BASIC ASSESSMENT REPORT

FOR THE

PROPOSED K33/ K52 ROAD INTERSECTION DEVELOPMENT, CITY OF JOHANNESBURG, GAUTENG

COMMENT PERIOD: 13 AUGUST TO 13 SEPTEMBER 2018

Proponent:

Gauteng Department of Roads and Transport

GAUTENG PROVINCE
Department: Roads and Transport
REPUBLIC OF SOUTH AFRICA

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Amendments on Document

Date	Report Reference Number		Description of Amendment
20180808	21805-DBAR_v0	21805-DBAR_v1	Minor Amendments, Finalisation of Report

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The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and Prism Environmental Management Services and its staff reserve the right to modify aspects of the report including the recommendations if and when new information becomes available from ongoing research or further work in this field, or pertaining to this investigation.

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EXECUTIVE SUMMARY

The K33 Road is a Planned north-south provincial road which is intended to provide vital connectivity in the area and to distribute traffic better with the elimination of the staggered intersection between the K52 and Cedar Road. The project will involve the establishment of an at-grade intersection with K33 and K52.

The current situation with the staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027) continue to provide unsafe road conditions. The intersection experiences high traffic volumes on a daily basis which creates extreme time delays due to the layout of the staggered intersection. The need to improve the current situation is therefore highly important and can be addressed through the elimination of the staggered intersection. This will result in significantly safer road conditions, alleviate traffic congestion and shortened travel time.

The K33 Road is situated in the northern regions of Johannesburg with the above-mentioned intersection located within the Chartwell area.

The Preliminary Design of the K33 was accepted and gazetted by the MEC in Notice 2626 of 2003 in terms of section 10(3) of the GTIA, Act 8 of 2001. The road is classified as a Class 2 Major Arterial road with a road reserve of width at a minimum of 62 meters. Class 2 roads forms part of the primary network for the urban area, focusing on long distance movement to, from and within the urban area.

As part of this Basic Assessment process, **layout alternatives** have been investigated as follows:

- The Proposal;
- Alternative 1; and
- No-Go Option.

The proposed activity involves the constructing of a new intersection to eliminate the existing staggered intersection between the K52 and Cedar Road. The project will involve the establishment of an at-grade intersection with a sectional construction of the K33 and K52.

Based on the findings of the specialist studies and impact assessment and taking into account the successful implementation of the EMPr, it is felt that this proposed K33/ K52 road intersection with associated access (The Proposal) should be authorised. The reasons for this opinion are discussed in more detail in the following subjections:

1. **Process to Date**

As part of the Basic Assessment process, the following has been undertaken in terms of public participation:

- A detailed Interested and Affected Party (I&AP) Database was compiled and included affected landowners, and organs of state that have jurisdiction over the site such as City of Johannesburg, Johannesburg Roads Agency, Department of Water and Sanitation, Johannesburg Water and Gauteng Department of Agriculture and Rural Development (GDARD). In addition, the I&AP database included the affected ward councillor of the area.
- Initial notification took place on 26 April 2018. Copies of Background Information Documents (BIDs) were emailed and /or hand delivered to I&APs on the I&AP Database. A public participation map was also compiled to show all affected landowners. Hand delivery took place based on this map.
- Two site notices were placed at the site.
- An advert was placed in the Star Newspaper to notify potential I&APs of the development.
- I&APs were provided 30 days (26 April 2018 to 28 May 2018) to register their interest in the proposed development.
- All I&APs that did so were added to the I&AP database. All comments made during this period were added to the Comments and Response Report which also included in Appendix E.
- As part of the review of this document (Basic Assessment Report), all registered I&APs will be notified of the public review and provided with a link to download a copy of the document. A 30-day public review period is provided from 13 August 2018 to 13 September 2018.

2. Need for the Project

Sustainable development is directly linked to the provision of a safe and efficient road network. The Gauteng Department of Roads and Transport has identified the need to improve the current road infrastructure in the area as the staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027) continue to provide unsafe road conditions. The intersection experiences excessive traffic volumes on a daily basis which creates extreme time delays due to the layout of the staggered intersection. The K33 Road is a Planned north-south provincial road which is intended to provide vital connectivity in the area and to improve the traffic distribution.

The Preliminary Design of the K33 was accepted and gazetted by the MEC in Notice 2626 of 2003 in terms of section 10(3) of the GTIA, Act 8 of 2001. The road is classified as a Class 2 Major Arterial road with a road reserve of width at a minimum of 62 meters. Class 2 roads forms part of the primary network for the urban area, focusing on long distance movement to, from and within the urban area.

The K33 is currently a greenfields project with an envisaged duel carriageway road with two 3.7 m lanes with a divided median. The section of the K33 associated with the intersection will only be constructed with one carriageway.

According to the World Health Organisation, road traffic injuries are one of the top three causes of disability and death. The need to improve the current situation is therefore highly important and can be addressed through the elimination of the staggered intersection. This will result in significantly safer road conditions, alleviate traffic congestion and shortened travel time.

The overall traffic flow on any highway depends to a great extent on the performance of the intersections involved. Four-leg/ cross intersection is best suited for this scenario as it can handle major two-lane roadways carrying moderate to high traffic volumes at relative high speeds and operates at near capacity (current situation).

The intersection will incorporate channelization to minimise conflict points within the intersection. Channelization is the separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavements markings or raised islands, to facilitate the safe and orderly movement of both vehicles and pedestrians. Proper channelization increases capacity, improves safety, provides maximum convenience and instils driver confidence.

In addition to the above, planning documents such as the RSDF (2011) and the Gauteng Roads Network indicate the need for the K33. Further, the Preliminary Design of the K33 was accepted and gazetted by the MEC in Notice 2626 of 2003 in terms of section 10(3) of the GTIA, Act 8 of 2001. It has therefore been taken into account in townplanning schemes in the area.

From a technical perspective, this alignment is preferred for a number of reasons. The most important of which is safety as the proposal eliminates the existing staggered intersection. In addition, this alignment conforms to the horizontal and vertical standards of a Class 2 Major Arterial Road. The Proposal also will allow for access as the minimum radius for the horizontal curves will be 1500 metres (as required). These radii allow for accesses every 600 metres on K33. The allowance of accesses is very important due the development of the area as well as the accommodation of the mobility of the road.

The need for this intersection is therefore as follows:

- Improved capacity and traffic flow for the area.
- Improved north-south linkage for the area.
- Decreased impacts on existing infrastructure;
- Economic and social benefits related the road.

- Significant improvement in traffic safety.
- Shortened travel time.
- Creation of development opportunities.
- Creation of employment opportunities.

The abovementioned objectives will be achieved through the proposed four-leg/ cross intersection with incorporated channelization development.

3. Environmental Sensitivity

Three specialist assessments were undertaken to determine the environmental and cultural sensitivity of the affected site. These include:

- Ecological Baseline and Impact Assessment;
- Heritage Impact Assessment; and
- Wetland Assessment and Delineation.

A Biodiversity Baseline & Impact Assessment was undertaken by the Biodiversity Company (2018) and found that the project area has been somewhat altered. This is due to the proximity of an existing urbanised environment and associated human activity, including: livestock, dumping of rubble, general littering and the infringement into natural areas via footpaths and roads.

The remaining natural habitats (including secondary grassland and stream habitats) exhibited a healthy balance between various common grassland species and associated herbaceous plants. The ecological integrity, importance and functioning of the natural grassland area as well as the non-perennial stream plays a crucial role as a water resource system and an important habitat for various fauna and flora. This diversity is indicative of the importance of these systems to collectively provide refugia, food and corridors for dispersal in and through the surrounding area. However, should the mitigation measures listed in the Biodiversity Baseline Assessment and EMPr be implemented and enforced, the proposed intersection will not result in loss of any unique ecosystems. *Hypoxis hemerocallidea* are not threatened but listed as Least Concern are visibly frequent at the site and larger study area and could be conserved in the larger study area (road reserve) and relocated from the footprint, if the development is approved. No threatened species occur at the site and thus there appears to be no loss of any threatened species, if the site is developed. Areas of the site affected is regarded as being moderately high sensitive and will require specific mitigation measures and close monitoring during construction.

The Heritage Impact Assessment conducted by HCAC (2018) identified no Archaeological sites or material on site. Three cemeteries were recorded within close proximity to the road reserve. A farm stead (Ruin) was identified in close proximity to the road reserve. However, the specialist stated that should the mitigation measures be implemented and enforced, no impact on the heritage resources will occur and the project can be supported.

A Wetland Assessment was undertaken by Prism EMS (2018) and determined that the Present Ecological Status (PES) for the wetland scored in the lower ranges as the wetland is largely modified and impacted on by historical activities. The Ecological Importance and Sensitivity (EIS) falls in the moderate range and has some functionality in respect of moderating water quality before it reaches the Klein Jukskei River. The Recommended Ecological Category (REC) for the wetland was categorised to remain in the category of moderately modified wetlands. It will thus require some rehabilitation to enhance the ecological function of the system. It is considered to be a moderately sensitive wetland, more specifically in respect of flow and water quality.

For this reason, it can be supported that the road development may go-ahead if the required buffers are maintained and the resource drivers preserved. The rehabilitation of the wetland is vital to recover the required ecological function. The wetland drivers must be enhanced as part of the rehabilitation of the affected areas. In respect of the construction phase, it is important to ensure that the required erosion protection measures linked to the crossing sections be carefully designed and installed.

4. Impact Assessment

A detailed impact assessment has been undertaken and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact occurring (Appendix I). Most impacts have a low significance once mitigation measures were applied. Therefore, based on the need and safety requirements with consideration of impact assessment undertaken as well as the findings of the specialist studies for the project, it is the opinion of the EAP, that the Proposal be approved.

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)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form 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 (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**

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. 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.

7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

8. An incomplete report may lead to an application for environmental authorisation being refused.

9. **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 authorisation being refused.**

10. 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 being refused.

11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

12. 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.

13. 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 of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
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.

Not Applicable.

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 activity involves the development of a road intersection, therefore not requiring a closure plan.

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

This report is currently available for public review and a copy of the document has been submitted to the Gauteng Department of Agriculture and Rural Development (GDARD), Department of Water and Sanitation (DWS) and City of Johannesburg (CoJ).

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.

Not Applicable

Have State Departments including the competent authority commented? No

If no, why?

Not yet applicable.

This document constitutes the Basic Assessment Report which will be subjected to 30 days' public participation. No comment has thus been provided.

All comments received during the public review period will be submitted as part of the final submission of the BAR to GDARD.

SECTION A: ACTIVITY INFORMATION

1. Proposal or Development Description

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

K33/ K52 Road Intersection Development, City of Johannesburg, Gauteng Province

In order to put the information contained in the Basic Assessment Report (BAR) in context, a short background is provided below.

The K33 Road is a Planned north-south provincial road which is intended to provide vital connectivity in the area and to distribute traffic better with the elimination of the staggered intersection between the K52 and Cedar Road. The project will involve the establishment of an at-grade intersection with K33 and K52.

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The K33 is currently a greenfields project with an envisaged duel carriageway road with two 3.7 m lanes with a divided median. The section of the K33 associated with the intersection will only be constructed with one carriageway.

One layout/ design alternative option was assessed as part of the application process. The preferred option (**the Proposal**) involves the installation of a new at-grade intersection with K33 and K52 with associated access and services infrastructure. Whereas the alternative investigated (**Alternative**), the partial realignment and adjustment of the existing interchange of Cedar Road and the K52.

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development	X	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

Water Use Licence Application (WULA): Section 21 C & I	
Legislation	**Competent Authority**
National Water Act, 1998 (Act No 36 of 1998)	Department of Water and Sanitation

If yes, have you applied for the authorisation(s)?	No
If yes, have you received approval(s)? (attach in appropriate appendix)	No

A integrated process is being undertaken and the Water Use Licence: Section 21 (c) and (i) application will be submitted to DWS after the commenting period of this report expires and all relevant comments have been addressed. The Water Use License Technical Report is attached to this report for comment (See attached Appendix F).

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, 1996 (Act No. 108 of 1996)	National (DEA) Provincial (GDARD)	4 December 1996
National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.	National (DEA) & Provincial (GDARD)	27 November 1998
National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.	National (DEA) & Provincial (GDARD)	27 November 1998 2 September 2014
Environmental Impact Assessment Regulations (GN R 982 of 4 December 2014) (as amended by GN 326 of 7 April 2017)	National (DEA) Provincial (GDARD)	8 December 2014 (as amended)
Listing Notice 1 (GN R 983 of 4 December 2014) (as amended by GN 327 of 7 April 2017)	National (DEA) Provincial (GDARD)	8 December 2014 (as amended)
Listing Notice 3 (GN R 985 of 4 December 2014) (as amended by GN 324 of 7 April 2017)	National (DEA) Provincial (GDARD)	8 December 2014 (as amended)
National Water Act [NWA], 1998 (Act, No 36 of 1998)	Department of Water	26 August 1998

	and Sanitation (DWS)	
National Heritage Resources Act, 1999 (Act No 25 of 1999)	South African Heritage Resources Agency (SAHRA) & Provincial Heritage Resources Authority Gauteng (PHRA-G)	14 April 1999
Generic Water Use Authorization Application Process – External Guideline	DWS	2007
Water Use Authorization Application Process – External Guideline	DWS	2007
Procedural Requirements for the Water Use License Application and Appeals (GN R 267 of 24 March 2017)	DWS	2017
Gauteng Environmental Management Framework	GDARD	2017
Guideline on Need and Desirability	DEA&DP	2010
Guideline on Alternatives	DEA&DP	2010
Guideline on Public Participation	DEA&DP	2011
GDARD Requirements for Biodiversity Assessments V3	GDARD	2014
IEMS Guideline series	DEA	2014

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

Legislation, policy of guideline	Description of compliance
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)	Section 24 of the Constitution states that – *"Everyone has the right to -* *1. an environment that is not harmful to their health or well-being; and* *2. have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –* *2.1. Prevent pollution and ecological degradation;* *2.2. Promote conservation; and* *2.3. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."* • A Basic Assessment Process including an Impact Assessment has been undertaken to ensure that negative impacts on the environment can be mitigated satisfactorily.
National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998), as amended	The NEMA is the umbrella framework for all environmental legislation primarily to assist with implementing the environmental rights of the Constitution. The NEMA provides fundamental principles required for environmental decision making and to achieve sustainable development. It also makes provision for duty of care to prevent, control and rehabilitate the effects of significant pollution and environmental degradation, and prosecute environmental crimes. These principles must be adhered to, and taken into consideration during the impact assessment phase. Section 24D and 24(2) of the NEMA makes provision for the publication of list and associated regulations containing activities identified that may not commence without obtaining prior environmental authorisation from the competent authority. The Act also requires that no person may commence an activity listed or specified unless the competent authority has granted an environmental authorisation of that activity. • A Basic Assessment Process including an Impact Assessment has been undertaken to ensure that negative impacts on the environment can be mitigated satisfactorily. This assessment is in line with the requirements of NEMA and the associated EIA Regulations. • Further, other important aspects of NEMA such as sustainability principles, such as the "Polluter Pays" and "the Precautionary Principle" have also been taken into account in the assessment of the impacts of the proposed development. • The commencement of the activity will not take place unless authorised by the competent authority.
Environmental Impact Assessment Regulations (GN R 982 of 4 December 2014) (as amended by GN 326 of 7 April 2017)	The purpose of the EIA Regulations, 2014 is to regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts.

	The Basic Assessment Process undertaken for the proposed development is in line with the requirements of the EIA Regulations.
	
	The following activities are triggered in terms of Section 24(2) of NEMA and the associated EIA Regulations, 2014 (GN R 982 of 4 December 2014) as amended, for:
	• Listing Notice 1 (GN R 983 of 4 December 2014) as amended:
	  ○ Activity 19
	• Listing Notice 3 (GN R 985 of 4 December 2014) as amended:
	  ○ Activity 4
	  ○ Activity 12
	  ○ Activity 14
	The triggered activities form part of this application and basic assessment process.

National Water Act (NWA), 1998 (Act No. 36 of 1998)	The National Water Act (NWA) (36 of 1998) regulates the surface and subsurface water of South Africa. The purpose of the act is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled. The following water uses are triggered in terms of Section 21 of the NWA: • Section 21(c) • Section 21(i) • A Water Use License (WUL) will be applied for, for the proposed development. The WUL process will be undertaken in terms of the relevant procedures and guidelines.
DWS: Regulations regarding the procedural requirements for Water Use Licence Applications and Appeals (Act No. 267 of 2017)	
DWS, 2007b. Water Use Authorization Application Process – External Guideline – August 2007	
DEA&DP, 2010a. Guideline on Need and Desirability	The need and desirability considers the different stages of an BAR. It considers individual questions of the needs, the impacts and effects on the environment. The Need and Desirability provides information and guidance for applicants when considering the need and desirability in terms of NEMA and the EIA Regulations.
DEA&DP, 2010b. Guideline on Alternatives	This guideline is applicable to this proposed development in terms of a description of feasible and reasonable alternatives. Different alternatives are considered and this guideline describes what each alternative involves and how these alternatives should be considered. The No-Go alternative is compulsory and must always be included.
DEA&DP, 2011. Guideline on Public Participation	Public participation processes have been followed with the consideration of the guideline as it provides the public or stakeholders with the scale of anticipated impacts, the public sensitivity to the project, indicates the types of potentially affected parties, the public participation mechanisms, whether it be public meetings, open days or press releases, etc. This guideline indicates how the EAP, Applicant and affected landowners can participate in a basis assessment and/or EIA.
DEA, 2014 – IEMS Guideline series	Compliance with the Integrated Environmental Management Series in terms of the NEMA, 1999 (EIA Regulations, 2014) for the proposed project. The guideline series informs the EAP of how the EIAs, public participation process, the listed activities in terms of the EIA Regulations, 2014 compare in a user friendly manner.
GDARD Requirements for Biodiversity Assessments V3, 2014	Compliance with the Gauteng Department of Agriculture and Rural Development Biodiversity Management Directorate in terms of the requirements

	for Biodiversity Assessments version 3. The Directorate establishes the minimum requirements for any biodiversity assessment undertaken by a competent specialist.
Need & Desirability Guideline (Notice 891 of 2014)	The Department of Environmental Affairs (DEA) published a guideline on determining the need and desirability of a proposed development. This document provides information and guidance considering the need and desirability in terms of NEMA, the EIA Regulations, the NEM: AQA, and NEM: WA. It also aims to assist Environmental Assessment Practitioners (EAPs) to prepare a well-structured and complete application and reports in order, and to assist the competent authorities to ensure that need and desirability are given due consideration during every EIA application, to expedite and ensure well-informed decision-making. • Section E, Part 9 of this report includes an assessment of the need and desirability of the proposed development which takes into account the Guidelines.
Public Participation Process Guideline (GN R 807 of 10 October 2012)	The DEA also published guidelines for public participation. However, these specifically relate to the EIA Regulations, 2010. • Section C of this report provides information on the public participation process. Where applicable, the guideline assisted in ensuring all the necessary I&APs were identified. However, as mentioned, these guidelines specifically relate to the EIA Regulations, 2010.
National Heritage Resource Act (NHRA), 1999 (Act No. 25 of 1999)	The National Heritage Resources Act (25 of 1999) was promulgated for the protection of National Heritage Resources and the empowerment of civil society to conserve their heritage Resources. In terms of Section 38 of this act, certain listed activities require authorisation from provincial agencies • As such, a copy of the Basic Assessment Report will be uploaded to the South African Heritage Resources Agency (SAHRIS) to obtain comment from PHRA-G. It should be noted that a Heritage Impact Assessment Report has been compiled on portion 614 of the Farm Randjesfontein 405 JR. The HIA report is located within Appendix G3 of this report.

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

Site Alternatives

According to the EIA Regulations, 2014 the following types of alternatives may be considered for a proposed project, alternatives relating to:

- Different project activities;
- Site selection; and
- Location or layout alternatives within the proposed site.

The proposed development is located within various portions of the farm Nietgedacht 535 JQ and the North Champagne Estates A.H, within Ward 96 of the City of Johannesburg Metropolitan Municipality, Gauteng Province.

Due to the nature of the proposed activity (a road intersection which connects to existing roads), assessment of alternative sites was not feasible.

Further, as a road is necessary due to the current unsafe road condition related to existing staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027), assessment of different project activities is not feasible.

Therefore, as part of this Basic Assessment process, **layout alternatives** have been investigated.

The following main components are required for consideration of the site layout alternatives, and will be discussed or described within this report:

- Safety considerations;
- Road alignment;
- Road Design; and
- Property Entrances/ access.

