earth Pro (US Dept. of State Geographer, MapLink/ Tele Atlas, Google, 2023).

6 RISKS, IMPACTS AND MITIGATION

Background:

Habitats of threatened plants are in danger most often due to urban developments such as is the case for the Gauteng Province (Pfab & Victor, 2002). Habitat conservation is the key to the conservation of invertebrates such as threatened butterflies (Deutschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Furthermore, corridors and linkages may play a significant role in insect conservation (Pryke & Samways, 2003, Samways, 2005).

Urbanisation is a major additional influence on the loss of natural areas (Rutherford & Westfall 1994). In the South Africa the pressure to develop areas are high since its infrastructure allows for improvement of human well-being. Urban nature conservation issues in South Africa are

overshadowed by the goal to improve human well-being, which focuses on aspects such as poverty, equity, redistribution of wealth and wealth creation (Cilliers, Müller & Drewes 2004). Nevertheless, the conservation of habitats is the key to invertebrate conservation, especially for those threatened species that are very habitat specific. This is also true for any detailed planning of corridors and buffer zones for invertebrates. Though proper management plans for habitats are not in place, setting aside special ecosystems is in line with the resent Biodiversity Act (2004) of the Republic of South Africa.

Corridors are important to link ecosystems of high conservation priority. Such corridors or linkages are there to improve the chances of survival of otherwise isolated populations (Samways, 2005). How wide should corridors be? The answer to this question depends on the conservation goal and the focal species (Samways, 2005). For an African butterfly assemblage this is about 250m when the corridor is for movement as well as being a habitat source (Pryke and Samways 2003). Hill (1995) found a figure of 200m for dung beetles in tropical Australian forest. In the agricultural context, and at least for some common insects, even small corridors can play a valuable role (Samways, 2005). Much more research remains to be done to find refined answers to the width of grassland corridors in South Africa. The width of corridors will also depend on the type of development, for instance the effects of the shade of multiple story buildings will be quite different from that of small houses.

To summarise: In practice, as far as developments are concerned, the key would be to prioritise and plan according to sensitive species and special ecosystems.

<u>In the case of this study:</u>

Grassland at the site appears visibly degraded. Trampling and numerous paths are noticeable at the site. Negative urban edge effects such as informal dumping are present. Site has residential areas at its northern and southern boundaries and are partly isolated. Alien invasive herbaceous weeds are conspicuous at the site, especially at hitherto cleared areas.

There are no wetlands or rocky ridges at the site.

No Threatened or Near Threatened plant- or animal species appear to be resident at the site. No other plant- or animal species of particular conservation concern appear to be present at the site.

An Endangered vegetation type Vaal-Vet Sandy Grassland (Gh 10), is mapped for the site. The scope for restoring and conserving the visibly degraded, modified and partly isolated vegetation as a unit representing the Vaal-Vet Sandy Grassland, at the site, is small.

There is little scope for the site to be part of a corridor of particular conservation importance.

The following potential risks, impacts and mitigation measures apply to the proposed development:

6.1 Identification of potential impacts and risks

The potential impacts identified are:

Construction Phase

- Potential impact 1: Loss of habitat owing to the removal of vegetation at the proposed development.
- Potential impact 2: Loss of sensitive species (Threatened, Near Threatened, Rare, Declining or Protected species) during the construction phase.
- Potential impact 3: Loss of connectivity and conservation corridor networks in the landscape.
- Potential impact 4: Contamination of soil during construction in particular by hydrocarbon spills.
- Potential impact 5: Killing of vertebrate fauna during the construction phase.

Operational Phase

- Potential impact 6: An increased infestation of exotic or alien invasive plant species owing to disturbance.

6.2 Potential impacts and risks during the construction phase

Classes of impacts for this study: Very High, High, Moderate, Low, Very Low

Aspect/Activity	Clearance of vegetation at part of the site for the development
Type of Impact	Direct
Potential Impact	Clearing of vegetation at the proposed development. This will entail the destruction of habitat of medium and low ecological sensitivity.
Status	Negative
Mitigation Required	Cultivation of indigenous vegetation at the site.
Impact Significance (Pre-Mitigation)	Moderate
Impact Significance (Post-Mitigation)	Moderate
RISK	Following the mitigation measures a moderate risk of impact is expected.

Aspect/Activity	Removal of sensitive species
Type of Impact	Direct
Potential Impact	Sensitive species: Presence of Threatened or Near Threatened plant- or animal species appear to be unlikely. No other plant or animal species of particular conservation concern appears to be present at the site.
Status	Neutral.
Mitigation Required	No specific mitigation measures for Threatened or Near Threatened sensitive species apply at the site.
Impact Significance (Pre-Mitigation)	Low
Impact Significance (Post-Mitigation)	Low
RISK	A low risk of threat to any sensitive species at the site is anticipated.

Aspect/Activity	Fragmentation of corridors of particular conservation concern
Type of Impact	Direct
Potential Impact	The scope for the proposed footprint to be a corridor of particular conservation concern is small.
Status	Negative
Mitigation Required	Planting of indigenous vegetation at the site is imperative.
Impact Significance (Pre-Mitigation)	Low
Impact Significance (Post-Mitigation)	Low
RISK	Following mitigation, a low impact risk is expected.

Aspect/Activity	Contamination of soil by leaving rubble/ waste or spilling petroleum fuels or any pollutants on soil which could infiltrate the soil
Type of Impact	Direct
Potential Impact	Rubble or waste could lead to infiltration of unwanted pollutants into the soil. Spilling of petroleum fuels and unwanted chemicals onto the soils that infiltrate these soils could lead to pollution of soils.
Status	Negative
Mitigation Required	Rubble or waste that could accompany the construction effort, if the development is approved, should be removed during and after construction. Measures should be taken to avoid any spills and infiltration of petroleum fuels or any chemical pollutants into the soil during construction phase.
Impact Significance (Pre-Mitigation)	Moderate
Impact Significance (Post-Mitigation)	Low
RISKS	A low risk is expected following mitigation.

Aspect/Activity	Possible disturbance, trapping, hunting and killing of vertebrates during construction phase
Type of Impact	Direct
Potential Impact	During the construction phase animal species could be disturbed, trapped, hunted or killed.
Status	Negative
Mitigation Required	If the development is approved, contractors must ensure that no animal species are disturbed, trapped, hunted or killed during the construction phase.
Impact Significance (Pre-Mitigation)	Moderate
Impact Significance (Post-Mitigation)	Low
RISKS	Following mitigation a low risk is anticipated.

6.3 Potential impacts during the operational phase

Aspect/Activity	An increased infestation of exotic or alien invasive plant species owing to clearance or disturbance where the footprint took place.
Type of Impact	Direct
Potential Impact	Infestation by alien invasive species could replace indigenous vegetation or potential areas where indigenous vegetation could recover. It is in particular declared alien invasive species such as *Prosopis glandulosa* (Mesquite), *Melia* azedarach (Syringa) or

	alien invasive Australian *Acacia* species (Australian Wattles) that should not be allowed to establish. Once established these combatting these alien invasive plant species may become very expensive in the long term.
Status	Negative
Mitigation Required	Continued monitoring and eradication of alien invasive plant species are imperative. It is in particular declared alien invasive species such as *Prosopis glandulosa* (Mesquite), *Melia azedarach* (Syringa) and alien invasive Australian *Acacia* species (Australian wattles) that should not be allowed to establish.
Impact Significance (Pre-Mitigation)	Moderate
Impact Significance (Post-Mitigation)	Low
RISKS	Following mitigation, a low risk is anticipated.

6.4 Risk and impact assessment summary for the construction phase

Aspect/ Impact Pathway	Nature of Potential Impact/ Risk	Status	Spatial Extent	Duration	Consequence	Probability	Reversibility of Impact	Irreplaceability	Potential Mitigation Measures	Significance of Impact and Risk		Confidence Level
										Without Mitigation/ Management	With Mitigation/ Management (Residual Impact/ Risk)	
Clearing of vegetation	Habitat loss, loss of indigenous species	Negative	Part of site	Long-Term	Substantial	Very likely	Low	Low	Clearance of vegetation of medium or low sensitivity will take place if the development is approved.	Moderate	Moderate	High
Loss of sensitive species	Loss of sensitive species (Note no Threatened species or Near-threatened species)	Neutral	Site	Long-Term	Very low (No threatened species anticipated to be impacted)	Unlikely	Not applicable	Not applicable	No specific mitigation measures apply to Threatened and Near Threatened sensitive species at the site, or any other plant- or animal species of particular conservation concern at the site.	Low	Low	High
Loss of corridors of particular conservation concern	Fragmentation of landscape and loss of connectivity	Negative	Site	Long-Term	Moderate	Unlikely	Moderate	Moderate	The scope for the proposed footprint to be part of a corridor of particular conservation concern is small.	Low	Low	High
Contamination of soil by spilling pollutants on soil which could infiltrate the soil	Soil contamination	Negative	Site	Long-Term	Moderate	Unlikely	Moderate	Moderate	Rubble and waste removal. Measures that avoid hydrocarbon (petroleum) spills to get into contact with the soil.	Moderate	Low	High

Disturbance or killing of vertebrates	Disturbance or killing of species	Negative	Site	Long-Term	Moderate	Unlikely	Moderate	Moderate	If the development is approved, contractors must ensure that no animal species are disturbed, trapped, hunted or killed during the construction phase.	Moderate	Low	High

6.5 Risk/ Impact assessment summary for the operational phase

Aspect/ Impact Pathway	Nature of Potential Impact/ Risk	Status	Spatial Extent	Duration	Consequence	Probability	Reversibility of Impact	Irreplaceability	Potential Mitigation Measures	Significance of Impact and Risk		Confidence Level
										Without Mitigation/ Management	With Mitigation/ Management (Residual Impact/ Risk)	
Increased infestation of exotic or alien invasive plant species	Loss of habitat quality	Negative	Site	Long-Term	Substantial	Likely	Moderate	Moderate	Monitoring and eradication of alien invasive plant species	Moderate	Low	High

6.6 Summary of risks and impacts

Ecological sensitivity at the site is low (Figure 2). There are no Threatened or Near Threatened animal- or plant species at the site, the vegetation has been degraded and modified, the site is partly isolated and there are no wetlands or rocky ridges at the site.

Following the mitigations which will be upheld and planned for the proposed footprint, all the impact risks listed above are moderate or low.

