EXIGENT

AUGUST 2023

FINAL BASIC ASSESSMENT REPORT

Construction of the Proposed Residential Development and Related Infrastructure: Derdepoortpark Extension 44 on Portions 426 and 679 of the Farm Derdepoort 326-JR, City of Tshwane (COT) Metropolitan Municipality.

Prepared for:

Zotec Developments (Pty) Ltd.

A SYSTEMS APPROACH
APPLIED TO YOUR REQUIREMENTS

PROJECT INFORMATION

Applicant and project information	
Contact person:	Leon Botha
Physical address:	Castle Gate Offices, 478 Koedoesnek Ave, Waterkloof Ridge, Pretoria, 0181
Project title	The construction of the Proposed Residential Development and Related Infrastructure on Derdepoortpark Extension 44 on Portions 426 and 679 of the Farm Derdepoort 326-JR, City of Tshwane (COT) Metropolitan Municipality
Enterprise name:	
Business registration number:	2003/023822/07

Details of the Environmental Assessment Practitioner	
Enterprise name:	Exigent Engineering Consultants CC
Contact person:	Jacolette Adam (EAP registration number: 2019/1040)
Contact details:	jacolette@exigent.co.za
Main report contributors and roles:	Franciska Snyman (author) Jacolette Adam (Reviewer)

Project information	
Gaut ref nr:	GAUT 002/23-24/E3600
Local Municipality:	City of Tshwane Metropolitan Municipality
Date of distribution on Draft Basic Assessment Report	23 May - 23 June 2023.
Date of distribution on Final Basic Assessment Report	24 August 2023

EXECUTIVE SUMMARY

Zotec Developments (Pty) Ltd is proposing a residential development and related infrastructure (to be known as Derdepoortpark Extension 44) with a density of 120 units per hectare, therefore, 912 units in total, on Portion 426 and Portion 679 of the Farm Derdepoort 326 - JR), which covers an extent of approximately 7.7894 ha. This application is for the clearing of indigenous vegetation, the construction of external infrastructure within 500 m of a wetland system, construction of stormwater infrastructure within 32 m of a watercourse, and the construction of the residential development. Part of the site is located on the proposed road reserve servitude area for the proposed K139 road alignment which has an area of approximately 3453m².

Exigent Engineering Consultants CC has been appointed to oversee all environmental processes regarding the proposed residential development. The current application is lodged in terms of the Environmental Impact Assessment Regulations of 2014, as amended (Government Notice Regulations 326 of 2017), promulgated in terms of Section 24(4) and 25 of the National Environmental Management Act of 1998 (Act No. 107 of 1998). A Basic Assessment process has been followed for activities triggered in terms of Listing Notice 1 of 2014, as amended (Government Notice Regulation 327 of 2017), for listed activities 27, as well as in terms of Listing Notice 3 of 2014, as amended (Government Notice Regulation 324 of 2017), for listed activities 4 and 12.

The following specialist assessments were conducted for the purpose of assessing the proposed residential development area:

- Geotechnical assessment: Laubscher Engineers Africa conducted a Geotechnical Investigation in 2008 to determine the engineering-geotechnical characteristics of the site. An additional Geotechnical Surficial Soils Investigation was conducted in 2023 by IntraSolutions to provide updated data for the project. Both specialist reports have been consulted for the purposes of this report. No rocky outcrops or shallow boulders were identified in the reports and the current investigations show that the site is underlain with relatively thick layers of colluvium and transported materials overlaying diabase.
- Heritage assessment: The paleontological sensitivity of the study area was found to be zero/insignificant and no further paleontological studies are required and no other heritage features were noted on site. The impact of the project on the heritage resources are low and it is recommended that the project can commence based on the condition that the recommendations of the specialist report are implemented as part of the Environmental Management Programme and based on approval from South African Heritage Resources Agency
- Ecological and Wetland Riparian assessment: According to the National Vegetation Map (SANBI, 2018), the proposed development lies within the Rand Highveld Grassland vegetation type of the Mesic Highveld Grassland Bioregion and the Grassland Biome as well as within the Marikana Thornveld vegetation type of the Central Bushveld Bioregion and the Savanna Biome. The National Biodiversity Assessment (NBA,2018), in terms of the IUCN red list of ecosystems, indicated the Ecosystem Threat status of the Marikana Thornveld vegetation types as **Endangered**. The National Biodiversity Assessment (NBA,2018), in terms of the IUCN red list of ecosystems, indicated the Ecosystem Threat status of the Rand Highveld Grassland as **Vulnerable**. Although the site is classified as having Marikana Thornveld Grassland and Rand Highveld Grassland, the site has undergone major transformation as it has been cleared and development has taken place on adjacent sites. The proposed development is not located within Critical Biodiversity Areas and Ecological Support Areas and no ridges were located within the site. The closest ridges are located approximately 2.4 km south-west of the site. The project area of influence is made up of a disturbed grassland vegetation type and alien species which is observed to have been transformed over time through anthropogenic and existing impacts such as local vegetation clearance and historical farming practices. After consultation of these various datasets, it was determined that no biodiversity priority areas exist within the study area. According to the Department of Environmental Affairs Screening tool the Terrestrial Biodiversity theme was classified as very high because the theme classified the study area as a Critically endangered ecosystem (CR). The animal theme was classified as medium as the theme indicated that there are seven (7) sensitive species which may occur onsite.

The specialist assessment observed that due to the amount of transformation of the site, no common bird species, small mammals, amphibians or reptiles were observed whilst walking the study area. The proposed study area does not possess any avian or amphibian habitats, hence clearing will not negatively affect these fauna species. The Department of Environmental Affairs screening tool indicated that the sensitivity for wetlands was very high. Upon site verification there were no wetlands or water courses located on site, however, as per the Department of Water and Sanitation regulatory area, the wetlands located within 500 m of the site were delineated and investigated at a desktop-level for the study area. The hydrological map in the Ecological study indicated that the Moretele River is located outside the site, however, still within the 500 m Department of Water and Sanitation regulatory area. The developer proposes stormwater services installations that will transect into the 32m buffer of the Moretele River, located across from the site.

The impact assessment undertaken for the proposed residential development indicated that the main negative impacts of the construction phase of the project would be the impact on the extent and integrity of Rand Highveld Grassland and Marikana Thornveld with reference to potential loss, impact on species composition and structure of vegetation, impact on ecosystem threat status, impact on explicit subtypes in the vegetation, impacts associated with the loss of the riparian area, possible sedimentation and erosion, infestation of alien invasive plant species and hydrological impacts. The main negative impacts anticipated for the operational phase of the proposed residential development included alien infestation of the surrounding areas where vegetation is removed for development. The positive impacts of the proposed residential development included the creation of job opportunities and additional housing prospects, increase in the local economy of the area, and in turn the provincial economy. A cumulative impact of this project would be additional vegetation clearing and ultimately change in land use required to allow for residential development. However, proper urban designs, which accommodates the natural features of the study area, by means of design and layout, enhances the use of the open space in the proposed development within a built-up urban environment.

The Public Participation Process is a critical aspect of any Environmental Impact Assessment Process. As part of the pre-application consultation process, stakeholders and pre-identified interested and affected parties were notified of the intent of the application process in terms of the National Environmental Management Act of 1998 (Act No. 107 of 1998). The main concerns raised during the pre-application consultation process included the lack of infrastructure in the area and that upgrades of existing services are required. No further comments were received from interested and affected parties during the review period after the Draft Basic Assessment Report was made available, however, stakeholder comments have been received. GDARD comments have been included in this report.

Based on the findings of the specialist assessments and the impact assessment, the Environmental Assessment Practitioner is of the opinion that the Environmental Authorisation for the proposed residential development can be granted provided that the mitigation measures identified and included within the Environmental Management Programme are adhered to. All recommendations as per the various specialist assessments must also be implemented on site, prior to, during and after the construction phase as stipulated in the respective documents. Furthermore, it is requested that the Environmental Authorisation be valid for 10 years.

LIST OF ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act of 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Areas
CRR	Comments and Reponses Report
DEA	Department of Environmental Affairs
DEFF	Department of Environment, Forestry and Fisheries
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Areas
GDARD	Gauteng Department of Agriculture and Rural Development
GN	Government Notice
GNR	Government Notice Regulation
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
NEMA	National Environmental Management Act of 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act of 2004 (Act No. 10 of 2004)
NHRA	National Heritage Resources Act of 1999 (Act No. 25 of 1999)
NWA	National Water Act of 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
SACNASP	South African Council of Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
TIA	Traffic Impact Assessment
MSDF	Municipal Spatial Development Framework
WUL	Water Use License
WULA	Water Use License Application

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GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1/2022)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.
2. This template is current as of April 2022. It is the responsibility of the EAP to ascertain whether subsequent versions of the template have been published or produced by the competent authority.
3. A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.
4. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority (uploaded to the EIA online system) empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application. The EIA online system can be accessed at https://eia.gauteng.gov.za.**
5. **Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.**
6. **A copy (PDF) of the final report and attachments must be uploaded to the EIA online system. The EIA online system can be accessed at https://eia.gauteng.gov.za.**
7. **Draft and final reports submitted in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) must be emailed to environmentsue@gauteng.gov.za.**
8. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
9. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
10. An incomplete report may lead to an application for environmental authorisation or Waste Management License being refused.
11. Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorization or Waste Management License being refused.
12. The use of “not applicable” in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation or Waste Management License being refused.
13. The applicant must fill in all relevant sections of this form. Incomplete applications will not be processed. The applicant will be notified of the missing information in the acknowledgement letter that will be sent within 10 days of receipt of the application.
14. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
15. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
P.O. Box 8769
Johannesburg
2000

Ground floor, Umnotho House, 56 Eloff Street, Johannesburg

Administrative Unit telephone number: (011) 240 3051/3052
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:						
File Reference Number:						
Application Number:						
Date Received:						

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

N/A

Is a closure plan applicable for this application and has it been included in this report? No

if not, state reasons for not including the closure plan.

The proposed residential development is a housing and associated infrastructure development which aims to provide housing solutions for current and future generations. Therefore, no closure of the proposed residential development is expected. Should decommissioning of the infrastructure be required in the future, the promulgated regulations at that time will be applicable and will be followed.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? **Yes**

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? **Yes**

If no, state reasons for not attaching the list.

Have State Departments including the competent authority commented? **Yes**

If no, why?

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

The construction of the Proposed Residential Development and related infrastructure of Derdepoortpark Extension 44 on Portions 426 and 679 of the Farm Derdepoort 326-JR, City of Tshwane Metropolitan Municipality.

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development	✓	Other, specify	

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES	~~NO~~

If yes, describe the legislation and the Competent Authority administering such legislation

The proposed residential development will require authorisation from the Department of Water and Sanitation (DWS) for civil works within 500 m of a wetland for civil works within 32m of a watercourse and a residential development within the 500 m Regulatory Area (as defined by Government Notice (Government Notice (GN) 509 of 2016)) of a wetland. A Water Use Licence (WUL) in terms of Section 21 of the National Water Act (Act No. 36 of 1998), will be required.

If yes, have you applied for the authorisation(s)?	**YES**	~~NO~~
If yes, have you received approval(s)? (attach in appropriate appendix)	~~YES~~	**NO**

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
Constitution of the Republic of South Africa (Act No 108 of 1996)	National & Provincial and local government	4 February 1997
National Environmental Management Act, 1998 (NEMA, Act No. 107 of 1998 as amended).	Gauteng Department of Agriculture and Rural Development (GDARD)	27 November 1998
Environmental Impact Assessment (EIA) Regulations of 2014, as amended (Government Notice Regulations (GNR) 326 of 2017)	GDARD	4 December 2014 7 April 2017
National Water Act, 1998 (NWA, Act No 36 of 1998) as amended	Department of Water and Sanitation	26 August 1998 1 October 1998
National Heritage Resources Act of 1999 (NHRA, Act no 25 of 1999)	Provincial Heritage Resources Agency Gauteng (PHRAG)	28 April 1999
The Conservation of Agricultural Resources Act of 1983 (CARA, Act No. 43 of 1983)	National Department of Fisheries, Forestry and Environment (DFFE)	27 April 1983
National Forest Act of 1998 (NFA, Act no. 84 of 1998)	DFFE	20 October 1998
National Environmental Management Biodiversity Act of 2004 (NEMBA, Act No 10 of 2004)	GDARD	31 May 2004
The Development Principles of the Spatial Planning and Land Use Management Act of 2013 (SPLUMA, Act No. 16 of 2013)	City of Tshwane (COT) Metropolitan Municipality	4 July 2014
All relevant Provincial regulations, municipal by-laws and ordinances which includes: • NEMA Regulations 2014 and 2017 • Gauteng Environmental Management Framework (2015) • The Gauteng Draft Red Data Policy • The Gauteng Draft Ridges Policy; • Protection of Agricultural Land in Gauteng Revised Policy (June 2006) • CoT Metropolitan Spatial Development Framework 2021	Listed documents will be consulted and any guidelines and/or restrictions found will be incorporated into this assessment.	Various dates

• CoT Metropolitan Municipality's Open Space Policy • CoT Integrated Development Plan 2021-2026		

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

Legislation, policy of guideline	Description of compliance
Constitution of the Republic of South Act (No. 108 of 1996)	This assessment is based on the principle that everyone has 'the right to a healthy environment and the right to have the environment protected' as per Chapter 2, Section 24 of the Constitution.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	The Environmental Authorisation (EA) for the proposed residential development is lawfully applied for in terms of the Environmental Impact Assessment (EIA) Regulations of 2014, as amended (GNR 326 of 2017) promulgated under NEMA. The conditions on the EA, if approved, will be adhered to.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The assessment of the site for heritage resources has been undertaken in terms and respect of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) as amended (NHRA).
National Water Act, 1998 (Act no. 36 of 1998) as amended	The proposed residential development will be within 100 m of a delineated watercourse.
National Forest Act, 1998 (Act no. 84 of 1998)	An Ecological Impact Statement (Appendix H4) is attached to the BAR
National Environmental Management Biodiversity Act, 2004 (Act 43 of 1983)	An Ecological Impact Statement (Appendix H4) is attached to the BAR
The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	No activities triggered in terms of the CARA
The Development Principles of the Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)	Comply with the principles of Section 7 in terms of spatial planning land development and land use management.
All relevant Provincial regulations, Municipal by-laws and ordinances This includes: • NEMA Regulations 2014 and 2017 • Gauteng Environmental Management Framework (2015) • The Gauteng Red Data Policy • The Gauteng Ridges Policy • Protection of Agricultural Land in Gauteng Revised Policy (June 2006) • CoT Metropolitan Municipality Spatial Development Framework 2021 • CoT Metropolitan Municipality's Open Space Policy • CoT Integrated Development Plan 2021-2026	• The GDARD red data policy provides methods of identifying and management of the Red Data species within the province. • The Protection of Agricultural Land in Gauteng Revised Policy provides methods of identifying and management of the agricultural lands within the province; • CoT Metropolitan Municipality SDF guides the development within the City boundaries. • CoT Metropolitan Municipality's Open Space Framework guides the development and management of the City open spaces. • CoT IDP guides the development in terms of operational planning of the city

Description of listed activities triggered for the purpose of the Application in terms of the EIA Regulations of 2014, as amended (GNR326, 2017)

Table 1. Listed activities triggered by the proposed residential development in terms of the EIA Regulations of 2014, as amended.

Indicate the number of the relevant Government Notice:	Activity No (s) (relevant notice): e.g. Listing notices 1, 2 or 3	Describe each listed activity as per the wording in the listing notices:	Describe each listed activity as per the wording relative to the project:
GN R327 - Listing Notice 1 of 2014, as amended	27	*The clearance of an area of one hectares or more, but less than 20 hectares of indigenous vegetation.*	The proposed residential development and related infrastructure will require the clearance of approximately 7.7984 ha of indigenous vegetation.
GN R327 – Listing Notice 1 of 2014, as amended	45	*The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure—* *(i) has an internal diameter of 0,36 metres or more; or* *excluding where such expansion—* *(aa) relates to transportation of water or storm water within a road reserve or* *(bb) will occur within an urban area.*	There is limited existing municipal stormwater systems within Intaba Street, the road which will be used for the site access. The developer proposes to upgrade this road and construct the stormwater infrastructure required for Intaba Street within the road reserve, within an urban area. However, part of the stormwater expansion will be located outside of the Urban Development Zone and outside of a road reserve. The developer proposes a 1500 mm ø be constructed as a boundary service by replacing the existing 450mm ø stormwater pipe. This proposed stormwater will connect to existing stormwater infrastructure in the southern corner of Intaba street, after which it will be directed underneath Baviaanspoort Road and be discharged via a new stormwater outlet structure that will be located within roughly 28m from the Moretele River,. The 3m stormwater servitude will need to be registered over Portion 20 of the Farm Derdepoort 326-JR as well as R/23 of the Farm Derdepoort. The length of the 1500mm ø pipe has a length of 138m which will discharge on the edge of the riparian zone through a stormwater outlet structure.
GN R327 - Listing Notice 1 of 2014, as amended	56	*The widening of a road by more than 6 metres, or the lengthening of a road by more* *than 1 kilometre—* *(i) where the existing reserve is wider than 13,5 meters*	**Site Access to Derdepoortpark Ext. 44 :** Both of the following options for the site access will widen part of Intaba Street where site access is planned. Option 1: The developer would be responsible to construct the recommended butterfly-type access to the subject township. To implement this access configuration, a short right turning lane on the northern approach and a short acceleration lane on the receiving end of the southern approach is to be constructed. The access (north-western) approach is to comprise of two inbound lanes with two outbound lanes and a minimum stacking distance of at least 25m.

Indicate the number of the relevant Government Notice:	Activity No (s) (relevant notice): e.g. Listing notices 1, 2 or 3	Describe each listed activity as per the wording in the listing notices:	Describe each listed activity as per the wording relative to the project:
			Option 2: The developer would be responsible to construct the recommended implementation of a traffic circle with an outside diameter in the order of 30m with single circulating lanes. The recommended stacking at the access is recommended to be at least 25m in total. It is our recommendation that the traffic circle geometry be approved and implemented. This option will also widen Intaba Street Although both proposed options would have sufficient capacity to accommodate the anticipated traffic, the traffic circle would also induce traffic calming to some extent. According to information provided through email correspondence with Dhubecon Consulting Engineers, Intaba Street has a road reserve of 20m. **Baviaanspoort Road (M15) / Intaba Street:** At the eastern approach of this intersection, road widening would be required to implement a short right turning lane with a dedicated continuous left turning slip-lane. In addition to the geometric upgrades, it is further proposed that this intersection should become signalized by the developer. NOTE: It is, however, important to note that the signalization and geometric upgrades as per Drawing No. 0637/CL/04 would become redundant once the SANRAL upgrades are constructed, specifically the extension of Intaba Street in a southern direction which is planned to form a new intersection with Baviaanspoort Road / K139 about 600m south of the site. This planned full intersection will replace the existing T-intersection between Baviaanspoort Road and Intaba Street, i.e., this intersection will be closed off (see Appendix F4 for Traffic Impact Report). Once this intersection is constructed, it is expected that all of the traffic traveling through the existing T-intersection between Intaba Street & Baviaanspoort Road would redistribute to this new intersection instead. The signalization and geometric upgrades proposed at this T-intersection would only be required if the subject development occurs before the SANRAL upgrades or if the SANRAL upgrades are delayed for some reason. These signals would therefore only be temporarily active (or could perhaps never be installed if the SANRAL

Indicate the number of the relevant Government Notice:	Activity No (s) (relevant notice): e.g. Listing notices 1, 2 or 3	Describe each listed activity as per the wording in the listing notices:	Describe each listed activity as per the wording relative to the project:
			upgrades are implemented according to schedule) until the intersection is replaced by the newly planned full intersection further south. According to information provided through email correspondence with Dhubecon Consulting Engineers, this intersection has a road reserve of 25 m to 28 m and therefore the road will be widened by more than 6m as it is currently around 8 m wide. **Sefako Makgatho Drive (R513) / Intaba Street / Kameeldrift Road:** It is proposed that the developer implement a left turning slip-way at the southern approach of the intersection. Along with this geometric upgrade, updated road markings and timing plans would also be required. The existing road appears to be roughly 12 m wide and will be upgraded for the intersection to make use of the 24 m road reserve. NOTE: The planned SANRAL upgrades at this intersection would comprise of the implementation of additional through lanes in each direction on Sefako Makgatho Drive. In total, there would be four through lanes traveling per direction on Sefako Makgatho Drive. If, however, the subject development occurs before the SANRAL upgrades, then the left turning slip-way would have to be implemented before the SANRAL upgrades as well. This could also imply that when the SANRAL road upgrades are implemented, then this left turning slip-way would have to be reconstructed by SANRAL, if Sefako Makgatho Drive is widened in a southern direction to accommodate the additional through lanes instead of widening in a northern direction by reducing the width of the median island.
GN R324 - Listing Notice 3 of 2014, as amended	12	*The clearance of an area of 300 square metres or more of indigenous vegetation, in Gauteng i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as*	According to the National Vegetation Map (SANBI, 2018), the proposed development lies within the Rand Highveld Grassland vegetation type of the Mesic Highveld Grassland Bioregion and the Grassland Biome along with the Marikana Thornveld vegetation type of the Central Bushveld Bioregion and the Savanna Biome. The National Biodiversity Assessment (NBA,2018), in terms of the IUCN red list of ecosystems, indicated the Ecosystem Threat status of the Marikana Thornveld vegetation types as Endangered, and Rand Highveld Grassland as Vulnerable.