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**	**Proposal Description** The Gauteng Department of Roads and Transport has identified the need to improve the current road infrastructure in the area as the staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027) continue to provide unsafe road conditions. The intersection experiences excessive traffic volumes on a daily basis which creates extreme time delays due to the layout of the staggered intersection. The need to improve the current situation is therefore highly important and can be addressed through the elimination of the staggered intersection. This will result in significantly safer road conditions, alleviate traffic congestion and shortened travel time. The K33 Road is a Planned north-south provincial road which is intended to provide vital connectivity in the area and to improve the traffic distribution. The conditions mentioned above can be addressed by constructing a new intersection and eliminating the existing staggered intersection between the K52 and Cedar Road. The project will involve the establishment of an at-grade intersection with a sectional construction of the K33 and K52. The proposed K33 is currently a greenfields project with an envisaged duel carriageway road with two 3.7 m lanes with a divided median. The proposed K33 will be a divided 4-lane dual carriageway road with a road reserve of width at a minimum of 62 metres. The road is classified as a Class 2 Major Arterial road. The section of the K33 associated with the intersection will however, only be constructed with one carriageway. The Gauteng Department of Roads and Transport plans to rehabilitate the exiting K52 (P39-1) Road and include the sectional construction of the K33 Road as part of the rehabilitation to improve the situation of the current intersection. **Property Access and interchange developments** To allow access of the proposed K33 the minimum radius of horizontal curves of 1500 metres had to be implemented and in accordance with the standards. The radii allow for accesses every 600 metres on the K33. The balance between mobility and access is very important and with the proposed K33 road having to accommodate both, due to the rapid growth in development within the area. The development aimed to limit the impact of social disruptions which made it the most preferred option. The proposed development will consist of three intersections: • K33 Intersection 1: Intersection between K52 and K33 at 1.978 km. This intersection will require traffic signals due to the extent of traffic envisaged. • K33 Intersection 2: An intersection between K33 and Cedar Road will be constructed at 2.650 km. The current phase of the K33 development will allow a free-flow movement due to the configuration of the K33 and Cedar Road.

- Cedar Road: An intersection will be required at 0.368 km to provide safe access to the associated Link Road.

Access to the proposed K33 road will be allowed through at-grade intersection, however, due to the Class 2- Major Arterial Urban road classification, specific minimum interval spacing must be implemented to allow for partial access and enhanced mobility. Access spacing is very important as the control of accesses contribute directly to the improvement of road and traffic safety. Table 1 provides an overview of the access spacing while Figure 1 shows the proposal and associated affected properties.

Table 1: K33 - Intersection spacing

Intersection/ Interchange	Km Distance	Spacing (m)
Intersection 1: K52 & K33	1.978	
Class 2- Major Arterial Urban Road (Minimum allowed spacing: 600 metres)		663
Intersection 2: K33 & Cedar Road	2.650	
Class 3- Minor Arterial Urban Road (Allowed spacing of 350 m to 480 m)		368
Intersection 3: Cedar Road & Link Road	0.368	

Figure 1: Illustration of proposed road design

The proposed alignment has no direct impact on existing property access. The following changes will however, be implemented in order to comply with the required standards and improve the road safety in the area:

- Change to existing road access on Vind'Or Ave, which will be diverted with a link road onto the re-aligned Cedar Road. Direct access from Vind'Or Ave will be closed off.

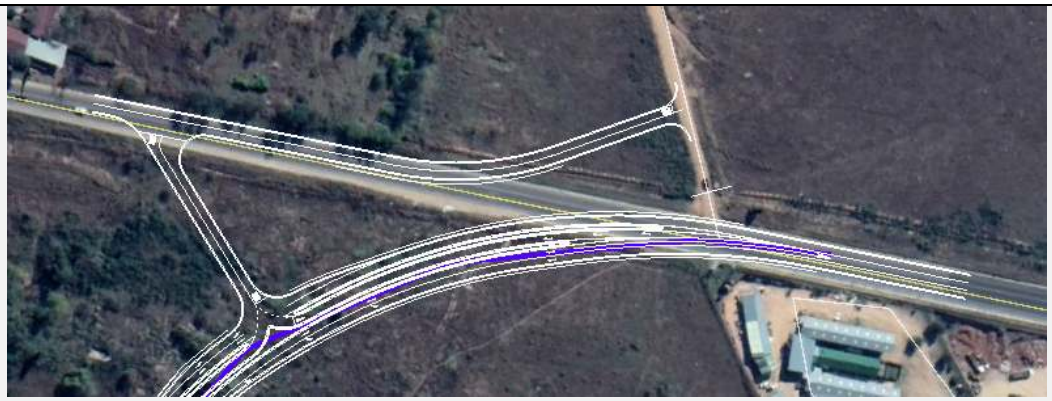

Figure 2: Figure illustrating Cedar Road and Vind'Or Ave.

- Change to existing road access from existing Cedar Road alignment onto K52. The existing Cedar Road and K52 intersection will be closed off once the new intersection is constructed. Access will be provided using the link road onto the K33.

Figure 3: Figure illustrating close-off of Cedar Road and K52 intersection with new access road.

Stormwater

The entire area drains towards a tributary of the Klein-Jukskei River that runs on the south eastern section of the site. The proposed road alignment crosses the riparian area and associated calculated floodlines on two separate occasions.

The efficient management of stormwater is very important not only within the road itself but within the entire road reserve to protect the environment and the integrity of the road structure especially the pavement layer. The stormwater within the proposed road upgrade and intersection will be managed by means of a system of major and minor culverts. Large pipe culverts will be installed in the areas where major surface water and stormwater is experienced. Minor stormwater structures will be installed at an interval of 200 metres and will consist of smaller pipe culverts to allow for continues flow of stormwater through the proposed road. See attached Engineer Design Report in Appendix I4.

Services Affected

Several services are affected by the alignment of K33 and Cedar Road:

		• Electrical Overhead Powerlines • Overhead Telephone Lines • Underground Telecommunication Lines These services either have to be relocated or protected with the construction of the road. From a technical perspective, this alignment is preferred for a number of reasons. The most important of which is safety as the proposal eliminates the existing staggered intersection. In addition, this alignment conforms to the horizontal and vertical standards of a Class 2 Major Arterial Road. The Proposal also will allow for access as the minimum radius for the horizontal curves will be 1500 metres (as required). These radii allow for accesses every 600 metres on K33. The allowance of accesses is very important due the development of the area as well as the accommodation of the mobility of the road. Furthermore, as the alignment of the K33 is gazetted already, town-planning schemes have taken the proposed road into consideration already,
2	**Alternative 1**	**Alternative 1 Description** As discussed above, the Gauteng Department of Roads and Transport has identified the need to improve the current road infrastructure in the area as the staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027) continue to provide unsafe road conditions. As part of this, the Department has investigated possible alternatives to the formalisation of a section of the K33 Road as part of a new intersection development. The alternative was investigated to identify possible ways of minimising the environmental impact and optimising traffic management for both current and future situations. The alternative investigated the upgrading and rehabilitation of Cedar Road with a sectional re-alignment to make provision for a new intersection. The re-alignment of Cedar Road will allow for improved and safer traffic conditions, however, a staggered intersection will still be present as the 6th Road (R552) and K52 intersection will be 128 meters to the south-east of the new intersection. This staggered intersection has safety and traffic implications.  **Figure 4: Proposed alternative 1 layout of Cedar Road & K52 intersection**

		Property Access and interchange developments The proposed alternative (alternative 1) will transform minimal natural vegetation as it utilises existing road infrastructure, including a transformed surface area. Alternative 1 will thus only require the development of one intersection. However, new access to the existing retail complex situated on the corner of Cedar Road and the K52 will require construction. Access to the retail complex from the K52 will be closed off due to safety reasons and road infrastructure standards. This intersection upgrade will resolve some of the current interchange issues but will only be a short-term solution as the planned K33 road will still have to be build in future. The cumulative impact that will result in the long term must be kept in mind. **Stormwater** The entire area drains towards a tributary of the Klein-Jukskei River that runs on the south eastern section of the site. The proposed road alignment does not cross the riparian area or associated calculated floodlines, and therefore do not require specific stormwater infrastructures within the re-alignment servitude. From a technical perspective, this alignment was not preferred due to the fact that a staggered intersection (and the safety and traffic issues associated with this) will remain. Further, new accesses will be required. No stormwater system upgrades are planned for in this alternative. The system will thus remain in current state.

Table 2: Summary of Alternatives considered

	Key differentials between alternatives considered
Proposal	The proposed activity involves the constructing of a new intersection to eliminate the existing staggered intersection between the K52 and Cedar Road. The project will involve the establishment of an at-grade intersection with a sectional construction of the K33 and K52. The proposed K33 is currently a greenfields project with an envisaged duel carriageway road with two 3.7 m lanes with a divided median. The proposed K33 will be a divided 4-lane dual carriageway road with a road reserve of width at a minimum of 62 metres. The road is classified as a Class 2 Major Arterial road. The section of the K33 associated with the intersection will however, only be constructed with one carriageway. The Gauteng Department of Roads and Transport plans to rehabilitate the exiting K52 (P39-1) Road and include the sectional construction of the K33 Road as part of the rehabilitation to improve the situation of the current intersection.
Alternative 1	The Gauteng Department of Roads and Transport has investigated possible alternatives to the formalisation of a section of the K33 Road as part of a new intersection development. The alternative was investigated to identify possible ways of minimising the environmental impact and optimising traffic management for both current and future situations. The alternative investigated the upgrading and rehabilitation of Cedar Road with a sectional re-

	alignment to make provision for a new intersection. The re-alignment of Cedar Road will allow for improved and safer traffic conditions, however, a staggered intersection will still be present as the 6th Road (R552) and K52 intersection will be 128 meters to the south-east of the new intersection.
Reason for preferred option (Proposed design)	Whilst the proposal does impact a natural area and a tributary of the Klein-Jukskei River, taking into account the biophysical, cultural and socio-economic environment, overall it is preferred the option: • The proposal is preferred as it optimises traffic safety as it will remove the existing staggered intersection. • It will also conform to the horizontal and vertical standards of a Class 2 Major Arterial Road and will have the necessary horizontal curves required for accesses every 600m. This will accommodate the development that is taking place in the area. • Further, the K33 alignment is accepted by the MEC and will be constructed where and when the need is required. The proposed option is designed to facilitate future development and anticipated increase in traffic volumes within the surrounding area. • The cumulative and long-term impacts are less than the alternative as the proposal will rectify the risk and safety factors for the long term and double-up in providing for the future plans linked to the K33 route. • Stormwater system upgrades will also form part of the road upgrade, that will have a positive impact on the aquatic resource quality characteristics.

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

Not Applicable.

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)***	
Alternatives:	
Alternative 1	
Alternative 2 (if any)	
	Ha/ m^2

or, for linear activities:

	Length of the activity:
Proposed activity – **Proposal**	1 600 meters
Alternatives:	
Alternative 1 (if any)	160 meters
Alternative 2 (if any)	Not Applicable

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

	Size of the site/servitude:
Proposed activity - **Proposal**	62 m in width
Alternatives:	
Alternative 1 (if any)	32 m in width
Alternative 2 (if any)	Not Applicable
	Meters in width.

*The servitude in this regard refers to the approved road reserve.

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	Not Applicable	

Describe the type of access road planned:

Please note:

The project involves the development of a road and new intersections however, access to the construction areas will be available from the existing road during construction,

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	Not Applicable	

Describe the type of access road planned:

Please note:

The alternative design involves the re-alignment of an existing road with the development of a new intersection. Access to the construction area will be available from the existing 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 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:

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 [ ] Number of times

(only complete when applicable)

6. Layout 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)

Please see **Appendix A1 & A2** for a copy of the layout plan for both the Proposal and the Alternative (Alternative 1). Please also see **Appendix A3** for copies of various sensitivity maps.

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 see **Appendix A3** for a copy of the Locality Map. Please also see **Appendix A3** for a copy of the sensitivity map.

7. Site photographs

Colour photographs from the centre 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 see **Appendix B** for site photographs.

8. 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.

Not Applicable

SECTION B1: DESCRIPTION OF RECEIVING ENVIRONMENT – PROPOSAL

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	**Not Applicable**	times

The proposed intersection and associated road infrastructure are located within the same receiving environment and was therefore not duplicated for each section.

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 (complete only when appropriate)	**1**	times

This section has been duplicated as follows:

1. Proposal;
2. Alternative 1.

As the there are minor changes to the receiving environment for each design investigated.

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	**Not Applicable**	(complete only when appropriate for above)
Section B – Location/route Alternative No.	**Once**	(complete only when appropriate for above)

1. Property Description

Property description: (Including Physical Address and Farm name, portion etc.)	The sectional development of the K33 road reserve associated with the new intersection will traverse the following properties:
	• Nietgedacht 535 JQ
	  ○ Portion 98
	  ○ Portion 165 (Unregistered Portion of Portion 69)
	  ○ Portion 69
	  ○ Portion 71
	  ○ Portion 108
	  ○ Portion 107
	  ○ Portion 22
	  ○ Portion 100 (Unregistered Portion of Portion 72)
	  ○ Portion 99 (Unregistered Portion of Portion 72)
	  ○ Portion 23
	  ○ Portion 10
	• North Champagne Estates A.H.
	  ○ Holding 13
	All properties listed above is situated with the City of Johannesburg Metropolitan Municipality, Gauteng Province.

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.

In the case of linear activities:

Proposal:	**Latitude (S):**	**Longitude (E):**
□ Starting point of the activity	-25.976979°	27.956931°
□ Middle point of the activity	-25.979818°	27.952245°
□ End point of the activity	-25.975648°	27.947365°

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 — Appendix D

The 21-digit Surveyor General code of each cadastral land parcel

PROPOSAL	**21-DIGIT SURVEYOR GENERAL CODE**																			
Nietgedacht 535 JQ																				
Portion 98	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**9**	**8**
Portion 165 (Unregistered Portion of Portion 69)	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**6**	**9**
Portion 69	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**6**	**9**
Portion 71	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**7**	**1**
Portion 108	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**1**	**0**	**8**
Portion 107	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**1**	**0**	**7**
Portion 22	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**2**	**2**
Portion 100 (Unregistered Portion of Portion 72)	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**7**	**2**
Portion 99 (Unregistered Portion of Portion 72)	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**7**	**2**
Portion 23	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**2**	**3**
Portion 10	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**1**	**0**

North Champagne Estates A.H.																				
Holding 13	**T**	**0**	**J**	**Q**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**

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

Gradient = $\frac{1401 - 1365}{696}$

= 1: 19.3

Land Slopes down from north to south at a gradient of approximately 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):**

Not Applicable

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):**

Not Applicable

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):**

Not Applicable

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
		X

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

The Department of Environmental Affairs Screening Tool identified Medium Agricultural Combined Sensitivity. Please see **Appendix I3** for Screening Report.

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 % =15	Natural veld with heavy alien infestation % =10	Veld dominated by alien species % =	Landscaped (vegetation) % =10
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =5	Bare soil % =
Paddock/ grazing fields % =30	Dumping/building rubble % =15	Riparian Zone % =15		

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
	X	

If YES, specify and explain:

Please note:

From a desktop perspective, the site falls part of the grassland vegetation type, Egoli Granite Grassland that is of high conservation priority and listed Endangered according to the National List of Threatened Ecosystems (2011). However, the majority of the site has experienced transformation due to human activities such as development, agriculture and livestock grazing and is therefore not considered representative of Egoli Granite Grassland.

Further, no endangered or rare flora or fauna species were identified by the Ecological Habitat Assessment which was undertaken. However, there are plant species that are not threatened but listed as Least Concern that are present at the site. This includes the *Hypoxis hemerocallidea.* It can be rescued and replanted locally. Mitigation measures regarding this have been included in the EMPr which is located in Appendix H.

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
		X

If YES, specify and explain:

Please note:

Hypoxis hemerocallidea was identified on site and is found within the surrounding area. However, is not threatened but are listed as Least Concern by the IUCN Red Data List (2017).

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

If YES, specify and explain:

Please note:

Whilst the Biodiversity Assessment did identify a small section of the site as having moderately-high sensitivity, the majority of the site was classified as having a low sensitivity. In particular, the Specialist noted:

"*It is clear from the regional ecological overview, as well as the baseline data collected to date that the Project area has been somewhat altered. This is due to the proximity of an existing urbanised environment and associated human activity, including: livestock, dumping of rubble, general littering and the infringement into natural areas via footpaths and roads."*

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

If yes complete specialist details

Name of the specialist:	Martinus Erasmus (Cand Sci Nat)		
Qualification(s) of the specialist:	B-Tech in Nature Conservation		
Postal address:	420 Vale Ave. Ferndale		
Postal code:	2194		
Telephone:		Cell:	081 319 1225
E-mail:	info@thebiodiversitycompany.com	Fax:	086 527 1965

Are any further specialist studies recommended by the specialist?	YES	NO
		X

If YES, specify:	Not Applicable.

If YES, is such a report(s) attached?	YES	NO
		X

If YES list the specialist reports attached below

Not Applicable.

Signature of specialist:

Date: July 2018

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	
Other land uses (describe):				

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

NORTH

	1;7;34	1;7;34	1;2;7;34	1;2;7;8;34	1;2;8;34
	1;8;25;34	1;8;14;34	1;7;8;12;13;14;15;34	1;8;34	1;8;13;15;34
WEST	1;8;25;34	1;8;12;14;15;34	1;2;7;8;10;28;29;34	1;2;13;14;15;34	1;2;7;12;13;14;15;34
	1;8;14;15;25;34	8;12;13;14;15;34	1;8;34	1;2;34	1;2;8;12;34
	1;8;14;15;34	1;8;34	1;34	1;2;8;34	1;2;34

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

The following specialist reports have been attached:

- Wetland Assessment;
- Biodiversity Baseline & Impact Assessment; and
- Heritage Assessment.

Please refer to **Error! Reference source not found.**.

In addition, the following two technical reports have been undertaken and are included in Appendix I4:

- Engineering Design Report including the 1:50 and 1:100 Year Floodline Report

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.

The proposed development occurs within the City of Johannesburg in Gauteng. A summary of the socio-economic environment for the City of Johannesburg (obtain from StatsSA) is included below.

The City of Johannesburg Local Municipality is situated in Gauteng province and covers an area of 1

645km^2. The City is the provincial capital of Gauteng, the wealthiest province in South Africa. According to Census 2011 information, the area has a total population of 4,4 million of which 76,4% are black African, 12,3% are white people, 5,6% are coloured people, and 4,9% are Indian/Asian.

Error! Reference source not found. below shows that the majority of people in the area have either some primary school education (33.6%) or secondary education (30%). Only 20.8% of the population has completed secondary school and an even smaller percentage (5.3%) have higher education (Stats SA, 2017).

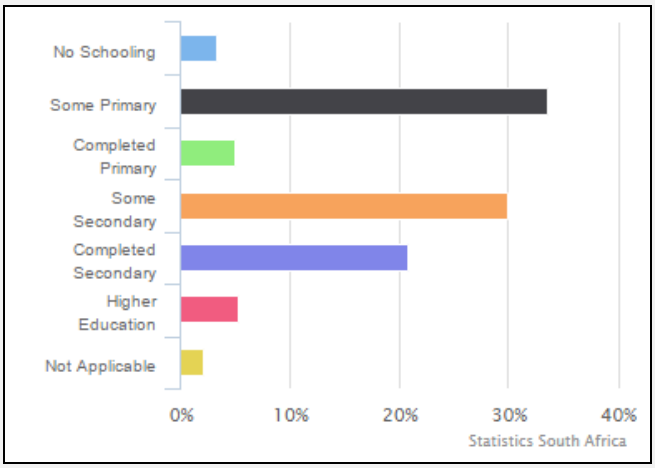

Figure 5: Highest Education Level (All Ages) (Stats SA, 2017).

Approximately 72.7% of the population are at a working age (15-64). Of those, approximately 52.6% (1 696 520 people) are employed (**Error! Reference source not found.**). The unemployment rate for the area is 25%. Of the 1 228 666 economically active youth (15–35 years) in the area, 31,5% are unemployed. In terms of living conditions, there is 1 434 856 households in the municipality with an average household size of 2,8 persons per household. 64,7% of households have access to piped water, 26,9% have water in their yard and only 1,4% of households do not have access piped water (Stats SA, 2017).

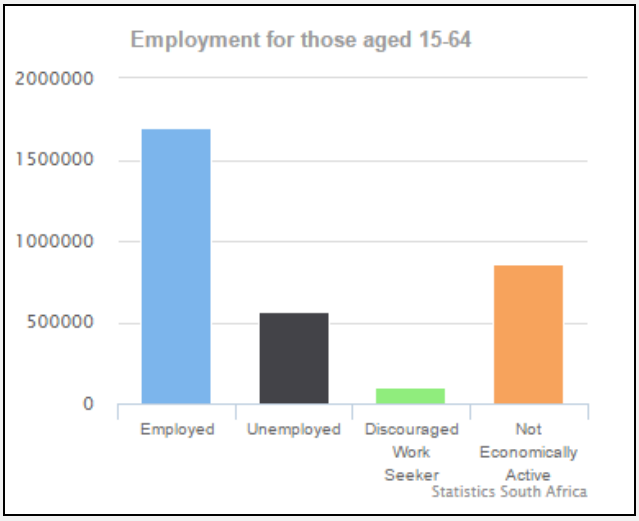

Figure 6: Employment for those aged 15-64 (Stats SA, 2017)

StatsSA states that 24% of the population living in the area make use of renting facilities and over 70% are home owners.

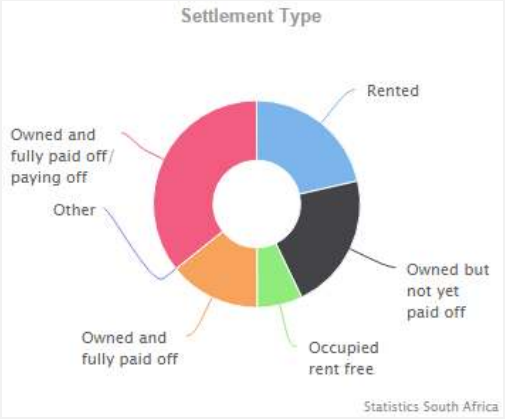

Figure 7: Settlement Type in the area

In addition to the above, the following planning documents and frameworks apply to the area and are discussed in more detail in the following subsections:

Regional Spatial Development Framework (RSDF), 2011: Administrative Region A:

The RSDF represents the prevailing spatial planning policy within the City of Johannesburg and is adopted in terms of the Municipal Systems Act, 2000 (Act No. 32 of 2000) as an integral component of the City's Integrated Development Plan (IDP).