7 CONCLUSION

- Grassland at the site appears visibly degraded. Trampling and numerous paths are noticeable at the site. Negative urban edge effects such as informal dumping are present. Site has residential areas near its northern boundaries and at its southern boundaries and are partly isolated. Alien invasive herbaceous weeds are conspicuous at the site, especially at hitherto cleared areas.
- Vegetation at the site is a visibly degraded grassland. Very few trees or shrubs are found at the grassland at the site. Indigenous grass species at the site include *Cynodon dactylon, Aristida congesta*, *Elionurus muticus, Eragrostis lehmanniana, Eragrostis curvula, Tragus berteronianus, Eragrostis superba* and *Pogonarthria squarrosa.* Indigenous herbaceous plant species at the site include *Helichrysum caespititium, Barleria macrostegia, Berkheya onopordifolia* var. *onopordifolia, Chamaesyce inaequilatera, Hibiscus pusillus* and *Osteospermum scariosum*. The geophytic herb *Bulbine narcissifolia* and the dwarf-shrubs *Ziziphus zeyheriana* and *Felicia muricata* are present at the site. Alien invasive herbaceous weeds at the site include *Schkuhria pinnata*, *Verbena aristigera, Conyza bonariensis*, *Tagetes minuta*, *Bidens pilosa*, *Gomphrena celosioides*, *Chenopodium album*, *Guileminea densa*, *Argemone ochroleuca* and *Alternanthera pungens.*
- There are no wetlands or rocky ridges at the site.
- An Endangered vegetation type Vaal-Vet Sandy Grassland (Gh 10), is mapped for the site. The scope for restoring and conserving the visibly degraded, modified and partly isolated vegetation as a unit representing the Vaal-Vet Sandy Grassland, at the site, is small.
- No Threatened or Near Threatened plant- or animal species appear to be resident at the site. No other plant- or animal species of particular conservation concern appear to be present at the site.
- There is little scope for the site to be part of a corridor of particular conservation importance.
- Ecological sensitivity at the site is low (Figure 2). There are no Threatened or Near Threatened animal- or plant species at the site, the vegetation has been degraded and modified, the site is partly isolated and there are no wetlands or rocky ridges at the site.
- Following the mitigations which will be upheld for the proposed footprint of development, all the impact risks listed above are moderate or low.

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ANNEXURE 1

List of plant species recorded at the site.

Plant species marked with an asterisk (*) are exotic.

Sources: Bromilow (2010); Crouch, Klopper, Court (2010); Duncan (2016); Fish, Mashau, Moeaha & Nembudani (2015); Germishuizen (2003), Goldblatt (1986); Goldblatt & Manning (1998); Johnson & Bytebier (2015); Manning (2007), Manning (2009), McMurtry, Grobler, Grobler & Burns (2008); Smith, Crouch. & Figueiredo (2017); Van Ginkel *et al*. (2011); Van Jaarsveld (2006); Van Oudtshoorn (2012); Van Wyk (2000); Van Wyk & Gericke (2000); Van Wyk & Malan (1998); Van Wyk & Van Wyk (2013); Van Wyk & Smith (2014); Van Wyk, van Oudtshoorn & Gericke (2009)

TAXON	COMMON NAMES	FAMILY
ANGIOSPERMAE: MONOCOTYLEDONS		
Aristida congesta	Tassel Three-awn	POACEAE
Bulbine narcissifolia		ASPHODELACEAE
Chloris virgata		POACEAE
Cynodon dactylon	Couch Grass	POACEAE
Elionurus muticus		POACEAE
Eragrostis curvula		POACEAE
Eragrostis lehmanniana		POACEAE
Eragrostis superba	Saw-toothed Love Grass	POACEAE
Heteropogon contortus	Spear Grass	POACEAE
Melinis repens	Natal Red-top	POACEAE
Pogonarthria squarrosa	Herringbone Grass	POACEAE
Tragus berteronianus		POACEAE
ANGIOSPERMS: DICOTYLEDONS		
**** Alternanthera pungens***	Dubbeltjie	AMARANTHACEAE
Barleria macrostegia		ACANTHACEAE
Berkheya onopordifolia		ASTERACEAE
**** Bidens pilosa***	Black Jack	ASTERACEAE
Chamaesyce inaquilatera		EUPHORBIACEAE
**** Chenopodium album***	White Goosefoot	CHENOPODIACEAE
Convolvulus sagittatus	Wild Bindweed	CONVOLVULACEAE
**** Conyza bonariensis***		ASTERACEAE
Conyza podocephala		ASTERACEAE
**** Datura ferox***	Thorn Apple	SOLANACEAE
Felicia muricata		ASTERACEAE

Gazania krebsiana subsp. ***krebsiana***		ASTERACEAE
Gomphocarpus fruticosus	Cotton Milkbush	APOCYNACEAE
**** Gomphrena celosioides***	Bachelor's Button	AMARANTHACEAE
****Guilleminea densa***	Matweed	AMARANTHACEAE
Helichrysum argyrosphaerum	Wild Everlasting	ASTERACEAE
Helichrysum caespititium		ASTERACEAE
Lepidium africanum	Pepperweed	BRASSICACEAE
**** Lepidium bonariense***	Pepperweed	BRASSICACEAE
**** Malva parviflora***	Cheeseweed	MALVACEAE
**** Melia azedarach***	Syringa berry-tree	MELIACEAE
Osteospermum scariosum		ASTERACEAE
**** Portulaca oleracea***		PORTULACACEAE
**** Schkuhria pinnata***	Dwarf Marigold	ASTERACEAE
Searsia pyroides		ANACARDIACEAE
**** Solanum elaeagnifolium***	Silverleaf Bitter Apple	SOLANACEAE
**** Sonchus oleraceus***		ASTERACEAE
**** Tagetes minuta***		ASTERACEAE
Tribulus terrestris	Devil's Thorn	ZYGOPHYLLACEAE
**** Verbena aristigera***	Fine-leaved Verbena	VERBENACEAE
Ziziphus zeyheriana	Dwarf Buffalo-thorn	RHAMNACEAE

ENVIRONMENTAL MANAGEMENT PROGRAMME

(EMPr)

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Table of Contents

I. Glossary of Terms and Abbreviations (See Annexure A)

II. Key to Acronyms

- DETECT Economic Development Tourism and Environmental Affairs
- DME Department of Mineral and Energy
- ECO Environmental Control Officer
- EMPr Environmental Management Programme
- EA Environmental Authorization
- ARC Agriculture Research Council
- BA Basic Assessment
- BAR Basic Assessment Report
- BID Background Information Document
- DEA Department of Environmental Affairs
- DWS Department of Water & Sanitation
- EIA Environmental Impact Assessment
- EIR Environmental Impact Report
- EAP Environmental Assessment Practitioner
- I&APs Interested and/or Affected Parties
- LRAD Land Reform for Agricultural Development
- NEMA National Environmental Management Act, 1998(Act 107 of 1998)
- NHRA National Heritage Resources Act
- SAHRA South African Heritage Resource Agency
- SANBI South African National Biodiversity Institute

EMP: SECTION 1: INTRODUCTION

1.1.Background

Current environmental legislation requires that an assessment of potential environmental issues is undertaken as an important component of development projects. The Environmental Impact Assessment process identifies potential impacts that may arise at various stages of the development process and how these impacts can be mitigated. An Environmental Management Plan serves as a guideline.

Bizycon Pty Ltd (PTY) LTD conducted a Basic Assessment environmental investigation that identified potential environmental impacts that may arise and made recommendations in the report on how these impacts can be managed, especially during construction stages of the development. It also identified issues that should be considered during the operational phase of the development.

This EMP is a key environmental document, the content of which the line contractor must comply with during the construction process with the assistance of an environmental control officer and the site engineer and all relevant role players. This is to include any post construction rehabilitation work, which may be needed, and which would be carried out by the contractor or specialist subcontractor who he may appoint to do such rehabilitation when needed.

This EMPr is also developed in accordance with the requirements of the National Environmental Management Act (NEMA, Act 107 of 1998).

1.2 Aims and objectives of the EMPr

1.2.1 Aim

This EMP outlines measures to be implemented in order to minimize the potential environmental impacts associated with construction of the proposed Cemetery and the associated ablution facilities. It serves as a guide for the contractor and the construction workforce on their roles and responsibilities concerning environmental management on site, and it provides a framework for environmental monitoring throughout the construction period.

1.2.2 Objectives

The EMP becomes a legally binding document upon granting of an environmental authorization. The objectives of this EMP include:

- Encourage good management practices through implementation of the proposed development and ensure commitment to environmental issues;
- Define how the management of the environment is reported and performance evaluated;
- To point out necessary mitigation measures to be carried out
- Develop waste management practices based on prevention, minimization, recycling, treatment or disposal of wastes;
- Follow all monitoring procedures required to identify impacts on the environment; and;

- Provide guidance to the employees and contractors regarding their environmental and legislative obligations.

SECTION 2: REGULATORY / LEGISLATIVE CONTEXT

The EPMr is prepared taking into cognizance relevant legislative instruments that relate to the proposed development. The onus lies on the applicant to ensure adherence to all necessary regulations. Contractors must be alerted of the existence of the EMPr and its legislative implications and the need to comply and **a copy of the EMPr must always be kept on site.**

DEALING WITH NON-COMPLIANCE WITH THE EMPr (Penalties/ Incentives)

The contractor shall put in place procedures to motivate his staff to comply with the EMPr and to ensure that the work force is sufficiently aware and understand all necessary legal requirements related to the construction process. It is also important for the contractor to ensure that the workforce understands the implications of acts of non-compliance, or deliberate and malicious damage to the environment by any staff member.

2.1 Key Legislation and Regulatory Requirements

The following legislations are instrument for the construction process of the poultry houses. Noncompliance will lead to the penalties as set by the relevant sections of the related legislations:

2.1.1 National Environmental Management Act No. 107 of 1998

The National Environmental Management Act of 1998; Chapter 7 Part 1 Section 28 States that:

- Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, and is responsible for the costs and repair of the environment.

2.1.1.1 Penalties for non-compliance

Chapter 7 of the National Environmental Management Act of 1998 indicates explicitly under subsections 8, 9, and 10 the steps that may be taken to recover environmental protection costs from any manager, agent or employee who omits or goes against this Act.

2.1.2 National Heritage Resources Act No. 25 of 1999

Chapter II Part 1 Section 27 (18) on Protection and Management of Heritage Resources provides guidelines that state that;

- No person will be allowed to destroy damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage sites without a permit issued by the heritage resources authority responsible for the protection of such site.