Indicate the number of the relevant Government Notice:	Activity No (s) (relevant notice): e.g. Listing notices 1, 2 or 3	Describe each listed activity as per the wording in the listing notices:	Describe each listed activity as per the wording relative to the project:
		critically endangered in the National Spatial Biodiversity Assessment 2004;	The proposed residential development will require the clearance of approximately 7.7984 ha of indigenous vegetation which is located within the Endangered Marikana Thornveld Ecosystem type, and the Vulnerable Rand Highveld Grassland Ecosystem type as classified by the NEMBA: Ecosystems list. Road and stormwater upgrades/construction will also take place in an area classed as a threatened ecosystem as discussed above.

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below

Alternative layouts:

- Alternative layouts were drawn up based on best practice engineering design methods as determined by the engineering and township development team as part of this process.
- A critical component of the layout assessment is to understand the market within the area where the proposed development will occur in order for the proposed development to respond to the market requirements.

Design alternatives:

- The engineers and project team evaluated site and soil conditions of the proposed sewer line in order to optimize the location and alignment.
- The proposed route alignment also had to consider joining existing services.

Provide a description of the alternatives considered

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other (provide details of "other")	**Description**
1	Proposal	Proposed Layout, site access and services: The preferred development alternative entails the construction of the Derdepoortpark Extension 44 residential township with a density of 912 units with a density of 120 units/ hectare on Portion 426 and Portion 679 on the Farm Derdepoort 326-JR, CoT Metropolitan Municipality, and related infrastructure. The development will be enhanced by the provision of private open spaces and play areas, to provide prospective residents with a safe space to relax. The preferred alternative for the proposed project has been selected in such a way so as to present an optimal design (in terms of economic preference) to the developer. The area that the access will occupy is estimated as 485.7 m² The subject site's developable area is approximately 7.93 ha in extent and the proposed township will be known as Derdepoortpark Ext. 44. township and zoned as 'Residential 4' with a proposed development density of 120 units/ ha. The expected target market would be the middle-income market, similar to other nearby residential developments/ complexes in the area. The proposed township is bounded by Baviaanspoort Road (M15/ Future K139) to the west, also known as the Moloto Road (R573) further north of the site. Intaba Street borders the site to the south-east and Sefako Makgatho Drive (R513/ K14) is located just north of the site. It is important to note that the implementation of the future K139 (Baviaanspoort / Moloto Road) west of the site has been taken over from Gautrans by the South African National Roads Agency who are planning significant upgrades on the majority of this road as well as other roads in the study area. These upgrades include the realignment and rehabilitation of existing roads as well as the implementation of a new grade-separated interchange between Baviaanspoort Road / Moloto Road and Sefako Makgatho Drive, near the north-western corner of the site. Furthermore, an entirely new north-south

road between Baviaanspoort Road and Stormvoël Road is planned (M8), which forms part of the implementation of the K139 provincial road. According to information received from KBK Engineers (Pty) Ltd, who are the design engineers responsible for the designs of these upgrades, construction of the first phase of these upgrades could start as early as mid-2023.

SANRAL has provided a letter of approval of the TIA report and is attached as Appendix F5 to this report.

As per the Roads and Stormwater report, a single site access is indicated and is located in Intaba Street. As indicated in **Figure 2** the Traffic Impact Assessment (TIA) a single access to the development is proposed off Intaba Street which is classified as a Class 4b residential collector road past the site. Note that the final position of the access will be confirmed as part of the submission of the Site Development Plan for the development. It can, however, be confirmed that the access will be located on the south-eastern boundary of the site on Intaba Street and that there is ample sight distance available in all directions on this road in particular. A conceptual layout of the proposed access is shown in Drawing No. 0637/CL/02a (TIA) in which it is proposed that a butterfly-type access be implemented. To implement this access configuration, local road widening on the western side of Intaba Street will be required so that a short right turning lane on the northern approach and a short receiving acceleration lane on the southern approach of the access intersection can be implemented.

Residential Development Parameter	Portion 426	Portion 679
Contributing area	37 410 m^2	41 940m^2
Total area of residential area: 79,350m^2		

Boundary Services	
Item	**Size/width/length/area**
Intaba Road	3 940.48m^2
Taxi Bay	80m^2
1500mm dia Stormwater pipe	399m^2

Municipal Services – External Services – Non-offset-able	
Roads and stormwater	
Pedestrian walkway	531m and at least 1.8m wide
Pedestrian crossing 37.4m^2	
675 mm dia stormwater pipe	60m
1500 mm dia stormwater pipe	138m

Provincial Roads - External services – Non-offset-able	
Roads and stormwater	
Sefako Makgatho / Kameeldrift Road Intersection	88.29m^2
Intaba / Baviaanspoort Road intersection	174.41m^2

In order to make provision for users of public transport, generated by the proposed development, the following facilities are proposed:

		Paved Sidewalks: It is recommended that a new paved sidewalk of at least 1.8m wide be constructed along the site's frontage on Intaba Street. This proposed new sidewalk is shown conceptually in Drawing No. 0637/CL/01 of Draft 2 TIA. Public Transport Layby: To make provision for users of public transport, it is recommended that a set of public transport laybys be constructed at the site's access intersection on Intaba Street (see Drawing No. 0637/CL/01 of TIA). The site currently has no services installed, therefore the developer will be responsible for constructing a 675 mm ø pipeline to connect to the existing culvert under the Baviaanspoort Road. This will be located north west of the development and falls within an Ecological Support Area along the Moretele River. Existing stormwater located along Intaba Street will be upgraded and will discharge within 32m of the Moretele River, outside the edge of the riparian zone.. According to the Stormwater Environment Plan (C3034-ENV-001) drafted by Civil Concepts (Appendix D 4) the extent of the footprint impacted during construction will have an area of 1458m^2 in the riparian area. As per this plan, stormwater outlet structure will consist of a brick structure with boulders acting as energy breakers, with an overflow area consisting of wetland vegetation and bio degradable geotextile. Below the overflow area an earth and boulder berm which will act as a silt trap and attenuation structure will be constructed. Refer to **Figure 6.** Appendix D of this BAR provides the services detailing for the proposed residential development. The Roads and Stormwater Bulk Service Report could only be submitted for approval after receipt of the approval of the Traffic Impact Assessment Report by SANRAL and Gauteng Department of Roads and Transport (GPDRT). These approvals have been received (refer to Appendix F 7 and F 8) and were submitted as part of the submission for approval of the Roads and Stormwater Bulk Service Report to the City of Tshwane. The submission took place on 17 August 2023. For electrical supply a new cable is proposed to be installled from Pumulani primary substation to the proposed township. The nearest 11kV sub-stations is Phumulani Sub Station which will supply the development. The preliminary load forecast for this new development is in the order of 2 750 kVA. The proposed route is illustrated in . The cable will connect at the substation and run south and cross over the Hartbeesspruit at 25°40'46.81"S and 28°17'26.11"E; run further south where it will eventually cut across Sefako Makgatho Drive where, it will run towards the east; then run along Kameeldroring Drive where it will connect at north-eastern edge of the property boundary. The proposed cable route will be roughly 3km long. Tshwane Electricity has confirmed that the required load of 2745kVA is available at Pumulani 132/11kV substation. Council does not allow for the distribution of the comments until there is an agreement in place but a declaration has been provided by the Electrical engineers. (Refer to Appendix D 8) Ownership of the infrastructure, that is to be installed as part of the external electrical services for this township, will remain property of the local municipality.

		The City of Tshwane: Water and Sanitation Department has approved the Water and Sewer services Report compiled by Civil Concepts. Once the Township application and the conditions of establishment have been approved, the services agreement will be drafted and the construction plans can be submitted for approval. (Appendix D5) Proposed upgrades to the water network for water supply to the development: The developer will be responsible for constructing a 250 mm ø uPVC pipe from the southern boundary of the development up to the existing 250 mm ø uPVC pipe in Intaba Road. All water pipes will be handed over to City of Tshwane upon completion. The proposed development will generate a sewer demand of 513.835 kℓ/day. This equates to an instantaneous peak dry weather flow of 14.871 ℓ/s, and an instantaneous peak wet weather flow of 17.10 ℓ/s. The nearest Bulk Sewer or connection is approximately 250m to the west of the development. A 400 mm ø uPVC collector runs along Sefako Makgatho Drive and then turns south towards a 500 mm ø uPVC Bulk line which runs under Baviaanspoort Street from the development to the outfall sewer. No upgrades are required to the sewer network. The developer will be responsible to break into the manhole on the 400 mm ø pipe in order to obtain a connection. A 3m servitude will be registered over Portion 20 of the Farm Derdepoort in favour of municipal services. All work to be handed over to City of Tshwane
2	Alternative 1: Alternative type of access to site	As shown in Drawing No. 0637/CL/02b TIA), it has been proposed to implement a traffic circle with an outside diameter of approximately 30 m as the intersection's control. The capacity analyses, as provided in Section 5.3 and 5.4 of the TIA report (Appendix F4), indicates that both site entrance options (option 1 described above) would have sufficient capacity to accommodate the traffic design. The final intersection control to be implemented, i.e, a butterfly intersection or traffic circle, would then be subject to the authorities' preferred option. Two inbound lanes and two outbound lanes are recommended for the access. Important to note is that the access will be security controlled and therefore adequate stacking distance should be provided to ensure that inbound vehicles queuing at the security gate do not impact on the through traffic along Intaba Street. For this purpose, *Traffic Methods for Highways 16 Vol 2* (Committee Draft 2.0, October 2019), was used to determine the required stacking distance for this site access. The following assumptions were made: Total development trip generations for weekday PM peak entering the development are 433vph; Service flow rate of 450 veh/hr was assumed for 'Swipe magnetic card'; it is expected that this system will be used or something very similar, such as a biometric system; and Peak hour factor (PHF) = 0.85. The traffic ratio percentage calculated to be about 113% (for the 90th percentile queue), which then according to Table 33 of the THM 16 (Vol 2) a theoretical storage length of three (3) vehicles (approximately 20m) is required for a double entry channel. It is recommended, however, that a minimum stacking distance of 25m be provided which would allow for about four (4) light passenger vehicles to queue comfortably without stacking onto Intaba Street. Given the extent of the

		development this recommended stacking distance is considered appropriate. In order to accommodate emergency and service vehicles, it is also necessary to ensure that at least one traffic lane (inbound or outbound) has a width of at least 3.5m wide with a total free-space of 4.5m and a height clearance of 5.2m, or as per the requirements of the local authority.
3	Alternative 2: Stormwater management	During the project planning and design phase, the engineering team evaluated the implementation of on-site attenuation facilities. However, after review of the CoT by-laws, it became apparent that CoT does not approve on-site attenuation facilities hence alternative stormwater management had to be implemented. The on-site attenuation could therefore not be implemented and the stormwater management had to divert to the stream.

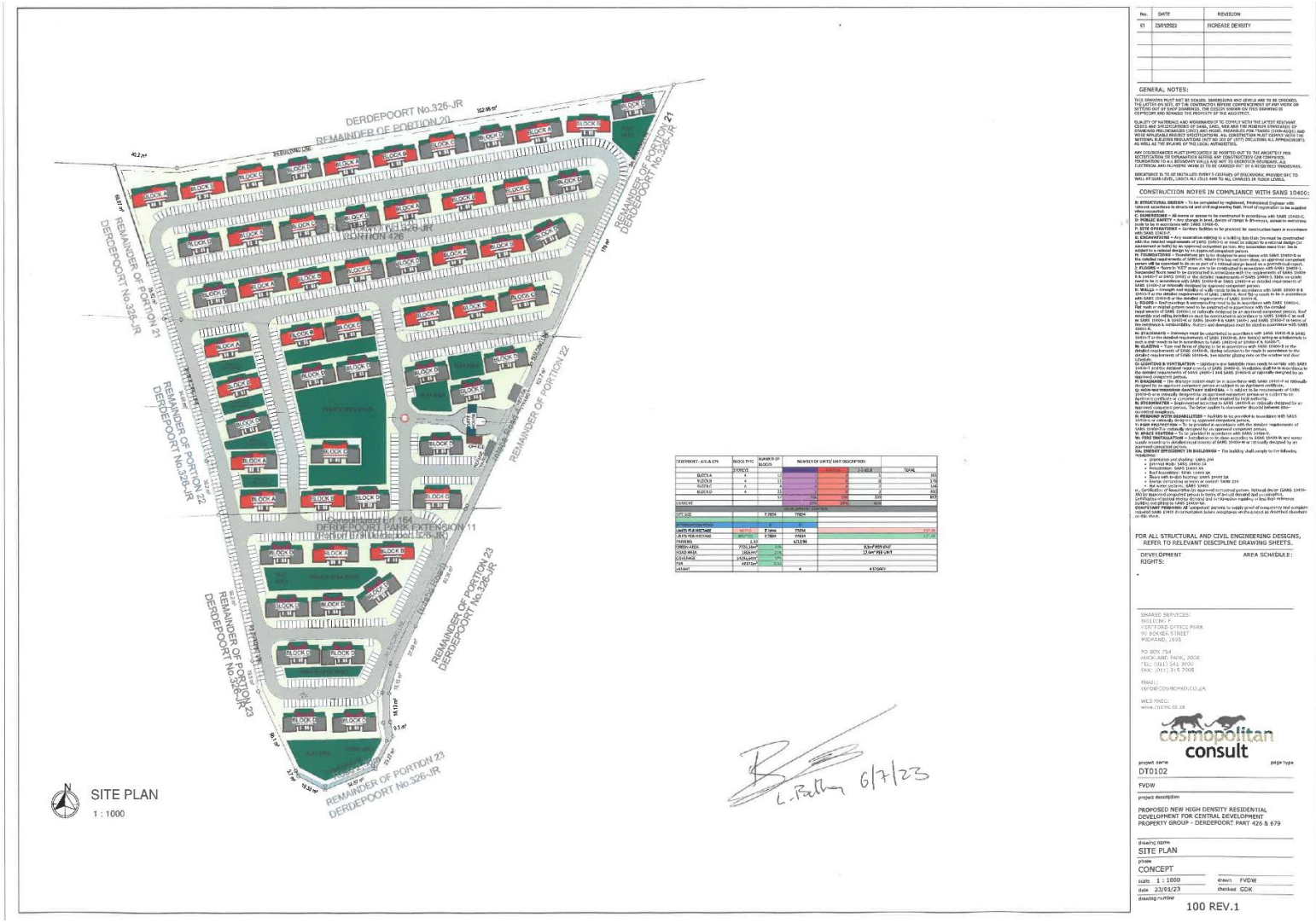


Figure 1: Draft layout as per proposal
(Also attached as Appendix C2)

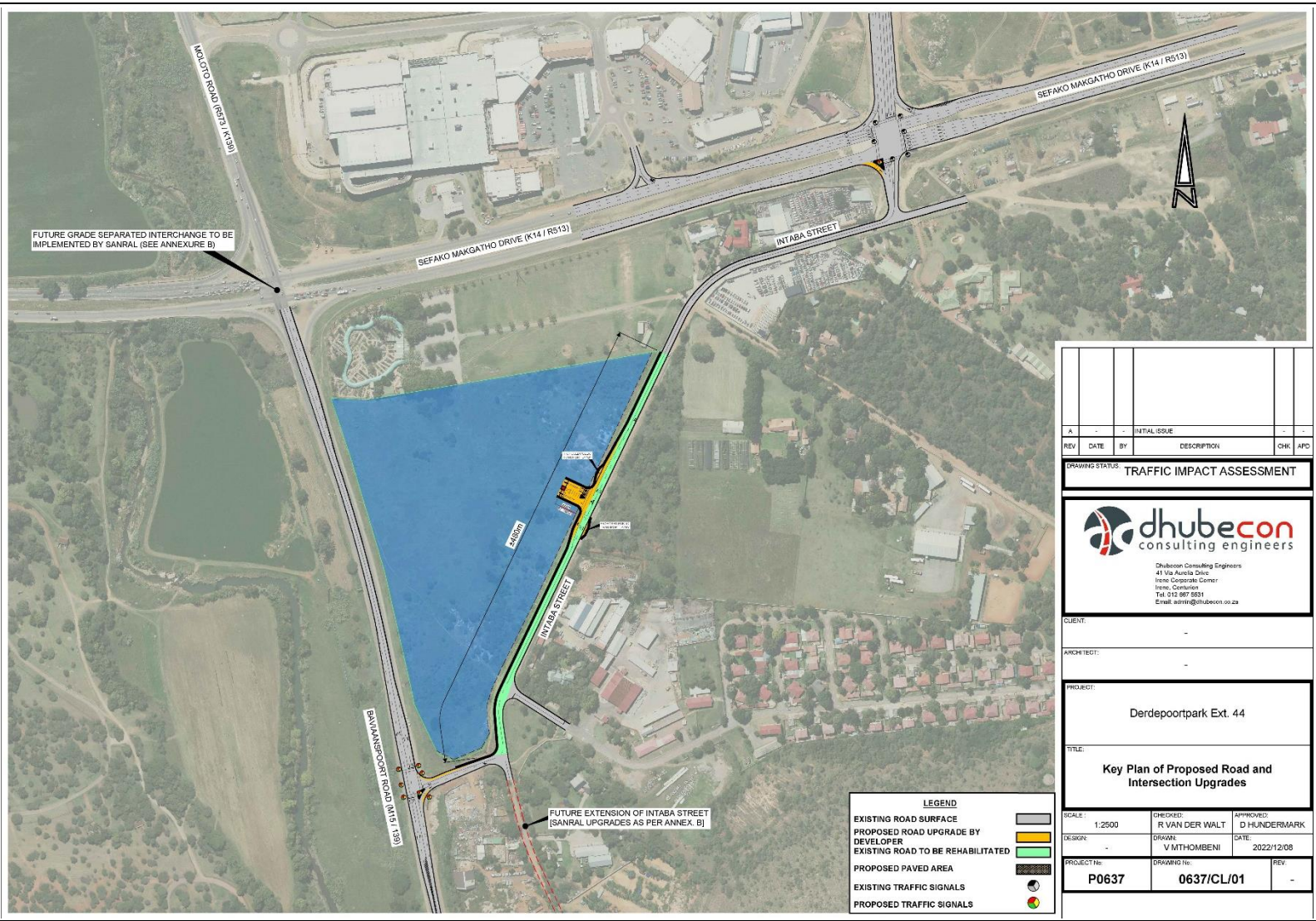


Figure 2: Proposed Road and intersection upgrades as per Traffic Impact Report.
(Also attached as Appendix C1)

