FINAL ENVIRONMENTAL IMPACT REPORT

For the proposed Ikageng Extension 13 on a Portion of Portion 2 and Portion 533 of the farm Town and Townlands of Potchefstroom 435, Registration Division IQ, North West




Prepared by

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PROJECT DETAIL

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Project Title	:	Proposed Ikageng Extension 13 on a Portion of Portion 2 and Portion 533 of the farm Town and Townlands of Potchefstroom 435, Registration Division IQ, North West
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GLOSSARY OF TERMS AND ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
GNR	Government Notice Regulation
I&AP	Interested and affected party
IDP	Integrated Development Plan
Mitigate	Activities designed to compensate for unavoidable environmental damage.
NEMA	National Environmental Management Act No. 107 of 1998
NWA	National Water Act No. 36 of 1998
PPP	Public Participation Process
READ	Department of Rural, Environmental and Agricultural Development
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework

EXECUTIVE SUMMARY

The Tlokwe Local Municipality is situated in the eastern part of the Dr. Kenneth Kaunda District Municipality which is situated in the south-eastern side of the North West Province. The municipal area comprises a total area of ~264684 km² and is home to a total population of ±170 668 people which amounts to ~57 306 households. According to the Tlokwe SDF a relatively large percentage of households still live in informal dwellings (Tlokwe SDF, 2014:38). Approximately 10.4% of households live in an informal dwelling (shack, not in backyard) and 7.4% live in an informal dwelling (shack, in backyard) (Tlokwe SDF, 2014:37). The greatest pressure for the provision of housing is experienced in the western urban areas. The waiting list for houses according to the Housing Sector Plan is estimated at 14 500 houses (Tlokwe SDF, 2014:47).

In response to the above the Tlokwe City Council intends to establish a township of approximately 1200 erven at a gross density of 36 units per hectare on a site located adjacent to and east of Ikageng Extension 7, between Lekhele / Mogolodi Street in the north and Ikageng Extension 3 in the south (refer to Figure 1 for the locality map). The project will comprise a green-fields area of approximately 48 hectares. The site was identified as being highly desirable due to its location within the urban edge (i.e. service provision), environmental conditions (i.e. geology, agricultural potential, ecological and archaeology sensitivity), as well as site access (i.e. to facilitate the movement of people during the operational phase).

The Environmental Impact Assessment (EIA) Regulations, 2014 (Regulation 982) determine that an environmental authorisation is required for certain listed activities, which might have detrimental effects on the environment. The following activity has been identified with special reference to the proposed development and is listed in the EIA Regulations:

- Activity 15 (GNR. 894): "*The clearance of an area of 20 hectares or more of indigenous vegetation*."

Being listed under Listing Notice 2 (Regulation 894) implies that the development is considered as potentially having a significant impact on the environment. Subsequently a 'thorough assessment process' is required as described in Regulations 21-24. Environamics has been appointed as the independent consultant to undertake the EIA on Tlokwe City Council's behalf.

Appendix 3 to GNR982 requires that the EIA process be undertaken in line with the approved plan of study for EIA and that the environmental impacts, mitigation and closure outcomes as well as the residual risks of the proposed activity be set out in the environmental impact assessment report (EIR). The potential positive and negative impacts associated with the proposed development have been assessed and the potentially most significant environmental impacts associated with the development are briefly summarised below:

Impacts during the construction phase:

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The potentially most significant impacts relate to the loss or fragmentation of habitats, loss of sensitive species, loss of habitat connectivity and open space, the

generation of waste, and socio-economic impacts such as the provision of temporary employment and other economic benefits, and the impact of construction workers on local communities.

Impacts during the operational phase:

During the operational phase the study area will serve as a residential extension of Ikageng. The potential impacts during this phase of the development will be permanent in nature. The negative impacts generally relate to impacts associated with the development of sinkholes, existing service infrastructure, and associated health and safety impacts, and increase in storm water runoff. The operational phase will have a direct positive impact through the provision of employment opportunities for its duration, and the provision of quality housing.

Cumulative impacts:

Cumulative impacts could arise if other similar projects are constructed in the area. According to the SDF (2014:68) the following areas may also be considered for residential development within the Tlokwe City Council area of jurisdiction:

- Area north of Promosa (New township establishment is earmarked for this area)
- Area west of Dassierand (Area earmarked for future development)
- Portions of the farm Vyfhoek (Area proposed for an integrated human settlement development)
- Area south of the urban area (vicinity of sewer works) – This area must accommodate future extension of sewer works as well as a proposed new regional cemetery.