2.1.2.1 Penalties for noncompliance

Section 51 of National Heritage Resources Act of 1999, set penalties to non-compliance as follows:

- A fine or imprisonment for a period not exceeding five years or to both such fine and imprisonment.
- A fine or imprisonment for a period not exceeding three years or to both such fine and imprisonment.
- A fine or imprisonment for a period not exceeding two years or to both such fine and imprisonment.

2.1.3 Occupational Health and Safety Act No. 85 of 1993

Section 14 (a) of the Occupational Health and Safety Act of 1993 makes the contractor responsible for the health and safety of persons who may be affected by any acts of omissions and the safety of the working environment under his jurisdiction.

2.1.3.1 Penalties for noncompliance

Section 38 (1) (2) (3) and (4) of this Act explicitly explain the offence and penalties to any employer who does or omits an act thereby causing any person to be injured at workplace.

2.1.4 Other necessary legislations but not limited to:

Environmental safety requirements in other legislative instruments such as the National Veld and Forest Fire Act, (No.101 of 1998), National water Act, (No.36of 1998) and Hazardous Substances Act, 1973, the National Air Quality Act, 39 of 2004, need to be taken into consideration and conditions observed during the implementation of his development.

2.2 KEY ROLE PLAYERS AND THEIR RESPONSIBILITIES

The successful implementation if the Empire hinges heavily on the proper identification, definition and allocation of roles to responsible persons or role players.

SECTION 3: SENSITIVE AREAS OF THE PROJECT AREA

Although the broad environment within and around the proposed development area is important in general consideration of construction impacts, the contractor shall ensure that his workforce are aware of the key sensitive sites within the project area and that they understand how their activities could impact directly or indirectly on environmental resources of these areas. The following descriptions need to be particularly understood and adhered to in the implementation of this EMP.

3.1 The Development site

The development site is a piece of land which was previously used for cultivation. The site is currently vacant, given the seizure of cultivation activities on the land. The proposed site is next to the community, and this requires extra care during construction stage. It is important that the site be fenced and all construction activities, including the ablution facilities, need to be established within the fenced area. Other than the Kagkala settlements, and the cattle facilities on the northern sections of the site, there are no other sensitive environments within eh immediate environments of the site.

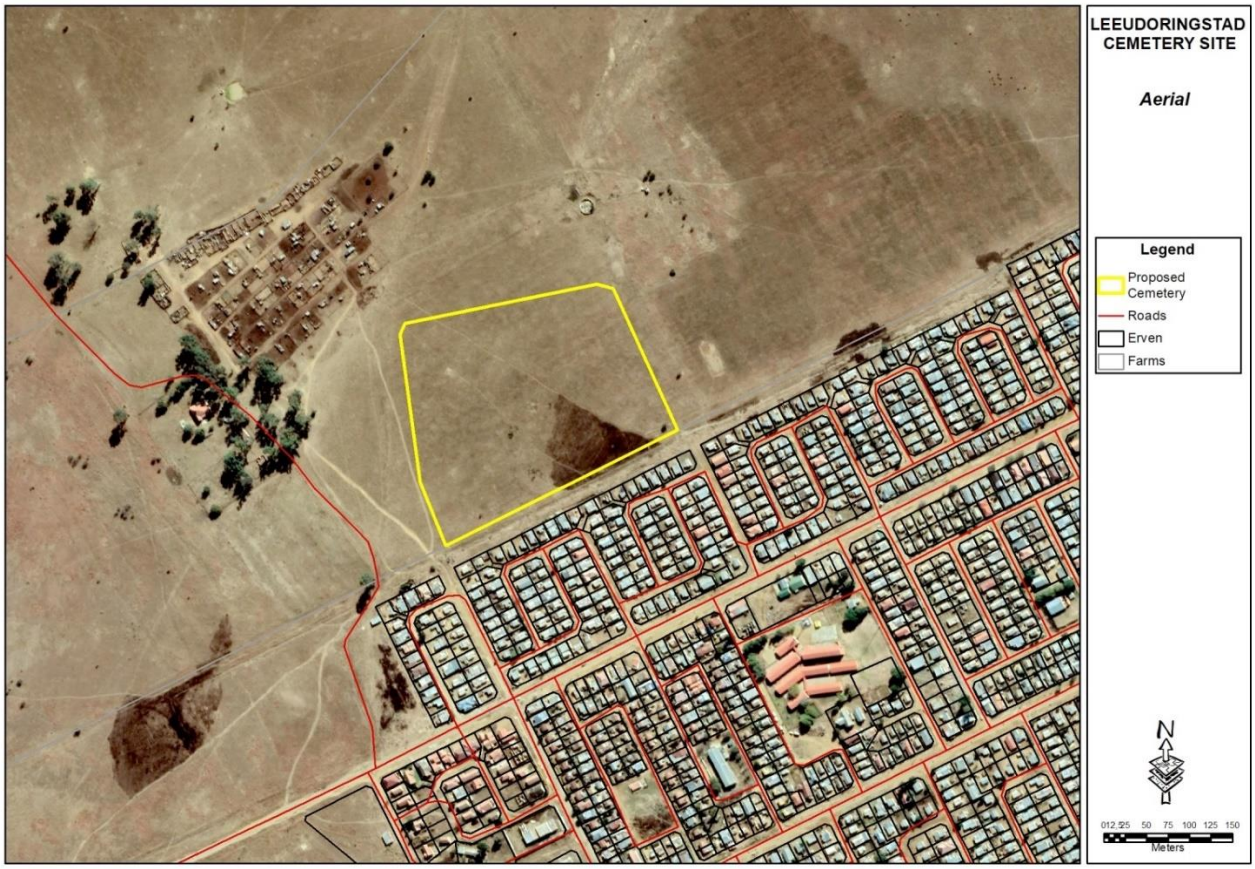

FIGURE 8 PROPOSED SITE

3.2 Protecting the Integrity of the Ecosystem of the project site

- As part of conserving biological diversity and protecting the integrity of the ecosystem within development areas, sites that are typically rich in species diversity, contain the presence of rare or endangered species, function as a unique or intriguing habitat, or are heritage sites, are often mapped as “sensitive sites”. The sensitivity refers broadly to sites being sensitive to the activities of man, and therefore, qualifying for additional protection over and above that of the surrounding areas.
- In the case of the site for the proposed farm, no such critical or sensitive areas such as wetlands, heritage, archaeological or culturally sensitive sites were uncounted. However, even though vegetation on the site will be removed gradually, it is important to preserve the integrity of vegetation on surrounding areas as mitigation measures for the stormwater or surface runoff.

3.3 Potential development activities

- Potential development activities that may impact on receiving environment include:
    a. Clearing of the site unto surrounding areas
    b. Storage of equipment and material unto surrounding areas
    c. Driving and turning of construction vehicles outside the designated area of construction
    d. Indiscriminate location of construction camp
    e. Excavations for foundations for buildings
    f. Mixing of mortar and concrete
    g. Structure assembly and erecting
    h. Transport of materials /supplies
    i. Waste generation and management

As general principles to observe in conducting activities:

- In order to make it easier to avoid, minimize or contain, the occurrence of the above impacts, all construction activities should be restricted to within the boundary of the development footprint.
- The though the vegetation on the site is severely transformed, the site is surrounded by river systems and which could be the receiver of any environmental malpractices on the site. Thus the buffer zones between the site development footprint and the river should be strictly maintained as no-development zones.

3.4 Ensuring Health and safety

- Although development in whatever form it takes is expected to benefit mankind, it in the process, could also cause disruptions to the established livelihood system and the general day-to-day operations of affected beneficiary communities or as in this case the surrounding communities farms or smallholdings.

- The purpose of this EMPr in this regard is to provide guidelines that would ensure that the health and safety needs of residents are taken into consideration during the construction and operation period and that, every necessary and possible step is taken to ensure that the normal social life of the community is not disrupted significantly during the period of construction and operation but rather improved in a positive manner.

SECTION 4: IMPACTS, MITIGATION MEASURES, AND MONITORING

- This section covers the core of the EMPr detailing potential environmental impacts, impacts sources and objectives are described, and environmental management mitigation measures to be implemented during construction are specified. **The contractor shall always adhere to these measures**. A checklist that may be used for internal monitoring of environmental performance is contained in Appendix 1.

The table below details the potential impacts, management objectives and proposed management actions required for mitigation.

Table 1 EMPr Impacts and Management Actions (Template adapted from CSIR, 2016).

Impact	Management Objectives	Management /Mitigation Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
Site Clearing and Vegetation Removal						
Clearing of the vegetation during site establishment fencing and construction.	To ensure safety of the surrounding environment	• All areas where vegetation is tripped off, such as camp site etc., should re-vegetation immediately after construction is complete.	• Site visit monitoring of construction period and before handover to ensure environment is properly taken care of.	Visual Observations	Continuous	Constructor, Site Engineer and ECO
Noise Impacts						
Noise is likely to be generated from the use of equipment and from construction workers on site.	Ensure that noise does not become nuisance to surrounding environment and neighbours	• Construction activities should be limited to daytime hours (i.e. 07:00- 17:00, as defined in South African National Standards (SANS) 10103). The noise generated during construction and operational phases must adhere to the relevant SANS standards.	Construction times to be monitored and managed (as well as included in the tender contract).	Records of complaints register and visual observations	Continuous	Contractor and ECO /EHS Officer
Traffic Impacts						
Traffic, congestion and potential for collisions during the	Prevent unnecessary impacts on the surroundings road network by supplying parking	• During the construction phase, suitable parking area should be created and designated for construction trucks and vehicles. • A construction supervisor should be appointed to coordinate construction traffic during the construction phase	Monitor, Record and report non-compliance.	Records of complaints register and visual observations	Continuous	Contractor EHS Manager