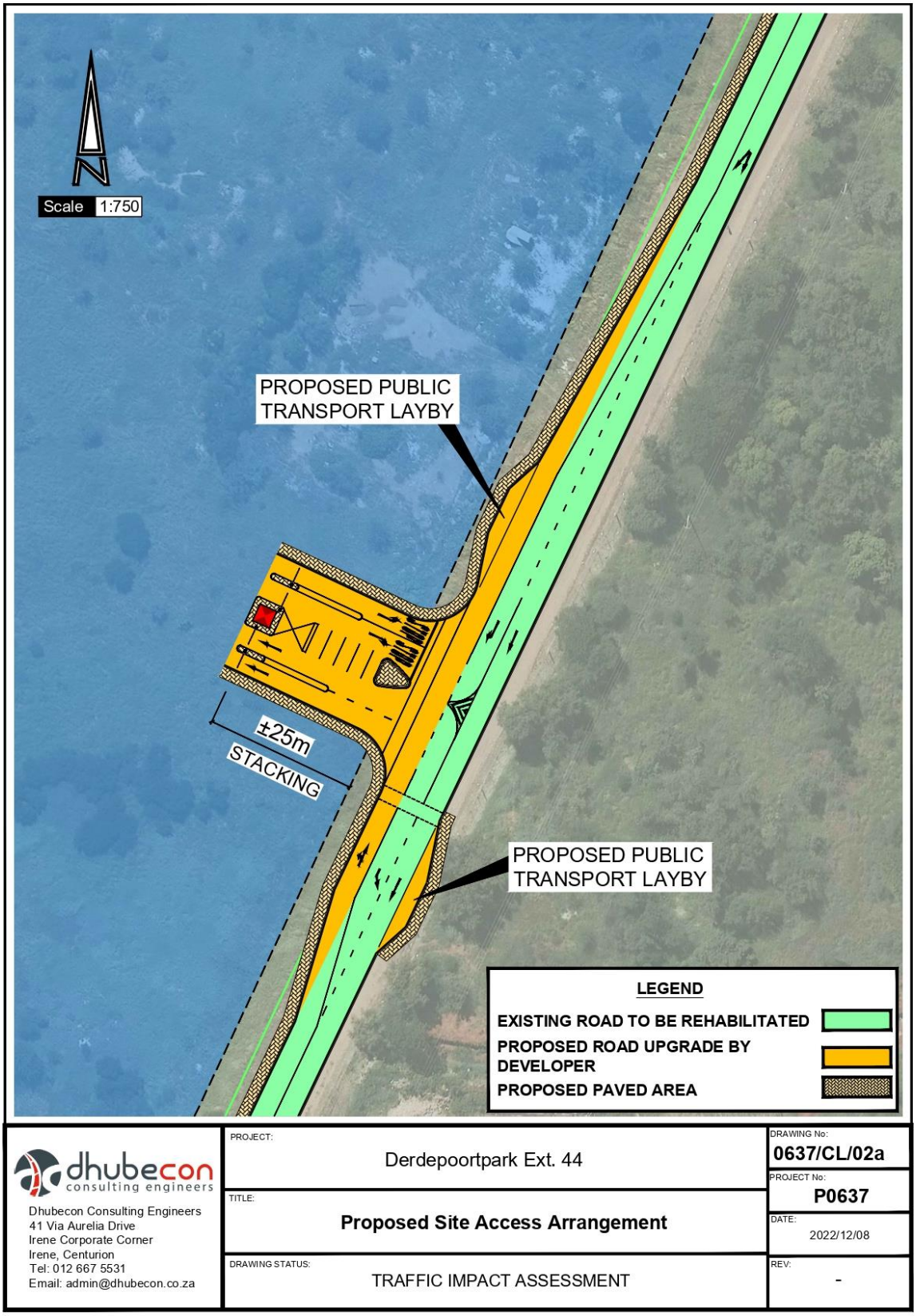


Figure 3: Proposed site access as per the Proposal

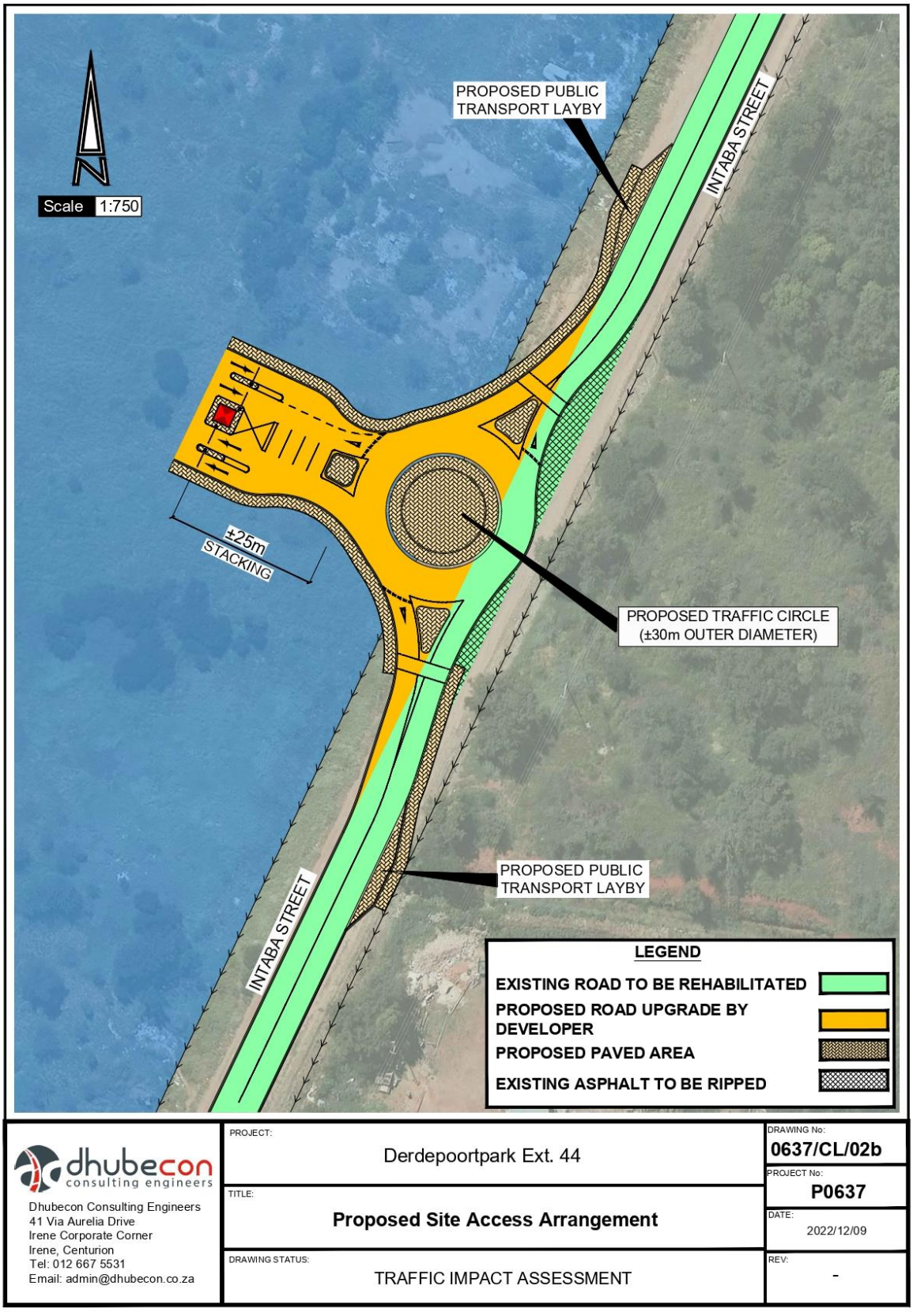


Figure 4: Proposed site access as per the Alternative

Figure 5: Stormwater Environment Plan drafted by Civil Concept
(Also attached as Appendix D4)

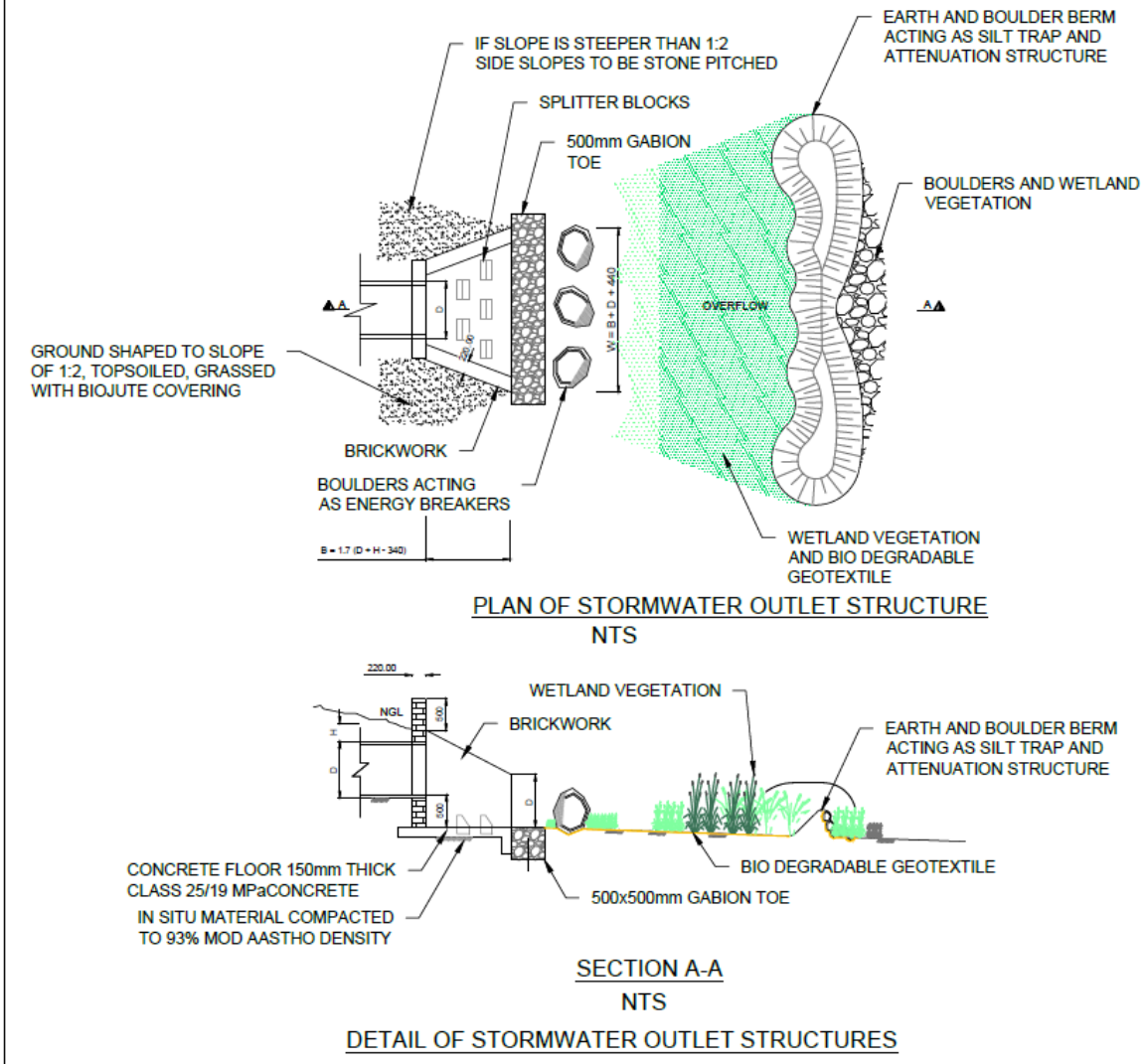


Figure 6: Detail of stormwater outlet structure

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

Activities alternatives:

- As the site is optimally located for a high density residential development, no other activities with relation to the proposed densities have been proposed for the development site.
- Activities proposed for the development of a residential township included the development of related infrastructure such as road upgrades, stormwater, sewer, water connection and electrical connection and route.
- Two alternatives have been provided above. The first alternative referred to an alternative site entrance and the second referred to alternative stormwater management.

Site alternatives:

- As the site is optimally located and the applicant is the owner of the properties, no alternative site location is proposed.
- Additionally, the applicant is well versed and has vested it's interests in residential developments, development alternatives were not evaluated.
- Thus far, the only alternatives identified have been a variation in the site access details, the exact location of the site access must be finalised, and the stormwater management. No site alternatives have been identified for the proposed residential development as this location have been identified as an optimal position for the activities proposed.
- This development site is located within close proximity/adjacent to numerous other similar housing developments and as such is aligned with the sense of place.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)***	**7.7894 ha**
Alternatives:	
Alternative 1 (if any)	7.7894 ha
Alternative 2 (if any)	1458m^2
	Ha/ m^2

or, for linear activities:

	Length of the activity:
Proposed activity	
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	
	m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

	Size of the site/servitude:
Proposed activity	**0.3453 ha**
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	
	Ha/m^2

5. SITE ACCESS

Proposal

Does ready access to the site exist, or is access directly from an existing road?	~~YES~~	**NO**
If NO, what is the distance over which a new access road will be built	+-25m	

Describe the type of access road planned:

Site access is planned on Portion 679 from Intaba Street with a Priority stop controlled butterfly T-intersection with free-flow conditions prevailing along Intaba Street. The proposed site access configuration will have adequate capacity to accommodate the anticipated development trips and will ensure that inbound vehicles do not impact on the movement of other vehicles travelling along Intaba Street.

The implementation of the butterfly configuration will also allow for traffic turning right out of the site to make use of the acceleration lane that would allow them to safely merge with the through traffic on Intaba Street. Intaba Street's condition past the site's frontage has significantly deteriorated over the years and it would only degrade further with the added development traffic, latent rights traffic and future growth in the background traffic. Given these poor existing road conditions, it is proposed that the developer rehabilitate this road back to a standard Class 4b road past the site's frontage.

The section of Intaba Street to be rehabilitated by the developer is approximately 480 m in length. The rehabilitation of Intaba Street also forms part of SANRAL's planned upgrades in the area and as a result, the rehabilitation of this road should only be the responsibility of the developer if this development occurs before the implementation of the SANRAL upgrades. The access (western) approach is to comprise of two inbound lanes with two outbound lanes and a minimum stacking distance of at least 20 m. Apart from the rehabilitation of the road as discussed above, this road is also set to be extended in a southbound direction from the south-eastern corner of the site. Approximately 600 m south of the site's south-eastern corner, this road's alignment is set to curve in a western direction until it eventually intersects with Baviaanspoort Road (M15) and the new north-south K139 road. At this planned new intersection, the intention is to construct a whole new southern leg which will also intersect with Stormvoël Road (M8) further to the south. This southern approach forms part of the planned alignment of the K139 road.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 1

Does ready access to the site exist, or is access directly from an existing road?	YES	**NO**
If NO, what is the distance over which a new access road will be built		+-49m

Describe the type of access road planned:

As shown in Drawing No. 0637/CL/02b of the (TIA (Appendix F4), it has been proposed to implement a traffic circle with an outside diameter of approximately 30 m as the intersection's control. The capacity analyses, as provided in Section 5.3 and 5.4 of the TIA report, indicates that both site entrance options (option 1 described above) would have sufficient capacity to accommodate the design traffic. The final intersection control to be implemented, i.e, a butterfly intersection or traffic circle, would then be subject to the authorities' preferred option.

Two inbound lanes and two outbound lanes are recommended for the access. Important to note is that the access will be security controlled and therefore adequate stacking distance should be provided to ensure that inbound vehicles queuing at the security gate do not impact on the through traffic along the Intaba Street.

For this purpose, THM 16 Vol 2 (Committee Draft 2.0, October 2019), was used to determine the required stacking distance for this site access. The following assumptions were made:
Total development trip generations for weekday PM peak entering the development are 433vph;
Service flow rate of 450 veh/hr was assumed for 'Swipe magnetic card'; it is expected that this system will be used or something very similar, such as a biometric system; and
Peak hour factor (PHF) = 0.85.
The traffic ratio percentage calculated to be about 113% (for the 90th percentile queue), which then according to Table 33 of the THM 16 (Vol 2) a theoretical storage length of three (3) vehicles (approximately 20 m) is required for a double entry channel. It is recommended, however, that a minimum stacking distance of 25 m be provided which would allow for about four (4) light passenger vehicles to queue comfortably without stacking onto Intaba Street. Given the extent of the development (952 units) this recommended stacking distance is considered appropriate. In order to accommodate emergency and service vehicles, it is also necessary to ensure that at least one traffic lane (inbound or outbound) has a width of at least 3.5m wide with a total free-space of 4.5m and a height clearance of 5.2m, or as per the requirements of the local authority.

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 2

Does ready access to the site exist, or is access directly from an existing road?	YES	NO
If NO, what is the distance over which a new access road will be built		m
Describe the type of access road planned:		

N/A

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated **1** Number of time

(only complete when applicable)

1. LAYOUT OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);

- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;

- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

Please refer to Appendix A for the site layout plan and locality map for the proposed residential development. Error! Reference source not found. below provides geographic context to the location of the proposed residential development.

2. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix**.** It should be supplemented with additional photographs of relevant features on the site, where applicable.

Please refer to Appendix B for the Site indicative photographs for the proposed residential development site.

3. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity to be attached in the appropriate Appendix.

Please refer to Appendix C for the Facility illustrations for the proposed residential development and all auxiliary infrastructure.