Given the location of the sites all located within the Tlokwe City Council area of jurisdiction the potential for cumulative impacts associated with the provision of bulk services is rated as high. However the cumulative impacts associate with poor service delivery can be mitigated to an acceptable level (refer to Section 5.12 of this report).

Regulation 23 of the EIA Regulations determine that an Environmental Impact Report (EIR) be prepared and submitted for the proposed activity within 106 days after the competent authority approves the final scoping report. Since the Department: Rural, Environment and Agricultural Development approved the final scoping report on 10 June 2015, this EIR will evaluate and rate each identified impact, and identify mitigation measures which may be required. This EIR also contains information that is necessary for the competent authority to consider the application and to reach a decision contemplated in Regulation 24.

1 INTRODUCTION

This section aims to introduce the Environmental Impact Report (EIR) and specifically to address the following requirements of the regulations:

Appendix 2.(2) A environmental impact assessment report contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include- (a) details of: (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae.

1.1 LEGAL MANDATE AND PURPOSE OF THE REPORT

Regulations No. 982, 983, 984 and 985 (of 4 December 2014) promulgated in terms of Section 24(5) and 44 of the National Environmental Management Act, (107 of 1998) determine that an EIA process should be followed for certain listed activities, which might have a detrimental impact on the environment. According to Regulation No. 982 the purpose of the Regulations is: "*…to regulate the procedure and criteria as contemplated in Chapter 5 of the Act 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, and for matters pertaining thereto*".

The EIA Regulations No. 983, 984 and 985 outline the activities for which EIA should apply. The following activity with special reference to the proposed activity is listed in the EIA Regulations:

Table 1.1: Listed activities

Relevant notice:	Activity No (s)	Description of the listed activity as per project description:
GNR. 984, 4 Dec. 2014	Activity 15	• *"The clearance of an area of 20 hectares or more of indigenous vegetation*." • Activity 15 is triggered since the proposed activity will result in the clearance of more than 20 hectares of indigenous vegetation.

Being listed under Listing Notice 2 (Regulation 984) implies that the proposed activity is considered as potentially having a significant impact on the environment. Subsequently a 'thorough assessment process' is required as described in Regulations 21-24. According to Appendix 3 of Regulation 982 the objective of the EIR is to, through a consultative process:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- Determine the—
    - nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    - degree to which these impacts-
        - can be reversed;
        - may cause irreplaceable loss of resources, and
        - can be avoided, managed or mitigated;
- identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment; identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- identify suitable measures to avoid, manage or mitigate identified impacts; and
- identify residual risks that need to be managed and monitored.

This report is the Final Environmental Impact Report (EIR). According to Regulation 982 all registered I&APs and relevant State Departments must be allowed the opportunity to review the reports. The draft EIR was made available to registered I&APs and all relevant State Departments. They were requested to provide written comments on the draft EIR within 30 days of receiving the report. All issued identified during this review period was documented and compiled into a Comments and Response Report as part of the report.

1.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Environamics was appointed by the applicant as the independent EAP to conduct the EIA and prepare all required reports. All correspondence to the EAP can be directed to:

Contact person:	Carli Steenkamp
Postal Address:	PO Box 6484, Baillie Park, 2526
Telephone:	018 299 1523 (w) 086 762 8336 (f)
Electronic Mail:	environamicssa@gmail.com

Regulation 13(1)(a) and (b) determines that an independent and suitably qualified and experienced EAP should conduct the EIA. In terms of the independent status of the EAP a declaration is attached as Appendix G6 to this report. The expertise of the EAP responsible for conducting the EIA is also summarized in a curriculum vitae included as part of Appendix G6.

1.3 DETAILS OF SPECIALISTS

The following specialists are also involved with the project:

Geotechnical site investigation - AGES

Contact person:	Mr. AS Potgieter
Postal Address:	76 Steve Biko Ave, 2522
Telephone:	018 297 6588 (t) 018 297 4813 (f) 082 924 0304 (Cell)
Electronic Mail:	spotgieter@ages-group.com

Engineering Services Report – Moedi Consulting Engineers Pty Ltd.