Impact	Management Objectives	Management /Mitigation Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
construction phase.	for construction vehicles on site. Managing the flow of traffic at critical areas where necessary.	(by drawing up a traffic plan prior to construction). • Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the construction and operational vehicles site must be adhered to				
Safety, Health and Environment						
Potential impact on the safety of construction workers due to construction activities (such as welding cutting, use of hot metals, working at heights, lifting of heavy items etc.).	Prevention of injuries to and fatalities of construction personnel during the construction phase.	• Ensure that skilled, licensed and competent Contractors, riggers and crane operators are appointed during the construction phase, along with the use of certified. Equipment and scaffolding. • Ensure that roads are not closed during construction, which may restrict access for emergency services. • Ensure that construction and operational staff members adhere to the relevant health and safety standards of the Occupational Health and Safety Act 181 of 1993	Monitors activities and record and report non-compliance by undertaking inspections.	Records of complaints register and visual observations	Continuous	Health and Safety Officer /contractor /ECO
Pollution caused by spillage or discharge of construction wastewater into the	Prevention unnecessary pollution impacts on the surrounding environment	• No mixing of cement directly on the ground. • All spills to be reported to the ECO. • Ensure that adequate containment structures are provided for the storage of construction materials on site.	Monitor activities and record and report non-compliance by undertaking inspections.	Incident registers	Continuous	Project Developer, ECO and contractor

Impact	Management Objectives	Management /Mitigation Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
surrounding environment		• Ensure the adequate removal and disposal of construction waste and material. • Oil containers must be stored on lined platform covered by disposable sand.				
Heritage Resources (Archaeology and Paleontology)						
Impact on Archaeology and Paleontology	Prevent damage and destruction to fossil, artifacts and material of heritage significance	• Carry out general monitoring of excavations for potential fossil heritage, artifacts and material of heritage importance as per the Chance Find Protocol (Refer to Heritage Report in BAR) • All work must cease immediately, if any human remains and /or other Archaeology, Paleontology and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ paleontologist and to AMAFA (or the South African Police Service), so that a systematic and professional investigation can be undertaken. Enough time should be allowed to remove/collect such material before construction recommences.	Monitor excavations and construction activities for archaeological and paleontological material. Contact AMAFA/SAHRA and identified paleontological/ Archaeology if any heritage features are uncovered.	Visual observation	Daily during excavation work. As required/ necessary during construction.	Contractor and ECO.
Groundwater Management						
Contamination of soil and ground water through	To control concrete and cement batching actives to	• Concrete mixing must be carried out on an impermeable surface (such as on boards or plastic sheeting and/or within a banded (lined) area with an impermeable surface).	Monitor the handling and storage of sand,	Register of incident	Daily	Project Developer, Contractor and EHS Manager.

Impact	Management Objectives	Management /Mitigation Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
spillage of concrete and cement	prevent spillages and contamination of soil, groundwater and the marine environment.	• Concrete mixing areas must be fitted with a containment facility for the collection of cement-laden water. This facility must be impervious to prevent soil groundwater contamination. • A washout facility must be provided for washing of concrete associated equipment. • Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Sand and aggregates containing cement must be kept damp to prevent the generation of dust. • Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a registered disposal facility.	stone and cement as instructed			
Wastewater Management						
Pollution caused by spillage or discharge of construction wastewater into the surrounding environment	Reduce construction wastewater discharge into the environment and the resulting impact	• Implement proper construction site management actions such as the installation of containment structures, good on-site housekeeping (regular sweeping of roadway and work areas, reporting system and environmental awareness training), and spillage management	Monitor via site audits ad records non-compliance and incidents.	Register of incidents Visual observation	Monthly	EHS Manager
Storm water Management						

Impact	Management Objectives	Management /Mitigation Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
Pollution of the surrounding environment because of contamination of storm water. Contamination could result from chemicals, oil, fuels, sewage, solid waste, litter etc.	Reduce the contamination of storm water	• The appointed Contractor should compile a Method Statement for Storm Water Management during the construction phase. • Provide secure storage for oil, chemicals and other waste materials to prevent contamination of storm water runoff. • Regular inspections of storm water infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds. • Erosion prevention structures should be placed to reduce water velocity within the drainage system. • Only essential vegetation should be removed and no disturbance to surrounding vegetation should be permitted. • Accumulation of water on the surface must be avoided always.	Compile Method Statement Monitor the banding and containment structures. Monitors via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections.)	Register of incidents Visual observation	Once off (and thereafter updated as required). Weekly Weekly	Contractor ECO/ EHS Manager Contractor
Waste Management						
Pollution of the surrounding environment because of the handling, temporary storage and disposal of solid waste (general	Reduce soil and groundwater and river contaminations because of incorrect storage, handling and disposal of general and hazardous waste.	• General waste and hazardous waste should be sorted temporarily on site in suitable (and correctly labeled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate. • Should on-site storage of general waste and hazardous waste exceed 100m^3 and 80m^3 respectively, then the National Norms and Standards for the	Inspection of the temporary waste storage area. Monitor waste generation and collection throughout the construction phase	Register of incidents Visual observation	Daily	ECO & EHS Manager

Impact	Management Objectives	Management /Mitigation Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
and hazardous).		Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to. • Ensure that the construction site is kept cleans always and that construction personnel are made aware of correct waste disposal methods. • No solid waste may be burned or buried on site.				
Air Quality Management						
Increased dust level and Air Quality Impact: Emissions from construction vehicles and generations of dust because of earthworks, as well as the delivery and mixing of construction material.	Reduce dust emissions during construction activities.	• Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimize dust generation. • Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40km/hour. • Limit construction activities to daytime hours.	Monitor dust suppression mechanisms and record non-compliances.	Register of incidents Visual observation	During complaints/incidents	EHS Manager, ECO and Contractor
Socio-Economic Impacts Management						
Employment creation and skills development opportunist	Maximize local employment and local business opportunities to promote and	• Enhance the use of local labour and local skills as far as reasonably possible. The project will employ approximately 20 people from the area.	Maximize local employment for unskilled labour and	Records of staff members Number of Local people employed	During the construction phase	Contractor and ECO.

Impact	Management Objectives	Management /Mitigation Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
during the construction	improve the local economy.	• Where the required skills do not occur locally, and where appropriate and applicable ensure that relevant local individuals are recruited. • Ensure that goods and services are sources from the local and regional economy as far as reasonably possible.	provincial/national skilled labour. Visual observation Procurement source documents			

MANAGEMENT PLAN FOR OPERATIONAL PHASE

Impact	Management Objectives	Management Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
Alien Vegetation Management						
Potential re-establishment of alien plants on site	Ensure the removal of alien invasive vegetation from the proposed projects area and prevent the establishment and spread of alien invasive plants.	• Ensure that any alien invasive plants that become re-established on site are removed promptly. The removal of these species must have carried out in line with relevant municipal and provincial procedures, guidelines and recommendations. • The removed species should be immediately disposed of correctly and should not be kept on site for prolonged periods of time, as this will enhance the spread of these species.	Monitor the removal of the alien invasive vegetation Visual observation		During the removal process	EHS Manager / Municipal Environmental Officer in Charge

Impact	Management Objectives	Management Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
Land rehabilitation	Ensure land (neighbours) impacted during construction phase is sufficiently rehabilitated.	• Infilling of all excavation work. • Remove all rubble from construction site and disposal of it at a registered landfill site.	Infill of excavation ensuring sub soil is filled first. Removal rubble to a registered	Visual observation	When /If complaints are received.	Project Developer
Safety, Health and Environment						
Soil and Water pollution	Prevent unnecessary pollution impacts on the surrounding environment.g	• Storm water should not be allowed to encounter effluent. • Monitoring water qualify of onsite borehole should be conducted.	Carry out though inspection of piping, loading hoses, and banding for leaks, using a checklist. Proof of attendance to training sessions to be kept on file at the terminal.	Incident reports Visual observation	Daily	Project Applicant (municipal Environmental Officers)
Air Pollution Environmental contamination of the surrounding environment from organic waste	Prevent unnecessary air pollution impacts because of the improper / inadequate / negligent operational procedures.	• Ensure that operational waste are appropriately and effectively contained and disposed without detriment to the environment. • Ensure that the development is designated and lined with impermeable substances (concrete) in accordance with advice from international best practice norms. • Establish appropriate emergency producers for	Assurance of functionally of fire extinguishers via inspections and certification by an accredited fire service company. Regularly check and record Air quality , and functionality of furnace strappers	Complaints report Maintenance register /Signed by operating engineer and Municipality environmental	As needed	Project Applicant

Impact	Management Objectives	Management Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
		accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. • The relevant standards for air quality must be adhered to.		Officer /Inspector		
Potential impact on the health of operating personnel, especially resulting in potential health injuries.	To ensure that there are no adverse effects on the health of operating personnel	• Operational personnel must wear basic (i.e. gloves) are necessary during the operational phase. • Fire extinguishers should be easily accessible on site.	Medical investigations or surveillance to be undertaken for the operating personnel. Keep a register of the medical records for the operating personnel.	Visual observation	As necessary	EHS Manager and Project Developer.
Storm water Management						
Increased storm water discharge into the surrounding environment which may end up in the rivers	Reduce the impacts of increased storm water discharge to the environment	• Regular monitoring of stormwater quality and river health	Implement surface water quality monitoring programme, based on consultation with the landowner	Incident reports	As agreed during the operational phase.	Project ECO Project Applicant (Municipal Environmental Officer)
		• Regular inspections of storm water infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds. • Accumulation of water on the surface must be avoided.	Undertake regular inspections of the storm water infrastructure (i.e. by implementation walk through inspections).		Weekly	Site Manager and EHS Manager

Impact	Management Objectives	Management Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
		• Waste traps in storm water system should be cleaned at regular intervals. • Run off to roads must avoided.				
Socio-Economic Management						
Additional employment opportunities	Maximize local employment and local business opportunities to promote and improve local economy	• Enhance the use of local labour and local skills as far as reasonably possible. • Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individual is trained. • Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.	Maximize local employment for unskilled labour and provincial/ national skilled labour		During the operational phase	Project Developer
Boost in the economy of Region 2	Maximize positive impacts through ensuring produce is sold to local markets	• Ensure that the proposed project has secured local buyers	Seek out local markets and secure formal trade agreement	Monthly supplier reports	Monthly	Project developer
Environmental Awareness`						
Increased energy consumption during the operational phase	Reduce energy consumption where possible	• Encourage the use of energy saving equipment (such low voltage light and low-pressure taps) and promote recycling. Operational personnel must be made aware of energy	Monitor energy usage via site investigations. Conduct training for all operational personnel		Monthly	EHS Manager / Municipality

Impact	Management Objectives	Management Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
		conservation practices as part of the environmental awareness training programme.				
		• Firefighting equipment must be made available at various appropriate locations				
Safety, Health and Environment						
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste	Prevent unnecessary pollution impacts on the surrounding environment	• General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, woods, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillage and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labeled waste collection bins and skips (or similar). • Ensure that enough general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis.	Monitor activities and record and report non-compliance by undertaking inspections.	Compliance reports Visual observations	Throughout the decommissioning phase	Project applicant, ECO and Contractor
Spill contingency, Management and Handling of Chemicals/Dangerous Goods						