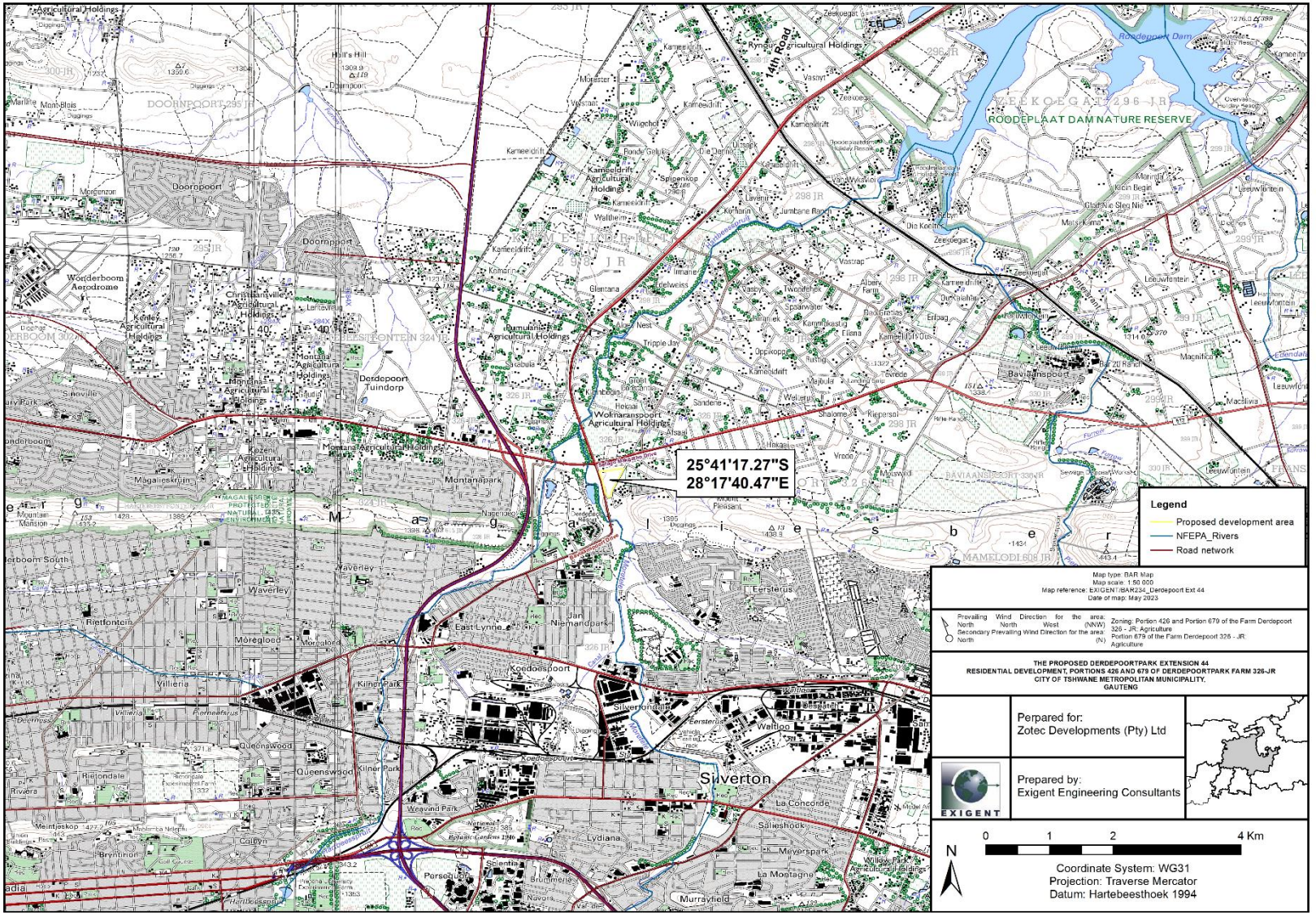


Figure 7: The 1:50 000 Topographic map of the proposed residential development site.

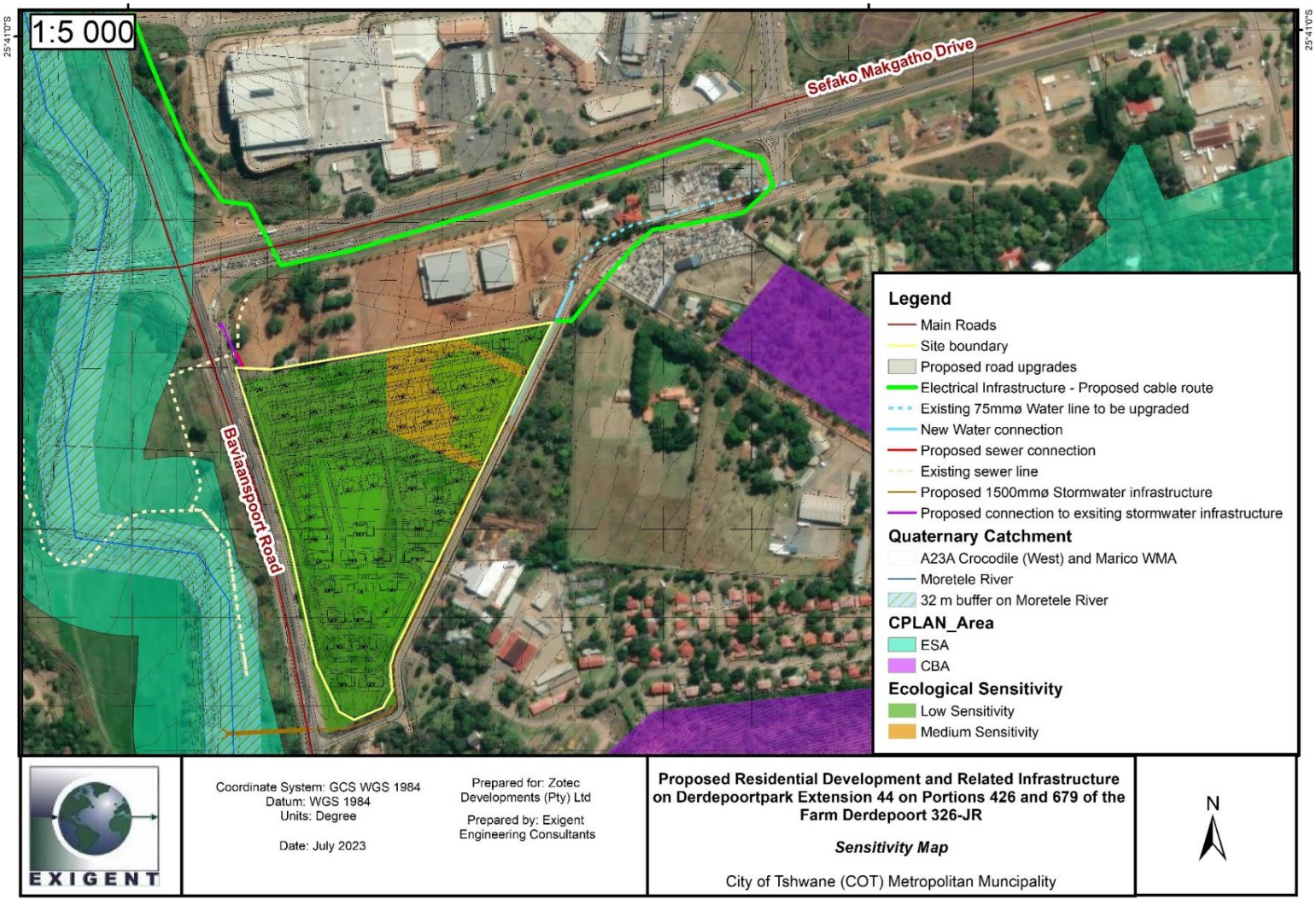


Figure 8: Site layout plan for the proposed residential development indicating all services infrastructure (including water, sewer, electricity, stormwater connections and site access) and sensitive features identified within the proposed residential development site. (1:500)

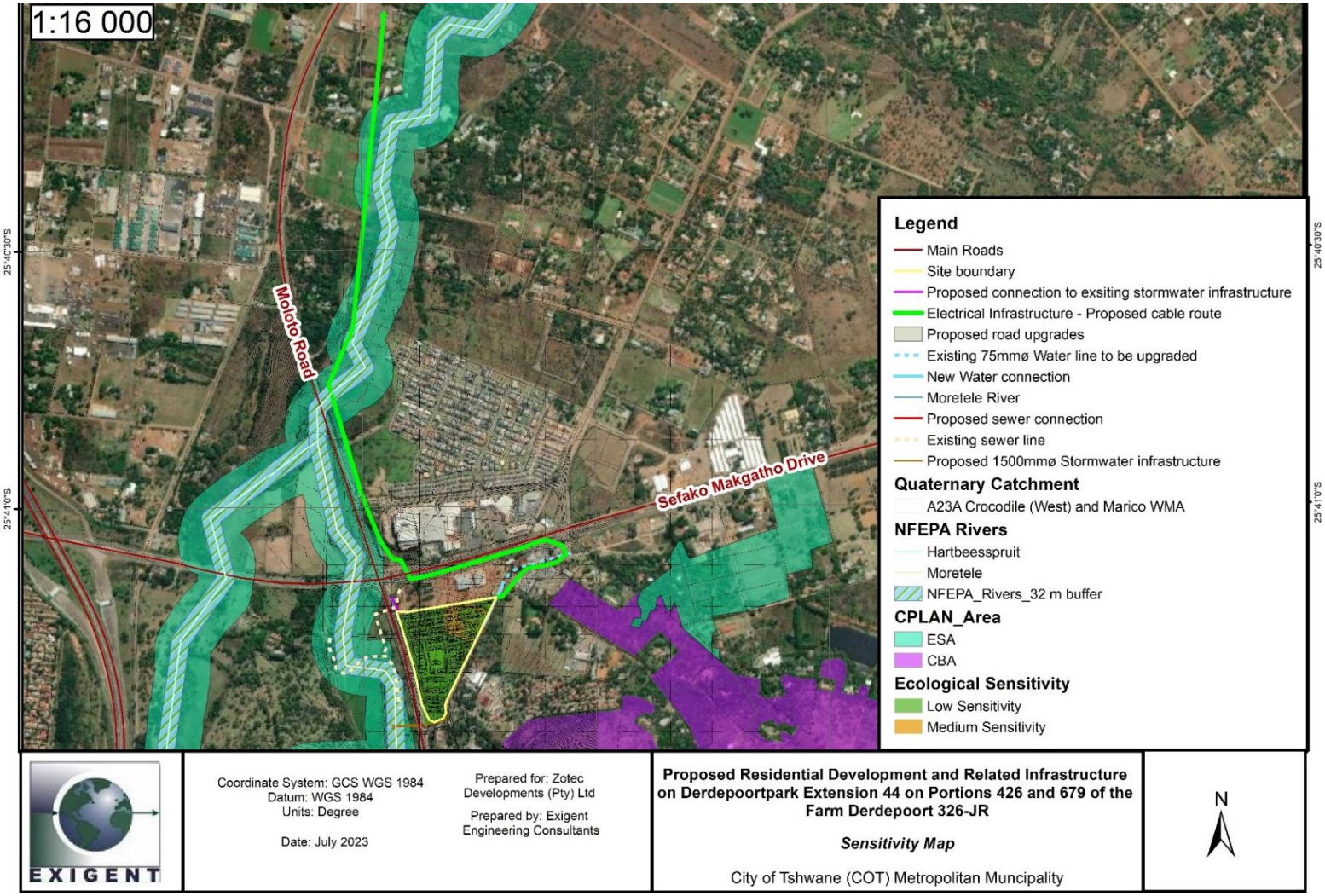


Figure 9: Site layout plan for the proposed residential development indicating all services infrastructure (including water, sewer, electricity, stormwater connections and site access) and sensitive features identified within the proposed residential development site. (1:16 000)

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route | **1** | time

Instructions for completion of Section B for location/route alternatives

1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alterative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives | **1** | time | (complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route | | (complete only when appropriate for above)

Section B – Location/route Alternative No. | | (complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Property description:
(Including Physical Address and Farm name, portion etc.)

- **Portion 426 and**
- **Portion 679 of the Farm Derdepoort 326-JR,**

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:	**Latitude (S):**	**Longitude (E):**
	-25.687812°	**28.295599°**

In the case of linear activities:

Alternative:	**Latitude (S):**	**Longitude (E):**
• Starting point of the activity	°	°
• Middle point of the activity	°	°
• End point of the activity	°	°

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached

The 21 digit Surveyor General code of each cadastral land parcel

HOUSING	T	0	J	R	0	0	0	0	0	0	0	0	0	3	2	6	0	0	4	2	6
DEVELOPMENT	T	0	J	R	0	0	0	0	0	0	0	0	0	3	2	6	0	0	6	7	9

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	**1:10 – 1:7,5**	1:7,5 – 1:5	Steeper than 1:5

4. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	**Undulating plain/low hills**	River front

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

a) Is the site located on any of the following?

Shallow water table (less than 1.5m deep)	YES	**NO**
Dolomite, sinkhole or doline areas	~~YES~~	**NO**
Seasonally wet soils (often close to water bodies)	**YES**	~~NO~~
Unstable rocky slopes or steep slopes with loose soil	~~YES~~	**NO**
Dispersive soils (soils that dissolve in water)	~~YES~~	**NO**
Soils with high clay content (clay fraction more than 40%)	**YES**	~~NO~~
Any other unstable soil or geological feature	~~YES~~	**NO**
An area sensitive to erosion	~~YES~~	**NO**

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s) ~~YES~~ **NO**

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
º	º

c) are any caves located within a 300m radius of the site(s) ~~YES~~ **NO**

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
º	º

d) are any sinkholes located within a 300m radius of the site(s) ~~YES~~ **NO**

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
º	º

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)? ~~YES~~ **NO**

According to the DEA Screening Tool (As included in Appendix H3 of this BAR), the overall Agricultural sensitivity of the proposed residential development site has been classified as having a High Sensitivity. However, no specialist study has been conducted for agricultural sensitivity as the Gauteng Agricultural Potential Atlas (GAPA_gehh94) has indicated that the agricultural value of the proposed development has been rated as Low, as seen in Figure 11.

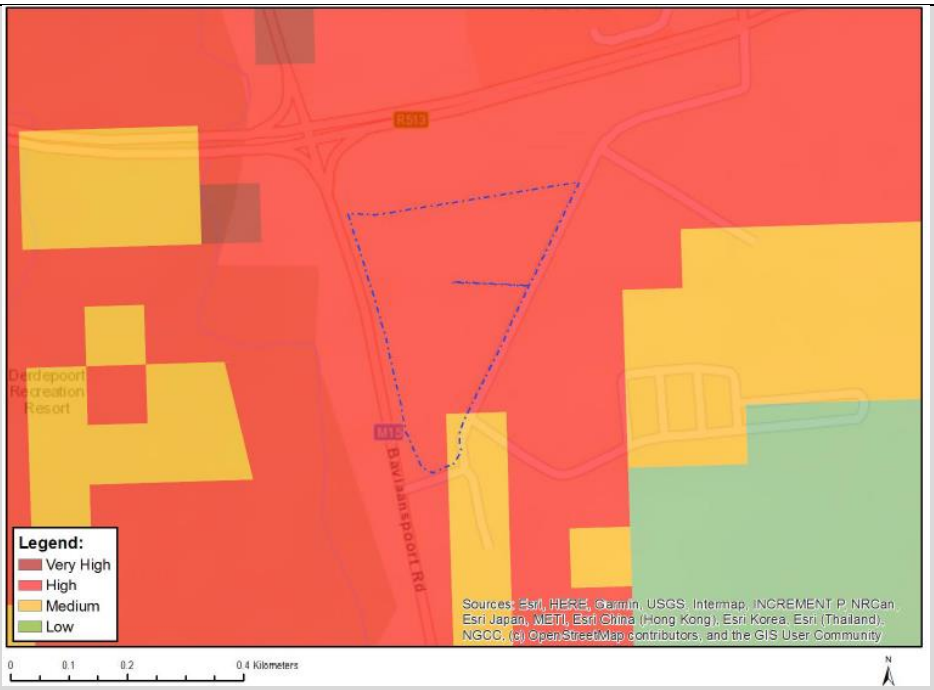


Figure 10: Agricultural sensitivity of the proposed residential development area (DEA Screening Tool).

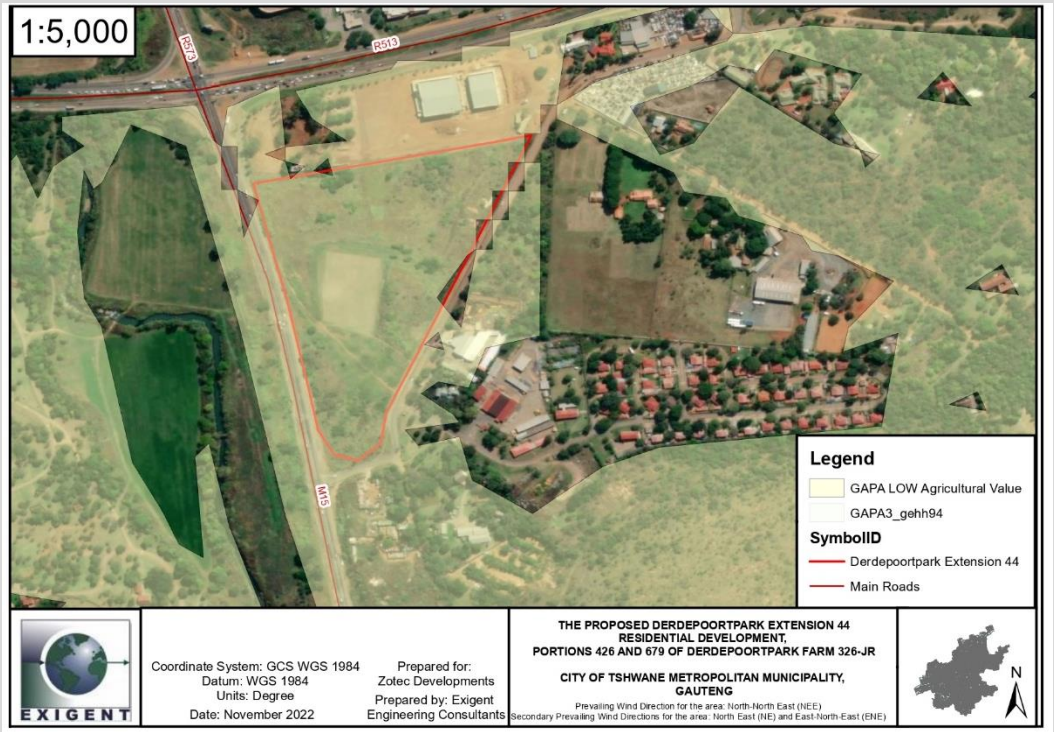


Figure 11. GAPA 4 Agricultural Sensitivity -Low

Please note: The Department may request specialist input/studies in respect of the above.