The proposed intersection development is situated within the City of Johannesburg Metropolitan Municipality in Region A. Region A, is one of seven administrative regions that make up the City of Johannesburg. It is located on the northern periphery of the City of Johannesburg Metropolitan area, bordered by Region C and Region E to the south, Mogale City Local Municipality to the west, City of Tshwane Municipality to the north and City of Ekhurhuleni Municipality to the east. The study site is located within Millgate, Farmall and Chartwell A.H.

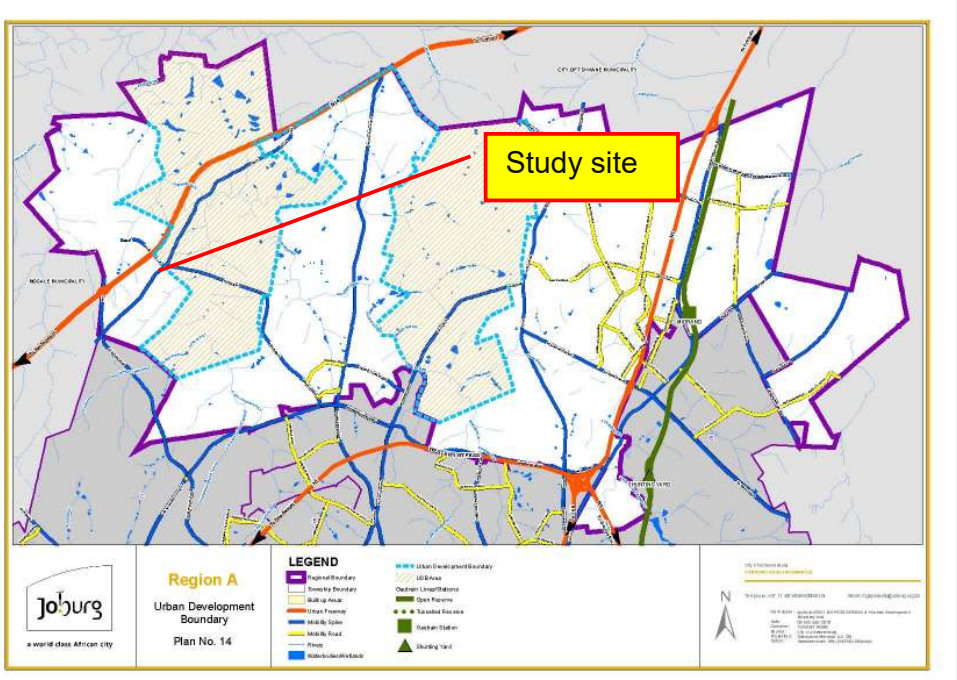

Figure 8: CoJ Region A - Urban Development Boundary

The proposed study site is situated in Sub-Area 2 of Region A according to the Regional Spatial Development Framework. Sub-Area 2 consists of Brendavere A.H., Boundary Park Extension 1, Craigavon A.H., Chartwell A.H., Farmall A.H., Houtkoppen 193-IQ, Inadan A.H., Johannesburg North, Kya Sand And Extensions, Maroeladal Extensions 5,7 &8, Millgate Farm A.H. And Mostyn Park A.H., North Champagne Estates A.H., Riverbend A.H., Sandpark A.H., Salfred, Trevallyn A.H. & Trevallyn A.H. Extension 1. In terms of the Growth Management Strategy (GMS), the study area falls within a Peri Urban Management Area.

Supporting Efficient Movement Systems is one of the GMS major priorities with major roads within Region A generally being overburdened. The construction of major planned roads will in future enhance better mobility. The proposed K33 north south route is identified as a possible solution for the current and future traffic situation and will be constructed as and when the need requires.

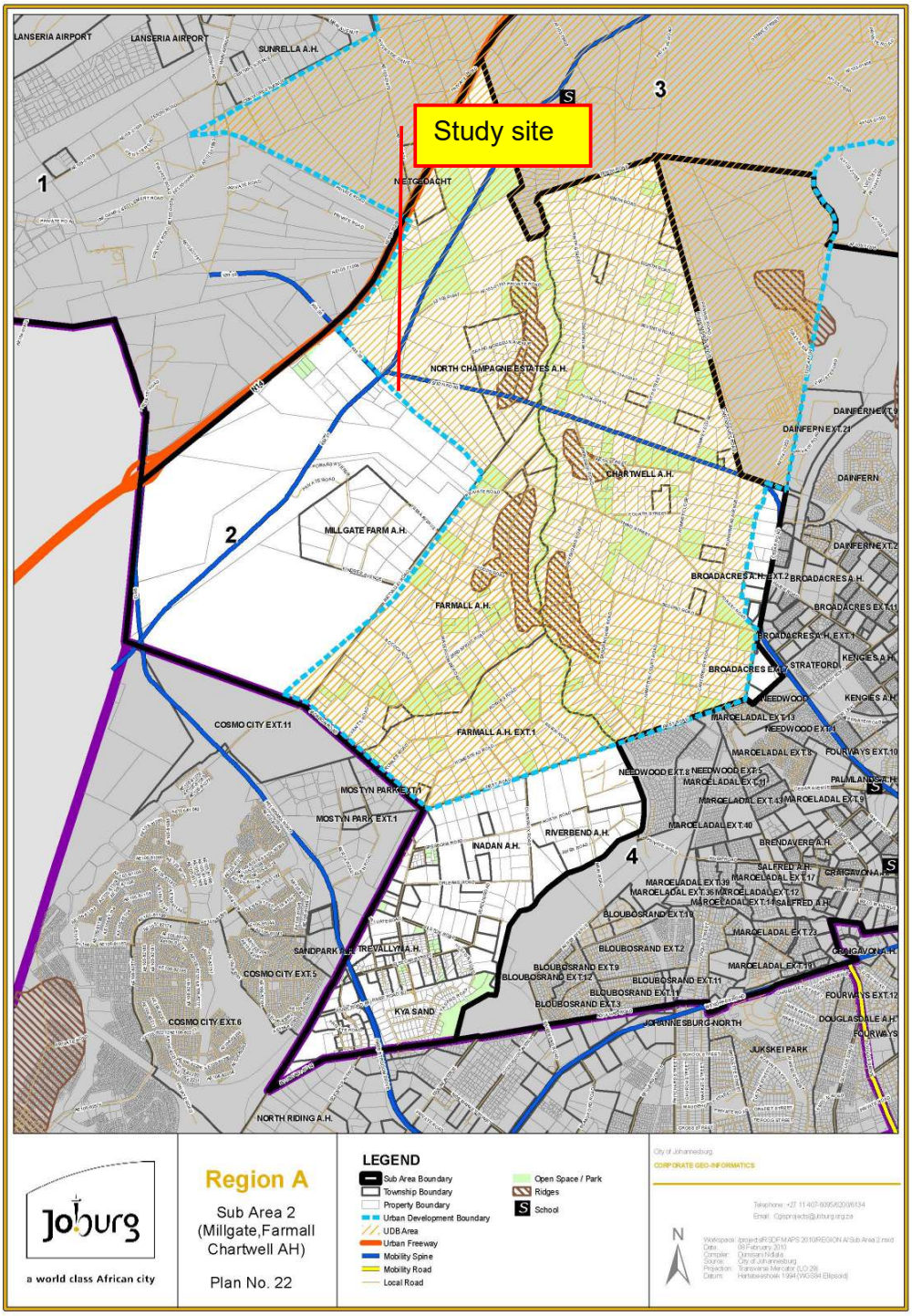

Figure 9: Region A - Sub Area 2 (RSDF, 2011)

According to the Lanseria Development Framework 2020 a single district mixed-use node is proposed for Western Sub-Region and is located on the planned K33, directly east of Kya Sand and south of the planned PWV5 freeway. This node is located on the southern boundary of the Western Sub-Region, within the Central Sub-Region. Although this node is not located within the Western Sub-Region, it is aimed at serving the Western Sub- Region population, specifically the Chartwell area, a gateway position to the Chartwell area.

To enable the above, it will be necessary to construct the K33, from Witkoppen Road (K60) across the Klein Jukskei River to link up with the internal road network of Chartwell. This district node could accommodate approximately 250000m^2 of business space by the year 2020 and can include a sizable office, retail and entertainment component, providing employment opportunities and services to the Chartwell area.

A commercial area is proposed east of the Lanseria Airport and is bordered by the K29, the planned K33, the planned PWV3 and the northern municipal boundary of Johannesburg. This commercial area is located within the noise pollution zones of Lanseria and is suitable as such. Such areas are not suitable for residential development.

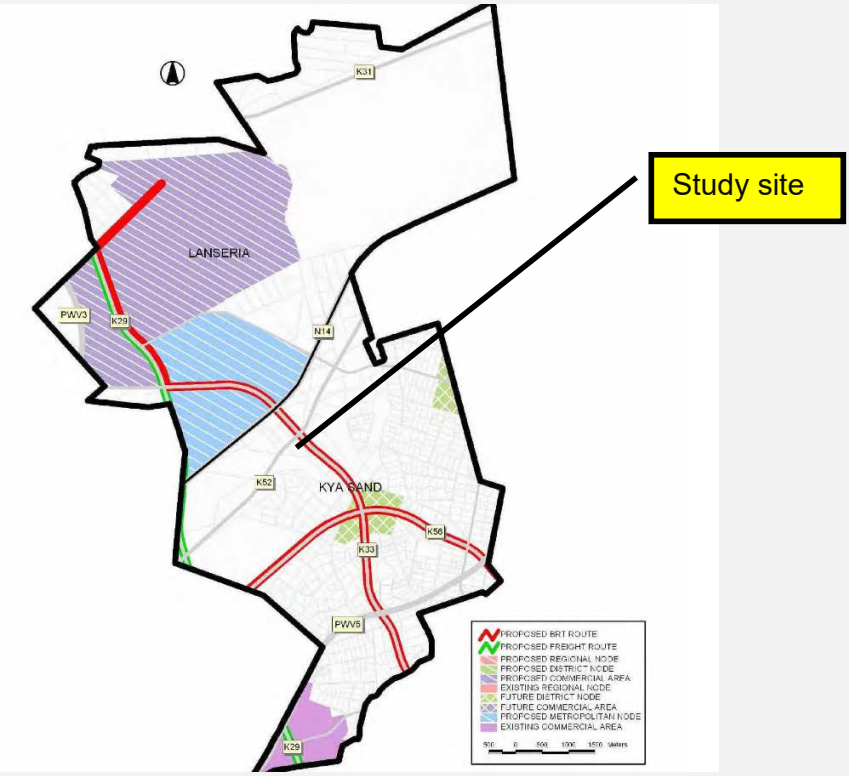

Figure 10: Future Planned Roads (LDF 2020)

A public transportation spine is proposed along the planned K33, which will link Lanseria and the Chartwell area to the northern suburbs of Johannesburg. This public transportation spine will run parallel to and work in tandem with the proposed K29 freight corridor. Each of these road spines will be dedicated but mutually reinforcing.

This road in not currently considered a priority. Because the Chartwell area is not proposed for densification up to the year 2020, scheduling the constriction of this distributor road over the longer term is supported. However, it is proposed that the southern section of the K33 be constructed, linking the K60 across the Klein Jukskei River to the internal road network for Chartwell. This will allow the development of the proposed district node located on the K33 (south of the PWV5), which would serve the Chartwell area.

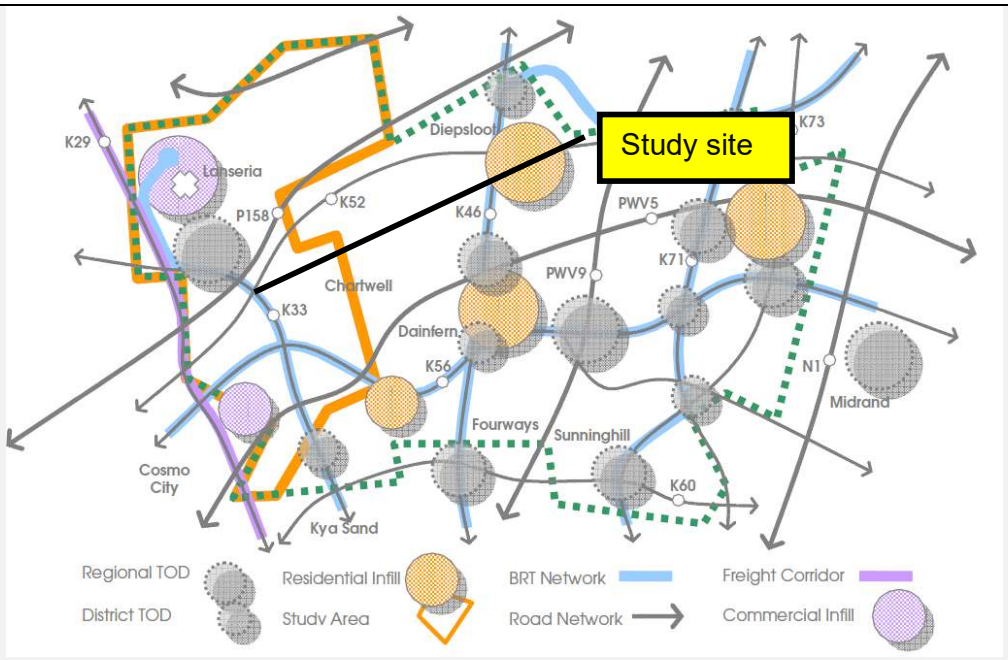

Figure 11: Proposed TOD development (LDF 2020)

The K29 (Malibongwe Drive) is currently the central road spine linking the Western Sub-Region to the greater Johannesburg region. Other significant roads include the PWV14 and the K52, which runs parallel to the PWV14 freeway. Both these roads link Mogale City to the Centurion area. Two planned roads in particular will improve accessibility within the Western Sub-Region. The first is the K60 (Witkoppen Road), traversing the southern reaches of the Western Sub- Region, and the K33, which will link the Chartwell small holding area to Randburg.

The proposed K33 is therefore in line with the RSDF (2011).

Employment

The proposed development will contribute to both the local and municipal economic growth through the uplifting of the local community. New job opportunities will be created during the construction phase. Once the construction phase is complete, the intersection will allow for improved mobility and transportation for the working force, by lowering travel time, shortening travel distance and greatly improving traffic safety. In addition, the intersection will allow for better connectivity between the development nodes which in turn provides new development opportunities.

From a residential development point of view, many communities will also benefit from the road through much reduced travelling times. The latent travel demand from Johannesburg North to these areas will be satisfied by constructing the K33.

This high order transport facility will also stimulate new- and enhance existing developments by serving as an important link for transport. It can be concluded the Road K33 is a high mobility facility and will alleviate traffic congestion as a result of through traffic of the area. In addition to the above, the proposed K33 will result in approximately R34 500 000.00 in Capital Spend. This will have a positive economic impact in the area and will result in numerous, positive multiplier effects.

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?	YES	NO
	X	

If YES, explain:

A Heritage Impact Assessment was conducted to confirm whether any potential impacts to heritage resources may occur. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the study area as development plans were not yet available at the time of the survey. Please refer to Appendix G3 for a copy of the Heritage Impact Assessment.

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:

The Heritage Specialist noted the following:

- No archaeological sites or material was recorded during the survey.
- Based on the SAHRIS Paleontological Sensitivity Map, the area is of insignificance paleontological sensitivity.
- In terms of the built environment, a Farmstead (K33 4) was recorded during the survey that is located 70 m to the West of the proposed road and will not be directly impacted on. In terms of Section 36 of the Act, the specialist identified three cemeteries in close proximity to the road reserve. However, these will not be directly impacted upon. It is recommended that these cemeteries should be retained in situ and demarcated with an access gate. This mitigation measure has been included in the EMPr.
- No public monuments are located within or close to the study area.

See Appendix G3: Heritage Impact Assessment for the full report.

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

A copy of the Basic Assessment Report including the Heritage Impact Assessment Report has been uploaded to SAHRIS in order to afford SAHRA an opportunity to comment. Any comments received will be provided in Appendix F of the final submission of the Basic Assessment Report.

SECTION B2: DESCRIPTION OF RECEIVING ENVIRONMENT – ALTERNATIVE 1

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	**Not Applicable**	times

The proposed intersection and associated road infrastructure is located within the same receiving environment and was therefore not duplicated for each section.

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 (complete only when appropriate)	**Once**	times

This section was completed twice. As there are minor changes to the receiving environment for each design investigated.

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	**Not Applicable**	(complete only when appropriate for above)
Section B – Location/route Alternative No.	**Once**	(complete only when appropriate for above)

1. Property Description

Property description:
(Including Physical Address and Farm name, portion etc.)
	The re-alignment of Cedar Road (R552) and improved will traverse the following properties:
	• Nietgedacht 535 JQ
	  ○ Portion 22
	  ○ Portion 23
	All properties listed above is situated with the City of Johannesburg Metropolitan Municipality, Gauteng Province.

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.

In the case of linear activities:

Proposal:	**Latitude (S):**	**Longitude (E):**
□ Starting point of the activity	-25.975592°	27.949318°
□ Middle point of the activity	-25.975189°	27.948833°
□ End point of the activity	-25.974755°	27.948420°

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	Not Applicable

The 21-digit Surveyor General code of each cadastral land parcel

PROPOSAL	**21-DIGIT SURVEYOR GENERAL CODE**																			
Nietgedacht 535 JQ																				
Portion 22	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**2**	**2**
Portion 23	**T**	**0**	**J**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**5**	**0**	**0**	**0**	**2**	**3**

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

Gradient = $\frac{1401 - 1365}{696}$

= 1: 19.3

Land Slopes down from north to south at a gradient of approximately 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):**

Not Applicable

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):**

Not Applicable

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):**

Not Applicable

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

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

The Department of Environmental Affairs Screening Tool identified Medium Agricultural Combined Sensitivity. Please see **Appendix I3** for Screening Report.

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 % =	Landscaped (vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =45	Building or other structure % =	Bare soil % =5
Paddock/ grazing fields % =	Dumping/building rubble % =15	Riparian Zone % =	Build-up Area % =50	

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:

Please note:

The area is completely transformed, as the re-alignment is mainly situated within existing road reserve.

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:

Please note:

Hypoxis hemerocallidea is found within the surrounding area. However, these species are not threatened but are listed as Least Concern by the IUCN Red Data List (2017).

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

If YES, specify and explain:

Please note:

Not Applicable as the area is transformed as the re-alignment falls within the existing road reserve.

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

If yes complete specialist details

Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		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:

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	
Other land uses (describe):				

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

NORTH

1;7;34	1;7;34	1;2;7;34	1;2;7;34	1;2;7;34
1;7;34	1;7;34	1;7;34	1;7;34	1;34
1;8;25;34	1;8;34	12;13;14;15;34	1;8;34	1;8;34
1;8;25;34	1;8;12;14;15;34	1;2;7;8;10;28;29;34	1;2;13;14;15;34	1;2;7;12;13;14;15;34
1;8;14;15;25;34	8;12;13;14;15;34	1;8;34	1;2;34	1;2;8;12;34

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

The following specialist reports have been attached specifically focused on the proposed alignment. As the alternative occurs within existing road reserve and is already transformed, specific focus on the area was not necessary. Due to the close proximity of the alternative and proposed alignment, the reports may however still have bearing on the alternative layout:

- Wetland Assessment;
- Biodiversity Baseline & Impact Assessment; and
- Heritage Assessment.

Please refer to **Error! Reference source not found.**

In addition, the Engineering Design Report including the 1:50 and 1:100 year floodline report is included in Appendix I4.

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.

The proposed development occurs within the City of Johannesburg in Gauteng. A summary of the socio-economic environment for the City of Johannesburg (obtain from StatsSA) is included below.

The City of Johannesburg Local Municipality is situated in Gauteng province and covers an area of 1 645km^2. The City is the provincial capital of Gauteng, the wealthiest province in South Africa. According to Census 2011 information, the area has a total population of 4,4 million of which 76,4% are black African, 12,3% are white people, 5,6% are coloured people, and 4,9% are Indian/Asian.

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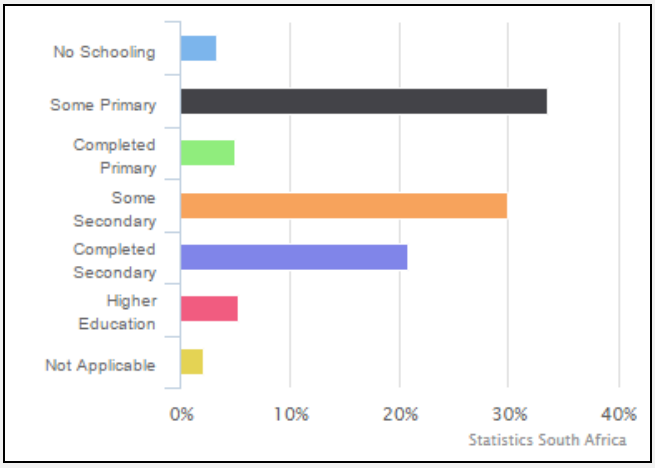

Figure 12: Highest Education Level (All Ages) (Stats SA, 2017).

Approximately 72.7% of the population are at a working age (15-64). Of those, approximately 52.6% (1 696 520 people) are employed (**Error! Reference source not found.**). The unemployment rate for the area is 25%. Of the 1 228 666 economically active youth (15–35 years) in the area, 31,5% are unemployed. In terms of living conditions, there is 1 434 856 households in the municipality with an average household size of 2,8 persons per household. 64,7% of households have access to piped water, 26,9% have water in their yard and only 1,4% of households do not have access piped water (Stats SA, 2017).