Impact	Management Objectives	Management Actions	Monitoring			
			Indicator	Methodology	Frequency	Responsibility
Potential spillage of effluent to the surrounding environment from chemicals used in the facility and burial processes and in ablution facilities of the cemetery	Reduce the spillage of domestic effluent and the impact thereof on the environment.	• Ensure that normal sewage management practices are implemented during usage	EHS Manager to monitor via site audits and record non-compliance and incidents	Incident reports Visual observations	Monthly	EHS Manager and Environmentalist
		• Ensure that the toilet/sanitation facilities are maintained in a clean, orderly a sanitary condition.	Monitor via site audits and record non-compliance and incidents	Incident reports Visual observations	Daily	EHS Manager and Contractor
Waste Management						
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste	Reduce soil and ground water contamination as a result of incorrect storage. Handling and disposal of general and hazardous waste	• Include regular waste collection from the facility into the municipal waste stream.	Carry out monitoring throughout the operational phase	Compliance reports Visual observations	Continuously thought-out life of project	Project Developer and EHS Manager
		•	•			

4. EMP CONCLUSIONS AND RECOMMENTATIONS

The significance of most of the issues identified may be effectively reduced after mitigation should this environmental management plan be carefully followed. The burial service is an activity that will take place gradually, hence a mass impact is not expected, expect from construction stage where the layout and demarcation will be done, with internal road and ablution facilities. With the acquisition of the right specification and modern equipment and with proper installation by the contractor, there is solid foundation on which to guarantee safe establishment and operation of the facility. The concluding recommendations are:

- Contractors need to follow the environmental management plan;
- A copy of the EMP should always be placed on site, and the contractor and team should be workshopped on the requirements of the EMP.
- The development needs to benefit the community in a tangible manner, and therefore, attempts need to be made to integrate community needs and aspirations into the implementation processes of the development.
- Where appropriate, the contractor must use local labour as much as possible;
- The contractor needs to show concerns for health in general and the health safety of the employees in particular;
- In terms of the National Environmental Management Act 107 of 1998 everybody is required to take reasonable measures to ensure that they do not pollute the environment. Reasonable measures include informing and educating employees about the environmental risks of their work and training them to operate in an environmentally acceptable manner;
- Furthermore, in terms of the National Environmental Management Act 107 of 1998 the cost of repair for any environmental damage shall be borne by the person responsible for the damage.
- Operational stage recommendations should be also implemented and the onus is on the applicant to ensure adherence to the mitigation measures proposed. Regular maintenance and monitoring is required from the municipality and to ensure smooth operations.
- The competent authority may also pay random visits to the facility to monitor compliance during construction and operation stages.

- **1.3.1 General**
- The contractor shall actively engage himself and workers (if necessary) on this project to knowing and understanding of relevant terms, descriptions, and abbreviations in this EMP as indicated below:
- ***Contractor (CT)***
- For the purpose of this EMP: "CT" refers to the main contractor(s) appointed for the construction activities of the project or portion of the project. The main contractor(s) are required to adhere to the EMP and are responsible for ensuring that all subcontractors, suppliers and staff appointed by them, also adhere to the EMP.
- ***All Staff***
- This is the entire workforce. Workers employed by the contractor or persons involved with activities related to the project, or persons present or visiting the construction area, including permanent, contract, or casual labour and informal traders.
- ***Environmental Control Officer (ECO)***
- An individual or representative of an organization appointed to act on matters concerning the day-to-day implementation of the EMP, and for liaison with the DAEA&RD, and the public affected by construction.
- ***DETECT***
- Department of Economic Development, Tourism, and Environmental Affairs – who is the competent authority in the case of this application.
- ***Local Community***
- People residing in the region and near the construction activities, including the owners and/or managers of land affected by construction, small holdings, workers on the land, and the people in nearby towns and villages.
- ***Public***
- Any individual or group of individuals concerned with or affected by the project and its consequences, - including the local community, local, regional, and national authorities, investors, workforce, customers, consumers, environmental interest groups, and the general public.
- ***Relevant Authority***
- This refers to the environmental authority on national, provincial or local level with the responsibility for granting approval to a proposal or allocating resources.
- **1.3.2 About the Construction Activities**
- ***Alternatives***

- A possible course of action, in place of another, that would meet the same purpose and need (of proposal). Alternative can refer to any of the following but are not limited to hereto: alternative sites for development, alternative site layouts, alternative design, alternative process and materials.
- ***Construction Areas/Site****:*
- This is land area on which the project is to be located. It includes the sites of individual stands, construction campsites, access roads and tracks, as well as any other area affected or disturbed by construction activities. The EMP (particularly) the specifications for rehabilitation) is relevant for all areas disturbed during construction.
- ***Development***
- This is the act of altering or modifying resources in order to obtain potential benefits.
- ***Access Roads and Tracks***
- Access Roads and Tracks refers exiting and newly established roads and tracks, and areas cleared or driven over to provide access to/from the construction areas, and for the transportation of the construction workforce, equipment and materials.

- **1.3.3 About the Environment**

- ***Receiving / Affected environment***
- Those parts of the socio-economic and biophysical environment impacted on by the development.
- ***Assessment***
- The process of collecting, organizing, analysing, interpreting, and communicating data that is relevant to some decision.
- ***Environment***
- The surrounding within which humans exist that are made up of: - the land, water and atmosphere, fauna and flora, including any part, combination or interrelationships among these; and all the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human wellbeing.
- ***Environmental Impact***
- This is the degree of change in an environment resulting from effect of an activity whether desirable or undesirable. Impacts may be direct consequences of an organization's activities or may be indirectly caused by them.
- ***Environmental Impact Report***
- A report describing the process of examining the environmental effects of a development proposal, the expected impacts and the proposed mitigation measures.
- ***Evaluation***

- The process of weighing information, the act of making value judgments or ascribing values to data in order to reach a decision.
- ***Hazards***
- Hazardous substances in this regard are anything that constitutes a source of, or exposure to danger. Some examples of hazardous sources or materials are:
- Diesel, petroleum, oil, bituminous products;
- Cement;
- Solvent based paints;
- Lubricants;
- Explosives;
- Drilling fluids;
- Pesticides, herbicides.
- ***Hydrological Features***
- Hydrological features include, but not limited to:
- Rivers and Wetlands;
- Open water;
- Vegetated drainage channels;
- Subterranean water;
- ***Life Support Systems***
- Life support systems include, but are not limited to:
- An ecological system in which its outputs are vital for sustaining specialized habitats;
- An ecological system in which its outputs are vital for sustaining human life (e.g. water purification).
- ***Mitigation***
- Measures designed to avoid, reduce or remedy adverse impacts.
- ***Monitoring***
- This is the repetitive and continued observation, measurement and evaluation of environmental data to follow changes over a period to assess the efficiency of control measures.
- ***Negative Impact***
- A change that reduces the quality of the environment (for example, by reducing species diversity and the reproductive capacity of the ecosystem, by damaging health, property or by causing nuisance.

- ***Rehabilitation***
- Measures implemented to restore a damaged Environment to an acceptable level.
- ***Significant impact***
- This is an impact that, by its magnitude, duration or intensity alters an important aspect of the environment.

Curriculum Vitae
of EAP

ENVIRONMENTAL SCIENTIST | CONSULTANT

CURRICULUM VITAE OF BRENDA MAKANZA

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PROFESSIONAL PROFILE

A dedicated and passionate Environmentalist with valuable theoretical and experiential acumen in the areas of environmental conservation and administration; Brenda Makanza holds 16 years of experience gained through direct involvement in several conservation initiatives. Currently a Principal Environmental Consultant of the DIGES, South Africa; responsible for leading, administrating and completing assessments on Environmental Statements, as well as overseeing studies, interpreting technical reports and appendices regarding the same.

She leverages academic skills gained through an honours-level degree in Environmental Science and Post Graduate Certificates in Integral Water Management and Geo-informatics; alongside the proficient ability to actively and valuably participate in the development, design and implementation of environmental / conservation management policies and consultation initiatives; thereby supporting the highest standards of Environmental Management and Sustainable Development, in all undertakings.

Career Objectives: Environmentalist| Sustainability Consultant / Advisor | EIA / Environmental Consultant| GIS Consultant.

PROFESSIONAL STRENGTHS:

- Persistent and balanced approach to the mutually beneficial achievement of organisational objectives and stakeholder goals.
- First-class problem-solving skills and practical decision-making abilities. Dedicated to maintaining high-quality standards in all tasks.
- Able to apply analytical thinking/reach conclusions apart from and when using technical models.
- Able to develop ideas and solutions to meet diverse objectives, as required by the situation.
- Passionate interest in the fields of environmental management and conservation. Fully skilled and qualified with regards to the area of interest.
- Strong communication skills, verbal and written. Apt research, data analysis and report creation acumen.
- Hard-working and highly motivated. Able to work on own initiative and as part of a team.
- Leadership skills; guide and motivates teams towards the valuable attainment of results.
- Organised and able to complete projects on time and within budget. Ability to continually ensure that processes are moving as efficiently as possible, without sacrificing quality.
- *Computer Literacy*: ArcGIS [Documentation(Geodatabases), Analysis and Map Production] | Erdas Imagine [Analysis and Map Production] | Microsoft Office [Reporting].

VALUE-ADDED DELIVERABLES | EXPERIENCE:

- Serves in an advisory capacity to Private Clients, Government Departments, Municipalities and Parastatals.
- Conducts Site Assessments, Environmental Impact Assessments, Environmental Audits, Groundwater Quality Analysis and Waste Management Audits, to identify contamination and other areas of concern.
- Conducts site analysis and map production using different GIS software;
- Documents spatial data using different databases;
- Researches collect and analyses data/samples, and prepares reports to assist with decision making. Applies theory to the specific context to identify creative, practical approaches to overcome challenging situations.
- Makes use of relevant industry tools, including Geographic Information Systems, in support of effective and efficient environmental monitoring and auditing.
- Upholds principles regarding the sustainable management of Natural Resources, liaising with stakeholders and assisting with the development of Environmental Policies.
- Enforces relevant Laws and Occupational Health and Safety requirements as indicated within the specific context, communicating guidelines to stakeholders through regular information sessions.
- Understands continuous improvement, and keeps up-to-date with changes in methodologies, new thinking and approaches.