7. GROUNDCOVER

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Natural veld – good condition % =	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % =	**Veld dominated by alien species % =100**	Landscaped (vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site	~~YES~~	**NO**

If YES, specify and explain:

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.	**YES**	~~NO~~

If YES, specify and explain:

Although no endangered flora and fauna species were found on the project site, the Moretele NFEPA river is located withing 120 m to the west which must be considered as sensitive (Error! Reference source not found.**2)** **Furthermore, there are two plant species of concern, *Amaryllidaceae Boophone disticha (L.f.)* and *Hyacinthaceae Drimia altissima (L.f.),* located across the street, according to The Botanical Database of Southern Africa (BODATSA) and Plants of Southern Africa (POSA)**

Are there any special or sensitive habitats or other natural features present on the site?	~~YES~~	**NO**

If YES, specify and explain:

Ecological Impact Statement Report

Was a specialist consulted to assist with completing this section	**YES**	~~NO~~

If yes complete specialist details

Name of the specialist:	Jacolette Adam		
Qualification(s) of the specialist:	MSc, LLM (Pr. Sci. Nat)		
Postal address:	P.O. Box 11634, Erasmuskloof		
Postal code:	0048		
Telephone:	082 852 6417	Cell:	082 852 6417
E-mail:	jacolette@exigent.co.za	Fax:	086 614 7327

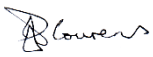
Are any further specialist studies recommended by the specialist?	~~YES~~	**NO**
If YES, specify:		
If YES, is such a report(s) attached?	~~YES~~	**NO**

If YES list the specialist reports attached below

Signature of specialist: Jdam Date: **22 May 2023**

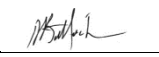
Geotechnical Investigation Report

Was a specialist consulted to assist with completing this section			**YES**	~~NO~~
If yes complete specialist details				
Name of the specialist:	Johan Lourens			
Qualification(s) of the specialist:	BSc Eng (Civil), PhD (Pr Eng)			
Postal address:	197 Orion Avenue, Waterkloof Ridge, Pretoria,			
Postal code:	0181			
Telephone:	082 652 9531	Cell:	082 652 9531	
E-mail:	veronl@mweb.co.za	Fax:	086 684 0931	
Are any further specialist studies recommended by the specialist?			~~YES~~	**NO**
If YES, specify:				
If YES, is such a report(s) attached?			~~YES~~	**NO**
If YES list the specialist reports attached below				

Signature of specialist:		Date:	**12 December 2022**

Geotechnical Surficial Soils Investigation Report

Was a specialist consulted to assist with completing this section			**YES**	~~NO~~
If yes complete specialist details				
Name of the specialist:	David Buttrick			
Qualification(s) of the specialist:	Ph.D (Eng Geol)			
Postal address:	2 Mulberry Hill Office Prak, Broadacres Drive Dainfern			
Postal code:	2191			
Telephone:	011 469 0854	Cell:	083 300 7013	
E-mail:	intrac@mweb.co.za	Fax:		
Are any further specialist studies recommended by the specialist?			~~YES~~	**NO**
If YES, specify:				
If YES, is such a report(s) attached?			~~YES~~	**NO**
If YES list the specialist reports attached below				

Signature of specialist:		Date:	**8 August 2023**

Heritage Impact Assessment

Was a specialist consulted to assist with completing this section			**YES**	
If yes complete specialist details				
Name of the specialist:	Jaco van der Walt			
Qualification(s) of the specialist:	BA Hons Archaeology, MA Archaeology			
Postal address:	Private Bag X 1049, Suite 34, Modimole			
Postal code:	0510			
Telephone:	+27 (0) 82 3738491	Cell:	+27 (0) 82 3738491	
E-mail:	jaco@heritageconsultants.co.za	Fax:	086 691 6461	
Are any further specialist studies recommended by the specialist?				**NO**
If YES, specify:				
If YES, is such a report(s) attached?			YES	NO
If YES list the specialist reports attached below				

Signature of specialist:	A declaration has been included in the specialist report (Appendix F)	Date:	26 January 2022

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	**2. River, stream, wetland**	3. Nature conservation area	**4. Public open space**	**5. Koppie or ridge**
6. Dam or reservoir	**7. Agriculture**	**8. Low density residential**	**9. Medium to high density residential**	10. Informal residential
11. Old age home	**12. Retail**	**13. Offices**	**14. Commercial & warehousing**	**15. Light industrial**
16. Heavy industrial[AN]	17. Hospitality facility	**18. Church**	**19. Education facilities**	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	24. Railway line[N]	**25. Major road (4 lanes or more)[N]**
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	34. Small Holdings	***35. Parking area**
Other land uses (describe)*:	**Parking area (Zambezi Retail Park and Tshwane Shopping Mall)**			

NOTE: Each block represents an area of 250m X 250m, if your proposed residential development is larger than this please use the appropriate number and orientation of hashed blocks

NORTH

1,2,7	**1,2,6**	**8,9**	**8,9,12,35**	**1,12,35**
1,2	**1,2,6,7**	**9,12,18,35**	**14,15**	**14,15,19**
2	**2,4,7**		**8,13,15**	**8,14, 15**
1	**1,2,7**	**14,15**	**8,14,15**	**1,8,**
1	**1,2,19**	**1,2**	**1,2**	**13,14**

WEST EAST

SOUTH

= Site

Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "[A]" and with an "[N]" respectively.

Have specialist reports been attached	**YES**	~~NO~~
If yes indicate the type of reports below		
Geotechnical Report **Provisional Geotechnical Surficial Soils Investigation** **Ecological and Wetland Riparian Assessment Report** **Heritage Impact Assessment**		

Please see a summary of the specialist reports which have been attached below. Kindly note that a summary of the Heritage impact assessment has been included in subsection 10 below.

Laubscher Engineers Africa conducted a Geotechnical Investigation in 2008 to determine the engineering-geotechnical characteristics of the site. An additional Geotechnical Surficial Soils Investigation was conducted in 2023 by IntraSolutions to provide updated data for the project. Both specialist reports have been consulted for the purposes of this report.

Geotechnical Investigation Report (2008)

The investigation was carried out by means of seven 760 mm diameter auger holes, drilled with a Williams LLDH 120 of Gauteng Piling (Pty) Ltd.

The indications from the investigation were that the proposed residential development site is underlain by a deeply weathered diabase sheet, which is covered by transported materials which range in thickness from approximately 2,0 m in the north of the site to approximately 16 m in the south of the site. The top layers of soil, to an average depth of some 1,5 m have a collapsible grain structure, with a collapse potential of about 2,7%. These soils generally have a low activity, with the exception of the material in hole no.7, which tested as medium active in the layer from 2,5 m to 5,5 m depth.

The residual diabase is deeply weathered, generally to a very dense or very stiff clayey silt or sandy clay. Very soft rock diabase was encountered at an average depth of 15,6 m below the natural ground surface. Residual highly weathered quartzite and mudrock were found in borehole A1 at a depth of about 12 m.

The laboratory test results showed the residual diabase to be generally medium to highly active. Only one example of slicken siding was, however, found in a sample brought to the surface. No slicken siding were observed in the borehole sides. The paucity of evidence of movement in the profile can be ascribed to the relatively thick cover of transported soil, which would inhibit moisture changes in the residual diabase. The in situ moisture content of the active layers was found to be relatively high, varying from 17,6% to 28,3%.

The groundwater table was found at an average depth of 12,7 m in five of the seven boreholes. No water was encountered in boreholes A2 and A3.

The maximum heave (on the present ground surface) of the residual diabase profile is estimated by means of Van der Merwe's method (Van der Merwe, 1964), to be about 50 mm. It should, however, be noted that the moisture content of the active layers are relatively high (23,3% on average). Building activities normally *increase* in moisture content in the soil below the buildings. An increase in moisture in the soil (which is already close to saturation) will therefore result in heave substantially less than the maximum possible heave. The largest movement in the soil below the buildings is thus likely to be induced by drying out of the soil. It is estimated that the maximum movement of the profile will be of the order of 20 mm to 25 mm.

Geotechnical Surficial Soils Investigation (2023)

The report presents and comments on the results and observations of the surficial soils investigations and the NHBRC site classification for single storey masonry buildings carried out on the site proposed for development as Derdepoort Portions 426 and 679. The report documents the terms of reference, available data used in the study, investigation procedures, geology, geohydrology, soil testing and recommendations, and references the Loubscher Engineers Africa report W733/vgl, dated 04th November 2008.

Where access was possible, test pits were opened across the site using a 20Ton excavator. Each test pit was entered and inspected by an engineering geologist who also described the soil profiles using the visual and tactile procedures advocated by Jennings et al (1973). Detailed descriptions of the test pit profiles from this investigation are given in Appendix 1 of that report.

For accurate classification and identification purposes, particle size distributions and Atterberg Limit tests have been carried out on samples recovered from the various soil unit horizons uncovered during these investigations. Selected soil unit samples are currently being tested for soil chemistry, collapse, shear box and CBR tests were also undertaken.

The current investigations show that the site is underlain with relatively thick layers of colluvium and transported materials overlaying diabase. The study area is mantled in many places by unconsolidated material deemed to be recent deposits (most likely 24 Ma [Miocene epoch] and younger). The material varies in thickness, sedimentological- and geotechnical properties.

In general it is not anticipated that slope stability will present a general hazard for structures placed on this area. However, where seepage groundwater 'daylights', particularly during very wet periods, particularly in cuttings, subsurface and surface drainage measures may be required.

The fine nature of many, if not most of the soil units encountered during investigations is such that after removal of natural cover, they present a potential erosion problem during periods of heavy rain and also dust removal by high winds of the dry season. Proper storm water management systems with erosion control measures will be required.

Groundwater seepage was not encountered in any of the excavated test pits. However, seepage was reported in the auger holes done between 11.1m to 14.8m within the residual diabase. Seasonal variations in the perched groundwater conditions should be anticipated.

A complete storm water design plan that provides drainage for the convenience of the community as well as the provision of drainage to control runoff from major stormwater events and seepage will need to be maintained on this site. It is generally accepted good practice to avoid any accumulation of surface waters near to the buildings by appropriate surface drainage design. This should also include the (minimum) 150mm freeboard, i.e. top of floor slab to top of ground level and proper attention to 'damp course' provisions, as required in the NHBRC Guidelines.

Where appropriate, the recommendations brought forth by this specialist have been incorporated as part of the mitigation measures contained in Section E below.

Ecological and Wetland Riparian Assessment Report

The Ecological and Wetland Riparian Assessment was conducted by Exigent (2023). The following summarises the findings of the assessment.

Vegetation

As per the desktop assessment conducted for the proposed residential development, it was indicated that the proposed residential development lies within the Rand Highveld Grassland vegetation type of the Mesic Highveld Grassland Bioregion and the Grassland Biome along with the Marikana Thornveld vegetation type of the Central Bushveld Bioregion and the Savanna Biome, NEMBA listed Ecosystem Type. The proposed residential development is not located within Critical Biodiversity (CBA) and Ecological Support Areas (ESA) as identified by the Gauteng Conservation plan (C-plan) V3.3. There are areas identified in the study area as part of the National Protected Areas Expansion Strategy (NPEAS, 2018).

Due to the high levels of disturbance in the surrounding area, the likelihood of the study area presenting a CBA, ESA or PA priority focus area and a vulnerable ecosystem is low. The likelihood of encountering small animals was also low within the study area.

Based on the findings of the site visits conducted for the proposed development, the site has two predominant vegetation communities:

- The *Aristida transvaalensis - Cymbopogon validus* grassland
- The *Aristida transvaalensis - Cymbopogon validus* grassland with exotic woodland

➢ The *Aristida transvaalensis - Cymbopogon validus grassland*

The *Aristida transvaalensis - Cymbopogon validus* grassland vegetation community is located along the Northern boundary of the proposed development site. The anthropogenic activities impacted upon the vegetation community includes main roads bordering the site, the dilapidated remnants of previous infrastructure located on site, dumping areas, footpaths, localised areas of clearance and alien invasive species encroachment in the soccer field area. An active construction site is situated on the northern edge of the proposed project area against the R513. The eastern edge consists of a small unnamed tar road and the western edge of the proposed project area runs along the M15. Currently, the proposed development area is vacant, and a few isolated tents used as informal shelters are present on site as the site is not fenced and is accessible via Wonderboom Street. The extent of this vegetation community is approximately 2.95 ha. The vegetation is containing numerous species, including but not limited to key grass species located on site *include Digitaria eriantha, Aristida transvaalensis* and *Hyparrhenia anamesa.*

This vegetation community has a sensitivity classified as low.

➢ The *Aristida transvaalensis - Cymbopogon validus* grassland with exotic woodland

This vegetation community has numerous impacts exercised upon it which include footpaths and localized clearance of vegetation. The extent of this vegetation community is approximately 2.55 ha. The *Aristida transvaalensis – Cymbopogon validus* grassland with trees vegetation is dominated by grasses, trees and alien invasive plant species. The observed various vegetation species within the study area includes: *Hyperrhenia hirta, Searsia lancea, Bidens pilosa, Cynodon dactylon, Datura stramonium, Pennisetum clandestinum, Melia azedarach, Morus (Mullberries), Imperata cylindrical, Aristida congesta, Hyphaene petersiana and Verbena bonariensis.*

Due to location of the project and the number of impacts exercised upon it, this vegetation type consist of a low sensitivity. A search and rescue mission must be undertaken in order to confirm the absence of *Hypoxis hemerocallidea* within the development footprint. If identified, adaptive measures would however be required in order to ensure the effective removal and relocation of these individuals within the grassland community.

Faunal Assessment

During the site visit, no common bird species, small mammals, amphibians or reptiles were observed whilst walking the study area. The proposed study area does not possess any avian or amphibian habitats, hence clearing will not negatively affect these fauna species.

As per the DEA screening tool, the following species listed below were expected to occur within the extents of the study area, however, based on the level of disturbance and the habitat type identified on site and the proximity to the proposed residential development, the following probabilities were assigned per species:

- *Kinixys lobatsiana* (VU): Low probability - Savanna bushveld and thornveld habitats
- *Neamblysomus julianae (NT):* Medium probability - *B*ushveld regions
- *Crocidura maquassiensis* (LC) Medium probability – Rocky habitats
- *Dasymys robertsii* (VU): Low probability – Marshes and wetland habitats
- *Clonia uvarovi* (VU): Medium probability – Woodland Savannah

None of the species of conservation concern were identified on site during the site visits conducted for the proposed residential development.

Overall Terrestrial Ecology Assessment

Based on the findings of the original desktop assessment conducted for the proposed residential development, the site is located in:

- The NEMBA listed Endangered Ecosystem: Rand Highveld Grassland and Marikana Thornveld vegetation types – No vegetation remnant to the Rand Highveld Grassland and Marikana Thornveld vegetation types of vegetation types is present on site.
- No part within a CBA and ESA
- The site contains areas with scattered trees which has the potential of containing 2 species of concern (animals) as identified by the DEA Screening tool – Of the 5 species, 2 has a potential of occurring within the study area, based on the habitat analysis, the *Aristida transvaalensis – Cymbopogon validus* grassland with trees habitat has been allocated a low to medium sensitivity, whereas the *Aristida transvaalensis – Cymbopogon validus* grassland areas habitat type has been allocated a low habitat sensitivity.

The concluding findings of the Ecological Impact Statement indicated that the *Aristida transvaalensis – Cymbopogon validus* grassland vegetation community was determined to have a low sensitivity and the *Aristida transvaalensis – Cymbopogon validus* grassland with the trees vegetation community was determined to have a low-medium sensitivity due to the sensitive species that has a probability of occurrence. Various mitigation measures have been proposed in order to ensure these species are relocated prior to the commencement of construction activities.

Riparian area

The riparian area associated with the Moretele River watercourse were identified and can be described as riverine areas. The riparian zone associated with the channel has been classified as largely modified (Class D). Modifications to the riparian zone are due to a change in floral species composition as a result of the encroachment of alien invasive species and the removal of indigenous species for the creation of roads to service both for the resort, pathway and M15. Species identified within this area mostly includes *Arundo donax* (Spanish Reed) with the presence of alien invasive vegetation identified within the riparian zone such as *Eucalyptus globulus* (blue gum) and some woody vegetation.

Riparian Ecological Category ScoresType of channel	Score (%)	Class
C Section	42.2	D

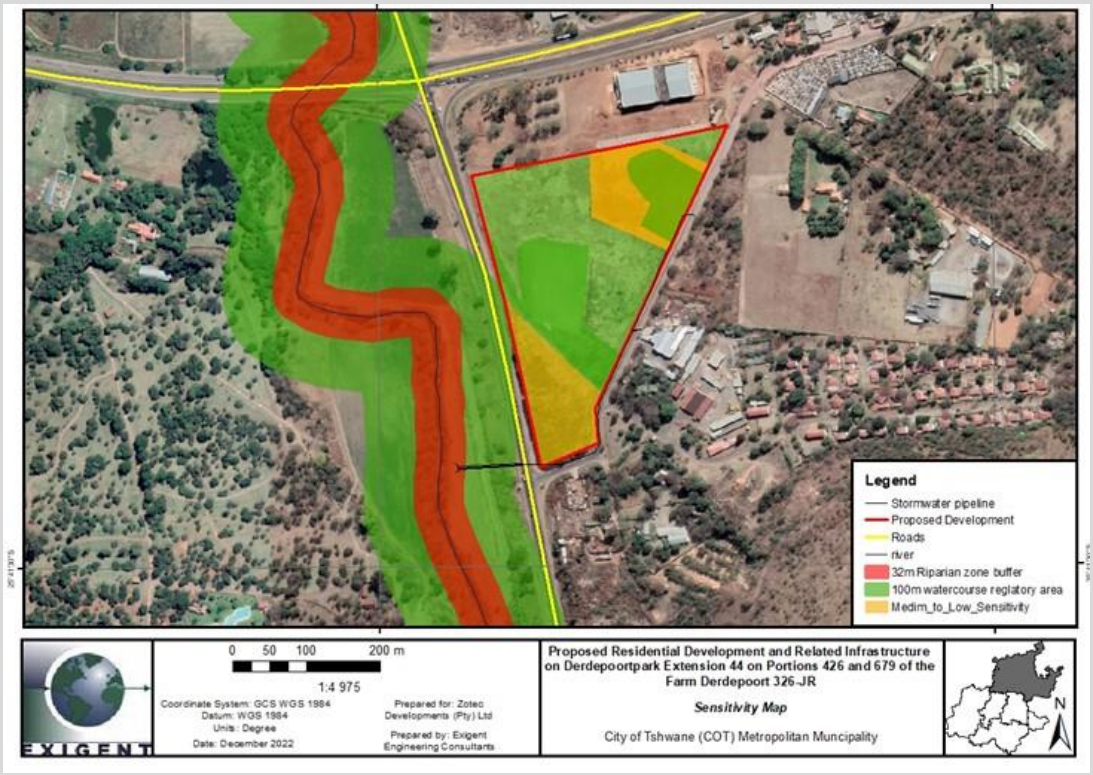


Figure 12: Sensitivity Map

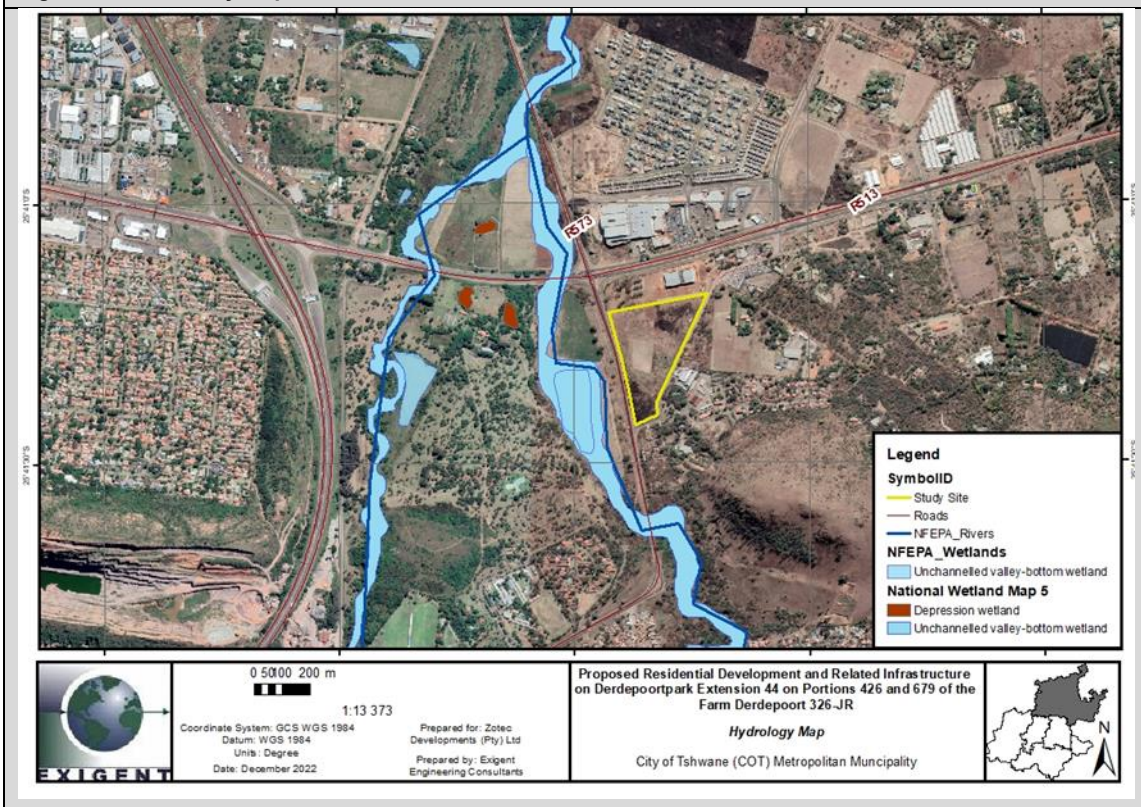


Figure 13: Surface hydrology of the area within proximity to the proposed development area (NFEPA, 2012; NBA, 2018).