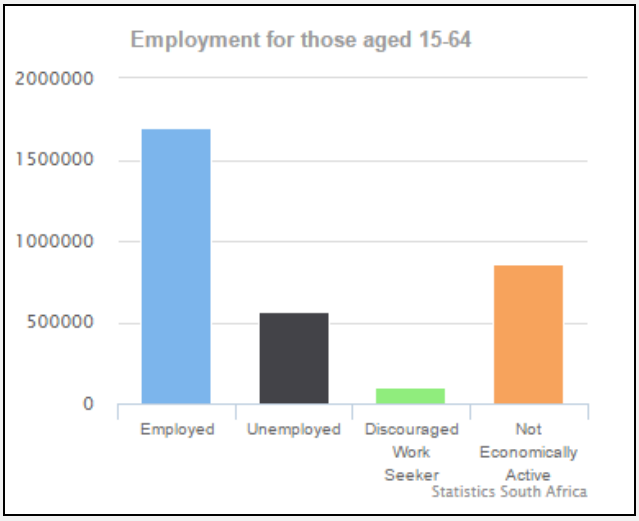

Figure 13: Employment for those aged 15-64 (Stats SA, 2017)

StatsSA states that 24% of the population living in the area make use of renting facilities and over 70% are home owners.

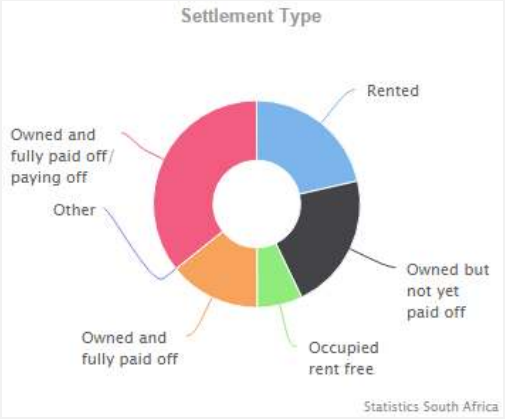

Figure 14: Settlement Type in the area

In addition to the above, the following planning documents and frameworks apply to the area and are discussed in more detail in the following subsections:

Regional Spatial Development Framework (RSDF), 2011: Administrative Region A:

The RSDF represents the prevailing spatial planning policy within the City of Johannesburg and is adopted in terms of the Municipal Systems Act, 2000 (Act No. 32 of 2000) as an integral component of the City's Integrated Development Plan (IDP).

The proposed intersection development is situated within the City of Johannesburg Metropolitan Municipality in Region A. Region A, is one of seven administrative regions that make up the City of Johannesburg. It is located on the northern periphery of the City of Johannesburg Metropolitan area, bordered by Region C and Region E to the south, Mogale City Local Municipality to the west, City of Tshwane Municipality to the north and City of Ekhurhuleni Municipality to the east. The study site is located within Millgate, Farmall and Chartwell A.H. **The importance of the K33 is highlighted in the planning documents (see Section B1.9 above) however, with the alternative, part of the K33 will not be constructed and as such, the alternative is not in line with the planning documents of the area.**

Employment and Safety

Whilst, the proposed development will contribute to both the local and municipal economic growth through the uplifting of the local community, it will be to a less extent than the proposal. Further, while new job opportunities will be created during the construction phase, these will be to a lesser extent as the construction cost will be reduced.

More importantly, once the construction phase is complete, the staggered intersection will remain and as such there will be, no great impact on travel time and mobility achieved. By increasing the spacing between the two intersections, there may be a slight reduction in safety risk.

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

Not Applicable

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:

Not Applicable

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)? If yes, please attached the comments from SAHRA in the appropriate Appendix	YES	NO

Not Applicable

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.

The purpose of this document is to provide stakeholders with an opportunity to review and evaluate the Basic Assessment Report. All comments received will be included in the final submission of the Basic Assessment Report.

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~~

The purpose of this document is to provide the reader with the required information for evaluation. Comments are pending based on this circulation.

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

Pending comment on this circulation.

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

Pending comment on this circulation

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):

During the initial notification phase, queries were raised regarding road design and timeframes involved throughout the project. Copies of all correspondence is included in Appendix E.

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

The purpose of this document is to provide the reader with the required information for evaluation. Comments are pending based on this circulation. However, comments received during the initial notification phase have been included already.

The public participation process undertaken is as follows:

- A detailed Interested and Affected Party (I&AP) Database was compiled and included affected landowners, and organs of state that have jurisdiction over the site such as City of Johannesburg, Johannesburg Roads Agency, Department of Water and Sanitation, Johannesburg Water and Gauteng Department of Agriculture and Rural Development (GDARD). In addition, the I&AP database included the affected ward councillor of the area.
- Initial notification took place on 26 April 2018. Copies of Background Information Documents (BIDs) were emailed and /or hand delivered to I&APs on the I&AP Database. A public participation map was also compiled to show all affected landowners. Hand delivery took place based on this map.
- Two site notices were placed at the site.
- An advert was placed in the Star Newspaper to notify potential I&APs of the development.
- I&APs were provided 30 days (26 April 2018 to 28 May 2018) to register their interest in the proposed development.
- All I&APs that did so were added to the I&AP database. All comments made during this period were added to the Comments and Response Report which also included in Appendix E.
- As part of the review of this document (Basic Assessment Report), all registered I&APs will be notified of the public review and provided with a link to download a copy of the document. A 30-day public review period is provided from 10 August 2018 to 10 September 2018.

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 E6 for a copy of the Comments and Response Register which includes all comments received during the initial notification period. All comments made during the review of the Basic Assessment report will be added to the Comments and Responses Register which will included in the final submission of the report to GDARD.

3.1. Objectives and Purpose of Public Participation

The purpose of the public participation process is to provide information regarding the proposed project to any potentially interested and/or affected person for use and consideration throughout the environmental assessment process. The information usually involves a combination of the technical project scope, environmental attributes and sensitives, cultural and heritage aspects as well as socio-economic factors that may be potentially beneficial or problematic to various role players.

The dissemination of such information is intended to assist the public with understanding how the proposed project and/or development may impact them and the environment in either a positive and/or negative manner, and especially where impacts are determined or perceived as significantly high, how such impacts may be influenced by project changes (layout or design aspects) or management measures may be implemented to reduce or minimise the significance of any identified impacts.

As a registered I&AP, members of the public of any affiliation are awarded the opportunity to remain informed of the steps, actions and decisions made within the environmental impact assessment process and are able to actively participate by reviewing all information provided by the EAP to the I&AP's in a reasonable period in order to provide comments, objections, suggestions or any other information that will assist the project to develop in a favourable for all manner or contribute to the competent authority's knowledge in order to make an informed decision on the application for environmental authorisation.

3.2. Notification Phase of Public Participation

The public participation process commenced with identifying and notifying all potential Interested and Affected Parties (I&AP's). Background information documents, comment forms and the Basic Assessment Report with all relevant supporting Documents were provided as a basic source of information or notices were viewed and potential interested and/or affected members of the public were invited to register as I&AP's for the remainder of the Basic Assessment Reporting phases of the process (refer to Section **Error! Reference source not found.**), as well as provide comment on the Basic Assessment Report (BAR) (this report).

3.2.1. Identified I&AP's

The following potential I&AP's were identified:

- South African National Roads Agency Limited (SANRAL)
- Department of Water and Sanitation
- The City of Johannesburg Metropolitan Municipality: Environmental Regulatory services
- City of Johannesburg Metropolitan Municipality: Department of Development Planning
- JRA
- SAHRA
- Ward Councillor 96
- Surrounding Landowners / Occupiers

Refer to **Error! Reference source not found.** for a detailed list of the interested and/or affected members of the public that were notified and/or subsequently registered as a I&AP.

3.2.2. Newspaper Notice

A notice was published in the following newspaper on the specified dates:

- **Provincial:** The Star, published on the 26th April 2018.

Refer to **Error! Reference source not found.** for proof of the newspaper notice.

3.2.3. Site Notice

Two site notices were placed on the proposed property boundary on the 6th Road and K52 intersection and on Cedar Road across Great North Timbers on 26 April 2018.

Refer to **Error! Reference source not found.** for proof of the notices placed on site.

3.2.4. Written Notifications

The surrounding landowners and/or occupiers and organs of state (listed in **Error! Reference source not found.**- I&AP Database) were notified in writing via email or hand delivery and were issued with a copy of the Background Information Document (BID) to provide further information on the project. Refer to **Error! Reference source not found.** for proof of the Written Notifications and hand delivery of BIDs.

All comments received during the public participation phase will be considered and will be incorporated into the Basic Assessment Report for final submission, the comments and response report to date, is located in **Error! Reference source not found.**.

Refer to Appendix E2 for proof of the emails and hand delivery of BIDs.

3.3. Basic Assessment Comment Period

The Basic Assessment Report will be available for comment to all registered interested and affected parties and relevant organs of state for a period of 30 days:

- 13 August 2018 – 13 September 2018

All comments received during this phase will be considered and incorporated into the Final Basic Assessment Report and will be attached in **Error! Reference source not found.**.

3.4. Comments Raised by I&AP's

All comments received during the initial notification phase have been captured in **Error! Reference source not found.**.

All further comments made during this public review phase (10 August 2018 to 10 September 2018) will be added to the Comments and Responses Report as the process unfolds and included in the Comments and Responses Report in the final submission of the Basic Assessment Report to GDARD.

Further, a summary of the comments received will be attached within section 3.4 during final submission of this report.

Refer to Appendix E4 for comments received to date.

3.5. Outcome of the Decision

Registered I&AP's will be notified in writing of the outcome of whether the environmental authorisation is refused/granted at the end of the Basic Assessment phase. The notification will include details of the process and timeframes in which to appeal the outcome of the decision made by the competent authority, GDARD.

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 E.1 – Proof of site notice

Appendix E.2 – Written notices issued as required in terms of the regulations

Appendix E.3 – Proof of newspaper advertisements

Appendix E.4 –Communications to and from interested and affected parties

Appendix E.5 – Minutes of any public and/or stakeholder meetings

Appendix E.6 - Comments and Responses Report

Appendix E.7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix E.8 –Comments from I&APs on amendments to the BA Report

Appendix E.9 – Copy of the register of I&AP's

Refer to **Error! Reference source not found.** for Public Participation information.

Please note that this report will be made available for comment for a period of 30 days, after which the comments will be incorporated in the BA report to be submitted to the GDARD for final decision.

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 | **0** | times (complete only when appropriate)

Section D Alternative No. | **0** | (complete only when appropriate for above)

Section D was not duplicated for each alternative because both alternative and the proposed development will utilise the same resources and follow the same process.

Thus, this section was not duplicated as both alignments are similar in design and process, even though the location differs.

1. Waste, Effluent, and Emission Management

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase? | YES [X] | NO [ ]

If yes, what estimated quantity will be produced per month? | Approximately $50m^3$

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

The building rubble and solid construction waste (such as sand, gravel, concrete and waste material) will be disposed of by a registered waste servicing company, by suppling and removing skips from the construction site as and when the need requires. The contractors will then be required to provide proof of safe disposal from a registered company or landfill.

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

Waste will be removed by a Certified Waste Management Company and be disposed of at a registered landfill site.

Will the activity produce solid waste during its operational phase? | YES [ ] | NO [X]

If yes, what estimated quantity will be produced per month? | Not applicable

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

Not Applicable.

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 [ ] | N/A [X]

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

Waste will be removed by a Certified Waste Management Company and be disposed of at a registered landfill site.

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:

A project specific EMPr has been compiled and is included in Appendix H. The EMPr includes a Waste Management Plan that aligns to the waste management hierarchy (reduce, reuse, recycle, recover, dispose/landfill).

Most activities included in the EMPr will focus on waste avoidance and reduction (for example, buying bulk to reduce the volume of packaging required).

In terms of construction rubble, the following will be undertaken:

- All construction rubble must be used on site as part of the existing development where possible, or must be taken off the construction site and disposed at an appropriate landfill.
- No material shall be left on site that may harm the environment. Broken, damaged and unused materials shall be picked up and removed from site.
- Concrete water will be re-used in the batching process.
- Stockpiles will be kept clean from rubble to be reused during backfilling and rehabilitation.

The project involves the development of a road. Minimal existing infrastructure will be affected during construction, however, the study area has been subject to historical dumping as a large part of the site is vacant, materials dumped cannot be used for backfilling or rehabilitation and will have to be disposed.

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?	N/A	
If yes, has the municipality confirmed that sufficient capacity exists for treating / disposing of the liquid effluent to be generated by this activity(ies)?	Not applicable	

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?	N/A

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

Not applicable.

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 X

If yes, provide the particulars of the facility:

Facility name:	Not applicable		
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:

Not applicable.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?	YES	NO X
If yes, what estimated quantity will be produced per month?	Not Applicable	

If yes, has the municipality confirmed that sufficient capacity exists for treating / disposing of the domestic effluent to be generated by this activity(ies)?	Not Applicable

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

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

Not applicable.

Emissions into the atmosphere

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

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:

Dust will be generated during the construction phase and will be regulated under the National Dust Control Regulations, 2013 (GN R 827).

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
X					

Some water will be required for construction activities. Water will need be acquired for drinking, construction / batching of cement and dust suppression.

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: Not applicable.

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
	X	

If yes, list the permits required

National Water Act, 1998 (NWA), 1998 (Act No. 36 of 1998): The following Section 21 water uses of the NWA include:

21(c): Impeding or diverting the flow of water in a watercourse; and

21(i): Altering the beds, banks and characteristics of water in watercourse.

The proposed road will traverse a riparian area on multiple locations and will require the installation of culverts and stormwater structures.

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

Water Use License Application will be submitted to the Department of Water and Sanitation. The Water Use Technical Report will form part of the Basic Assessment Report for public comment (this report).

3. Power Supply

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

Electricity required for the construction phase will be provided by mobile generators and diesel-powered equipment.

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

Not applicable.

4. Energy Efficiency

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

The design measures and construction methodology have made provision for the efficient use of energy. Further steps have been taken in the Environmental Management Report to mitigate the effective use of electricity during the construction phase. Environmental awareness posters regarding the effective use of energy will be posted within the construction camp to make employees aware of the importance of using electricity efficiently. See EMPr in **Error! Reference source not found.**

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

No alternative energy source was deemed feasible in terms of the practicality and economic implications of the proposed development. Additionally, the design and construction need to conform to various development standards.

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.

During the notification period, I&APs have requested to be registered and further information on the project. No specific issues were raised.

Pending. The purpose of the circulation of this document is to allow I&APs an opportunity to evaluate the Basic Assessment Report.

No issues have therefore been raised.

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):

Pending. The purpose of the circulation of this document is to allow I&APs an opportunity to evaluate the Basic Assessment Report.

2. Impacts that may result from the Construction and Operational Phase

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

Impacts were identified in a number of ways including the following:

- Impacts associated with triggered activities contained in Listing Notice 1 and 3 of the EIA Regulations, 2014 (as amended) for which authorisation has been applied for;
- Impacts identified by specialists;
- An assessment of the project activities and components; and
- Issues highlighted by I&APs (both the general public and authorities).

The significance of the identified impacts was determined using the approach outlined below which is line with the requirements of the EIA Regulations, 2014. Each impact was assessed for both the Proposal as well as Alternative 1. In some cases, impacts only applied to Alternative 1.

The **significance** of an impact is defined as the combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The nature and type of impact may be direct or indirect and may also be positive or negative, refer to **Table 3:** below for the specific definitions.

Table 3: Nature and type of impact.

	Nature and Type of Impact:		
IMPACT	**Direct**	Impacts that are caused directly by the activity and generally occur at the same time and place as the activity	✓/✗
	Indirect	Indirect or induced changes that may occur as a result of the activity. These include all 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	Those impacts associated with the activity which add to, or interact synergistically with existing impacts of past or existing activities, and include direct or indirect impacts which accumulate over time and space	✓/✗
	Positive	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will benefit significantly, and includes neutral impacts (those that are not considered to be negative	✓

	Negative	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will be comprised	✖

Error! Reference source not found. Table 4 presents the defined criteria used to determine the **consequence** of the impact occurring which incorporates the extent, duration and intensity (severity) of the impact.

Table 4: Consequence of the Impact occurring.

CONSEQUENCE	**Extent of Impact:**	
	Site	Impact is limited to the site and immediate surroundings, within the study site boundary or property (immobile impacts)
	Neighbouring	Impact extends across the site boundary to adjacent properties (mobile impacts)
	Local	Impact occurs within a 5km radius of the site
	Regional	Impact occurs within a provincial boundary
	National	Impact occurs across one or more provincial boundaries
	Duration of Impact:	
	Incidental	The impact will cease almost immediately (within weeks) if the activity is stopped, or may occur during isolated or sporadic incidences
	Short-term	The impact is limited to the construction phase, or the impact will cease within 1 - 2 years if the activity is stopped
	Medium-term	The impact will cease within 5 years if the activity is stopped
	Long-term	The impact will cease after the operational life of the activity, either by natural processes or by human intervention
	Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient
	Intensity or Severity of Impact:	
	Low	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are not affected
	Low-Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are modified insignificantly
	Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are altered
	Medium-High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes are severely altered
	High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will permanently cease

The probability of the impact occurring is the likelihood of the impacts actually occurring and is determined based on the classification provided in Table 5.

Table 5: Probability and confidence of impact prediction

PROBABILITY	**Probability of Potential Impact Occurrence:**	
	Improbable	The possibility of the impact materialising is very low either because of design or historic experience
	Possible	The possibility of the impact materialising is low either because of design or historic experience

	Likely	There is a possibility that the impact will occur
	Highly Likely	There is a distinct possibility that the impact will occur
	Definite	The impact will occur regardless of any prevention measures

The **significance** of the impact is determined by considering the consequence and probability without taking into account any mitigation or management measures and is then ranked according to the ratings listed in Table 5. Error! Reference source not found.. The level of confidence associated with the impact prediction is also considered as low, medium or high (Table 6).

Table 6: Significance rating of the impact.

	Significance Ratings:	
SIGNIFICANCE	**Low**	Neither environmental nor social and cultural receptors will be adversely affected by the impact. Management measures are usually not provided for low impacts
	Low-Medium	Management measures are usually encouraged to ensure that the impacts remain of Low-Medium significance. Management measures may be proposed to ensure that the significance ranking remains low-medium
	Medium	Natural, cultural and/or social functions and processes are altered by the activities, and management measures must be provided to reduce the significance rating
	Medium-High	Natural, cultural and/or social functions and processes are altered significantly by the activities, although management measures may still be feasible
	High	Natural, cultural, and/or social functions and processes are adversely affected by the activities. The precautionary approach will be adopted for all high significant impacts and all possible measures must be taken to reduce the impact

Table 7: Level of confidence of the impact prediction

	Level of Confidence in the Impact Prediction:	
CONFIDENCE	**Low**	Less than 40% sure of impact prediction due to gaps in specialist knowledge and/or availability of information
	Medium	Between 40 and 70% sure of impact prediction due to limited specialist knowledge and/or availability of information
	High	Greater than 70% sure of impact prediction due to outcome of specialist knowledge and/or availability of information

Once significance rating has been determined for each impact, management and mitigation measures must be determined for all impacts that have a significance ranking of Medium and higher in order to attempt to reduce the level of significance that the impact may reflect.

The EIA Regulations, 2014 specifically require a description is provided of the degree to which these impacts:

- can be reversed;
- may cause irreplaceable loss of resources; and
- can be avoided, managed or mitigated.

Based on the proposed mitigation measures the EAP will determined a mitigation efficiency (Table 8**Error! Reference source not found.**) whereby the initial significance is re-evaluated and ranked again to affect a significance that incorporates the mitigation based on its effectiveness. The overall significance is then re-ranked and a final significance rating is determined.

Table 8: Mitigation efficiency

	Mitigation Efficiency	
ION EFFICIE	**None**	Not applicable

	Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact. Positive impacts will remain the same
	Low	Where the significance rating reduces by one level, after mitigation
	Medium	Where the significance rating reduces by two levels, after mitigation
	High	Where the significance rating reduces by three levels, after mitigation
	Very High	Where the significance rating reduces by more than three levels, after mitigation

The reversibility is directly proportional the "Loss of Resource" where no loss of resource is experienced, the impact is completely reversible; where a substantial "Loss of resource" is experienced there is a medium degree of reversibility; and an irreversible impact relates to a complete loss of resources, i.e. irreplaceable (Error! Reference source not found.**Table 9**).

Table 9: Degree of reversibility and loss of resources

DEGREE REVERSABILITY & LOSS OF RESOURCES	**Loss of Resources:**	
	No Loss	No loss of social, cultural and/or ecological resource(s) are experienced. Positive impacts will not experience resource loss
	Partial	The activity results in an insignificant or partial loss of social, cultural and/or ecological resource(s)
	Substantial	The activity results in a significant loss of social, cultural and/or ecological resource(s)
	Irreplaceable	The activity results in the complete and irreplaceable social, cultural and/or ecological loss of resource(s)
	Reversibility:	
	Irreversible	Impacts on natural, cultural and/or social functions and processes are irreversible to the pre-impacted state in such a way that the application of resources will not cause any degree of reversibility
	Medium Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if less than 50% resources are applied
	High Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if more than 50% resources are applied
	Reversible	Impacts on natural, cultural and/or social functions and processes are fully reversible to the pre-impacted state if adequate resources are applied

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

Please note that the impact assessment provided below is a summary only and that the full impact assessment is contained in **Appendix I2.** The full impact assessment provides an overview of both the probability of the impact occurring as well as the mitigation efficiency and as such gives an indication of the risk of the impact occurring as well as the risk that the mitigation will not be implemented/or be effective. Impacts have been assessed for the proposal, alternative 1 and the no-go option.