- Promotes knowledge management and a learning environment through leadership and personal example; seeking and applying developed wisdom and best practices in all undertakings.

QUALIFICATIONS

ISO 14001: 2015: Lead Auditor, SACAS, 2022

Combined ISO 45001:2018 and ISO 14001: 2015: Implementation and Internal Audit, NOSA, 2020

Incident Investigation Level 3, NOSA, 2020

SAMTRAC, NOSA, 2020

PGC Professional Diploma Geo-Informatics; UNIGIS, 2016

PGC Introduction to Geo-informatics; University of Johannesburg, 2012

PGC Integral Water Management; Saxion University, The Netherlands, 2008

Environmental Science & Health [with Honours]; NUST, Zimbabwe, 2004

Senior Certificate / Matric; Mutare Girls High, Zimbabwe, 1999

PROFESSIONAL REGISTRATION

SACNASP : Pr. Sci. Nat (Environmental Science-400016/17)
EAPASA : Registered EAP (2019/1542)
WISA : Associate Member

PROFESSIONAL EXPERIENCE

Name of firm	DIGES Group, South Africa
Designation	**Principal Environmental Consultant**
Period of work	2009 to Date

Key Roles & Accountabilities:

- Responsible for carrying out assessments on all Environmental Statements; overseeing the interpretation of technical reports and appendices which may comprise part or all of the ES.
- Conducting / managing site surveys and utilising data gathered to forecast future ecological developments.
- Studying/assessing Environmental Impact Developments on; soil, groundwater, rivers, lakes and wildlife habitats within a variety of ecosystems.
- Ensuring that the EIA register is maintained / up-to-date, and preparing/presenting all required statements and documentation regarding; evidence for public inquiries and reports to relevant stakeholders.
- Working in strict compliance with all relevant legislation, policies and stakeholder department instructions and resolutions.
- Implementing and upholding the application of all job site safety plans; attending the weekly general safety meeting and the weekly supervisor's safety meeting to gain and provide feedback on-site safety issues.
- Compiling and making available all required safety program documentation, records and regulatory compliance documentation.
- Performing reviews and inspections of the Jobsite to ensure full compliance with Provincial OH&S regulations, codes and policy.
- Identifying workplace safety hazards, and developing and implementing all necessary corrective actions to minimise or eliminate the same.

Key Projects:

- EIA and Map production for various townships, residential complexes and office parks.
- Borrow Pit applications
- EIA and Map production for the construction of various ESKOM Electricity Power lines and substations.
- EIA, Monitoring and Map production for various roads, bridges and pipelines.
- Formulation of Municipality Policies and State of the Environment reporting.

- Licensing, monitoring and auditing of several Landfills.
- WULA and GA for powerlines, mines and roads.
- Documentation- Compilation of borehole databases.

Projects and Professional Technical Experience

Walk-downs and CEMPr

- Walk-down and CEMPr for the Ariadne-Venus 400kV powerline within various Municipalities in KZN Province
- Walk-down and compilation of CEMPr for the Medupi Witkop 400kV powerline in various Municipalities, Limpopo Province.

Basic Assessment

- EMP and Basic Assessment Report for Establishment of Seshego Cemetery within Polokwane Local Municipality.
- EMP and Basic Assessment Report for Upgrading of gravel road from Praktiseer to Taung village within Greater Tubatse Local Municipality
- Basic Assessment for the construction of Klarinet Bridge within Emalahleni Local Municipality.
- Proposed construction of a 132kV power line from PPRUST substation to the proposed Akanani substation within Mogalakwena Local Municipality.
- Basic Assessment for the establishment of Sakhelwe extension within Emakhazeni Local Municipality.
- Proposed Southgate Township Establishment within Polokwane Local Municipality.

Scoping & Environmental Impact Assessments

- Proposed construction of a 30 km 132kV power line from Amandla substation within Elias Motsoaledi Local Municipality, Greater Sekhukhune District to Kwaggafontein substation within Thembisile Hani Local Municipality, Nkangala District.
- Proposed construction of a 45 km 132kV power line from Jane Furse ss to the new Mamatsekele ss within Makhuduthamage Local Municipality, Greater Sekhukhune District.
- Proposed Koedoesdoorns township establishment within Thabazimbi Local Municipality;
- Proposed Madala township establishment within Emakhazeni Local Municipality.
- Proposed Rustenburg Strengthening Project within Rustenburg Local Municipality.
- Proposed construction for the Limpopo East Strengthening Corridor within Limpopo Province.
- Proposed construction of Hyperrama pipeline within COE.

Amendments

- First and second amendment for the 132kV Mamatsekele powerline within Limpopo Province.
- Borrow Pit Application for road upgrading from Polokwane to Matlala village within Aganang local Municipality Capricorn District, Limpopo Province.

Borrow Pits

- Borrow Pit Application for upgrade (gravel to tar road) of roads D4066 and D4100 from Lebowakgomo/Middlekop
- Borrow Pit Application for upgrading from gravel to tar of road from Matsakali to Altein, to Shangoni Gate within Colin's Chabane Local Municipality
- Borrow Pit Application for upgrading from gravel to tar of road from Giyani to Malonga within Greater Giyani Local Municipality.
- Borrow Pit Application for upgrading of the road (gravel to Tar) from Manaileng to Rafiri within Lepelle Nkumpi Local Municipality.
- Borrow Pit Application for upgrading Of 5 km Internal Road (Gravel to Tar) At Marulaneng within Lepelle Nkumpi Local Municipality.

Strategic Planning

- Review & Updating of Free State Environmental Outlook
- Review & Updating of Bushbuckridge Local Municipality Integrated Waste Management Plan
- Review & Updating of eNdumeni Local Municipality Integrated Waste Management Plan
- Compilation of the South 32, Khutala Mine Biodiversity Action Plan
- Compilation of South 32, Khutala Mine Integrated Waste Water Management Plan
- Compilation of South 32, Khutala Mine Integrated Waste Management Plan

Water Use Licence Applications

- Amendment of WUL for Tivani Mine, Greater Tzaneen.
- WULA for Klarinet Ext5 and Ext6 Bridge Construction.

- WULA for construction of 400kV Ariadne-Venus power line within KZN province.
- General Authorisation for the construction of Hyperrama pipeline within COE.
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Monitoring

- Landfill auditing and water monitoring at the City of Ekurhuleni's operational and closed landfills.
- Landfill auditing and water monitoring at the City of Ekurhuleni's operational and closed landfills.

Name of firm	Ministry of Environment, Water & Climate, Zimbabwe
Designation	**Assistant: Southern Africa Biodiversity Support Programme**
Period of work	2007 to 2008

Key Roles & Accountabilities:

- Compiled/packaged and disseminated all required targeted biodiversity materials to relevant stakeholders; documenting specific activities undertaken by National Biodiversity Task Forces and Expert Working Groups, and recording the outcomes of the same.
- Communicated with the Programme Management Unit (PMU) in Gaborone, and host institutions, regarding the maintenance of Regional databases for up-to-date information on Programme outputs.
- Worked closely alongside the Convention Biological Diversity National Focal Point & National Programme Co-ordinator, ensuring that National Clearing House Mechanisms (CHMs) could access information on biodiversity-related documents and outputs as needed.
- Assisted the National Programme Co-ordinator in raising awareness of the Programme at different National forums and developed Biodiversity proposals for funding requirements.
- Liaised with relevant stakeholders including; clients, local authorities, professionals and contractors on several Programme related issues.
- Convened meetings of; the National Biodiversity Forum, expert working groups and other key stakeholders, on specific biodiversity topics.
- Conducted an 'inventory' of relevant biodiversity initiatives/projects underway within the country and the SADC Region.

Name of firm	IUCN ROSA [The World Conversation Union], Zimbabwe
Designation	**Intern: Ecosystems Programme**
Period of work	2002 to 2003

Key Roles & Accountabilities:

- Worked alongside Regional, National, and International environmental organisations; assisting in developing environmental management policies that took into account relevant economic, social, and environmental values.
- Generated situational analyses, summary documents and preliminary reports used in project formulation/development.
- Designed environmental project proposals for Southern Africa, and sought funding for developed proposals; preparing work plans and related key result areas regarding the same.
- Compiled implementation schedules, activity tasks, programme material requirements and itineraries for Regional workshops, as required.
- Documented and maintained records of specific activities undertaken by participants within the Ecosystems Programme.

PERSONAL DETAILS

Date of Birth, Nationality	24 March 1981,
Gender	Female
Languages	English

Curriculum Vitae

Of

Honu-Siabi MacCarthy

Cell: +27 (0) 719212618 Fax: +27(0)86 776 33 25 E-mail: macsiabi@gmail.com /maccarthy@developmentimpact.co.za

PERSONAL INFORMATION

Surname	:	Honu-Siabi
First Names	:	MacCarthy
Gender	:	Male
Current residence	:	South Africa (Pietermaritzburg / Johannesburg)

Profile summary:
Having been working in the development sector for a while, I have acquired more than 7years experience in critically assessing the environmental, economic and social impacts of development interventions, in South Africa. I have worked with both the public and private sector on diverse developmental initiatives and mostly work across sectors, and in collaborate with other individuals, teams and institutions in ensuring collective efforts towards sustainable and people-centered development and growth in South Africa and in on the continent of Africa as a whole.