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

City of Tshwane Metropolitan Municipality Integrated Development Plan (IDP)

The CoT is classified as a Category A municipality by the Municipal Demarcation Board, in terms of Section 4 of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998) (CoT IDP 2021–2026). The City was established on 5 December 2000 through the integration of various municipalities and councils that had previously served the greater Pretoria regime and surrounding areas (CoT IDP 2021–2026). The boundary of the City was further amended on 28 May 2008 through a proclamation in the Government Gazette, which incorporated the former Metsweding District Municipality, including Nokeng tsa Taemane (Cullinan) and Kungwini (Bronkhorstspruit), into the borders of Tshwane. The incorporation, which gave birth to the new City of Tshwane in May 2011 after the local government elections, was in line with the Gauteng Global City Region Strategy to reduce the number of municipalities in Gauteng by the year 2016 (CoT IDP 2021–2026).

With the incorporation of the above-mentioned areas, the area covers up to 6 345 km² (CoT IDP 2021–2026). The size of Tshwane can be practically explained in that the city stretches almost 121 km from east to west and 108 km from north to south, making it (at that time) the third-largest city in the world in terms of land area, after New York and Tokyo/Yokohama (CoT IDP 2021–2026). It also makes up more than 30% of Gauteng, which is 19 055 km² in extent (CoT IDP 2021–2026).

As the administrative seat of government and host to a number of embassies, Tshwane has proven to be a leader on the African continent in providing affordable industrial sites, various industries, office space, and educational and research facilities (CoT IDP 2021–2026). The City of Tshwane is a catalyst for growth as a major metropolitan and as the capital city (CoT IDP 2021–2026). As the administrative hub of the country it has an established international footprint, as it contains one of the highest number of embassies in the world, an array of research institutions and numerous major industries that offer it a significant competitive advantage over other cities (CoT IDP 2021–2026).

With an estimated 3.56 million population, the CoT Metropolitan Municipality housed 6.0% and 24.2% of South Africa's and Gauteng's total population in 2019 respectively (CoT IDP 2021–2026). Between 2009 and 2019, the population growth rate in the CoT averaged 2.74% per annum, which is close to double the growth rate of South Africa as a whole (1.61%) (CoT IDP 2021–2026). Gauteng's average annual growth rate came in just under at 2.51% over the same period (CoT IDP 2021–2026).

The CoT Metropolitan Municipality's male/female split in population was 98.0 males per 100 females in 2019 (CoT IDP 2021–2026). In 2019, the City of Tshwane Metropolitan Municipality's population consisted of 78.95% African (2.81 million), 16.89% White (601 000), 2.02% Coloured (71 900) and 2.14% Asian (76 000) people (CoT IDP 2021–2026).

Within CoT Metropolitan Municipality, the number of people without any schooling decreased from 2009 to 2019 with an average annual rate of -1.95%, while the number of people within the 'matric only' category, increased from 586,000 to 876,000 (CoT IDP 2021–2026). The number of people with 'matric and a certificate/diploma' increased with an average annual rate of 3.29%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 5.47% (CoT IDP 2021–2026). Overall improvement in the level of education is visible with an increase in the number of people with 'matric' or higher education (CoT IDP 2021–2026).

A total of 2.47 million individuals in CoT Metropolitan Municipality were considered functionally literate in 2019, while 200 000 people were considered to be illiterate(CoT IDP 2021–2026). Expressed as a rate, this amounts to 92.53% of the population, which is an increase of 0.037 percentage points since 2009 (88.87%). The number of illiterate individuals decreased on average by -1.16% annually from 2009 to 2019, with the number of functional literate people increasing at 3.28% annually (CoT IDP 2021–2026).

The CoT is the fourth biggest municipality in South Africa and second biggest in Gauteng in terms of gross value added by region with gross value add of R497 billion. In 2019, City of Tshwane contributed 28.4 percent to the provincial economy (CoT IDP 2021–2026). Moreover, Tshwane accounted for 9.79 percent of the country's economy (CoT IDP 2021–2026).

The total number of households within City of Tshwane Metropolitan Municipality increased at an average annual rate of 3.17% from 2008 to 2018 (CoT IDP 2021–2026). With high in-migration into a region, the number of households increased, putting additional strain on household infrastructure (CoT IDP 2021–2026). Sanitation is one of the basic necessities, which contributes to human dignity and quality of life and is an essential pre-requisite for success in the fight against poverty, hunger and child deaths among other pressing socio-economic challenges South Africa faces (CoT IDP 2021–2026). Access to safe water is a fundamental human need and plays an important role in socio-economic development (CoT IDP 2021–2026). When looking at

the water backlog (number of households below RDP-level) overtime, it can be seen that in 2008 the number of households below the RDP-level were 35 300 within City of Tshwane Metropolitan Municipality, this decreased annually at -8.46% per annum to 14 600 in 2018 (CoT IDP 2021–2026).

Household infrastructure is under strain due to high in-migration into the region. In the short to medium term this can result in an increase in the number of households not living in a formal dwelling, as the provision of household infrastructure usually takes time to deliver (CoT IDP 2021–2026).

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-
(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of a site-
(i) exceeding 5 000 m2 in extent; or
(ii) involving three or more existing erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(d) the re-zoning of a site exceeding 10 000 m2 in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site? If YES, explain:	~~YES~~	**NO**

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

Due to the requirement for a Heritage Impact Assessment requirement being triggered in terms of the National Heritage Resources Act, a specialist was appointed to conduct a site assessment for the proposed residential development site.

The following key findings concludes the findings of the heritage specialist assessment:
The project area is a highly disturbed property with extremely overgrown vegetation across the entire area. The eastern edge consists of a small unnamed tar road. The western edge of the proposed project area runs along the M15. The project area shows signs of past construction and development that has since been broken down. Multiple modern ruins are scattered across the proposed project area. Illegal dumping takes place within the project area along the major access routes. Currently, the proposed development area is vacant, safe for an informal soccer field and a few isolated tents used as informal shelter.

The project area has been completely altered and disturbed in the recent past and the ephemeral evidence of the Early Iron Age ceramics recorded during the van der Walt (2007) assessment have been destroyed and no trace of these could be found during the assessment undertaken by Pelser (2022) and the current assessment. These were located at S 25°41.199 E 28°17.733 (). From Google imagery between 2007 and 2015 the area was subjected to earthworks and extensive mechanical clearing, with a development to the east of the site being constructed and demolished during this time. These activities would have obliterated any indicators of heritage resources.

The palaeontological sensitivity of the study area is zero/insignificant and no further palaeontological studies are required and no other heritage features were noted. The impact of the project on heritage resources are low and it is recommended that the project can commence on the condition that the recommendations in the HIA are implemented as part of the EMPr and based on approval from SAHRA.

Recommendations for condition of authorisation
The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:
Recommendations in HIA:

- Implementation of the Chance Find Procedure for the project as outlined under Section 10.2 in the assessment report
- Archaeological monitoring of earthworks during the construction phase at the Early Iron Age Location identified in the Van der Walt (2007) report.

Figure 14: Photographic representation of the modern ruins and modern foundations of demolished ruins taken near the eastern edge of the project area.

Will any building or structure older than 60 years be affected in any way?	~~YES~~ **NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	~~YES~~ **NO**
If yes, please attached the comments from SAHRA in the appropriate Appendix	

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

1. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?	**YES**	~~NO~~
If yes, has any comments been received from the local authority?	**YES**	~~NO~~

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

Jannie Gous of City of Tshwane Utility Services Department – Energy and Electricity Division provided a comment during the Public Participation announcement period and stated that the proposed development is not affecting their infrastructure.

City of Tshwane Environmental Planning & Open Space Management Section provided comments on the Draft Basic Assessment Report. The contents of the comments indicated that the Department has no objection to the proposed development, however it was recommended that a revised Geotechnical Investigation should be included for the submission of the Final report. This has been completed and a new Geotechnical report has been included as Appendix F4 of this report.

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If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

2. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	**YES**	~~NO~~

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

ESKOM stated that they would not be affected by the development (See Appendix E3). Should comments be received by any organ of state during the public review phase of the draft BAR, these comments will be captured and responded to in the final BAR.

South African Heritage Resources Agency (SAHRA) provided comments and noted that the HIA field survey indicated no heritage sites or artefacts of significance were noted or identified, and that no burial grounds and graves where noted or identified due to the vegetative overgrowth. The project area is a fallow area which had multiple structures present until 1995 when all structures were demolished, therefore there are no existing structures in the project area which are older than 60 years. A previously identified Early Iron Age site that contained pottery, stone tools, tuyère pipe fragments and slag was found to be damaged by possible mechanical clearing. While the clearing was comprehensive, some subsurface material may be present. The SAHRA Development Applications Unit (DAU) has no objections to the proposed development but a Monitoring report of the recommended archaeological monitoring by an archaeologist must be submitted to SAHRA once the construction phase is completed. Further additional specific conditions are provided for the development as follows:

- **Monitoring report of the recommended archaeological monitoring by an archaeologist must be submitted to SAHRA once the construction phase is completed. If archaeological artefacts are uncovered, work must stop and a permit in terms of section 35(4) of the NHRA must be applied for before further work may continue in that area;**
- **38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA DAU (Annlin Matabane/Natasha Higgitt 021 202 8660) must be alerted as per section 35(3) of the NHRA. Non-compliance with this section of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule;**
- **38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA DAU (Annlin Matabane/Natasha Higgitt 021 202 8660), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with this section of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule;**
- **38(4)d – See section 51(1) of the NHRA;**
- **38(4)e – The following conditions apply with regards to the appointment of specialists:**
- **i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;**
- **The Final BAR and EMPR must be submitted to the SAHRIS Case for record purposes;**
- **The decision regarding the EA Application must be communicated to SAHRA and uploaded to the SAHRIS Case application.**

If "NO" briefly explain why no comments have been received

3. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses, Report as prescribed in the regulations and be attached to this application.

Please refer to Appendix E for the Comments and Response Report for the proposed residential development. Please note that all public participation conducted, and the reporting thereon, has been done in a manner to take into account the Protection of Personal Information Act (POPIA) (Act 4 of 2013). As such, all personal information (including names and all means of contact) has been retracted for the purpose of the public review period. Please see the Exigent Privacy Policy included in Appendix E which provides an indication as to the distribution restrictions and information use of contact details.

4. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices issued as required in terms of the regulations
Appendix 3 – Proof of newspaper advertisements
Appendix 4 –Communications to and from interested and affected parties
Appendix 5 – Minutes of any public and/or stakeholder meetings
Appendix 6 - Comments and Responses Report
Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report
Appendix 8 –Comments from I&APs on amendments to the BA Report
Appendix 9 – Copy of the register of I&APs

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives (complete only when appropriate) | **1** | time

Section D Alternative No. | 1 | (complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase? **YES** / ~~NO~~

If yes, what estimated quantity will be produced per month?

Possibly 20% of the raw materials used on site as per average contingency plans

How will the construction solid waste be disposed of (describe)?

During the construction phase of the proposed residential development, general construction rubble will be produced as part of daily works. This will include brick shards and broken bricks, excess aggregate. All the materials used such as the building rubble and solid construction waste (for example sand, gravel, concrete and waste material) that cannot be used for filling and rehabilitation and other litter and waste generated during the construction phase will be temporarily stored on site, possibly in waste bins/skips, and then removed from site and disposed of safely and responsibly at the nearest appropriate licensed waste disposal site.

Where will the construction solid waste be disposed of (describe)?

The solid waste generated from the construction activities will be removed by a Certified Waste Management Company and be disposed of at a registered landfill site if it cannot be crushed and reused as backfill material

Will the activity produce solid waste during its operational phase? **Yes household waste** **YES** / NO

If yes, what estimated quantity will be produced per month?

Amount cannot be specified at this stage

How will the solid waste be disposed of (describe)?

Household waste must be taken to the closest general waste landfill site for which a service agreement must be obtained.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity? ~~YES~~ / **NO**

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

It states in the Conditions of Establishment that the township owner shall at his own expense have all litter within the township area removed to the Satisfaction of the City of Tshwane Metropolitan Municipality, when required to do so by the City of Tshwane Metropolitan Municipality. The township owner shall provide sufficient refuse collection points in the township and shall make arrangements to the satisfaction of the Municipality for the removal of all refuse.

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? ~~YES~~ / **NO**

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility? ~~YES~~ / **NO**

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

All waste streams generated during construction and operational phase must be managed in accordance with the hierarchy of waste management principles and disposed of at an authorized landfill or waste disposal site must be the last option. Proof of waste disposal certificates must be kept on site and made available to the Department upon request. Waste separation can be encouraged.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	~~YES~~	**NO**
If yes, what estimated quantity will be produced per month?		m^3
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?	~~YES~~	**NO**

Will the activity produce any effluent that will be treated and/or disposed of on site?	~~Yes~~	**NO**
If yes, what estimated quantity will be produced per month?		m^3

If yes describe the nature of the effluent and how it will be disposed.

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

Will the activity produce effluent that will be treated and/or disposed of at another facility?	~~YES~~	**NO**

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?	**YES**	~~NO~~
If yes, what estimated quantity will be produced per month?	15 928,9 kℓ/month	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?	**YES**	~~NO~~

Will the activity produce any effluent that will be treated and/or disposed of on site?	~~YES~~	**NO**

If yes describe how it will be treated and disposed off.

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	~~YES~~	**NO**
If yes, is it controlled by any legislation of any sphere of government?	YES	NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

2. WATER USE

Indicate the source(s) of water that will be used for the activity

municipal	~~Directly from water board~~	~~groundwater~~	~~river, stream, dam or lake~~	~~other~~	~~the activity will not use water~~

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month: N/A

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs?	**YES**	~~NO~~

If yes, list the permits required

The proposed residential development will require a Water Use Licence in terms of Section 21 (c) and (i) of the National Water Act (Act 36 of 1998), as amended. This will be required as the development of the stormwater and sewer infrastructure will be located within 500 m of a regulatory area of the watercourse and stormwater infrastructure within 32m of a watercourse.

If yes, have you applied for the water use permit(s)?	**YES**	~~NO~~
If yes, have you received approval(s)? (attached in appropriate appendix)	~~YES~~	**NO**

3. POWER SUPPLY

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source

The power supply will be managed by ESKOM (Municipal power supply).

If power supply is not available, where will power be sourced from?

4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Recommendations will be provided to the developer to make use of :

- **Energy efficient sources of Electricity such as the use of Solar Geysers, wrapped geysers, Gas Stoves; Heat Pumps; Street and Security lighting with individual solar panels; LED lightning.**
- **Energy Efficient ways of construction via insulation, glazing, shutters etc.**
- **Providing glazing to let the sun in or block it out**
- **Design living areas with larger windows that allow more light in and reduce the need to use electrical lighting during the day**
- **Eco-friendly building material that can be recycled/ reused should rather, if possible, be used than building material that cannot be recycled.**

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

As described above.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4)(b)(i).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

One interested and affected party stated that infrastructure such as water capacity in the area needs to be upgraded and that there is a shortage in electricity. He also stated that there is lack of road and stormwater infrastructure.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

The I&AP was thanked for their comments and was told that they would be noted. At the time of receiving the comment from the I&AP the final services reports had not been received.

It is important to note that an engineering services report has been compiled for this site, and that the proposed development will be constructed with adequate services and infrastructure as necessary. It is recommended that all service level agreements are in place prior to construction of the proposed development.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

The impacts of the proposed residential development and alternative were assessed according to the criteria in the table below and will include the degree to which these impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated.

ASPECT	IMPACT RATING
Status of the impact: A statement of whether the impact is positive (a benefit), negative (a cost), or neutral.	
Direct impacts	Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
Indirect impacts	Impacts of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
Cumulative impacts	Impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.
Nature of the impact: The evaluation of the nature is impact specific. Most negative impacts will remain negative, however, after mitigation, significance should reduce: • Positive. • Negative.	
Extent: A description of whether the impact would occur on a scale limited to within the study area (local), limited to within 5 km of the study area (area); on a regional scale i.e. City of Tshwane Metropolitan Municipality & Gauteng (region); or would occur at a national or international scale.	

Local	1
Area	2
Region	3
National	4
International	5

Duration:

A prediction of whether the duration of the impact would be Immediate and once-off (less than one month), more than once, but short term (less than one year), regular, medium term (1 to 5 years), Long term (6 to 15 years), Project life/permanent (> 15 years, with the impact ceasing after the operational life of the development or should be considered as permanent).

Immediate	1
Short term	2
Medium term	3
Long term	4
Project life/permanent	5

Severity (extent +duration + intensity)

Intensity: This provides an order of magnitude of whether or not the intensity (magnitude/size/frequency) of the impact would be negligible, low, medium, high or very high. This is based on the following aspects:

- an assessment of the reversibility of the impact (permanent loss of resources, or impact is reversible after project life);
- whether or not the aspect is controversial;
- an assessment of the irreplaceability of the resource loss caused by the activity (whether the project will destroy the resources which are easily replaceable, or the project will destroy resources which are irreplaceable and cannot be replaced);

Negligible	The impact does not affect physical, biophysical or socio-economic functions and processes.	1
Low/potential harmful	The impact has limited impacts on physical, biophysical or socio-economic functions and processes.	2
Medium/slightly harmful	The impact has an effect on physical, biophysical and socio-economic functions and processes, but in such a way that these processes can still continue to function albeit in a modified fashion.	3
High/Harmful	Where the physical, bio-physical and socio-economic functions and processes are impacted on in such a way as to cause them to temporarily or permanently cease.	4
Very high/Disastrous	Where the physical, bio-physical and socio-economic functions and processes are highly impacted on in such a way as to cause them to permanently cease.	5

- the level of alteration to the natural systems, processes or systems.

Incidence (frequency + probability)

Frequency: This provides a description of any repetitive, continuous or time-linked characteristics of the impact: Once Off (occurring any time during construction or operation); Intermittent (occurring from time to time, without specific periodicity); Periodic (occurring at more or less regular intervals); Continuous (without interruption).

Once Off	Once	1
Rare	1/5 to 1/10 years	2
Frequent	Once a year	3
Very frequent	Once a month	4
Continuous	≥ Once a day/ per shift	5

Probability of occurrence: A description of the chance that consequences of that selected level of severity could occur during the exposure.

Highly unlikely	The probability of the impact occurring is highly unlikely due to its design or historic experience.	1
Improbable	The probability of the impact occurring is low due to its design or historic experience.	2
Probable	There is a distinct probability of the impact occurring	3
Almost certain	It is most likely that the impact will occur	4
Definite	The impact will occur regardless of any prevention measures	5

Risk rating	The risk rating is calculated based on input from the above assessments. The incidence of occurrence is calculated by adding the Extent of the impact to the duration of the impact. The

Severity of the impact is calculated based on input from the extent of the impact, the duration and the intensity.

Risk = Severity (extent +duration + intensity) x Incidence (frequency + probability)

Significance: The significance of the risk based on the identified impacts has been expressed qualitatively as follows:

- **low** – the impact is of little importance/insignificant, but may/may not require minimal management
- **medium** - the impact is important, management is required to reduce negative impacts to acceptable levels.
- **high** - the impact is of great importance, negative impacts could render development options or the entire project unacceptable if they cannot be reduced to acceptable levels and/or if they are not balanced by significant positive impacts, management of negative impacts is essential.