Table 10: Summary Impact Assessment for the Construction Phase

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
CONSTRUCTION PHASE							
Atmospheric Emissions	Direct	Dust emissions	Proposal	Negative	*Medium*	• A speed limit of 20km/h must be maintained on all dirt roads. • Dust suppression by means of either water or biodegradable chemical agent is required. • Frequency of suppression dependent on conditions and season - must be determined by CM with assistance and recommendations of the ECO.	*Low-Medium*
			Alternative 1		*Medium*		*Low-Medium*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Emissions from vehicles and equipment (CO2, NOx, SOx, VOC's etc.)	Proposal	Negative	*Low-Medium*	• In terms of transportation of workers and materials, collective transportation arrangements should be made to reduce individual car journeys where possible. • All vehicles used during the project should be properly maintained and in good working order. • All vehicles and other machinery should comply with road worthy requirements and comply with legislation in terms of allowable emissions. • Equipment must be inspected on a weekly basis by the CM and ECO.	*Low*
			Alternative 1		*Low-Medium*		*Low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Noise	Direct	Noise increase due to construction activities	Proposal	Negative	*Medium*	• Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. • Construction activities should be limited to appropriate daytime working hours only.	*Low-Medium*
			Alternative 1		*Medium*		*Low-Medium*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Discharge to Water	Direct	Sewage	Proposal	Negative	*Low*	• Prevention measures must be put in place to prevent sewer spillages during servicing of chemical toilets. • Chemical toilets must be supplied and maintained during the construction phase • Ablution facilities (chemical toilets) are to be provided by the Contractor, at a ratio of 1:10. • Ablution facilities (chemical toilets) must be erected within 100m from all workplaces but within the development footprint. • Toilets are to be secured to the ground, and must have a closing mechanism. • Toilet paper must be provided at these facilities and must be serviced once per week. • Certified contractors to maintain and remove chemical toilets regularly. • The contractor must ensure that spillage does not occur	*Low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*Low*	when toilets are cleaned/serviced and contents must be properly stored and disposed of. • Discharge of waste into the environment and/or burial of waste are strictly prohibited. • Sanitary arrangements must be to the satisfaction of the PM, ECO, the local authorities and the applicable legal requirements.	*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Water Quality	Proposal	Negative	*Medium*	Stock piling outside the wetland area, stormwater management, dry season construction, coffer damming, filtration.	*Low-Medium*
			Alternative 1		*Low*	No Mitigation required	*Low*
			No-Go Option		*Low-Medium*	The current system is already impacted by existing use including illegal dumping etc. Should the no-go option take place, no mitigation measures will be undertaken to improve the system.	*Low-Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
	Indirect	Silt	Proposal	Negative	*Low-Medium*	• The preferred design crosses watercourses and is in close proximity to wetlands. • Instability and erosion of steep slopes must be stabilised immediately. Re-vegetation in consultation area with landscape architect and ECO should be done if and where required. • To reduce the loss of material by erosion, disturbance must be kept to a minimum. • If clearing of slopes occur within the rainy season, earth berms must be created along the up-slope side of the construction area. • Where possible, natural vegetation should be retained to reduce the risk of erosion. • Silt fences must be used to stabilise the site, reduce erosion and silt entering the natural environment. No unchecked silt may enter the natural environment. • Haybails must be installed where soil displacement occurs. Stock piling outside the wetland area, stormwater management, dry season construction, coffer damming, filtration	*Low*
			Alternative 1		*Low*		*Low*
			No-Go Option		*Low-Medium*	The current system is already impacted by existing use including illegal dumping etc. Should the no-go option take place, no mitigation measures will be undertaken to improve the system.	*Low-Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
	Direct	Surface water run-off	Proposal	Negative	*Low-Medium*	• Storm water management during construction will be implemented however, for the preferred design crosses watercourses and is in close proximity to wetlands. • Increased run-off during construction should be managed using berms, temporary cut-off drains, attenuation ponds or other suitable structures, in consultation with the ECO and resident Engineer. • Stormwater management system is to be installed as soon as possible following site establishment, to attenuate stormwater during the construction phase, as well as during the operational phase. • Surface-water run-off and stormwater must be directed away from trenches and areas of excavation. • No construction activities permitted outside of road reserve.	*Low*
			Alternative 1		*Low-Medium*		*Low*
			No-Go Option	Negative	*Low-Medium*	The current system is already impacted by existing use including illegal dumping etc. Should the no-go option take place, no mitigation measures will be undertaken to improve the system.	*Low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
	Direct	Contamination of water from hazardous substances	Proposal	Negative	*Low-Medium*	• The preferred design crosses watercourses, riparian zones and other sensitive areas. It is therefore in close proximity to wetlands. Stringent control measures needs to be applied. • Drip trays must be placed under all vehicles when immobile for longer than 24 hours. Vehicles suspected of leaking must be monitored and conduct a pre start-up inspection checklist. • Drip trays must be checked and replaced for vehicles standing (parked) for prolonged periods. • Drip trays must be of a sufficient size and volume to collect any hydrocarbon leakages from a stationary vehicle. • Spill kits (absorbent material) must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. • Spilled substances must be contained in impermeable containers for removal to a licensed hazardous waste site. • Significant spills should be reported to the Project Manager or Contractors Manager and ECO who should report this to the relevant authority • Cement batching areas and hazardous storage area must be suitably burmed to prevent runoff.	*Low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*Low*	• No chemical toilets, cement batching or hazardous storage area may be placed within delineated floodlines. * Staff that will be handling hazardous materials must be trained to do so. Limited use of machinery in the wetland area. No servicing of vehicles and equipment on site.	*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Disturbance of natural system	Proposal	Negative	*Medium-High*	• The preferred design crosses watercourses and is in close proximity to wetlands and other sensitive areas. Stringent control measure should therefore be implemented. • Ensure that all workers or equipment remain within development footprint. • No-go zones must be cornered off to prevent trespassing. • Activities within natural area must be monitored and supervised by ECO and CM. • Cement batching must be done outside of floodlines or within mobile impermeable containers.	*Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*Low*	• Housekeeping must be inspected daily. Stock piling outside the wetland area, stormwater management, dry season construction, coffer damming, filtration.	*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Disturbance/pollution of sub-surface flow	Proposal	Negative	*Medium*	• The preferred design crosses watercourses and is in close proximity to wetlands and other sensitive areas. Stringent control measure should therefore be implemented. • Ensure that all workers or equipment remain within development footprint. • No-go zones must be cornered off to prevent trespassing. • Activities within natural area must be monitored and supervised by ECO and CM. • Cement batching must be done outside of floodlines or within mobile impermeable containers.	*Low-Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*Low*	• Housekeeping must be inspected daily. Stock piling outside the wetland area, stormwater management, dry season construction, coffer damming, filtration.	*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
	Direct	Disturbance of aquatic ecological systems	Proposal	Negative	*Medium*	• The preferred design crosses watercourses and is in close proximity to wetlands and other sensitive areas. Stringent control measure should therefore be implemented. • Ensure that all workers or equipment remain within development footprint. • No-go zones must be cornered off to prevent trespassing. • Activities within natural area must be monitored and supervised by ECO and CM. • Cement batching must be done outside of floodlines or within mobile impermeable containers. • Housekeeping must be inspected daily. Stock piling outside the wetland area, stormwater management, dry season construction, coffer damming, filtration.	*Low-Medium*
			Alternative 1		*Low*	No mitigation required.	*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
Waste Generation	Indirect	Domestic waste	Proposal	Negative	*Low*	• Waste recycling to be put in place. • Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable.•All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site. The Contractor shall supply the ECO with a certificate of disposal for auditing purposes.• General waste sorting between hazardous and general waste must be implemented. Hazardous waste must be stored separately.	*low*
			Alternative 1		*Low*		*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Construction waste	Proposal	Negative	*Medium*	• Litter (from outside the camp included) and cement bags etc. must be collected and put into suitable closed bins on a daily basis. • Construction rubble must be disposed of at a registered site • No Construction rubble to be used for infilling.	*Low-Medium*
			Alternative 1		*Medium*		*Low-Medium*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
	Direct	Hazardous waste	Proposal	Negative	*Low*	• The classification of waste determines the handling methods and the ultimate disposal of the material. The contractor shall manage hazardous waste that are anticipated to be generated by his operations as follows: Characterise the waste to determine if it is general or hazardous. Obtain and provide an acceptable container with a label. Place hazardous waste material in the container. Inspect the container on a regular basis Haul the full container to the licenced and correct disposal site. Provide documentary evidence of proper disposal of the waste. • Only temporary storage of waste is allowed (once of storage of waste for a period less than 90 days). The volume of material should be limited to less than 80m3 of hazardous waste. Should this be exceeded the Norms and Standards for the Storage of Waste will need to be complied with.	*low*
			Alternative 1		*Low*		*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Soil Alteration	Direct	Loss of topsoil	Proposal	Negative	*Medium*	• Top soil should be separated and re-used where possible. • First in, last out approach must be implemented with topsoil stockpiles. • Double-handling of topsoil stockpiles are strictly prohibited. • Topsoil stockpiles must be stored outside of floodline area.	*Low-Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*Low-Medium*		*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Loss of land capability	Proposal	Negative	*Medium*	• The proposed site does not have a high agricultural potential nor is currently used for agriculture. The site however comprise of a wetland and riparian zone. Mitigation measures are therefore recommended and required.• Even though the area only has a medium agricultural sensitivity, the loss of land capability is high as the road will minimise potential future development opportunities within the affected properties.	*Low-Medium*
			Alternative 1		*Low-Medium*		*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Alteration of topography	Proposal	Negative	*Medium*	Both cut- and fill measures must be implemented to minimise the alteration to the topography.	*Medium*
			Alternative 1		*Medium*		*Low-Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Soil erosion	Proposal	Negative	*Low*	All stockpiles must be stabilised. Areas stripped of vegetation must be monitored for signs of erosion. Preventative measures must be put in place. Excavated areas must be monitored for signs of erosion. Erosion areas identified must be reported to the SM and ECO. • Filled areas must be monitored for erosion, specially areas not yet stabilised.	*Low*
			Alternative 1		*Low*		*Low*
			No-Go Option	Negative	*Low*	Not Applicable	*Low*
	Direct	Soil pollution	Proposal	Negative	*Low-Medium*	• All vehicle/equipment maintenance and washing must be done in the workshop area, equipped with a bund wall and grease trap oil separator. • Workshop area must be monitored for fuel and oil spills. • Spills must be cleaned up immediately and remediated to the satisfaction of the ECO and PM. • Spill kits must be comprehensive and available on site at all times. An adequate supply of absorbent material must be available to accommodate emergency spills.	*low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*Low-Medium*	• Stockpiles, workshop areas and storage area must be placed outside of the floodline area. • Spillkit toolbox talks must be conducted regularly.	*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Resource Consumption	Direct	Electricity consumption	Proposal	Negative	*Low*	•During the construction phase the contractors will mainly make use of generators. •The nature of the project will not require high levels of electricity usage as most of the construction will make use of plant equipment •Energy efficient/ saving technology must be incorporated within the design. during construction and for operations	*low*
			Alternative 1		*Low*		*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Water consumption	Proposal	Negative	*Low-Medium*	• Enforce water saving strategies. • Environmental awareness training. • Regular inspections must be conducted.	*Low*
			Alternative 1		*Low-Medium*		*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
	Direct	Fuel consumption	Proposal	Negative	*Low-Medium*	• Record and monitor fuel consumption • Keep fuel consumption on record • Reduce theft of fuel (increase security) • Implement safe refuelling procedures if refuelling on site to minimise the risk of spilling.	*low*
			Alternative 1		*Low-Medium*		*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Raw materials consumption	Proposal	Negative	*Low-Medium*	• Promote effective use of raw material. • Incorporate alternative materials within design.	*Low-Medium*
			Alternative 1		*Low-Medium*		*Low-Medium*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Effects on Biodiversity	Direct	Loss of habitat	Proposal	Negative	*Medium*	Exotic and invasive plants should be controlled and removed. • The wetland and stream area must be rehabilitated • Stormwater infrastructure and area around culvert must be reshaped to mimic natural area. • No-go areas must be cordoned off to prevent un-authorised entry • No personnel allowed outside of the road reserve. • Search and Rescue plan to be followed. • Construction to be curbed to working areas.	*Low-Medium*
			Alternative 1		*Low*		*Low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Loss of fauna	Proposal	Negative	*Low*	• Wetlands and sensitive areas inhabits endangered fauna and flora. If the preferred design is approved, construction contractors, sub-contractors and operators must ensure that no fauna taxa are unduly disturbed, trapped, hunted or killed • All workers will undergo environmental awareness training to address potential human and wildlife interaction and the permissible reactions to this interaction. •Search and Rescue operations must be implemented before any clearance of areas.	*low*
			Alternative 1		*Low*		*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Loss of flora	Proposal	Negative	*Medium*	•Wetlands and sensitive areas inhabits endangered fauna and flora. Search and Rescue operations must be implemented before any clearance of areas •Individuals of declining plant species need to be relocated where applicable, to a suitable site nearby before the construction work of the development, if approved, is initiated. This should be done by suitably qualified persons to ensure the success of the rescue effort. Permits for relocation are to be obtained form GDARD for the rescue effort if necessary.	*Low-Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*Low*	•*In situ* relocation of indigenous vegetation should be attempted • All landscaping must be done with indigenous vegetation from the surrounding area. • All personnel are prohibited from going outside the road reserve.	*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Indirect	Degradation of ecological systems	Proposal	Negative	*Medium*	• Ecological systems such as wetlands and riparian zones are found within the extent of the site. No-go zones must be demarcated and adhered to throughout the construction phase. • Dedicated implementation of the EMPr • All landscaping must be done with indigenous vegetation from the surrounding area.	*Low-Medium*
			Alternative 1		*None*	No mitigation required.	*None*
			No-Go Option	Negative	*None*	Not Applicable	*None*

IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
Indirect	Disruption of natural corridors	Proposal	Negative	*Medium*	• Ecological systems such as wetlands and riparian zones are found within the extent of the site. No-go zones must be demarcated and adhered to throughout the construction phase. • Dedicated implementation of the EMPr • All landscaping must be done with indigenous vegetation from the surrounding area. • Construction within riparian areas must be conducted under close supervision of the ECO and CM. Daily pre-construction inspections must be done to prevent any possible migrating animals from being injured during construction. • Cut-off drains must be installed to divert possible migrating animals around construction areas.	*Low-Medium*
		Alternative 1		*None*	No mitigation required.	*None*
		No-Go Option	Negative	*None*	Not Applicable	*None*
Indirect	Further loss of vegetation community	Proposal	Negative	*Low-Medium*	• Ecological systems such as wetlands and riparian zones are found within the extent of the site. No-go zones must be demarcated and adhered to throughout the construction phase. • Dedicated implementation of the EMPr • All landscaping must be done with indigenous vegetation from the surrounding area. • Construction within riparian areas must be conducted under close supervision of the ECO and CM. Daily pre-construction inspections must be done to prevent any possible migrating animals from being injured during construction. • Cut-off drains must be installed to divert possible migrating	*Low-Medium*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			Alternative 1		*None*	animals around construction areas. •No-go zones must be cornered off and protected from any construction activities.	*None*
			No-Go Option	Negative	*None*	Not Applicable	*None*
Incidents, accidents and potential emergency situations	Direct	Pollution incidents	Proposal	Negative	*Low*	• Spill kits to be located in strategic areas for when needed • Regular site and plant inspection must be conducted • Environmental awareness training • Waste management must be properly implement in accordance with the h EMPr	*low*
			Alternative 1		*Low*		*low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Health and safety	Proposal	Negative	*Low-Medium*	• 24 hour security and access control. • Health and Safety awareness training. • Contractor to submit a Health and Safety Plan, prepared in accordance with the Health and Safety Specification, for approval prior to the commencement of work. • A Safety representative should be appointed	*low*
			Alternative 1		*Medium*		*Low-Medium*

IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
		No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Direct	Storage of hydrocarbons	Proposal	Negative	*Low-Medium*	• Best practice regarding storage of substances • Spill kits to be located in strategic areas for when needed • Environmental awareness training • Firefighting equipment must be accessible on site at all times. • Display of emergency numbers • Quantity management of regarding storage area and quantities • Hydrocarbons must be stored outside of controlled zone.	*low*
		Alternative 1		*Low-Medium*		*low*
		No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Direct	Fire	Proposal	Negative	*Low*	• Adhere to the appropriate emergency procedures • Firefighting equipment must be accessible on site at all times. • Display of emergency numbers • In addition, designated smoking areas should be provided and there should be zero tolerance to smoking outside these areas. Cooking over open flames is not allowed.	*low*
		Alternative 1		*Low*		*low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			No-Go Option	Negative	*Low-Medium*	If site remains unmanaged, fires could occur as a result from illegal dumping and other activities	*Low-Medium*
Social	Direct	Visual impact	Proposal	Negative	*Low-Medium*	• Suitable screening to be put in place during construction to minimise visual impacts. • No littering to be allowed. • Good housekeeping practices to be followed '• Construction activities must be limited to scope of work.	*Low*
			Alternative 1		*Low-Medium*		*Low*
			No-Go Option	Negative	*Medium*	Illegal dumping and uncontrolled activities on site increases the visual impact on the neighbouring area	*Medium*
	Direct	Safety and security	Proposal	Negative	*Low*	• 24 hour access control to the site and 24 hour security. • Workers found to be engaging in activities such as excessive consumption of alcohol, drug use or selling of any such items on site must be disciplined.• Traffic signals capable of reflecting at night must be installed throughout effected area. • excavated areas close to open road sections must be suitably barricaded with appropriate signage.	*Low*
			Alternative 1		*Low*		*Low*

IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
		No-Go Option	Negative	*Low*	No management on site will result in the increase of illegal activities.	*Low*
Direct	Traffic disruptions	Proposal	Negative	*Low-Medium*	• With the new roads being built, traffic warning and calming measures will be put in place when construction activities may impact on traffic flow. • Traffic signals capable of reflecting at night must be installed throughout effected area. • Traffic points men must be appointed for the duration of the construction phase during work on existing road infrastructure to minimise traffic disruptions	*Low*
		Alternative 1		*Medium-High*		*Medium*
		No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Direct	Loss of cultural heritage	Proposal	Negative	*Low*	• No heritage resources will be affected however: • The cemeteries identified in close proximity to the site must be fenced and provided access. • These areas must be regarded as no-go zones for all construction personnel. • The chance find procedure in the EMPr must be adhered to.	*Low*
		Alternative 1		*Low*		*Low*
		No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Direct	Impacts on existing infrastructure and users	Proposal	Negative	*Low*	Current landowner and occupant is applying for proposed development and will therefore not have significant impact, however, all existing infrastructures will be removed to the satisfaction of the ECO.	*Low*
		Alternative 1		*Low-Medium*		*Low*

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Direct	Loss of sense of place	Proposal	Negative	*Low-Medium*	During the construction phase suitable fencing and screening must be erected to minimise impacts	*Low*
			Alternative 1		*Low-Medium*		*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
Economic	Direct	Decline/increase in economy	Proposal	Positive	***Medium***	• Local contractors and suppliers to be used during the construction phase as far as possible. •The sourcing of raw material from local manufacturers will benefit local community.	*Medium-High*
			Alternative 1		***Medium***		*Medium-High*
			No-Go Option	Negative	*Medium*	Should the project not go ahead, there will not be any generation of new employment opportunities.	*Medium*
	Direct	Employment	Proposal	Positive	*Low-Medium*	• Local contractors and suppliers to be used during the construction phase as far as possible.	*Medium-High*
			Alternative 1		*Low-Medium*		*Medium-High*
			No-Go Option	Negative	*Medium*	Should the project not go ahead, there will not be any generation of new employment opportunities.	*Medium*

Table 11: Summary Impact Assessment for the Operational Phase

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)
	TYPE	DESCRIPTION	ALTERNATIVE	NATURE			
OPERATIONAL PHASE							
Atmospheric Emissions	Direct	Dust emissions	Proposal	Negative	*Low*	No mitigation measures required	*Low*
			Alternative 1		*Low*		*Low*
			No-Go Option	Negative	*Low*	Not Applicable	*Low*
	Direct	Emissions from vehicles and equipment (CO2, NOx, SOx, VOC's etc.)	Proposal	Negative	*Low*	No mitigation measures required	*Low*
			Alternative 1		*Low*		*Low*
			No-Go Option	Not Applicable	*Low*	No mitigation measures required	*Low*
Noise	Direct	Noise increase due to vehicles using the road	Proposal	Negative	*Low*	The proposed development involves the development of high density road intersection. The noise increase will be typical to the surrounding area.	*Low*
			Alternative 1		*Low*		*Low*