EDUCATION

Name of Institution	Degree/Qualification obtained	Year Obtained
University of the Witwatersrand	**PGD in Public and Development Sector Monitoring and Evaluation**	2015
University of North West -RSA	**Master of Social Sciences (MS Sc.) –** Policy and Development Studies	2014
North West University - RSA	**Environmental Impact Assessment (Cert)**	2013
North West University - RSA	**Post Decision Environmental Monitoring and Enforcement (Cert)**	2013
University of North West GSB -RSA	**Project Management (Cert)**	2012
University of Cape Coast - Ghana	**Bachelor of Management Studies – (Honors)**	2007
International School Of Aviation – Ghana	**Tourism Management (Diploma)**	2001

Skills and Competencies

- Good Programme implementation and management skills
- Ability to use MS Projects in scheduling, executing and managing complex projects
- Conversant with all Microsoft Office End User Applications (Word, Excel, PowerPoint, Access, Publisher etc.), Corel Draw, SPSS etc.
- General Knowledge in computer Hardware and Software.
- Excellent verbal and written communication skills all levels
- Research, workshop, organization, facilitation and Presentation skills
- Attention to details and strong result-oriented thinking and innovation ability
- Ability to work under pressure with less or no supervision
- Design and implementation of monitoring systems
- Data collection (multiple methods/tools), data analysis and reporting skills
- Ability to search, using search protocols, and write up high quality academic/professional output

RESEARCH ACTIVITIES / CONFERENCES /WORKSHOPS

Research Projects

1. **Design Evaluation of the National Food and Nutrition Security Hybrid model, (NDSD)-THUSO:**
   This evaluation is commissioned by the National Department of Social Development towards a redesign of the Food and Nutrition Security Programme, to include use of vouchers, and other technological advances. July 2021 – January 2022.
2. **Process and Design Evaluation:** ***Emerging Public Leaders Programme, Emerging Public Leaders Programme****:* Cohort 1 and 2 fellows and No-fellows 2018-2021. Phase 1 concluded Feb 2020. This is a Follow up evaluation of implementation and impact of EPL programme on Public Sector Capacity Building in Ghana.
3. **M&E Technical Support and Monitoring:** ***SADC Parliamentary Forum SRHR HIV/AIDS & Governance Programme*****:** Funded by the Swedish Government and being implemented in 14 Southern African Countries. Tasks include providing technical M&E advice to M&E consultant, analyzing monitoring data, preparing Annual Reports, and planning and developing to M&E capacity building programmes.
4. **Implementation Evaluation:** ***Emerging Public Leaders Programme, Cohort 1 and Cohort fellows and No-fellows Phase 2 concluded Feb 2021****.*
   Follow up evaluation to access the impact of the Emerging public Leaders Programme on Public Sector Capacity in Ghana. Testing the M&E system designed and its implementation.
5. **Process and Implementation Evaluation and Design of Monitoring and Evaluation System** for the Emerging Public Leaders Programme, based in Ghana and Liberia, and Headquartered in Washington DC.
   This assignment involves, process evaluation of programme implementation in Ghana for 2018-2020, and a review of the monitoring and evaluation system towards redesigning to fit the West African Context. March 2019 – Dec 2020 (70% Complete, awaiting end of programme rolling evaluation).

Theses	**An Analysis of the Implementation of a Monitoring & Evaluation System at the NGO sector: The Case of the NGO SaveAct, 2013** *(Paper on this is being edited for publication)*
Market research	Commercialization Goat meat in the KZN Province Department of Finance & Economic Development (Funder) 2011

Conferences /Presentations

Conference	**Presenter:** Unpacking diagnostics as a key component in public policy making process: The need for evidence in diagnosing societal problems **5th SAMEA Biennial Conference** **Sandton, Johannesburg, RSA** 12-16 October 2015
Capacity-Building Workshop	**Research synthesis and Systematic Reviews** (3IE training) **African Evidence network Colloquium on Research evidence use** University of Johannesburg November 2014
Workshop and conference	**Participant** - Workshop on Systematic Reviews and Impact Evaluations **Presenter:** *The critical role of monitoring and evaluation systems in impact evaluation: Lessons from a case study* **3IE, Asian Development Bank *Conference:* Making Impact Evaluations Mater; Better evidence for Effective Policies and Programmes.** Asian Development Bank Manila, Philippines 1-5 September, 2014
Conference	**Presenter-** An Analysis of the Implementation of a Monitoring and Evaluation System: The Case of the NGO SaveAct **SAMEA, DPME *Conference on:* Policy Research: Do findings make a difference** 16 to 20 September 2013
Capacity-Building Workshop	**Participant**-Developing Monitoring and Evaluation Systems SAMEA and DPME *workshop Series* 25-27 September, 2013, Durban

AWARDS AND RECOGNITIONS

Conference Scholarship	3IE Sponsorship to attend and present poster at workshop and conference dubbed Making Impact Evaluations Matter. Manila, Philippines, Sept 1-7, 2014
Best Poster Presentation Award	1st Position, Best poster presentation, Making Impact Evaluation Matter Conference, Manila, Philippines, 2014
Emerging Evaluator Award (Scholarship)	South African Monitoring and Evaluation Association (SAMEA) 4th Biennial Conference, Sandton, Johannesburg, Sept 2013
Runner up (2nd Position) – National	Millennium Essay Competition (Organized for all Secondary Schools Nationwide) Ghana Millennium Commission, Nov 2000

EMPLOYMENT HISTORY

Employer	**Bizycon Pty Ltd / Development Impact Group**
Position	Snr EAP – EIAs, Research & Evaluations
Duties	Managing projects and consulting -
Duration	2011 to date (own consultancy)
Employer	**Thuso Enviro and Agric Development**
Position	EAP/Consultant 2016 – 2019 Snr EAP – EIAs, Research & Evaluations 2019 – to date
Duties	Managing projects and consulting – Conducting and managing EIAs, and all environmental processes
Employer	**Quest Research Services (QRS)**
Position	Snr Consultant – Monitoring and Evaluation
Duties	Project consultancy - Part time - Part of team
Duration	2016 - 2019
Employer	**University of the Witwatersrand**
Position	MOOC Community Teaching /Facilitating (short consultancy)
Duties	Assisting with student issues, monitoring and moderating

	online discussion forums and helping plan and review new modules and online courses.
Duration	September 2016 – November 2016
Employer	**Anglophone Centre for learning on Evaluation and Results (CLEAR-AA), Wits School of Governance**
Position	Researcher
Duties	Rendering support to Snr M&E technical expect Managing projects and offering support on key projects of CLEAR-AA, assisting institutions develop M&E systems and capacity, Undertaking research, conducting surveys, collecting and analyzing data and report writing, in addition to conducting presentations and meetings, and also organizing workshops and other interactive events.
Duration	November 2015 – April 2016
Employer	**Nature & Development Group of Africa**
Position	Project Manager (consulting) Project Manager – Environmental Consulting and Research
Duration	2009 – 2012, 2012 to 2015
Name of employer	**Nisis Engineering Designs Co. Ltd** (Project Management/Civil Engineering/Construction)
Position held	Assist. Manager (Projects and Administration)
Duties	Management of Projects and Procurement (For Construction of Public Water and Sanitation Facilities), Managing personnel and preparing of quarterly reports, General administration
Duration	Feb, 2006—November, 2007.
Name of company	**Thembaletu Community Education Centre**
Position	Trainer/ Facilitator
Duties	Training participants in Basic Business Skills, Reviewing Training material, preparing and conducting assessments and Evaluation and reporting at meetings

2. ENVIRONMENTAL IMPACT ASSESSMENT PROJECTS:

Some Selected Projects worked on as EAP (conduct and Manage EIA component of projects) include:

Environmental Impact Assessment (EIA) for Oukasie Walk In Housing, Madibeng LM- North West

Project Implementing Agent	:	Malepa Planning
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi

Role Conduct Environmental Impact Assessment
Project status : Authorized 2022

Environmental Impact Assessment (EIA) for Regiele Ext 9 - Housing, Koster – Ketleng River LM, North West
Project Implementing Agent : Malepa Planning
Project Consultant (Environmental) : MacCarthy Honu-Siabi
Role Conduct Environmental Impact Assessment
Project status : Authorized 2022

Environmental Impact Assessment (BAR) for uMzinkhulu Ext 9 and 10 Housing – North West
Project Implementing Agent : Isibuko Development planners
Project Consultant (Environmental) : MacCarthy Honu-Siabi
Role Conduct Environmental Impact Assessment
Project status : Authorized 2022

Environmental Impact Assessment (EIA) for 500 Serviced Sites in Ekuvukeni, Alfred Duma LM – North West
Project Implementing Agent : Isibuko Development planners
Project Consultant (Environmental) : MacCarthy Honu-Siabi
Role Conduct Environmental Impact Assessment
Project status : Authorized 2022

Environmental Impact Assessment (BAR) for Bekunthetho Low-income Housing – Amajuba DM - North West
Project Implementing Agent : Isibuko Development planners
Project Consultant (Environmental) : MacCarthy Honu-Siabi
Role Conduct Environmental Impact Assessment
Project status : Authorized 2022

Environmental Impact Assessment (BAR) for Brakfontein Township Establishment – Swartruggens - North West
Project Implementing Agent : AkkaMaduna
Project Leader : Mr R Themeli
Project Consultant (Environmental) : MacCarthy Honu-Siabi
Role Conduct Environmental Impact Assessment
Project status : In progress, 2021

Environmental Impact Assessment (EIA) for Popo Molefe Insitu Upgrade and Expansion– Rustenburg - North West
Project Implementing Agent : AkkaMaduna
Project Leader : Mr R Themeli
Project Consultant (Environmental) : MacCarthy Honu-Siabi
Role Conduct Environmental Impact Assessment
Project status : In progress 2021

Environmental Impact Assessment (EIA) for Popo Molefe Insitu Upgrade and Expansion– Rustenburg - North West
Project Implementing Agent : AkkaMaduna
Project Leader : Mr R Themeli
Project Consultant (Environmental) : MacCarthy Honu-Siabi
Role Conduct Environmental Impact Assessment
Project status : In progress 2021

Some Selected Projects worked on in this regard include:

Environmental Impact Assessment (BAR) for Residential development on Erf 1087 Posmasburg, Northern Cape

Project Implementing Agent	:	Thuso Enviro and Developments
Project Leader	:	Mr R Themeli
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	In progress 2020

Environmental Impact Assessment for Greenco Poultry Farm, Bela Bela, Limpopo

Project Implementing Agent	:	Development Impact Group (DIG) and **Thuso Enviro**
Project Leder	:	Mr R Themeli
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Authorized June 2020

Environmental Impact Assessment (BAR) for Residential Devt on 15 Strathcona Drive, Clansthal, Durban - KZN

Project Implementing Agent	:	Siyamthanda Projects
Project Leader	:	Mr H P Rayes
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Authorized June 2022

Environmental Impact Assessment for Drycut Housing Project, Newcastle

Project Implementing Agent	:	Isibuko Development Planners
Project Leader	:	Ms Sithokoza Cele
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Authorised Aug 2020

Environmental Analysis for Town Planning Scheme: Nqutu Local Municipality

Project Implementing Agent	:	NANGA Projects
Project Leader	:	Mr Suleiman Mwajuzuu
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2019