Low risk	0 – 50
Medium risk	51 – 100
High risk	101 - 150

In terms of the identification of issues and associated impacts for the proposed project, the following should be noted:

- The issues have been identified by the EAP team, the proponent, landowners and Interested and Affected Parties.
- A broad definition of the "environment" is considered, which includes the natural (biotic and abiotic), social, cultural, economic and built environments.
- Certain issues and associated impacts have been identified as potentially occurring, but their occurrence is not definite. However, they need to be identified to inform decision-making and to enable the relevant parties to proactively address them should they occur, or prevent them from occurring.
- Both negative and positive impacts are identified and described.

The following specialist studies were commissioned:

- Ecological and Wetland Riparian Assessment;
- Heritage Impact Assessment;
- Geotechnical assessment

These studies were undertaken by independent professionals regarded as specialists in their specific disciplines. The requirements for specialist reports stipulated in Appendix 6 of the R326 of 2017 of NEMA have been complied with.

Briefly describe 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 residential development. This must include an assessment of the significance of all impacts.

Table 2. Specialist assessments proposed by the DEA Screening tool for the proposed residential development.

Proposed Assessment	Sensitivity in the screening tool	Sensitivities identified in the Screening Report	EAP's comments on findings of the screening tool
Archaeological and Cultural Heritage Impact Assessment	Very High	.Within 5km of a Grade I Heritage site	A Heritage Impact Assessment was undertaken to provide an indication towards the sensitivity of the area based on the type of development and the surrounding land uses. In terms of the findings of the assessment, **no structures or features of archaeological or heritage significance were identified within the study area**.
Palaeontology Impact Assessment	High	Features with a High paleontological sensitivity	As part of the Heritage Impact Assessment compiled by Beyond Heritage (2023) one of the key findings included that "The paleontological sensitivity of the study area is **zero/insignificant and no further palaeontological studies are required**."
Terrestrial Biodiversity Impact Assessment	Very High	Features informing sensitivity rating: Critically endangered ecosystem	An Ecological Assessment was compiled for the proposed residential development area. The findings indicated that the **proposed development is made up of a disturbed grassland vegetation type and alien species which is observed to have been transformed over time** through anthropogenic and existing impacts such as local vegetation clearance and historical farming practices. It was also determined that **no biodiversity priority areas exist within the boundaries of the project area**.
Aquatic Biodiversity Impact Assessment	Very High	Very High sensitivity in terms of screening report.	The DEA screening tool indicated that the sensitivity for wetlands was very high. Upon site verification there were **no wetlands or water courses located on site**. However as per the DWS regulatory area, the **wetlands located within 500 m of the site** was delineated for the study area at a desktop level investigated. The hydrological map in the Ecological study Figure 6.1 indicated that the Moretele River occurs outside the site however within the 500 m regulator area.
Plant Species Assessment	Medium	Eight plant species with a medium sensitivity rating were named: • *Sensitive species 1252* • *Delosperma gautengense* • *Sensitive species 733,* • *Sensitive species 430,* • *Dicliptera magaliesbergensis,* • *Brachycorythis conica subsp. Transvaalensis* • *Sensitive species 1248* • *Prunus Africana*	**None of these species were identified on site during the site visits** conducted for the proposed development. Due to the high levels of disturbance in the surrounding area, the **likelihood of the study area presenting a CBA, ESA or PA priority focus area and a vulnerable ecosystem is low**. Based on the findings of the site visits conducted for the proposed development, the site has two predominant vegetation communities: • The *Aristida transvaalensis - Cymbopogon validus* grassland • The *Aristida transvaalensis - Cymbopogon validus* grassland with exotic woodland
Animal Species Assessment	Medium	Species listed to possibly occur and evaluated in the compliance statement: • *Neamblysomus julianae* • *Crocidura maquassiensis* • *Dasymys robertsii* • *Clonia uvarovi*	An Ecological Assessment was compiled for the proposed residential development area. **None of these species were identified on site** during the site visits conducted for the proposed development, neither were any other animal species identified. **The likelihood of encountering small animals was also low** within the study area.

Proposed Assessment	Sensitivity in the screening tool	Sensitivities identified in the Screening Report	EAP's comments on findings of the screening tool
		• *Kinixys lobatsiana* • *Hydrictis maculiocollis* • *Sagittarius serpentarius*	

PREFERRED ALTERNATIVE	
Loss of vegetation species	
IMPACT	**The potential loss of the extent and integrity of Rand Highveld Grassland and Marikana Thornveld**

Within the project area the vegetation structure is highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland. The current status of the project area does not reflect the Rand Highveld Grassland and Marikana Thornveld vegetation types. The presence of anthropogenic disturbances and historic clearing contributes to the loss of integrity of these vegetation types. Since the extent and integrity of the Rand Highveld Grassland and Marikana Thornveld with reference to potential loss is not represented in the project area due to the absence of these vegetation types of this impact will therefore not be assessed.

IMPACT	**Impact on species composition and structure of vegetation**

Within the project area the vegetation structure is described as a highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland. The proposed development site and is calculated to be 7.935 ha which will be require the clearance of vegetation. The site is severely transformed and displays high anthropogenic activities hence clearing the area classified as highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland will not cause a high impact to the existing vegetation. The species composition of the site is not indicative of the Rand Highveld Grassland and Marikana Thornveld vegetation types. Within the site approximately 100 % of the highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland area will be lost to transformation either due to concreting, landscaping and installation of services to accommodate the layout plan. This impact will therefore not be assessed.

IMPACT	**Impact on ecosystem threat status**

The ecosystem threat status is considered endangered and vulnerable and according to the NBA Vegetation layer (NBA, 2018) and as per the TSH Threatened Ecosystems (SANBI, 2006) the study site was considered critical. The footprint area with regard to the entire site is used to determine the loss of habitat. This site does not present a vegetation composition typical to the Rand Highveld Grassland and Marikana Thornveld vegetation types, hence leaving room for the re-evaluation of the threat status. The disturbed *Aristida transvaalensis – Cymbopogon validus* grassland habitat will experience a loss of 5.5 ha (69%).

Impact	**Type**	**Severity**		**Incidence**			**Risk class**		
		Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Before mitigation**		**After mitigation**
Negative	Direct	1	5	2	1	1	16	**LOW**	**LOW**

COMMENT/MITIGATION:

- Natural open spaces outside the development footprint should be left in their undeveloped state.
- Any existing or new exotic vegetation within the proposed development site must be eradicated.
- A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during the construction and operational phase.
- Indigenous veg to be used for landscaping purposes

IMPACT	**Impact on explicit subtypes in the vegetation**

As per the databases, the vegetation within the project area is classified as the Rand Highveld Grassland and Marikana Thornveld vegetation types. However upon site inspection the composition of vegetation on the site is dominated by highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland type species and not the associated with the Rand Highveld Grassland and Marikana Thornveld vegetation types. Within the proposed development area, there is no indication of a wetland vegetation type, whereas the remainder of the proposed development area is comprised of highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland with a small area scattered with alien trees which will be impacted upon (5.5 ha) the impact of this subtype is assessed below.

Impact	**Type**	**Severity**		**Incidence**			**Risk class**		
		Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Before mitigation**		**After mitigation**
Negative	Cumulative	1	4	3	1	5	54	**MEDIUM**	**LOW**

COMMENT/MITIGATION:

- Natural open spaces outside the development footprint should be left in their undeveloped state.
- Any existing or new exotic vegetation within the proposed development site must be eradicated.
- A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during the construction and operational phase.
- Indigenous veg to be used for landscaping purposes

PREFERRED ALTERNATIVE

Loss of faunal species

IMPACT | **Impact on faunal species due to site clearance**

During the ecological site visit, no common bird species, small mammals, amphibians or reptiles were observed whilst walking the study area. The proposed study area does not possess any avian or amphibian habitats, hence clearing will not negatively affect these fauna

Impact	Type	Severity		Incidence			Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	1	5	2	1	1	16	LOW	LOW

COMMENT/MITIGATION:

- Site clearance must take place from west to east (uphill) to provide any species that may occur the opportunity to migrate towards the east and where development is sparse and towards the north-east where a large undeveloped area occurs.
- Any encounters with possible animal species must be handled with care and no harm must come to the animal.
- No pesticides, insecticides or killing of animals may be undertaken

IMPACT | **Impact on overall ecosystem diversity of the site**

The extent of loss within the Rand Highveld Grassland and Marikana Thornveld vegetation types is not calculated as the site represents no characteristics of these vegetation type. The partial extent of the highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland with some alien trees vegetation type, 5.5 ha will be impacted upon. This is surrounded by developments such as a main roads, and associated infrastructure. The project area is not flagged as a corridor and there are no aquatic features within the proposed development area. the overall ecosystem is assessed below.

Impact	Type	Severity		Incidence			Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	1	5	2	1	1	16	LOW	LOW

COMMENT/MITIGATION:

- Strict management during construction phase to limit the extent of the footprint of the impact.
- No areas outside the final footprint may be cleared.
- Indigenous veg to be used for landscaping purposes
- Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas.

IMPACT | **Impact on any changes to the threat status of ecosystems in the CBA**

The footprint area with regard to the entire site is used to determine the loss of habitat. This site does not present any CBA, ESA or PA's, nor vegetation representative of the Rand Highveld Grassland and Marikana Thornveld vegetation types, hence leaving room for the re-evaluation of the threat status. A loss of 5.5 ha (69 %). of the highly disturbed *Aristida transvaalensis* – Cymbopogon validus grassland vegetation will occur. The impact of ecosystem diversity is assessed below

Imapct	Type	Severity		Incidence			Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Indirect	1	5	2	1	1	16	LOW	LOW

COMMENT/MITIGATION:

- Strict management during construction phase to limit the extent of the footprint of the impact.
- No areas outside the final footprint may be cleared.
- Indigenous veg to be used for landscaping purposes.
- Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas.

Heritage Impact

IMPACT | **Cultural and heritage aspects**

Potential impact

Due to the lack of any archaeological finds, there will be no impact to known heritage resources. Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures as recommended in this report should be implemented during all phases of the project. Impacts of the project on heritage resources is expected to be low during all phases of the development.

PREFERRED ALTERNATIVE

Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

CONSTRUCTION PHASE

IMPACT | Infestation of alien invasive species during construction

The disturbance of the highly disturbed *Aristida transvaalensis – Cymbopogon validus* grassland by the proposed activities may increase the spread of exotic species. Alien and invasive species are already a problem in the project area and utmost care should be taken not to disperse and increase the colonisation of these species.

Impact during Construction phase: Direct, Indirect and cumulative impacts

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	2	5	3	5	5	100	MEDIUM	MEDIUM

COMMENT/MITIGATION:

- Any existing or new exotic vegetation within the proposed development site must be eradicated.
- A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during the construction and operational phase.
- Indigenous vegetation to be used for landscaping purposes

IMPACT | Hydrological impacts

Although there are no delineated wetlands located within the project area, it is important to make sure no spills take place to prevent the contamination into the groundwater and all surface water run-off must be managed during the construction phase. The developer proposed external services installation and upgrades withing close proximity to the Moretele River. Appropriate planning and management within these areas must be carefully done.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Indirect	2	3	3	3	3	48	LOW	LOW

COMMENT/MITIGATION WITHIN PROPERTY BOUNDARY:

- Silt traps must be installed on the development site boundary during construction;
- Small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion;
- "Trench-breakers", which are in-trench barriers, should be installed within any trench excavations to intercept and minimise the accumulation of surface runoff water from upslope areas running down the trenches;
- Erosion control structures must be put in place where soil may be prone to erosion;
- Bare areas where vegetation has been removed pose a risk of becoming a sediment load during heavy rainfall, this must be managed by placing it on the upslope side of the development site;
- Temporary stormwater management structures must be used during construction. Any areas damaged as a result of stormwater runoff from the construction site must be rehabilitated immediately; and
- During rehabilitation, prompt and progressive reinstatement of bare areas is required. During reinstatement, the topsoil layer is to be replaced last, to simulate the pre-construction soil conditions.

COMMENT/MITIGATION WITHIN MORETELE RIVER AREA:

- The construction footprint must be kept as small as possible.
- Topsoil must be carefully removed and stored for use in rehabilitation of the area after construction has been completed.
- The area must be sectioned off to prevent vehicle encroachment beyond the required work areas.
- As soon as construction of the culvert has been completed the area must be reinstated with topsoil and the vegetation contained therein.

PREFERRED ALTERNATIVE									
IMPACT	**Pollution of surface and groundwater due to chemical, oil and spillages**								
Contaminants such as hydrocarbons, solids and pathogens will be generated from several potential sources (examples include petrol/diesel, oil/grease and other hazardous substances). These contaminants have the capacity to negatively affect ecosystems including sensitive or intolerant species of flora and fauna.									
Impact	**Type**	**Severity**		**Incidence**			**Risk class**		
		Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Before mitigation**		**After mitigation**
Negative	Direct	2	3	5	2	2	40	**LOW**	**LOW**
COMMENT/MITIGATION: • Extra care must be taken to prevent any potentially hazardous substances from entering the groundwater during heavy rainfall events by implementing mitigation plans, such as the Stormwater Management Plan; • The use and handling of all chemicals and potentially hazardous substances must take place on an impermeable surface and bunded areas to prevent chemicals and potentially hazardous substances from infiltrating the soil; • All rubble and other types of waste must be appropriately stored and disposed of at a licensed waste disposal site; • Contingency plans must be compiled for possible spillages of dangerous goods and include details for decontamination and process to be followed; • Spill kits must be available in the event of a hydrocarbon or chemical spill									
IMPACT	**Pollution of the surface water and groundwater due to raw sewer spills**								
Due to the nature of the proposed project, there is a likelihood of sewage spillages due to malfunction of infrastructure, polluting the wetland system during the construction and operational phases. The health risks associated with high *E. coli* levels are of serious concern.									
Impact	**Type**	**Severity**			**Incidence**		**Risk class**		
		Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Before mitigation**		**After mitigation**
Negative	Direct	2	3	5	2	2	40	**LOW**	**LOW**
COMMENT/MITIGATION: • Preventive measure must be undertaken during the construction of the infrastructures, securing all joints for minimum spillage occurrences. • Should a spillage occur, it must be reported to the relevant departments immediately. • Where contamination occurs, soil must be immediately removed to prevent further contamination. • Records must be kept of sewage spillages during all phases of the proposed residential development. • An emergency preparedness plan must be in place for instances where spills occur that can be harmful to people or the receiving environment									
IMPACT	**Potential loss of riparian area.**								
Construction work in the riparian area could lead to harmful consequences such as loss of vegetation, problems in re-establishment of vegetation after completion of works.									
Impact	**Type**	**Severity**		**Incidence**			**Risk class**		
		Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Before mitigation**		**After mitigation**
Negative	Direct	1	2	2	1	3	20	**LOW**	**LOW**
COMMENT/MITIGATION: • No stockpiling of any materials may take place adjacent to the river. • Erosion control measures must be implemented in areas sensitive to erosion such as edges of slopes, exposed soil etc. • These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which are used in the protection of slopes. • In addition, the condition of water that occurs in the river is to remain clear and no increase in turbidity is allowed as a result of increased sediment levels resulting from working on the banks or bed • Strict management during construction phase to limit the extent of the footprint of the impact. • No areas outside the final footprint may be cleared. • Indigenous veg to be used for landscaping purposes. • Management of construction related impacts such as eating areas, concrete mixing areas, storage yard should only be allowed in designated areas.									

PREFERRED ALTERNATIVE

IMPACT | Erosion

Vegetation clearance may result in sheet erosion. The clearance of vegetation will further reduce the capacity of the land surface to retard the flow of surface water, thus, decreasing infiltration, and increasing both the quantity and velocity of surface water runoff and erosion.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	2	5	3	3	3	60	MEDIUM	LOW

COMMENT/MITIGATION:

- Topsoil and subsoil should be stockpiled separately, to not impact on areas outside the servitude;
- Topsoil storage should not exceed a height of 2 m.
- During rehabilitation, prompt and progressive reinstatement of bare areas is required. The topsoil layer is to be replaced on top during reinstatement.
- Checks must be carried out at regular intervals to identify areas where erosion is occurring;
- The control of soil erosion and siltation associated with construction is important at all locations on site, and particularly adjacent to riparian area. Both temporary and permanent soil erosion control measures must be used during the construction phase. Any earth-worked areas, which may lay bare for extended periods, should be temporarily grassed.
- Remedial action, including the rehabilitation of eroded areas and, where necessary, the relocation of the paths causing erosion, is to be undertaken

IMPACT | Socio-economic impacts - creation of job opportunities

A number of temporary employment and skills development opportunities will be created during construction. These opportunities will be of short-term duration and will be limited to the construction requirements of the Contractor, however skills can be transferred which may be used during further opportunities. Future employment opportunities may arise from the residents of the Derdepoortpark Extension 44 development employing domestic workers.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Positive	Direct	3	3	4	5	5	100	MEDIUM	No mitigation required

COMMENT/MITIGATION:

- The contractor should, if possible, use local labour to ensure the economic growth of the surrounding area. (The applicant has already confirmed this aim)

IMPACT | Security/Safety impacts on the surrounding properties/estates

As part of the proposed residential development, the safety of the surrounding properties and businesses are of high concern. During the construction phase, it will be critical that the safety of the residents of the estate not to be compromised as a result of the proposed residential development.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	1	5	3	4	1	45	LOW	LOW

COMMENT/MITIGATION:

- The principal contractor is to provide a detailed security plan aimed towards ensuring the safety of the adjacent residential areas and business, during the construction phase of the proposed development.
- The construction footprint must be demarcated and cordoned off prior to the commencement of the construction works.
- No construction workers are to be permitted to wander past the boundaries of the demarcated construction footprint.

IMPACT | Cultural and heritage aspects

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.
Construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.

The below table was extracted from the HIA report:

PREFERRED ALTERNATIVE		
	Without Mitigation	**Wit Mitigation (Preservation/excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	16 (Low)	16 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA

The following table was compiled according to the above extracts:

Impact	**Type**	**Severity**			**Incidence**		**Risk class**		
		Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Before mitigation**		**After mitigation**
Negative	Direct	1	5	2	1	2	17	**LOW**	**LOW**

COMMENT/MITIGATION:

- Implementation of a chance find procedure for the project
- Archaeological monitoring of earthworks during the construction phase at the Early Iron Age Location identified in the Van der Walt (2007) report.

CUMULATIVE IMPACTS:

The proposed project will have a low cumulative impact as no significant heritage resources will be adversely affected.

RESIDUAL IMPACTS:

Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.

GEOTECHNICAL ASPECTS - FOUNDATIONS DESIGNS

These investigations discussed in the Provisional Geotechnical Surficial Soils Investigation (2023) have confirmed that potentially problematic soils mantle the bedrock over large sections of the site area. The occupence of these soils and their anticipated in-service behaviour has been analysed and broad preliminary zonation provided on the Soil Map, Drawing IR1833/1 (Appendix F4) with the zones defined below:

SUB-AREA DESIGNATIONS SHOWN ON THE SOIL MAP	**PRELIMINARY COMMENTARY**
2[H1/C-C1/S]	Anticipate 7.5mm to 15mm total heave (H1), <5mm to 10mm collapse settlement (C-C1) and less than 10mm settlement (S).
2[H2-H3/C-C1/S]	Anticipate 15mm to >30mm total heave (H2-H3), <5mm to 10mm collapse settlement (C-C1) and less than 10mm settlement (S).

IMPACT | **Sub-areas with designation 2[H1/C-C1/S] – drainage precautions**

Preliminary recommendations are provided below and are based on the variable sub-surface conditions encountered. The subsurface profile on this site is typical of a thick layer of loose to medium dense colluvium, overlying medium dense to dense transported material and pebble marker up to depths of 3m:

Impact	**Type**	**Severity**			**Incidence**		**Risk class**		
		Extent	**Duration**	**Intensity**	**Frequency**	**Probability**	**Before mitigation**		**After mitigation**
Negative	Cumulative	1	4	4	1	3	32	**LOW**	**LOW**

COMMENT/MITIGATION:

- Ensure freeboard of at least 150mm, i.e. top of floor slab to top of natural ground level, as required in the NHBRC Guidelines.
- Site drainage and service and plumbing precautions are to apply. Avoid water ponding or water ingress into the subsurface near the building.
- Bearing pressures not to exceed 50KPa.