			No-Go Option	Negative	*Low*	No mitigation measures required	*Low*
Discharge to Water (Surface and Groundwater)	Direct	Sewage	Proposal	Not Applicable	*None*	Not Applicable	*None*
			Alternative 1		*None*		*None*
			No-Go Option		*None*	Not Applicable	*None*
	Indirect	Silt	Proposal	Negative	*Low*	During Operational phase, the entire site will be landscaped and maintained. No bare soil will be present on the developed road. The potential for silt displacement will be unlikely. Stormwater infrastructure must be regularly inspected.	*Low*
			Alternative 1		*Low*		*Low*
			No-Go Option	Negative	*Low-Medium*	Uncontrolled erosion and dumping within the vacant areas will result in an increase of silt depositing.	*Low-Medium*
	Direct	Surface water run-off	Proposal	Negative	*Low*	• Storm water management system to be implemented and maintained.	*Low*
			Alternative 1		*Low-Medium*		*Low-Medium*
			No-Go Option	Negative	*Low-Medium*	No formalised structure in place	*Low-Medium*
	Direct	Contamination of water from hazardous substances	Proposal	Negative	*Low*	No mitigation required	*Low*

			Alternative 1		*Low*		*Low*
			No-Go Option	Negative	*Low*	Not applicable	*Low*
	Direct	Disturbance of natural system	Proposal	Negative	*Low*	During operation phase all channelized structures are designed to control run-off to natural areas. Release point must be regularly checked to prevent degradation.	*Low*
			Alternative 1		*Low*		*Low*
			No-Go Option	Negative	*Low-Medium*	Illegal dumping and trespassing may result in further disturbance of natural system.	*Low-Medium*
	Direct	Disturbance of aquatic ecological systems	Proposal	Negative	*Low*	During operation phase all channelized structures are designed to control run-off to natural areas. Release point must be regularly checked to prevent degradation.	*Low*
			Alternative 1		*Low-Medium*		*Low-Medium*
			No-Go Option	Negative	*Low-Medium*	Illegal dumping and trespassing may result in further disturbance of aquatic ecological systems.	*Low-Medium*
Waste Generation	Direct	Domestic waste	Proposal	Negative	*Low*	• Road side must be cleaned by municipality	*low*
			Alternative 1		*Low*		*low*

			No-Go Option	Negative	*Low-Medium*	Illegal dumping of domestic waste may further degrade the existing site.	*Low-Medium*
Soil Alteration	Not Applicable	Loss of topsoil	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option		*None*	Not Applicable	*None*
	Not Applicable	Loss of land capability	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Negative	*Low-Medium*	Continued erosion and dumping will reduce capability	*Low-Medium*
	Not Applicable	Alteration of topography	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option		*None*	Not Applicable	*None*
	Direct	Soil erosion	Proposal	Not Applicable	*Low*	The only potential cause of soil erosion during operation is through poor management of stormwater and road maintenance. This can be mitigated through proper implementation Stormwater management plan and adequate municipal service provisions.	*Low*
			Alternative 1		*Low*		*Low*
			No-Go Option	Negative	*Low-Medium*	Without a formal stormwater system and municipal services in place erosion will continue and worsen in time	*Low-Medium*

	Direct	Soil pollution	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Negative	*Low-Medium*	Without any management structures in place soil pollution can not be monitored or managed.	*Low-Medium*
Resource Consumption	Not Applicable	Electricity consumption	Proposal	Negative	*Low-Medium*	• Energy efficient/ saving technology must be incorporated within the design. during operations e.g. robots and street lamps. • Energy saving initiatives should be enforced: switching off lights during the day.	*Low*
			Alternative 1		*Low-Medium*		*Low*
			No-Go Option	Not Applicable	*None*	N/A during the operational phase.	*None*
	Not Applicable	Water consumption	Proposal	Not Applicable	*None*	N/A during the operational phase.	*Low*
			Alternative 1		*None*		*Low*
			No-Go Option	Not Applicable	*None*	N/A during the operational phase.	*None*
	Not Applicable	Fuel consumption	Proposal	Not Applicable	*None*	n/a during the operational phase.	*Low*
			Alternative 1		*None*		*Low*
			No-Go Option	Not Applicable	*None*	N/A during the operational phase.	*None*

	Not Applicable	Raw materials consumption	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option		*None*	N/A during the operational phase.	*None*
Effects on Biodiversity	Not Applicable	Loss of habitat	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Negative	*Low-Medium*		*Low-Medium*
	Not Applicable	Loss of fauna	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Negative	*Low-Medium*	Without formalising the vacant land, the site will continue to degrade which will result in the loss of Fauna.	*Low-Medium*
	Not Applicable	Loss of flora	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Negative	*Low-Medium*	Without formalising the vacant land, the site will continue to degrade which will result in the loss of Flora.	*Low-Medium*

	Not Applicable	Degradation of ecological systems	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Negative	*Low-Medium*	Without formalising the vacant land, the site will continue to degrade increasing the footprint of disturbance within the study site	*Low-Medium*
	Direct	Disruption of natural corridors	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Negative	*Low-Medium*	Without formalising the vacant land, the site will continue to degrade the ecological system.	*Low-Medium*
Incidents, accidents and potential emergency situations	Direct	Pollution incidents	Proposal	Negative	*Low*	Municipal clean-up services are required.	*low*
			Alternative 1		*Low*		*low*
			No-Go Option	Negative	*Low*	Not Applicable	*low*
	Direct	Health and safety	Proposal	Positive	*Medium-High*	• Speed limits to be implemented. • Traffic calming and safety measures to be implemented during any maintenance activities taking place on the site (e.g. collecting litter, cutting grass and landscaping). • Traffic signage to be maintained in proper working condition.	*Medium-High*
			Alternative 1	Negative	*Low*		*low*

			No-Go Option	Negative	*Medium-High*	Not Applicable – the existing unsafe conditions will continue to be in place.	*Medium-High*
	Not Applicable	Storage of hydrocarbons	Proposal	Not Applicable	*None*	No mitigation measures required	*None*
			Alternative 1		*None*		*None*
			No-Go Option	Not Applicable	*None*	N/A during the operational phase.	*None*
	Direct	Fire	Proposal	Negative	*Low*	• Adhere to the appropriate emergency procedures • Firebreaks to be maintained on the sides of the road to protect adjacent properties from potential fires caused by motorists.	*low*
			Alternative 1		*Low*		*low*
			No-Go Option	Negative	*Low-Medium*	If site remains unmanaged, fires could occur as a result from illegal dumping and other activities.	*Low-Medium*
Social	Direct	Visual impact	Proposal	Negative	*Low*	No mitigation required	*Low*

			Alternative 1		*Low*		*Low*
			No-Go Option	Negative	*Medium*	Illegal dumping and uncontrolled activities on site increases the visual impact on the neighbouring area	*Medium*
	Direct	Safety and security	Proposal	Positive	*Medium-High*	• Speed limits to be implemented. • Traffic calming and safety measures to be implemented during any maintenance activities taking place on the site (e.g. collecting litter, cutting grass and landscaping). • Traffic signage to be maintained in proper working condition.	*Medium-High*
			Alternative 1	Negative	*Low*		*low*
			No-Go Option	Negative	*Medium*	N/A during the operational phase.	*Medium*
	Direct	Traffic disruptions	Proposal	Positive	*Medium-High*	• Traffic signs and traffic lights must be placed and maintained in and around the proposed development to ensure adequate traffic management.	*Medium-High*
			Alternative 1	Negative	*Low*		*Low*
			No-Go Option	Not Applicable	*None*	Not Applicable	*None*
	Not Applicable	Loss of cultural heritage	Proposal	Not Applicable	*None*	N/A during the operational phase.	*None*
			Alternative 1		*None*		*None*
			No-Go Option		*None*	N/A during the operational phase.	*None*

	Direct	Loss of sense of place	Proposal	Not Applicable	*None*	The proposed development will be aligned with the surrounding area.	*None*
			Alternative 1		*None*		*None*
			No-Go Option		*None*		*None*
Economic	Direct	Decline/increase in economy	Proposal	Positive	*Medium-High*	Development and formalisation of vacant land will align with strategic objectives of the area thereby increasing the potential economy of the local community by providing more development, investment opportunities and infrastructure.	*Medium-High*
			Alternative 1		*Medium*		*Medium*
			No-Go Option	Negative	*Medium*	If the study site stays vacant it will not contribute to economical growth for the local community	*Medium*
	Direct	Employment	Proposal	Positive	*Low-Medium*	Local employment must be enforced if additional employment is required for the operation phase.	*Medium*
			Alternative 1		*Low-Medium*		*Medium*
	Not Applicable		No-Go Option	Not Applicable	*None*	Not Applicable	*None*

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

Please see **Appendix G** for the Specialist Assessments used to complete the impact assessment:

- Ecological Assessment
- Heritage Impact Assessment
- Wetland Assessment

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

The following assumptions, gaps and/or limitations accompany the specialist assessments conducted:

Ecological Assessment

The following limitations apply to the study:

- As per the scope of work, the fieldwork component of the assessment comprised of one assessment only, which was conducted during the wet season. This study has not assessed any temporal trends for the respective seasons;
- Despite these limitations, a comprehensive desktop study was conducted, in conjunction with the detailed results from the surveys, and as such there is a high confidence in the information provided.

Wetland Assessment

The following limitations apply to the study:

- The study was limited to a snapshot view during a few site visits. The field investigations were undertaken during March and April 2018 to assess and confirm the delineated Wetland zones present on the survey area. Weather conditions during the survey were favourable for recordings. The delineations were recorded by hand held GPS.
- It must be noted that, during the process of converting spatial data to final output drawings, several steps are followed that may affect the accuracy of areas delineated. Due care has been taken to preserve accuracy. Printing or other forms of reproduction may also distort the scale indicated in maps. It is therefore suggested that the wetland areas identified in this report be pegged in the field in collaboration with the surveyor for precise boundaries.
- It is unlikely that more surveys would alter the outcome of this study radically

Heritage Impact Assessment

The following limitations apply:

- The authors acknowledge that the brief literature review is not exhaustive on the literature of the area.
- Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature.
- This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

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

Proposal

The proposed re-aligned road will provide an important north-south link in the area and will improve mobility in the area. As the development involves the construction of the K33 road development on its proposed alignment as planned for future expansion and upgrade to the road infrastructure, no decommissioning or closure was investigated.

Alternative 1

As the development involves the construction an intersection that will resolve the current issues but will require the upgrade of the intersection of the K52 and K33 in future to facilitate the K33 road development on its proposed alignment as planned for. During future expansion and upgrade to the road infrastructure, it will require decommissioning or closure of the road and intersection provided for in Alternative 1. The decommissioning or closure of the road will have to be assessed to comply with legislation at the specific time in future. Same is not assessed in full during this application. The impacts envisaged for the upgrade will be the same as the proposal assessed for this upgrade.

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

Not applicable.

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

Not applicable.

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:

Cumulative impacts are included in the detailed impact assessment included in **Appendix I** but in summary, the following impacts have been considered as cumulative for each phase of development:

Proposal:

Construction Phase:

Cumulative Impacts	Description
Dust emissions	Any construction activity produces some levels of dust emission, as multiple developments are undertaken within the greater area, it will accumulate and increase the impact of dust emissions.
Emissions from vehicles and equipment (CO_2, NOx, SOx, VOC's etc.)	During the construction phase, multiple plant equipment will be used. The increase in heavy vehicles in the area will increase the existing emissions.
Noise increase due to construction activities	Any construction activity produces some levels of noise due to heavy equipment used, as multiple developments are undertaken within the greater area, it will accumulate and increase the noise nuisance levels.
Surface water run-off	The clearance of vegetation will contribute to an increase of surface water run-off within the area. Due to the increase in build-up areas, the development will contribute to an increase of surface water run-off
Loss of land Capability	The transformation of land will contribute to the increasing development within the area which in turn, accumulates to a greater loss in agricultural land capability.

Electricity Consumption	During the construction phase, it is anticipated that mobile generators will be used. However, should electricity be utilised from the municipal grid, it would contribute to a cumulated impact on electricity consumption.
Water Consumption	During the construction phase water is consumed for multiple uses. This will have a cumulative effect on the existing water consumption. In addition, the area is experiencing rapid growth which contributes to an increase of water consumption.
Fuel Consumption	During the construction phase fuel is consumed for multiple uses. This will have a cumulative effect on the existing fuel consumption. In addition, the area is experiencing rapid growth which contributes to an increase of fuel consumption.
Raw Material Consumption	During the construction phase raw materials are used for multiple uses. This will have a cumulative effect as the area is experiencing rapid growth which contributes to an increase in the utilisation of raw materials.
Traffic Disruptions	The project involves the construction of a road intersection which will have a direct impact on traffic. The construction phase will directly contribute to the cumulation of traffic disruptions in the area, due to the increase in development and movement in the area.
Increase in Economy	The construction phase will directly contribute to the increase in the local economy as businesses within the surrounding area will be utilised during the construction phase. This will have a cumulative impact as the greater area is experiencing rapid growth.
Increase in Employment	The construction phase will directly contribute to the increase in the local employment as local skilled and un-skilled labour will be utilised during the construction phase. This will have a cumulative impact as the greater area is experiencing rapid growth with more and more employment opportunities arising.

Operational Phase:

Cumulative Impacts	Description
Dust emissions	Over time the road will accumulate dirt and sand which in turn generates dust. This creates a cumulative effect as the existing roads in the area experience the same situation. It must be noted that the dust emissions from tared roads is expected to be insignificant.
Emissions from vehicles and equipment (CO2, NOx, SOx, VOC's etc.)	The increase in vehicles utilising the proposed road will create a cumulative impact on emissions originating from vehicles.
Noise increase during operations	The increase in vehicles utilising the proposed road will create a cumulative impact on noise generation.
Surface water run-off	The increase in hardened surfaces will contribute to an increase of surface water run-off within the area. Due to the increase in build-up areas, the development will contribute to an increase of surface water run-off
Increase in Economy	The increase in mobility will contribute to the increase in the local economy as the envisaged mobility spine will be sectionally constructed.
Increase in Employment	The increase in mobility will contribute to the increase in the local employment opportunities and improved travel time, to and from work opportunities, thereby extending the commuters travel range for potential work.

It should be noted that even taking into account their cumulative nature, these impacts could be satisfactorily mitigated.

Alternative 1

Same or similar cumulative impacts are envisaged for Alternative 1 to the proposal. The exception for the alternative is that the Alternative 1 will provide a short-term solution to the current problem. It must be noted that the Alternative 1 will have major cumulative impacts if taken into consideration that the required upgrade of the K33 will have to follow in due time. Thus, resulting in a cumulative impact scenario as the impacts envisaged for the Proposal will then result, compound to the impacts calculated for the Alternative 1 now. Thus, doubled-up impacts.

Hence the Proposal is promoted for the long-term solution and long-term impact minimization.

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.

5.1. Proposal – Preferred Alternative (Proposal)

The proposed activity involves the constructing of a new intersection to eliminate the existing staggered intersection between the K52 and Cedar Road. The project will involve the establishment of an at-grade intersection with a sectional construction of the K33 and K52.

Based on the findings of the specialist study and impact assessment and taking into account the successful implementation of the EMPr, it is felt that this proposed K33/ K52 road intersection with associated access (The Proposal) should be authorised. The reasons for this opinion are discussed in more detail in the following subjections:

5.1.1. Need for the Project

Sustainable development is directly linked to the provision of a safe and efficient road network. The Gauteng Department of Roads and Transport has identified the need to improve the current road infrastructure in the area as the staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027) continue to provide unsafe road conditions. The intersection experiences excessive traffic volumes on a daily basis which creates extreme time delays due to the layout of the staggered intersection. The K33 Road is a Planned north-south provincial road which is intended to provide vital connectivity in the area and to improve the traffic distribution.

The Preliminary Design of the K33 was accepted and gazetted by the MEC in Notice 2626 of 2003 in terms of section 10(3) of the GTIA, Act 8 of 2001. The road is classified as a Class 2 Major Arterial road with a road reserve of width at a minimum of 62 meters. Class 2 roads forms part of the primary network for the urban area, focusing on long distance movement to, from and within the urban area.

The K33 is currently a greenfields project with an envisaged duel carriageway road with two 3.7 m lanes with a divided median. The section of the K33 associated with the intersection will only be constructed with one carriageway.

According to the World Health Organisation, road traffic injuries are one of the top three causes of disability and death. The need to improve the current situation is therefore highly important and can be addressed through the elimination of the staggered intersection. This will result in significantly safer road conditions, alleviate traffic congestion and shortened travel time.

The overall traffic flow on any highway depends to a great extent on the performance of the intersections involved. Four-leg/ cross intersection is best suited for this scenario as it can handle major two-lane roadways carrying moderate to high traffic volumes at relative high speeds and operates at near capacity (current situation).

The intersection will incorporate channelization to minimise conflict points within the intersection. Channelization is the separation or regulation of conflicting traffic movements into definite paths of

travel by the use of pavements markings or raised islands, to facilitate the safe and orderly movement of both vehicles and pedestrians. Proper channelization increases capacity, improves safety, provides maximum convenience and instils driver confidence.

In addition to the above, planning documents such as the RSDF (2011) and the Gauteng Roads Network indicate the need for the K33. Further, the Preliminary Design of the K33 was accepted and gazetted by the MEC in Notice 2626 of 2003 in terms of section 10(3) of the GTIA, Act 8 of 2001. It has therefore been taken into account in townplanning schemes in the area.

From a technical perspective, this alignment is preferred for a number of reasons. The most important of which is safety as the proposal eliminates the existing staggered intersection. In addition, this alignment conforms to the horizontal and vertical standards of a Class 2 Major Arterial Road. The Proposal also will allow for access as the minimum radius for the horizontal curves will be 1500 metres (as required). These radii allow for accesses every 600 metres on K33. The allowance of accesses is very important due the development of the area as well as the accommodation of the mobility of the road.

The need for this intersection is therefore as follows:

- Improved capacity and traffic flow for the area.
- Improved north-south linkage for the area.
- Decreased impacts on existing infrastructure;
- Economic and social benefits related the road.
- Significant improvement in traffic safety.
- Shortened travel time.
- Creation of development opportunities.
- Creation of employment opportunities.

The abovementioned objectives will be achieved through the proposed four-leg/ cross intersection with incorporated channelization development.

5.1.2. Environmental Sensitivity

A Biodiversity Baseline & Impact Assessment was undertaken and found that the project area has been somewhat altered. This is due to the proximity of an existing urbanised environment and associated human activity, including: livestock, dumping of rubble, general littering and the infringement into natural areas via footpaths and roads.

The remaining natural habitats (including secondary grassland and stream habitats) exhibited a healthy balance between various common grassland species and associated herbaceous plants. The ecological integrity, importance and functioning of the natural grassland area as well as the non-perennial stream plays a crucial role as a water resource system and an important habitat for various fauna and flora. This diversity is indicative of the importance of these systems to collectively provide refugia, food and corridors for dispersal in and through the surrounding area. However, should the mitigation measures listed in the Biodiversity Baseline Assessment and EMPr be implemented and enforced, the proposed intersection will not result in loss of any unique ecosystems. *Hypoxis hemerocallidea* are not threatened but listed as Least Concern are visibly frequent at the site and larger study area and could be conserved in the larger study area (road reserve) and relocated from the footprint, if the development is

approved. No threatened species occur at the site and thus there appears to be no loss of any threatened species, if the site is developed. Areas of the site affected is regarded as being moderately high sensitive and will require specific mitigation measures and close monitoring during construction.

5.1.3. Heritage Sensitivity

The Heritage Impact Assessment conducted identified no Archaeological sites or material on site. Three cemeteries were recorded within close proximity to the road reserve. A farm stead (Ruin) was identified in close proximity to the road reserve. However, the specialist stated that should the mitigation measures be implemented and enforced, no impact on the heritage resources will occur and the project can be supported.

5.1.4. Wetland Sensitivity

A Wetland Assessment was undertaken and determined that the Present Ecological Status (PES) for the wetland scored in the lower ranges as the wetland is largely modified and impacted on by historical activities. The Ecological Importance and Sensitivity (EIS) falls in the moderate range and has some functionality in respect of moderating water quality before it reaches the Klein Jukskei River. The Recommended Ecological Category (REC) for the wetland was categorised to remain in the category of moderately modified wetlands. It will thus require some rehabilitation to enhance the ecological function of the system. It is considered to be a moderately sensitive wetland, more specifically in respect of flow and water quality.

For this reason, it can be supported that the road development may go-ahead if the required buffers are maintained and the resource drivers preserved. The rehabilitation of the wetland is vital to recover the required ecological function. The wetland drivers must be enhanced as part of the rehabilitation of the affected areas. In respect of the construction phase, it is important to ensure that the required erosion protection measures linked to the crossing sections be carefully designed and installed.

5.1.5. Impact Assessment

A detailed impact assessment has been undertaken and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact occurring (**Appendix I**). Most impacts have a low significance once mitigation measures were applied, see TABLE**Error! Reference source not found.** 12 below for a summary of impacts with low-Medium and higher significance after the implementation of mitigation measures.

The comparative cumulative and long-term impacts render the Proposal a better option as the impacts for the Alternative 1 will be compound in the long-term.

Based on the need and safety requirements with consideration of impact assessment undertaken as well as the findings of the specialist studies for the project, it is the opinion of the EAP, that **the Proposal be approved**.

Table 12: Summary of impact after mitigation with low-medium and higher significance for the proposal.