Environmental Analysis for Town Planning Scheme: Umlalazi Local Municipality

Project Implementing Agent	:	NANGA Projects
Project Leader	:	Mr Suleiman Mwajuzuu
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2018

Environmental Analysis for Town Planning Scheme: Emfuleni Local Municipality, Mpumalanga

Project Implementing Agent	:	Isibuko Development Planners
Project Leader	:	Mr M Maseko
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Approved 2018

Project identification and Township Establishments Nkangala District – Strategic Development Framework (SDF)

Project Implementing Agent	:	Isibuko Development Planners
Project Leader	:	Mr M Maseko
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	2016

Middleburg Housing Project, Delmas – Environmental Impact Assessment (Scoping)

Project Implementing Agent	:	Isibuko Development Planners
Project Leader	:	Mr M Maseko
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Feasibility Scoping 2016

West Rand Poultry Value Chain – Environmental Impact Assessment

Project Implementing Agent	:	National Dept of Rural Devet & Land Reform, Nkwele Agribusiness &Investments & Thuso Enviro
Project Leader	:	Mr Thati Tladi
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2016

Environmental Impact Assessment Groutiville Priority 2 Sanitation Project

Project Implementing Agent	:	Linda Masinga & Associates, Durban
Project Leader	:	Patrick Addo
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2015

Environmental Impact Assessment Namani Shopping Mall Ekuvukeni – near Ladysmith

Project Implementing Agent	:	Isineke Developments
Project Leader	:	Dr Nelson Mwanyama
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2015

Environmental Impact Assessment (Basic Assessment) Mkhuze Waste Water Treatment Works

Project manager	:	RCR Collaborative, Durban
Project Leader	:	Patrick Addo
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2015

Environmental Impact Assessment (Environmental Scoping &EIA) for Redcliff Housing Project

Project manager	:	RCR Collaborative, Durban
Project Leader	:	Patrick Addo
Project Consultant (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2012

Environmental Impact Assessment for the Rehabilitation of Storm-Damaged Roads in Hibiscus Coast Municipality

Project manager	:	Liquid Platinum
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
Project status	:	Completed 2009

Environmental Impact Assessment for Kenville Housing Project (Durban)

Project manager	:	Project Preparation Trust of KZN
Project leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi

My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed 2009

Environmental Impact Assessment for the Vulamehlo Ward 5 Housing Project

Project manager	:	TMS Properties
Project leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed 2010

Environmental Scoping for the Emapeleni Housing Project (Emapeleni)

Project manager	:	eThekwini Municipality
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	In progress

Environmental Scoping for the Kwadinabakubo Housing Project

Project manager	:	eThekwini Municipality
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Completed 2008

Environmental Scoping for the Cotton lands Housing Project (Cottonlands, Ndwedwe)

Project manager	:	eThekwini Municipality
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, public participation and report preparation
Project status	:	In progress

Wetland Assessment for the Copesville Housing Project (Copesville, Pietermaritzburg)

Project manager	:	Mr. M. Marareni (Umpheme Development Services)
Project leader	:	Dr. Nelson Mwanyama/Patric Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My Duties	:	Wetland Delineation and Report preparation
Project status	:	Successfully completed 2009

Environmental Impact Assessment for the Umlasi AA and Chicago Housing Project (Umlaasi, Durban)

Project manager	:	Chris Calitz (Terraplan Associates)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed 2009

Environmental Impact Assessment for the Umlasi - Isimbini Housing Project (Umlasi, Durban)

Project manager	:	Chris Calitz (Terraplan Associates)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi

My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed 2009

Environmental Impact Assessment for the Zanzibari Housing Project (Bluff, Durban)

Project manager	:	Project Preparation Trust of KZN
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Completed

Environmental Screening/Assessment for the Chartsworth Bulk and Infill Housing Project

Project manager	:	Nelson Allopi and Associates
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	Dr. Nelson Mwanyama MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed 2009

Environmental Impact Assessment for the Valley View Special Residential Housing Project (Valley-View Road, Marrianhill)

Project manager	:	eThekwini Housing
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed 2010

Environmental Impact Assessment for the Rehabilitation and Upgrade of Roads in Inanda Project (Inanda, Durban)

Project manager	:	Sigh Govender and Associates
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Completed 2010

Environmental Impact Assessment for the Sandton Phase 2 Housing Project (Kwandengezi, Pine Town)

Project manager	:	Sakum Housing Cc
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Environmental Impact Assessment for a Helicopter Landing Facility in Darnell

Project manager	:	Silvermoon Investment 364 Cc
Project Leader	:	Patrick Addo
Project Manager	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation

Environmental Impact Assessment for the Frediville Phase 2 Housing Project (Fredville, Hamasdale)

Project manager	:	Chris Calitz (Terraplan Associates)

Project Leader : Patrick Addo
Project Manager (Environmental) : MacCarthy Honu-Siabi
My duties : Field work, data collection and report preparation
Project status : Successfully completed

Environmental Impact Assessment for the Bhubhubhu Housing Project (Mfolozi Municipality)
Project manager : Chris Calitz (Terraplan Associates)
Project Leader : Patrick Addo
Project Manager (Environmental) : MacCarthy Honu-Siabi
My duties : Field work, data collection and report preparation
Project status : Successfully completed

Environmental Impact Assessment for the Iutval Rural Housing Project (Indaka Local Municipality)
Project manager : Mr. Graham (Siyamthanda Development)
Project Leader : Patrick Addo
Project Manager (Environmental) : MacCarthy Honu-Siabi
My duties : Field work, data collection and report preparation
Project status : Successfully completed

Environmental Impact Assessment for the Cato Crest Housing Project
Project manager : Bernd Rothaug (RCR Collaborative)
Project Leader : Patrick Addo
Project Manager (Environmental) : MacCarthy Honu-Siabi
My duties : Field work, data collection and report preparation
Project status : In Progress.

Environmental Impact Assessment for the Waterfall Ext. 4 Housing Development
Project Leader : Patrick Addo
Project Manager (Environmental) : MacCarthy Honu-Siabi
My duties : Field work, data collection and report preparation
Project status : In Progress

Other Housing Development Projects

Projects worked on in this regard include:

Environmental Impact Assessment for the Zidweni Rural Housing Project (Zedweni, Ingwe Municipality)
Project manager : Mr. M. Marareni (Umpheme Developments)
Project Leader : Patrick Addo
Project Manager (Environmental) : MacCarthy Honu-Siabi
My duties : Field work, data collection and report preparation
Project status : Successfully completed

Environmental Impact Assessment for the Manzamnyama Rural Housing Project (Centocow, Ingwe Municipality)
Project manager : Mr. Ray Doherty
Project Leader : Patrick Addo
Project Manager (Environmental) : MacCarthy Honu-Siabi
My duties : Field work, data collection and report preparation
Project status : Successfully completed

Environmental Impact Assessment for the Qiniselani-Manyuswa Rural Housing Project (Qiniselani near Hillcrest)

Project manager	:	Chris Calitz (Terraplan Associates)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Environmental Impact Assessment for the Vukuzithathe Rural Housing Project (Ezinqoleni)

Project manager	:	Mr. M. Marareni (Umpheme Developments)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Environmental Impact Assessment for the Zidweni Rural Housing Project (Zidweni, Creighton)

Project manager	:	Mr. M. Marareni (Umpheme Developments)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Environmental Impact Assessment for the KwaMashabane Rural Housing Project (Mbazwana)

Project manager	:	Mr. M. Marareni (Umpheme Developments)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Environmental Impact Assessment for the KwaMashabane Rural Housing Project (Mbazwana)

Project manager	:	Mr. M. Marareni (Umpheme Developments)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Strategic Planning and Environmental Assessment (SEA) Developments

Projects worked on in this regard include:

Strategic Environmental Impact Assessment for the Groutville, Adinville, Melville and Dube Village Township Regeneration Strategy (Groutville)

Project manager	:	S'bongiseni Maseko (Isibuko se Africa)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation

Project status	:	Successfully completed

Strategic Environmental Impact Assessment for the Shakaskraal, Woodmead, Shayamoya and Nkobongo Township Regeneration Strategy (Shakaskraal)

Project manager	:	S'bongiseni Maseko (Isibuko se Africa)
Project leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Strategic Environmental Assessment for preparation of a Strategic Development Framework for Phelandaba Township

Project manager	:	S'bongiseni Maseko (Isibuko se Africa)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Strategic Environmental Assessment for preparation of a Strategic Development Framework for Ndumo Township

Project manager	:	S'bongiseni Maseko (Isibuko se Africa)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Strategic Environmental Assessment for the preparation of a Strategic Development Framework for Bhambanana Township (Jozini)

Project manager	:	S'bongiseni Maseko (Isibuko se Africa)
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Field work, data collection and report preparation
Project status	:	Successfully completed

Other Work on EIAs and Environmental Management

Rehabilitation of Storm-Damaged Roads in Hibiscus Coast Municipality

Project manager	:	Liquid Platinum
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
Duties	:	ECO (Monitoring and preparation of monthly reports)
Project status		Completed

Kwaxolo Low Cost Housing Project, Kwaxolo, Bushy Vales, Marburg

Project manager	:	Malusi Zwane Dept. Of Human Settlement
Project Leader	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
Duties	:	Sales Administration
Project status	:	Completed

Environmental Scoping for Ekwandeni Housing Project

Project manager	:	eThekwini Housing
Project Leader	:	Patrick Addo
My duties	:	Public Participation – Information Distribution
Project status	:	Completed

Preparation of Business Plan for the Commercialization of the Goat Industry in North West

Prepared for	:	Department of Economic development
Project manager	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Market research - data collection and analysis report preparation
Project status	:	Completed

Empangweni Housing Development

Project manager	:	Patrick Addo
Project Manager (Environmental)	:	MacCarthy Honu-Siabi
My duties	:	Beneficiary Data Collection and processing

REFERENCES

1. Name	:	Mr Mxolisi Ndlovu
Position	:	Director and Snr Planner
Organisation	:	Izunzo YeSizwe
Contact details		033 345 2529
		mxolisi@inzunzoyesizwe.co.za
2 Name	:	Mr Regginald Themeli
Position	:	Director of Projects /CEO
Organisation	:	Thuso Enviro and Agric Development
Contact Number	:	Rthemeli@yahoo.com
3. Name	:	Mr. P. K. Addo
Position	:	Managing Director
Organisation	:	Nature and Development Group of Africa CC Pietermaritzburg
Contact Number	:	+27(0)83 555 22 88