PREFERRED ALTERNATIVE

IMPACT | **Sub-areas with designation 2[H2-H3/C-C1/S] – Site drainage and plumbing services precautions**

Preliminary recommendations are provided below and are based on the variable sub-surface conditions encountered. The subsurface profile varies on this site and is typical of loose to medium dense colluvium, transported material, and pebble marker overlying shallow residual diabase.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Cumulative	1	4	4	1	3	36	LOW	LOW

COMMENT/MITIGATION:

- Ensure freeboard of at least 150mm, i.e. top of floor slab to top of natural ground level, as required in the NHBRC Guidelines.
- Site drainage and service and plumbing precautions are to apply. Avoid water ponding or water ingress into the subsurface near the building.
- Bearing pressures not to exceed 50KPa.

IMPACT | **Slope stability and erosion**

Exposure of the fine grained soils in cuttings on steep slopes may lead to erosion and ravelling of the material when dry.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Cumulative	2	5	3	3	3	60	MEDIUM	LOW

COMMENT/MITIGATION:

- Stormwater is controlled and removed efficiently and effectively to prevent erosion.
- Where steep or near vertical cuts are required particularly in the dolomite residuum provide retaining appropriate retaining wall support and protection.
- Seepage may create problems where cut is to aquitard interface

NO-GO ALTERNATIVE

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Sedimentation and erosion	LOW	The site will be left as is. No additional mitigation measures will be implemented.	No mitigation measures will be implemented	The site will be left as is. No additional mitigation measures will be implemented.
Infestation and spread of alien invasive species	MEDIUM	The site will be left as is. No additional mitigation measures will be implemented. Additionally, the infestation of the study area will continue	No mitigation measures will be implemented	The site will be left as is. No additional mitigation measures will be implemented.
Loss of possible job opportunities	HIGH	The site will be left as is. No additional mitigation measures will be implemented.	No additional job opportunities will be created	The site will be left as is. No additional mitigation measures will be implemented

PREFERRED ALTERNATIVE

OPERATIONAL PHASE

IMPACT | **Infestation of alien invasive species during operation**

The disturbance of the natural vegetation by the proposed activities may increase the spread of exotic species. Alien and invasive species are already a problem in the project area and utmost care should be taken not to disperse and increase the colonisation of these species.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	1	2	3	3	5	64	MEDIUM	MEDIUM

COMMENT/MITIGATION:

- Successful re-vegetation in all areas is crucial to stabilise soils and limit infestation by invasive alien plant species. Rehabilitation should be undertaken on a progressive basis in these areas.
- A monitoring program should be put in place to remove exotic vegetation and maintain open space areas free from exotic invasions during operation.

PREFERRED ALTERNATIVE

IMPACT | Hydrological impacts

Although there are no delineated wetlands is located within the project area, it is important to make sure that no spills take place to prevent the contamination into the groundwater and surface run-off.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Indirect	1	2	3	5	3	48	LOW	LOW

COMMENT/MITIGATION:

- Stormwater infrastructure will be completed by the time the project is fully operational and landscaping will have been completed too. Therefore, impacts on the hydrology of the area will not be significant.
- If any bare areas are left unvegetated they could be vulnerable to heavy rainfall or windy conditions. These areas should therefore be covered as soon as possible.
- Bare areas where vegetation has been removed pose a risk of becoming a sediment load into river during heavy rainfall or windy conditions. Bare areas which have not recovered from the construction phase, should therefore be covered during such events.
- Temporary stormwater management structures should be used during operational phase in areas which have not recovered fully from construction activities.
- Any areas damaged as a result of stormwater runoff from the construction site must be rehabilitated.

IMPACT | Socio-economic impacts - creation of job opportunities

A number of temporary and permanent employment and skills development opportunities will be created during operational phase of the proposed residential development. These opportunities will be of short-long term duration and will be limited to the construction requirements of the Contractor, however skills can be transferred which may be used during further opportunities. Future employment opportunities may arise from the resident of this development employing domestic workers.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Positive	Direct	3	3	4	5	5	100	MEDIUM	No mitigation required

COMMENT/MITIGATION:

- The Home Owners Association should, if possible, use local labour to ensure the economic growth of the surrounding area.
- The new development will result in increased income to the Zambezi Retail Park less which is located within 300m of the proposed development, as well as the other surrounding businesses in the area.

IMPACT | Potential loss of riparian area. due to construction of Stormwater pipe

Construction work in the riparian area could lead to harmful consequences such as loss of vegetation, problems in re-establishment of vegetation after completion of works.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	1	2	2	1	3	20	LOW	LOW

COMMENT/MITIGATION:

- Rehabilitation of disturbed vegetation must be undertaken as soon as construction has been completed. This must be aimed at improving the status quo of the riparian zone, i.e. by removing alien invasive species and planting indigenous species. The following guidelines apply to re-vegetation:
- Site preparation:
- Utilise erosion and sediment control techniques where needed.
- Grade the disturbed area to a stable uniform slope. Vegetative cover will not develop on an unstable slope.
- Loosen the soil by hand.
- Plant when the weather will permit e.g. suitable temperatures and moisture for plant growth. Spring plantings give the best results.
- On unstable soils use a soil saver such as fibre netting or a fibre mat.

PREFERRED ALTERNATIVE

- The sloped area is seeded and the mat placed on top to protect the bare soil before the planted vegetation has become established should the slope of the area be steep and could lead to erosion.

IMPACT | **Erosion**

Sheet erosion may occur during the operational phase as a result of the construction activities that has taken place on site. Where rehabilitation and bank stabilising has not taken place fully by the end of the construction activities, there is a risk of sedimentation and erosion taking place.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	1	2	3	2	3	30	LOW	LOW

COMMENT/MITIGATION:

- Checks must be carried out at regular intervals to identify areas where erosion is occurring.
- The control of soil erosion and siltation associated with operation is important at all locations on site, and particularly adjacent to riparian area. Both temporary and permanent soil erosion control measures must be used during the operation phase.
- Remedial action, including the rehabilitation of eroded areas and, where necessary, the relocation of the paths causing erosion, is to be undertaken.
- During rehabilitation, prompt and progressive reinstatement of bare areas is required. The topsoil layer is to be replaced on top during reinstatement.

IMPACT | **Socio-economic impacts – economic growth possibilities**

Due to both the provision of additional job opportunities, as well as the availability of additional housing prospects, there will be a degree of regional economic growth.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Positive	**Direct**	3	5	3	4	5	99	**MEDIUM**	**No mitigation required**

COMMENT/MITIGATION:
No mitigation measures required.

IMPACT | **Pollution of surface and groundwater due to potential sewer spills**

During the operational phase of this project, there is a higher risk of sewer spills due to the possibility of infrastructure malfunction. The occurrence of sewer spills can be mitigated through precautionary applications as identified below.

Impact	Type	Severity			Incidence		Risk class		
		Extent	Duration	Intensity	Frequency	Probability	Before mitigation		After mitigation
Negative	Direct	3	5	5	2	2	52	MEDIUM	LOW

COMMENT/MITIGATION:

- Preventive measure must be undertaken during the construction of the infrastructures, securing all joints for minimum spillage occurrences.
- Should a spillage occur, the EMP should be followed.
- Where contamination occurs, soil must be immediately removed to prevent further contamination.
- Should faulty infrastructure be identified, it must be replaced immediately after discovery. This must form part of a maintenance plan approved by the competent authority.
- Records must be kept of sewage spillages during both phases, construction and operational.
- An emergency preparedness plan must be in place for instances where spills occur that can be harful to people or the receiving enviroment.

PREFERRED ALTERNATIVE				
NO-GO ALTERNATIVE				
Sedimentation and erosion	**LOW**	The site will be left as is. No additional mitigation measures will be implemented.	No mitigation measures will be implemented	The site will be left as is. No additional mitigation measures will be implemented.
Infestation and spread of alien invasive species	**MEDIUM**	The site will be left as is. No additional mitigation measures will be implemented. Additionally, the infestation of the wetland vegetation area will continue	No mitigation measures will be implemented	The site will be left as is. No additional mitigation measures will be implemented.
Loss of possible job opportunities	**HIGH**	The site will be left as is. No additional mitigation measures will be implemented.	No additional job opportunities will be created	The site will be left as is. No additional mitigation measures will be implemented

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

The following specialist reports have been included in Appendix F of the BAR:

- **Ecological and Wetland Riparian Assessment**
- **Heritage Impact Assessment**
- **Geotechnical Report**
- **Provisional Geotechnical Surficial Soils Investigation**

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed residential development.

To obtain a comprehensive understanding of the vegetation in the study area, a long-term study should be conducted as certain species only flower in certain seasons. However, due to time constraints, such long-term studies were not feasible, and most conclusions have been based on the field survey which was conducted on 7 October 2022.

Routine maintenance of the proposed external infrastructure needs to be done following the completion of the construction phase. This has been incorporated into the EMPr of the proposed project and must be incorporated into the management guidelines of the future residential development as run by the Home Owners Association.

The heritage impact assessment indicated that a brief literature review is not exhaustive on the literature of the area. Also, due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered and possible occurrence of graves and other cultural material cannot be excluded. The assessment only dealt with the proposed residential development area and was done in a non-intrusive surveying manner.

3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

Briefly describe 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 decommissioning and closure phase for the various alternatives of the proposed residential development. This must include an assessment of the significance of all impacts.

Proposal

N/A

Alternative 1

N/A

Alternative 2

N/A

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

N/A

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

N/A

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

The proposed residential development is located on vacant land, which is owned by the developer (Zotec Developments (Pty) Ltd.).

A cumulative impact of this project would be additional vegetation clearing and ultimately change in land use required to allow for residential development. However, proper urban designs, which accommodates the natural features of the study area, by means of design and layout, enhances the use of the open space in the proposed development within an urban environment.

Sensitive areas would be protected by implementing mitigation measures as stated in the Environmental Management Programme (EMPr) Report.

5. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Proposal

The impacts during the construction and operational phase have been identified.

The main negative impacts during the construction include, the natural environment in terms of the flora, fauna, hydrology, pollution of groundwater, alien vegetation infestation and erosion and the impact of infestation of alien invasive species.

During the operational phase of the proposed residential development, impacts include the natural environment in terms of the hydrology, cumulative vegetation clearance, alien vegetation and erosion. The disturbance of the natural vegetation by the proposed activities may increase the spread of exotic species. Alien and invasive species are already a problem in the project area and utmost care should be taken not to disperse and increase the colonisation of these species.

Vegetation clearance is an ongoing impact during urban development, which is considered a cumulative impact. However proper urban designs, which accommodates the natural features by means of design and layout, enhances the use of the open space in the proposed development within an urban environment is encouraged.

The impact is expected to be limited due to the housing need in the area, the general sense of place of the area complements the surrounding land uses, and the highly disturbed nature of the area proposed for the construction footprint. The positive impacts are related to upgrading of infrastructure, the employment opportunities for the surrounding community/area and the additional housing opportunities to be presented, leading to economic growth.

For alternative 1:

This alternative will result in all of the same impacts as the preferred proposal because the alternative access type, location and footprint would not vary. It has therefore, not been investigated and discussed at length.

For alternative 2:

The best practice principles has been applied to the engineering design in terms of the proposed infrastructure, therefore proposed services designs does not change the impacts of the proposed development. A minimum footprint approach during construction must be undertaken in order to ensure that minimal impacts on all sensitive features are maintained. The impacts during the construction and operational phase have been identified and will be similar for the alternative proposal. The negative impacts of the construction phase of the proposed residential development would be seen in the impacts such as the potential loss of riparian area, pollution of surface and groundwater, erosion, infestation of alien invasive plant species and the hydrological impacts. The main negative impacts anticipated for the operational phase of the proposed residential development will be seen in hydrological impacts and potential loss of riparian area due to construction of Stormwater pipe. The positive impacts of the proposed residential development are seen in the creation of job opportunities and additional housing prospects, boosting the local economy, and in turn the provincial economy. When all the potential positive and the negative impacts are taken into consideration, it is considered that the proposed works will have a limited additional negative impacts on the receiving environment. Due to the need for the project, with regards to the setting and highly disturbed nature of the area proposed for the construction footprint, the impact is expected to be limited.

No-go (compulsory)

The area surrounding the project site is in need of infrastructure upgrades. In the current state, Intaba Street, located along the proposed development, is narrow, in a poor condition and affected to potholes. The edges are affected by erosion. There are several businesses in the area as well as residential dwellings and the road is used for access to those areas.

There is no stormwater infrastructure along the road except along the southern end of the road for approximately 55m. Stormwater infrastructure will need to be constructed to help management of surface flow. Further erosion will also take place and soil may be washed into the existing stormwater inlets along Baviaanspoort road, leading to sediment loads depositing in the Moretele River area.

The no-go alternative would mean that the construction and related operation of the proposed residential development and associated infrastructure does not commence. This would in turn limite the additional growth in the area resulting in the current land to remain vacant and the infestation of alien invasive species will also continue. Without an upgrade to the road and further deterioration of the road will occur, and a hazard to drivers will continue to the increase. The access to the site is also planned from Intaba Street, which further necessitates the need to rehabilitate the road.

Furthermore, the potential job opportunities which will be created by the proposed residential development would not be presented and the potential housing opportunities in the area would not be created.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

In accordance with the EIA Regulations, the potential impacts due to the construction and operational phases of the proposed residential development has been identified and assessed. An EMPr has been prepared in accordance with Appendix 4 of the EIA Regulations of 2014, as amended (GNR 326 of 2017) in terms of the NEMA and includes information on the proposed management or mitigation measures that was taken to address the environmental impacts that have been identified in this Draft BAR. These impacts include environmental impacts or objectives in respect of planning and design, pre-construction and construction activities, operation or undertaking of the activity and rehabilitation of the natural environment.

Any comments and/or concerns identified by I&APs during the review period of this Draft BAR review period will be incorporated into the Final BAR to be submitted to the GDARD for consideration.

Impacts for the construction and operational phases have been identified. The main negative impacts are possible erosion and potential impact on the /Moretele River if correct management of stormwater is not implemented; if care is not taken when construction takes place along in the riparian area; and the impact of infestation of alien invasive species.

When all the potential positive and the negative impacts are taken into consideration, it is considered that the proposed residential development will have a limited additional negative impact on the receiving environment.

The impact of the proposed residential development on the receiving environment, should appropriate mitigation measures be implemented, would be limited.

For alternative 1:

Other than an alternative entrance to the project area, no development alternatives were proposed for the proposed residential development, as the Applicant bought the site for the specific purpose of construction of the proposed residential development.

For alternative 2:

Other than an alternative entrance to the project area, no development alternatives were proposed for the proposed residential development, as the Applicant bought the site for the specific purpose of construction of the proposed residential development. Best practice principles were applied for the all concept design and engineering infrastructure so as to ensure limited impacts to the sensitive areas (wetland and its associated buffer area).

Where construction works within the sensitive areas are required (specifically regarding the external services infrastructure), a minimum impact footprint approach must be followed by all members of the construction and operational team. This aims to ensure that minimal impacts on the sensitive features are maintained.

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

An alternative entrance to the project area, and alternative stormwater management measures were reviewed. No development alternatives were proposed for the proposed residential development, as the Applicant bought the site for the specific purpose of construction of the proposed residential development. Best practice principles will be applied for the all concept design and engineering infrastructure so as to ensure limited impacts to the riparian areas. Where construction works within the sensitive areas are required (specifically regarding the external services infrastructure), a minimum impact footprint approach must be followed by all members of the construction and operational team. This aims to ensure that minimal impacts on the sensitive features are maintained.

If this project is authorised, rehabilitation post construction will be implemented as stated in the EMPr.

The project will create jobs in the planning, as well as the construction phase.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed residential development and the outcome thereof.

The proposed residential development is located on two properties, Portions 426 and 679 of the Farm Derdepoort 326-JR. Both properties have been zoned as both zoned as Residential 3 . The proposed project has considered and is guided by the region's SDF and IDP priorities of the area. The proposed residential development aligns with the principles listed in the SDF vision of "spatial resilience" in which the vulnerability to environmental degradation is reduced by protecting the ecological systems and supporting the transition to environmental sustainability while also supporting the 'spatial efficiency' principle through supporting job creation.

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).	**YES**	~~NO~~

If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Mitigation measures which has been listed in the impact assessment sections as well as implementation of the EMPr.

9. THE NEEDS AND DESIRABILITY OF THE PROPOSED RESIDENTIAL DEVELOPMENT (AS PER NOTICE 792 OF 2012, OR THE UPDATED VERSION OF THIS GUIDELINE)

The site for the proposed residential development is located within the CoT, in the Gauteng Province. Gauteng is the smallest of the nine provinces; however, it comprises the largest share of the South African population which amounts to approximately 13. 7million people which is 24.1% of South Africa's total population of 56.5 million.

According to the IDPs for the municipality, the CoT as a population of 3 650 000 people. The population growth rate is approximately 2.74 % increase per annum. This development is necessary to accommodate the growing population of the province as a whole.

The proposed residential development will be located on Portion 426 and Portion 679 of the Farm Derdepoort 326-JR. The ecological impact of the proposed residential development is limited to the proposed residential development site and the stormwater outlet within the riparian area of the Moretele River. Environmental best practices will be followed throughout the construction and operational phases of the proposed residential development, especially within the installation of the stormwater infrastructure within the Moretele River sensitive area. The proposed residential development will be partially located within the NEMBA Endangered Ecosystem type, the Marikana Thornveld, and partially located within the NEMBA Vulnerable Ecosystem type, the Rand Highveld Grassland. However, due to numerous historical agricultural activities (as indicated by the Heritage Impact Assessment), no remnant vegetation of this ecosystem type is remaining, as verified by the ecological assessment. As verified by the geotechnical description of the proposed residential development sites, no rocky outcrops were found on site.

As per the Gauteng C-Plan (2011), the site will be located within less than 240 m of an area classified as a CBAs and within an Ecological Support Area, therefor all caution must be taken and mitigation measures as per the EMPr must be adhered to

As reference to the Heritage Impact Assessment report, the overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in that report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project. A chance find protocol as presented by the Heritage Assessment Specialist has been incorporated into the project specific EMPr.

This project will improve the livelihood of the larger area due to the creation of job opportunities and skills development during construction, and will also allow for an increase in the local economy of the surrounding area by creating much needed housing opportunities. During the construction phase, preference must be given to the local affected parties when recruiting laborer's. These parties must be trained in such a way as to assist with furthering their skills, where possible. The benefits will include additional housing prospects for future inhabitants of the Gauteng province.

The EMPr (Appendix G) provides measures to prevent or minimize the impact of the proposed residential development before, during and after construction. This project will have a minimum impact on additional resources as sustainable engineering designs and methods will be used throughout the development and monthly ECO monitoring will occur. In the long term, positive impacts will occur due to the proposed residential development.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED (CONSIDER WHEN THE ACTIVITY IS EXPECTED TO BE CONCLUDED)

The environmental authorisation is required for a period of 10 years.

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) (MUST INCLUDE POST CONSTRUCTION MONITORING REQUIREMENTS AND WHEN THESE WILL BE CONCLUDED.)

If the EAP answers "Yes" to Point above then an EMP is to be attached to this report as an Appendix

EMPr attached	**Yes**

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix H: EMPr

Appendix I: Other information

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.