	IMPACTS		SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)	COMMENTS
	DESCRIPTION	ALTERNATIVE				
CONSTRUCTION PHASE						
Atmospheric Emissions	Dust emissions	Proposal	*Medium*	• A speed limit of 20km/h must be maintained on all dirt roads. • Dust suppression by means of either water or biodegradable chemical agent is required. • Frequency of suppression dependent on conditions and season - must be determined by CM with assistance and recommendations of the ECO.	*Low-Medium*	There will always be a certain level of dust emmisions during the construction phase. Depending on the season, the frequency of suppression must be adapted to address excessive dust generation on site.
Noise	Noise increase due to construction activities	Proposal	*Medium*	• Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. • Construction activities should be limited to appropriate daytime working hours only.	*Low-Medium*	Construction activities will always produce excessive noise levels, the significance depends on different phases of the development. The noise impact remains low-medium even though construction equipment will be inspected on a daily basis.
Discharge to Water	Surface water run-off	Proposal	*Medium*	• Storm water management during construction will be implemented however, for the preferred design crosses watercourses and is in close proximity to wetlands. • Increased run-off during construction should be managed using berms, temporary cut-off drains, attenuation ponds or other suitable structures, in consultation with the ECO and resident Engineer. • Stormwater management system is to be installed as soon as possible following site establishment, to attenuate stormwater during the construction phase, as well as during the operational phase. • Surface-water run-off and stormwater must be directed away from trenches and areas of excavation. • No construction activities permitted outside of road reserve.	*Low-Medium*	Impact remains low-medium even though all surface water run-off will be properly managed by stormwater infrastructure. All surface water run-off will be managed and diverted to designated areas before being relieved into the natural system, however, as construction activities will be conducted within riparian area and incident potentials remain, the impact remains low-medium.

	Disturbance of natural system	Proposal	*Medium-High*	• The preferred design crosses watercourses and is in close proximity to wetlands and other sensitive areas. Stringent control measure should therefore be implemented. • Ensure that all workers or equipment remain within development footprint. • No-go zones must be cornered off to prevent trespassing. • Activities within natural area must be monitored and supervised by ECO and CM. • Cement batching must be done outside of floodlines or within mobile impermeable containers. • Housekeeping must be inspected daily.	*Medium*	The proposed alignment will traverse an aquatic natural system and a moderately-high sensitive ecological area. If the listed mitigation measures are implemented efficiently, no significant impacts are expected, however, to the location of the study area and nature of natural environment the impact remains medium.
	Disturbance of aquatic ecological systems	Proposal	*Medium*	• The preferred design crosses watercourses and is in close proximity to wetlands and other sensitive areas. Stringent control measure should therefore be implemented. • Ensure that all workers or equipment remain within development footprint. • No-go zones must be cornered off to prevent trespassing. • Activities within natural area must be monitored and supervised by ECO and CM. • Cement batching must be done outside of floodlines or within mobile impermeable containers. • Housekeeping must be inspected daily. • Habitat assessment must be conducted on the banks of the riparian area and wetlands by the ECO to identify any possible impacts on the natural aquatic system.	*Low-Medium*	The proposed alignment will traverse an aquatic natural system. If the listed mitigation measures are implemented efficiently, no significant impacts are expected, however, to the location of the study area and nature of natural environment the impact remains low-medium. The installation of the proposed stormwater infrastructure are of great importance and must be installed first to reduce the impact of surface water flow.
Soil Alteration	Loss of topsoil	Proposal	*Medium*	• Top soil should be separated and re-used where possible. • First in, last out approach must be implemented with topsoil stockpiles. • Double-handling of topsoil stockpiles are strictly prohibited. • Topsoil stockpiles must be stored outside of floodline area.	*Low-Medium*	The correct implementation of the listed mitigation measures is critical to minimise the impact on topsoil. The removal of virgin soil within the road reserve remains a low-medium impact, even though the topsoil will be utilised during the rehabilitation phase.
Soil Alteration Resource Consumption	Loss of land capability	Proposal	*Medium*	• The proposed site does not have a high agricultural potential nor is currently used for agriculture. The site however comprises of a wetland and riparian zone. Mitigation measures are therefore recommended and required. • Even though the area only has a medium agricultural sensitivity, the loss of land capability is high as the road will minimise potential future development opportunities within the affected properties.	*Low-Medium*	The proposed road divides various properties which minimises the agricultural and other capabilities of the area, it should however be noted that due to the riparian area, the capability was not high to begin with.
	Alteration of topography	Proposal	*Medium*	Both cut- and fill measures must be implemented to minimise the alteration to the topography.	*Medium*	The project will predominantly involve the cutting and filling of surface area during construction. As the project is linear, it is expected that the alteration to the topography will remain medium.
	Raw materials consumption	Proposal	*Low-Medium*	• Promote effective use of raw material. • Incorporate alternative materials within design.	*Low-Medium*	The construction of a road of this magnitude requires large amounts of raw and construction material. The construction of roads requires the construction and layering of multiple materials.

Resource Consumption Effects on Biodiversity	Loss of habitat	Proposal	*Medium*	• Exotic and invasive plants should be controlled and removed. • The wetland and stream area must be rehabilitated • Stormwater infrastructure and area around culvert must be reshaped to mimic natural area. • No-go areas must be cordoned off to prevent un-authorised entry • No personnel allowed outside of the road reserve.	*Low-Medium*	The overall area will experience some levels of habitat loss due to the road section separating the area. If the listed mitigation measures are implemented efficiently, this impact can be reduced.
	Loss of flora	Proposal	*Medium*	•Wetlands and sensitive areas inhabits endangered fauna and flora. Search and Rescue operations must be implemented before any clearance of areas •Individuals of declining plant species need to be relocated where applicable, to a suitable site nearby before the construction work of the development, if approved, is initiated. This should be done by suitably qualified persons to ensure the success of the rescue effort. Permits for relocation are to be obtained form GDARD for the rescue effort if necessary. •*In situ* relocation of indigenous vegetation should be attempted • All landscaping must be done with indigenous vegetation from the surrounding area. • All personnel are prohibited from going outside the road reserve.	*Low-Medium*	The *in-situ* relocation of sensitive vegetation within the road reserve will affectively mitigate the impact to the loss of flora. The significance will remain low-medium, as some of the plant species are regarded as declining.
Effects on Biodiversity Social	Disruption of natural corridors	Proposal	*Low-Medium*	• Ecological systems such as wetlands and riparian zones are found within the extent of the site. No-go zones must be demarcated and adhered to throughout the construction phase • Dedicated implementation of the EMPr • All landscaping must be done with indigenous vegetation from the surrounding area. • Construction within riparian areas must be conducted under close supervision of the ECO and CM. Daily pre-construction inspections must be done to prevent any possible migrating animals from being injured during construction. • Cut-off drains must be installed to divert possible migrating animals around construction areas.	*Low-Medium*	If the listed mitigation measures are implemented efficiently the impact on natural corridors should remain intact. Stormwater infrastructure must allow for the safe migration of animals.
	Further loss of vegetation community	Proposal	*Low-Medium*	• Ecological systems such as wetlands and riparian zones are found within the extent of the site. No-go zones must be demarcated and adhered to throughout the construction phase. • Dedicated implementation of the EMPr • All landscaping must be done with indigenous vegetation from the surrounding area. • Construction within riparian areas must be conducted under close supervision of the ECO and CM. Daily pre-construction inspections must be done to prevent any possible migrating animals from being injured during construction.	*Low-Medium*	Impacts on the vegetation community will be restricted to the road reserve. Search and Rescue will be conducted under the supervision of the ECO. The significance will remain low-medium due to certain moderately-high sensitive communities being affected by the proposed road.

				• Cut-off drains must be installed to divert possible migrating animals around construction areas. •No-go zones must be cornered off and protected from any construction activities.		
OPERATIONAL PHASE						

5.2. Alternative 1

With Alternative 1, the Gauteng Department of Roads and Transport has investigated possible alternatives to the formalisation of a section of the K33 Road as part of a new intersection development. The alternative was investigated to identify possible ways of minimising the environmental impact and optimising traffic management for both current and future situations.

The alternative investigated the upgrading and rehabilitation of Cedar Road with a sectional re-alignment to make provision for a new intersection. The re-alignment of Cedar Road will allow for improved and safer traffic conditions, however, a staggered intersection will still be present as the 6th Road (R552) and K52 intersection will be 128 meters to the south-east of the new intersection.

The alternative investigated was deemed unfeasible by the GDRT after internal studies revealed the current and future traffic outputs required. The intersection in question requires the catering for excessive traffic outputs, the alternative was thus regarded as a temporary solution for the current safety impacts experienced by extending the spacing between the two T-intersection. However, due to the various requirements related to the intersection in terms of safety, mobility and catering for future traffic demands, the alternative investigated was deemed not feasible as it would not be able to address these requirements and could therefore **not be supported.**

5.2.1. Need for the Project

Sustainable development is directly linked to the provision of a safe and efficient road network. The Gauteng Department of Roads and Transport has identified the need to improve the current road infrastructure in the area as the staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027) continue to provide unsafe road conditions. However, Alternative 1 does not remove the issues related to the staggered intersection and as such does not meet all the Department's needs. Further, in terms of the planning documents such as the RSDF (2011), the need for the K33 is highlighted. The development of the alternative intersection will not include any development of a portion of the K33 which is needed in the future to deal with increased traffic etc. For this reason, the Alternative **is not preferred** from a need and desirability perspective.

In addition to the above, the K33 has been gazetted by the MEC and taken into account in various townplanning schemes. The implementation of the alternative has been considered by developers in the area and therefore may result in additional issues in the area.

Lastly, the implementation of the alternative would make it necessary to construct new access to the existing retail complex situated on the corner of Cedar Road and the K52. The alternative would therefore have impacts on existing business.

5.2.2. Environmental Sensitivity

The alternative investigated the sectional re-alignment of Cedar road traversing a developed road reserve and retail parking area. The entire study area is transformed with no anticipated environmental impact. However, stormwater management is very important and could have an environmental impact if the release of surface water run-off is not sufficiently managed.

5.2.3. Impact Assessment

A detailed impact assessment has been undertaken for Alternative 1 and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact

occurring (**Appendix I2**).

Although Alternative 1 has a lesser impact on the biophysical environment, it has a greater impact on the social and economic environment. Most importantly, Alternative does not meet the need and desirability of the development (as it still includes the development of a staggered intersection and the issues associated with this).

The Alternative 1 will result in cumulative and composite impacts in the long-term as the ultimate scenario of upgrading of the K33 to the planned route will be required. Hence, compound impacts will result in accordance.

Based on this**, Alternative 1 is not preferred** for a number of reasons, see **Error! Reference source not found.** Table 13 below for a summary of impacts with low-Medium and higher significance after the implementation of mitigation measures. It is therefore the opinion of the EAP, that Alternative 1 **NOT BE AUTHORISED**.

Table 13: Summary of impact after mitigation with low-medium and higher significance for alternative 1.

	IMPACTS		SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)	COMMENTS
	DESCRIPTION	ALTERNATIVE				
CONSTRUCTION PHASE						
Atmospheric Emissions	Dust emissions	Alternative 1	*Medium*	• A speed limit of 20km/h must be maintained on all dirt roads. • Dust suppression by means of either water or biodegradable chemical agent is required. • Frequency of suppression dependent on conditions and season - must be determined by CM with assistance and recommendations of the ECO.	*Low-Medium*	There will always be a certain level of dust emissions during the construction phase. Depending on the season, the frequency of suppression must be adapted to address excessive dust generation on site.
Noise	Noise increase due to construction activities	Alternative 1	*Medium*	• Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. • Construction activities should be limited to appropriate daytime working hours only.	*Low-Medium*	Construction activities will always produce excessive noise levels, the significance depends on different phases of the development. The noise impact remains low-medium even though construction equipment will be inspected on a daily basis.
Soil Alteration	Alteration of topography	Alternative 1	*Medium*	Both cut- and fill measures must be implemented to minimise the alteration to the topography.	*Low-Medium*	The project will predominantly involve the cutting and filling of surface area during construction. As the project is linear, it is expected that the alteration to the topography will remain low-medium.
Resource Consumption	Raw materials consumption	Alternative 1	*Low-Medium*	• Promote effective use of raw material. • Incorporate alternative materials within design.	*Low-Medium*	The construction of a road of this magnitude requires large amounts of raw and construction material. The construction of roads requires the construction and layering of multiple materials.
Incidents, accidents and potential emergency situations	Health and safety	Alternative 1	*Medium*	• 24 hour security and access control. • Health and Safety awareness training. • Contractor to submit a Health and Safety Plan, prepared in accordance with the Health and Safety Specification, for approval prior to the commencement of work. • A Safety representative should be appointed.	*Low-Medium*	The alternative requires the re-alignment of an existing road. During construction this will have a major health and safety risk for both employees on the construction side and motorists using the road. This will remain of low-medium significance even after the implementation of the listed mitigation measures.

Social	Traffic disruptions	Alternative 1	*Medium-High*	• With the new roads being built, traffic warning and calming measures will be put in place when construction activities may impact on traffic flow. • Traffic signals capable of reflecting at night must be installed throughout effected area. • Traffic points men must be appointed for the duration of the construction phase during work on existing road infrastructure to minimise traffic disruptions	*Medium*	The alternative requires the re-alignment of an existing road. During construction this will create major traffic disruptions for motorists using the road. This will remain a medium significance even after the implementation of the listed mitigation measures as the current traffic situation is already experiencing major congestion during peak hours.
OPERATIONAL PHASE						

5.3. No-go (compulsory)

The No-Go Option relates to not upgrading the current situation. This will result in an increase of traffic related accidents and possible loss of human life. The vacant land within the approved K33 road reserve will continue to degrade due to illegal dumping which could result in surface water contamination due to run-off through dumping areas. The current road infrastructure is operating at full capacity with major congestion during peak traffic. Development along the envisaged K33 mobility spine and Lanseria development node will not transpire without upgrading the current road infrastructure which is preventing the required mobility in the area. As mentioned in the project description, the major need for upgrading the road is to provide safer road conditions for motorist, generating shortened travel time and minimising traffic disruptions/ congestion which in turn will provide a positive stimulus for the local economy.

5.3.1. Need for the Project

Should the No-go Option be selected, the main needs of the project will **NOT** be met, namely the improvement of traffic safety, shortening of travel time and increasing mobility. From a needs, perspective, the No-go option is therefore **NOT** preferred.

5.3.2. Impact Assessment

A detailed impact assessment has been undertaken for No-Go and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact occurring (**Appendix I2**). See **Error! Reference source not found.** Table 14 below for a summary of impacts with low-Medium and higher significance after the implementation of mitigation measures.

Based on the impact assessment undertaken as well as the need for the project, it is the opinion of the EAP, that the No-Go Option **MUST BE DISCARDED.**

Table 14: Summary of impact after mitigation with low-medium and higher significance for the No Go.

	IMPACTS		SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	SIGNIFICANCE (WM)	COMMENTS
	DESCRIPTION	ALTERNATIVE				
OPERATIONAL PHASE						
Discharge to Water (Surface and Groundwater)	Silt	No-Go Option	*Low-Medium*	No Mitigation Required	*Low-Medium*	Illegal dumping and trespassing may result in silt depositing into natural system.
	Surface water run-off	No-Go Option	*Low-Medium*		*Low-Medium*	No formalised structure in place
	Disturbance of natural system	No-Go Option	*Low-Medium*		*Low-Medium*	Illegal dumping and trespassing may result in further disturbance of natural system.
	Disturbance of aquatic ecological systems	No-Go Option	*Low-Medium*		*Low-Medium*	Illegal dumping and trespassing may result in further disturbance of aquatic ecological systems.
Waste Generation	Domestic waste	No-Go Option	*Low-Medium*		*Low-Medium*	Illegal dumping of domestic waste may further degrade the existing site.
	Construction waste	No-Go Option	*Low-Medium*		*Low-Medium*	Illegal dumping of construction waste may further degrade the existing site.
Soil Alteration	Loss of land capability	No-Go Option	*Low-Medium*		*Low-Medium*	Illegal dumping may further degrade the existing site and result in loss of land capability.
	Soil erosion	No-Go Option	*Low-Medium*		*Low-Medium*	Without a formal stormwater system and municipal services in place erosion will continue and worsen in time

	Soil pollution	No-Go Option	*Low-Medium*		*Low-Medium*	Without any management structures in place soil pollution can not be monitored or managed.
Effects on Biodiversity	Loss of habitat	No-Go Option	*Low-Medium*		*Low-Medium*	Illegal dumping may further degrade the existing site and result in loss of natural habitats
	Loss of fauna	No-Go Option	*Low-Medium*		*Low-Medium*	Without formalising the vacant land, the site will continue to degrade which will result in the loss of Fauna.
	Loss of flora	No-Go Option	*Low-Medium*		*Low-Medium*	Without formalising the vacant land, the site will continue to degrade which will result in the loss of Flora.
	Degradation of ecological systems	No-Go Option	*Low-Medium*		*Low-Medium*	Without formalising the vacant land, the site will continue to degrade increasing the footprint of disturbance within the study site
	Disruption of natural corridors	No-Go Option	*Low-Medium*		*Low-Medium*	Without formalising the vacant land, the site will continue to degrade the ecological system.
Incidents, accidents and potential emergency situations	Health and safety	No-Go Option	*Medium-High*		*Medium-High*	The current interchange is regarded as extremely unsafe the significance will continue to increase if nothing is done.
	Fire	No-Go Option	*Low-Medium*		*Low-Medium*	If site remains unmanaged, fires could occur as a result from illegal dumping
Social	Visual impact	No-Go Option	*Medium*		*Medium*	Illegal dumping and uncontrolled activities on site increase the visual impact on the neighbouring area
	Safety and security	No-Go Option	*Medium*		*Medium*	Traffic congestion due to the current road intersection will increase the potential of criminal activities due to stagnant vehicles.

Economic	Decline/increase in economy	No-Go Option	*Medium*		*Medium*	If the current road infrastructure is not upgraded, no development will take place and traffic mobility will continue to deteriorate.

6. Impact Summary of the Proposal or Preferred Alternative

For proposal:

See section 5.1 -Proposal (Preferred Alternative)

For alternative:

See section 5.25.1 -Alternative 1

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.

When assessing the alternatives, the following was assessed:

- The findings of the specialist study undertaken;
- The results of the impact assessment; and
- The need for the project.

A Biodiversity Baseline & Impact Assessment was undertaken and found that the project area has been somewhat altered. This is due to the proximity of an existing urbanised environment and associated human activity, including: livestock, dumping of rubble, general littering and the infringement into natural areas via footpaths and roads. The remaining natural habitats (including secondary grassland and stream habitats) exhibited a healthy balance between various common grassland species and associated herbaceous plants. However, should the mitigation measures listed in the Biodiversity Baseline Assessment and EMPr be implemented and enforced, the proposed intersection will not result in loss of any unique ecosystems. *Hypoxis hemerocallidea* are not threatened but listed as Least Concern are visibly frequent at the site and larger study area and could be conserved in the larger study area (road reserve) and relocated from the footprint, if the development is approved.

The Heritage Impact Assessment conducted identified no Archaeological sites or material on site. Three cemeteries were recorded within close proximity to the road reserve. A farm stead (Ruin) was identified in close proximity to the road reserve. However, the specialist stated that should the mitigation measures be implemented and enforced, no impact on the heritage resources will occur and the project can be supported.

Sustainable development is directly linked to the provision of a safe and efficient road network. The Gauteng Department of Roads and Transport has identified the need to improve the current road infrastructure in the area as the staggered intersection between K52 (formally known as P39-1/ R114) and Cedar Road (formally known as D1027) continue to provide unsafe road conditions. The intersection experiences excessive traffic volumes on a daily basis which creates extreme time delays due to the layout of the staggered intersection. The K33 Road is a Planned north-south provincial road which is intended to provide vital connectivity in the area and to improve the traffic distribution.

The Preliminary Design of the K33 was accepted and gazetted by the MEC in Notice 2626 of 2003 in terms of section 10(3) of the GTIA, Act 8 of 2001. The road is classified as a Class 2 Major Arterial road with a road reserve of width at a minimum of 62 meters. Class 2 roads forms part of the primary network for the urban area, focusing on long distance movement to, from and within the urban area.

According to the World Health Organisation, road traffic injuries are one of the top three causes of disability and death. The need to improve the current situation is therefore highly important and can be

addressed through the elimination of the staggered intersection. This will result in significantly safer road conditions, alleviate traffic congestion and shortened travel time.

The intersection will incorporate channelization to minimise conflict points within the intersection. Channelization is the separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavements markings or raised islands, to facilitate the safe and orderly movement of both vehicles and pedestrians. Proper channelization increases capacity, improves safety, provides maximum convenience and instils driver confidence.

In addition to the above, planning documents such as the RSDF (2011) and the Gauteng Roads Network indicate the need for the K33. Further, the Preliminary Design of the K33 was accepted and gazetted by the MEC in Notice 2626 of 2003 in terms of section 10(3) of the GTIA, Act 8 of 2001. It has therefore been taken into account in townplanning schemes in the area.

From a technical perspective, this alignment is preferred for a number of reasons. The most important of which is safety as the proposal eliminates the existing staggered intersection. In addition, this alignment conforms to the horizontal and vertical standards of a Class 2 Major Arterial Road. The Proposal also will allow for access as the minimum radius for the horizontal curves will be 1500 metres (as required). These radii allow for accesses every 600 metres on K33. The allowance of accesses is very important due the development of the area as well as the accommodation of the mobility of the road.

The need for this intersection is therefore as follows:

- Improved capacity and traffic flow for the area.
- Improved north-south linkage for the area.
- Decreased impacts on existing infrastructure;
- Economic and social benefits related the road.
- Significant improvement in traffic safety.
- Shortened travel time.
- Creation of development opportunities.
- Creation of employment opportunities.

The abovementioned objectives will be achieved through the proposed four-leg/ cross intersection with incorporated channelization development.

Therefore, based on the findings of the specialist study and impact assessment and taking into account the successful implementation of the EMPr, it is felt that Proposal should be authorised.

7. Spatial Development Tools

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

The following spatial development tools were applied and/or considered:

- The City of Johannesburg Spatial Development Framework 2011 was consulted as Spatial Development Tool to establish the need and strategy for one day constructing the K33.
- GDARD C-PLAN and environmentally sensitive layers were utilized during the compilation

of this report to identify biodiversity specialist reports as well as possible sensitive areas within the area.

- Gauteng Provincial Environmental Management Framework was utilized in the compilation of this report. The proposed alignment occurs within Zone 1 and Zone 2. An Ecological Habitat Assessment however was undertaken and found that the proposed intersection would not result in losses of sensitive habitat or species if mitigation measures were implemented.
- Lanseria Development Framework 2020 – identified the strategic planning for the development of future mobility spines and development nodes related to the K33.

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
	X	

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

Not applicable.

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:

A number of critical mitigation measures accompany this recommendation and should be included as conditions of the environmental authorisation (should it be granted). These include:

- **The Proposal** should be implemented.
- An Environmental Control Officer (ECO) should be appointed to ensure compliance to the authorization and EMPr.
- Individuals of the Least Concern plant species *Hypoxis hemerocallidea* need to be relocated where applicable, to a suitable site nearby before the construction work of the development, if approved, is initiated. This should be done by suitably qualified persons to ensure the success of the rescue effort. Permits for relocation are to be obtained form GDARD for the rescue effort if necessary. Evidence of successful search and rescue must be documented and made available for the Department at all times
- Exotic and invasive plants should be controlled and removed.
- Construction contractors, sub-contractors and operators must ensure that no fauna taxa are unduly disturbed, trapped, hunted or killed.
- The construction camp, laydown area and all chemical toilets and storage areas must be located outside of the floodline and buffer areas.
- Sufficient traffic signage and traffic point men must be placed on site during construction in proximity to existing road infrastructure.
- Dust suppression must be implemented if and where required. The frequency to be determined by the ECO.

9. The Needs and Desirability of the Proposed Development (As Per Notice 792 Of 2012, or the updated version of this Guideline)

The need and desirability of the proposed intersection was assessed in terms of Notice 891 of 2014 which is the updated guideline available regarding need and desirability. In line with this, the consideration of "need and desirability" included consideration of the strategic context of the proposed.

Further, a detailed impact assessment process including the compilation of an Ecological Habitat Assessment, Heritage Impact Assessment and Wetland Assessment have been undertaken and shows that impacts related to the proposed intersection can be satisfactorily mitigated. In addition, the construction of the proposed intersection will result in employment opportunities in the area. The most important objective of the proposed intersection is the significant improvement of traffic safety and mobility within the area. As the area has strong strategic importance in terms of the investigated mobility spine, this is an important consideration in terms of need and desirability.

The following questions have also been addressed in line with the Guideline for Need and Desirability (Notice 891 of 2014).

Table 15: Need and Desirability Assessment

Question from the Need and Desirability Guideline	Response
Securing ecological sustainable development and use of natural resources	
How will this development (and its separate elements / aspects) on the ecological integrity of the area?	The Ecological habitat assessment which was undertaken found that the proposed intersection will not result in loss of any unique ecosystems. *Hypoxis hemerocallidea* are not threatened but listed as Least Concern are visibly frequent at the site and larger study area and could be conserved in the larger study area (road reserve) and relocated from the footprint. There appears to be no loss of any threatened species, if the site is developed. Areas of the site affected is regarded as being moderately-high sensitive and will require specific mitigation measures and close monitoring during construction. **Based on this, the proposed intersection will not significantly impact on the ecological integrity of the area.**
How were the following ecological integrity considerations taken into account? • Threatened Ecosystems • Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal	This Basic Assessment Report has taken into account the ecological integrity of the area in the following way: • An initial sensitivity map was compiled to identify potential ecological

shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure, • Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs") • Conservation targets, • Environmental Management Framework, • Spatial Development Framework, and • Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.)	sensitivities. This map took into account CBAs, ESAs, watercourses, Important Bird Areas (IBAs) etc. • Based on this, it was determined that an Ecological Assessment was required. • An Ecological Assessment was therefore undertaken and took into account aspects such as threatened and sensitive ecosystems etc. A detailed final sensitivity map was compiled based on the findings of the study. • The findings of the Ecological Assessment were used to determine and assess impacts related to the development. A detailed impact assessment which assessed the proposal, alternative and no-go option was compiled.
How will this development disturb or enhance ecosystems and / or result in the loss or protection of biological impacts that could not be avoided altogether, what measures were explored to minimize and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Please refer to Appendix I2 for the detailed impact assessment which identified the main impacts as well as the pertinent mitigation measures that reduce negative impacts and enhance positive benefits. Further, please see the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures. Including those suggested to enhance positive benefits (i.e. such as the use of local labour where possible).
How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimize and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Please refer to Appendix I2 for the detailed impact assessment which identified the main impacts related to the pollution and/or degradation of biophysical environment. Further, please see the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures.
What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimize, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Please refer to Appendix I2 for the detailed impact assessment which includes impacts related to waste as well as the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures.

How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimize and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Please refer to Appendix I2 for the detailed impact assessment which includes impacts related to resources as well as the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures.
How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardize the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimize the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts? • Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialized growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life) • Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity	Please refer to Appendix I2 for the detailed impact assessment which includes impacts related to resources as well as the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures. It should be noted that the proposed development involves the development of a road intersection with a section of the approved K33 and therefore will not exacerbate the increased use of resources to maintain economic growth.

costs of using these resources this the proposed development alternative?). • Do the proposed location, type and scale of development promote a reduced dependency on resources?	
How were a risk-averse and cautious approach applied in terms of ecological impacts? • What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? • What is the level of risk associated with the limits of current knowledge? • Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	A risk-averse and cautious approach was undertaken throughout the process including the compilation of specialist studies, the impact assessment and the EMPr. In particular, it was incorporated in the following ways: • The specialist identified gaps which were noted in both the specialist report and BAR. • The impact assessment specifically deals with gaps identified by specialists and/or lack of information through the assessment of 'Level of Confidence'. • The EMPr provided numerous mitigation measures to ensure that even impacts that were identified to be a 'low' risk would be further mitigated. In all cases, the level of risk associated with the current knowledge was deemed sufficient for undertaking the impact assessment for providing a recommendation. It is therefore the EAP's opinion that a risk averse and cautious approach has been applied to the development.
How will the ecological impacts resulting from this development impact on people's environmental right in terms following: • Negative impacts e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimize, manage and remedy negative impacts? • Positive impacts: e.g. improved access to resources, improved amenity,	Please refer to Appendix I2 for the detailed impact assessment as well as the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures. However, in summary, it is felt that the negative impacts related to the development will not have a significantly negative impact on people's environmental right through the dedicated implementation of the EMPr. The importance and significant difference to the current traffic conditions and motorist safety surpasses most negative impacts.

improved air or water quality, etc. What measures were taken to enhance positive impacts?	The positive impacts associated with the proposed intersection include: • Improved capacity, traffic flow and mobility for the area. • Improved north-south linkage for the area. • Decreased impacts on existing infrastructure; • Economic and social benefits related to increased mobility and safer traveling as well as the increase in development opportunities due to the increased traffic capacity and nodal links.
Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	It is felt that it will not have a significantly negative impact on ecosystem services as the majority of Intersection will be constructed on transformed areas. No loss of livelihoods, heritage or significant opportunity costs are anticipated, with reserve consolidation taking place.
Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	The Ecological Specialist noted the following: "*A Biodiversity Baseline & Impact Assessment was undertaken and found that the project area has been somewhat altered. This is due to the proximity of an existing urbanised environment and associated human activity, including: livestock, dumping of rubble, general littering and the infringement into natural areas via footpaths and roads. The remaining natural habitats (including secondary grassland and stream habitats) exhibited a healthy balance between various common grassland species and associated herbaceous plants. The ecological integrity, importance and functioning of the natural grassland area as well as the non-perennial stream plays a crucial role as a water resource system and an important habitat for various fauna and flora. However, should the mitigation measures listed in the Biodiversity Baseline Assessment and EMPr be implemented and enforced, the proposed intersection will not result in loss of any unique ecosystems.*"

	Based on this and the detailed impact assessment (refer to Appendix I2), it is not expected that the proposed intersection will significantly impact on the ecological targets of the area.
Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Two alternative intersection were assessed, namely: • The Proposal; and • Alternative 1. When assessing these alternatives, the following was assessed: • The findings of the specialist study undertaken; • The results of the impact assessment; and • The need for the project. • Professional opinion of GDRT The Ecological habitat assessment preferred the Alternative as it limited the impact on the sensitive areas. Further, taking into account the findings of the specialist study, a detailed impact assessment was undertaken for both the Proposal and the alternative intersection (Alternative 1). A summary of the findings is provided in **Table 11** and **Table 12** above. However, in summary, the health, security and most importantly the safety impacts had a greater intensity and were more likely to occur for Alternative 1 due to the staggered intersection and realistic lifespan of the alternative intersection (Alternative 1). The strategic importance and location of the required intersection must cater for the current traffic situation and make sufficient provision for future growth and increase of traffic volumes. In terms of the need for the project, only the proposed intersection would meet all the need for the project. The Proposal is preferred as it meets the need for the project without compromising both human and natural

	environment and is thus in line with the concepts contained in Section 24 of the Constitution as well as the concept of sustainable development as contained in the National Environmental Management Act, 1998 (Act 107 of 1998). **Therefore, based on the findings of the specialist study and impact assessment and taking into account the successful implementation of the EMPr, it is felt that Proposal should be authorised and is the BPEO.**
Promoting justifiable economic and social development	
What is the socio-economic context of the area, based on, amongst other considerations, the following considerations? • The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any strategic plans, frameworks of policies applicable to the area, • Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.). • Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and • Municipal Economic Development Strategy ("LED Strategy").	Please see Section 9 of the BAR which provides an overview of the socio-economic context of the area. In summary, the proposal is in line with regional planning for the area and will fulfil an important function. It takes into account the new and future developments in the area. The proposed intersection takes into account existing infrastructure which is already in place (I.e retail businesses) and ensures that it will not need to be demolished.

Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?
• Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?
	Please refer to Appendix I2 for the detailed impact assessment as well as the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures. In summary, the social and economic main impacts that were assessed included:
	
	• Social
	  ○ Visual impact
	  ○ Safety and security
	  ○ Traffic disruptions
	  ○ Loss of cultural heritage
	  ○ Loss of sense of place
	• Economic

	○ Decline/increase in economy ○ Employment
How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The proposed intersection will significantly improve road and traffic safety in the area and provide new development and employment opportunities.
Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	Yes, the proposed development will allow for the development of a necessary intersection which will result in shorter travel time which in turn provides communities with improved mobility.
In terms of location, describe how the placement of the proposed development will: • Result in the creation of residential and employment opportunities in close proximity to or integrated with each other • Reduce the need for transport of people and goods • Result in access to public transport or enable non-motorized and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport), • Compliment other uses in the area • Be in line with the planning for the area, • for urban related development, make use of underutilized land available with the urban edge • optimize the use of existing resources and infrastructure, • opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement), • discourage "urban sprawl" and contribute to compaction/densification, • contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	The proposed location of the proposed intersection considered a number of aspects including: • The need for an improved north-south mobility; • Existing services infrastructure. • The ecological and aquatic sensitivity of the area. • Safety and travel time through the intersection. The following can also be noted: • The proposed intersection will create employment during construction and operation. • It will provide a much-needed upgrade to the current intersection in terms of capacity and safety • It compliments other land uses in the area as the road is required to improve traffic due to numerous residential developments and future planned developments in the area. • The road is in line with regional planning by GDRT. • The proposed intersection occurs within the urban edge. • As it is not a residential development it cannot contribute to compaction/densification. • The road is required to enable continued development in the area. A number of large developments are

• encourage environmentally sustainable land development practices and processes, • take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.), • the investment in the settlement or area in question will generate the highest socio=economic returns (i.e an area with high economic potential), • impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and • in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	currently being developed within the surrounding area and the intersection will relieve traffic related to these developments and provide the needed mobility required by regional planning. • The proposed intersection will not impact on any cultural aspects. A heritage impact assessment was done on the study site. • The proposal promotes a more integrated City of Johannesburg as it provides a necessary linkage.
How were a risk-averse and cautious approach applied in terms of socio-economic impacts? • What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? • What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge? • Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	A risk-averse and cautious approach was undertaken throughout the process including the compilation of the impact assessment and the EMPr. In particular, it was incorporated in the following ways: • The impact assessment specifically deals with gaps and/or lack of information through the assessment of 'Level of Confidence'. • The EMPr provided numerous mitigation measures to ensure that even impacts that were identified to be a 'low' risk would be further mitigated. In all cases, the level of risk associated with the current knowledge was deemed sufficient for undertaking the impact assessment for providing a recommendation. It is therefore the EAP's opinion that a risk averse and cautious approach has been applied to the development.
How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	Please refer to Appendix I2 for the detailed impact assessment as well as the detailed and site specific EMPr which is contained in

• Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimize, manage and remedy negative impacts?
• Positive impacts. What measures were taken to enhance positive impacts?
	Appendix H for all proposed mitigation measures. In summary, the social and economic main impacts that were assessed included:
	
	• Social
	  ○ Visual impact
	  ○ Safety and security
	  ○ Traffic disruptions
	  ○ Loss of cultural heritage
	  ○ Loss of sense of place
	• Economic
	  ○ Decline/increase in economy
	  ○ Employment
	
	In summary, most social and economic impacts are positive in nature. Those that are negative can be satisfactorily mitigated and thus the development does not impact on people's environmental rights.

Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilization of natural resources, etc.)?	The proposed intersection has been located to align with the approved future K33, to address the current situation within the area and make provision for the K33 when the construction thereof commences. This will minimise the construction of one intersection and later the other when the K33 is developed. Please refer to Appendix I2 for the detailed impact assessment as well as the detailed and site specific EMPr which is contained in Appendix H for all proposed mitigation measures.
What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	Two alternative intersection were assessed, namely: • The Proposal; and • Alternative 1. When assessing these alternatives, the following was assessed: • The findings of the specialist study undertaken; • The results of the impact assessment; and • The need for the project. • Professional opinion of GDRT The Ecological habitat assessment preferred the

	Alternative as it limited the impact on the sensitive areas. Further, taking into account the findings of the specialist study, a detailed impact assessment was undertaken for both the Proposal and the alternative intersection (Alternative 1). A summary of the findings are provided in **Table 11** and **Table 12** above. However, in summary, the health, security and most importantly the safety impacts had a greater intensity and were more likely to occur for Alternative 1 due to the staggered intersection and realistic lifespan of the alternative intersection (Alternative 1). The strategic importance and location of the required intersection must cater for the current traffic situation and make sufficient provision for future growth and increase of traffic volumes. In terms of the need for the project, only the proposed intersection would meet all the need for the project. The Proposal is preferred as it meets the need for the project without compromising both human and natural environment and is thus in line with the concepts contained in Section 24 of the Constitution as well as the concept of sustainable development as contained in the National Environmental Management Act, 1998 (Act 107 of 1998). **Therefore, based on the findings of the specialist study and impact assessment and taking into account the successful implementation of the EMPr, it is felt that Proposal should be authorised and is the BPEO.**
What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the “best practicable environmental option”	A detailed impact assessment process has been undertaken including the development of alternatives which were assessed. In addition, in line with the requirements of the EIA Regulations, 2014, the BAR is being made available for review and I&APS will be able to comment on the impact assessment. It is the opinion of the EAP, that no impacts assessed will distributed in such a way to discriminate against any disadvantaged person. Instead, the

to be selected, or is there a need for other alternatives to be considered?	proposed intersection will allow for the development of an improved intersection that does not impact on existing infrastructure. The alternatives assessed do allow for the best practicable environmental option to be determined and the EAP is of the opinion that no further alternatives need to be assessed.
What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The proposed intersection will be used by numerous road users including categories of people disadvantaged by unfair discrimination.
What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	In identifying the impacts associated with the development as well as the development of the EMPr, the full lifecycle was assessed. Further, the full EMPr includes the roles and responsibilities for the development and ensures that the responsibility of the implementation of the EMPr falls to the developer.
What measures were taken to: • ensure the participation of all interested and affected parties, • provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation • ensure participation by vulnerable and disadvantaged persons, • promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means, • ensure openness and transparency, and access to information in terms of the process, • ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to	A detailed public participation process is being undertaken as part of the Basic Assessment process. As part of this, a detailed Interested and Affected Party (I&AP) Database was compiled and included registered I&Aps. The database also includes organs of state that have jurisdiction over the site such as City of Johannesburg, Johannesburg Roads Agency, Department of Water and Sanitation, Johannesburg Water and Gauteng Department of Agriculture and Rural Development (GDARD). In addition, the I&AP database included the affected ward councillor of the area as well as the Chartwell North Estates Home Owners Association and the Chartwell Country Estates Residents Association. As part of the notification phase, written notification in the form of a Background Information Document (BID) were emailed to all I&APs on the I&AP Database. In addition, a

all forms of knowledge, including traditional and ordinary knowledge, and • ensure that the vital role of women and youth in environmental management and development were recognized and their full participation therein were promoted?	public participation map was compiled to show all adjacent landowners. Hand Delivery of BIDs took place. Two site notices were also placed around the site and an advert was also placed in The Star. The BID, advert and site notices provided a short background on the project and encouraged I&APs to register as I&APs. As numerous communication methods (including site notices, adverts, hand delivery of BIDs and emails) are being employed, it is felt that public participation has been such to ensure participation by all potentially interested or affected people.
Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low- middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)	The proposed intersection will improve the safety and mobility which is important at a regional level and will improve traffic.
What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Please refer to Appendix H: EMPr which includes an Environmental Awareness Plan. As part of this, workers will be informed of their rights to refuse work that might be harmful to human health or the environment.
Describe how the development will impact on job creation in terms of, amongst other aspects: • the number of temporary versus permanent jobs that will be created, • whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area), • the distance from where labourers will have to travel, • the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits); and • the opportunity costs in terms of job	The following can be noted in regards to this: • Prism EMS have indicated in the EMPr, contained under Appendix H, that local employment should be encouraged to promote skills transfer and development. This will enhance the general area and provide job opportunities to potential job seekers and manage it in the best suitable way. • An assessment of the social environment of the area suggests that there is labour available in the area. • The proposed road intersection occurs in close proximity to numerous

creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.)	residential developments and informal settlements and thus, the distance labourers will have to commute is not expected to be significant. • The proposed development will not result in any losses of any jobs and job related opportunity costs are not expected.
What measures were taken to ensure: • That there were intergovernmental coordination and harmonization of policies, legislation and actions relating to the environment, and • That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	National Legislation i.e. NEMA, NWA, NHRA, NEM:BA were consulted in the preparation of this Basic Assessment Report. Provincial guidelines also formed part of the literature review. Spatial development tools also aided the EAP to assess and provide information pertaining to the proposed development. Any comments received from I&APs or organs of state are included in the comments and response register.
Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The EMPr which has been compiled is site specific and includes realistic and achievable mitigation measures which aim to reduce any negative impacts as well as to enhance any positive benefits associated with the project.
What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	A detailed EMPr has been compiled and includes detailed roles and responsibilities. In addition, a penalty system for contractors is included.
Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Two alternative intersection were assessed, namely: • The Proposal; and • Alternative 1. When assessing these alternatives, the following was assessed: • The findings of the specialist study undertaken; • The results of the impact assessment; and

		• The need for the project. • Professional opinion of GDRT The Ecological habitat assessment preferred the Alternative as it limited the impact on the sensitive areas. Further, taking into account the findings of the specialist study, a detailed impact assessment was undertaken for both the Proposal and the alternative intersection (Alternative 1). A summary of the findings are provided in **Table 11** and **Table 12** above. However, in summary, the health, security and most importantly the safety impacts had a greater intensity and were more likely to occur for Alternative 1 due to the staggered intersection and realistic lifespan of the alternative intersection (Alternative 1). The strategic importance and location of the required intersection must cater for the current traffic situation and make sufficient provision for future growth and increase of traffic volumes. In terms of the need for the project, only the proposed intersection would meet all the need for the project. The Proposal is preferred as it meets the need for the project without compromising both human and natural environment and is thus in line with the concepts contained in Section 24 of the Constitution as well as the concept of sustainable development as contained in the National Environmental Management Act, 1998 (Act 107 of 1998). **Therefore, based on the findings of the specialist study and impact assessment and taking into account the successful implementation of the EMPr, it is felt that Proposal should be authorised and is the BPEO.**

10. The Period for which the Environmental Authorisation is Required (Consider when the Activity is Expected to be Concluded)

The proposed period for which the environmental authorization should be valid prior to operation is 8 years with an option to extend if necessary. Should construction not commence within this period, the authorization will lapse and new authorization process would be required.

However, once the project has commenced, it cannot be seen to have an expiry date (i.e. during the operational phase), because of the nature of the project and because the project is intending to construct permanent infrastructure on the proposed site.

11. Environmental Management Programme (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 8 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 E1 – Proof of site notice
Appendix E2 – Written notices issued as required in terms of the regulations
Appendix E3 – Proof of newspaper advertisements
Appendix E4 –Communications to and from interested and affected parties
Appendix E5 – Minutes of any public and/or stakeholder meetings
Appendix E6 - Comments and Responses Report
Appendix E7 –Comments from I&APs on Basic Assessment (BA) Report
Appendix E8 –Comments from I&APs on amendments to the BA Report
Appendix E9 – Copy of the register of I&APs
Appendix F: WULA Technical Report
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.