Contact person:	Mr. L. van Rooyen
Postal Address:	PO Box 1852, Klerksdorp, 2570
Telephone:	018 462 9603 (t) 018 462 2111 (f) 083 287 6544 (Cell)
Electronic Mail:	lennert@moedi.co.za

Heritage Impact Assessment -

Contact person:	Mr. J.A. van Schalkwyk
Postal Address:	62 Coetzer Avenue, Monument Park, Pretoria, 0181
Telephone:	012 347 7270 (w) 086 611 3902 (f) 076 790 6777 (Cell)
Email:	jvschalkwyk@mweb.co.za

Ecological Fauna and Flora Habitat Survey and brief wetland assessment - Anthene Ecological CC

Contact person:	Mr R. Terblanche
Postal Address:	Private Bag X6001, Potchefstroom, 2520
Telephone:	082 614 6684 (Cell)
Electronic Mail:	Reinierf.terblanche@gmail.com

1.4 STATUS OF THE EIA PROCESS

The EIA process is conducted strictly in accordance with the stipulations set out in Regulations 21-24 of Regulation No. 982. Table 1.2 provides a summary of the EIA process and future steps to be taken. It can be confirmed that to date:

- A site visit was conducted on 24 February 2015 to discuss the proposed development and assess the site.

- A fully completed application form and Draft Scoping Report was submitted to the North West Department: Rural, Environment and Agricultural Development on 2 April 2015.
- The public participation process was initiated on 2 April 2015 and all I&APs were requested to submit their comments on the Draft Scoping Report by 5 May 2015.
- The Final Scoping Report (FSR) was submitted to the North West Department: Rural, Environment and Agricultural Development on 12 May 2015.
- The North West Department: Rural, Environment and Agricultural Development accepted the final scoping report in a letter dated 10 June 2015.
- The Draft EIR was submitted to the North West Department: Rural, Environment and Agricultural Development on 1 July 2015 and was made available to registered I&APs and relevant State Departments on 1 July 2015. They were requested to provide their comments on the report within 30 days of the notification (31 July 2015).

It is envisaged that the EIA process should be completed within approximately five months of submitting the Final EIR, i.e. by January 2016 – see Table 1.

Table 1.2: Project schedule

Activity	Prescribed timeframe	Timeframe
Submit application form & draft scoping report	-	March 2015
Commenting period on draft scoping report	30 Days	April-May 2015
Submission of final scoping report	44 Days	May. 2015
Accept scoping report	43 Days	June 2015
Commenting period on draft EIR & EMPr	30 Days	31 July 2015
Submission of final EIR & EMPr	106 Days	3 Aug. 2015
Decision	107 Days	Dec. 2016
Registered I&APs notified of decision	12 Days	January 2016

1.5 STRUCTURE OF THE REPORT

This report is structured in accordance with the prescribed contents stipulated in Appendix 3 of Regulation No.982. It consists of seven sections demonstrating compliance to the specifications of the regulations as illustrated in Table 1.3.

Table 1.3: Structure of the report

Requirements for the contents of a scoping report as specified in the Regulations		Section in report	Pages
Appendix 3.(3) - An environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-			
(a)	details of -	1	9-16
	(i) the EAP who prepared the report; and		
	ii) the expertise of the EAP, including a curriculum vitae.		
(b)	the location of the activity, including-	2	17-20
	(i) the 21 digit Surveyor General code of each cadastral land parcel;		
	(ii) where available, the physical address and farm name;		
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;		
(c)	a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-		
	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or		
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;		
(d)	a description of the scope of the proposed activity, including-		
	(i) all listed and specified activities triggered and being applied for; and		
	(ii) a description of the associated structures and infrastructure related to the development.		
(e)	a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.	3	21-29
(f)	a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	4	30-31
(g)	A motivation for the preferred development footprint within the approved site.	5	32-40
(h)	a full description of the process followed to reach the proposed development footprint within the approved site, including –		
	(i) details of all the development footprint alternatives considered;		
	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;		
	(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.		

	(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;		
	(ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and		
	(x) a concluding statement indicating the preferred alternative development location within the approved site.		
	(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	6	41-75
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;		
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;		
	(viii) the possible mitigation measures that could be applied and level of residual risk;		
(i)	a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-		
	(i) a description of all environmental issues and risks that were identified during the EIA process; and		
	(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.		
(j)	an assessment of each identified potentially significant impact and risk, including-		
	(i) cumulative impacts;		
	(ii) the nature, significance and consequences of the impact and risk;		
	(iii) the extent and duration of the impact and risk;		
	(iv) the probability of the impact and risk occurring;		
	(v) the degree to which the impact and risk can be reversed;		
	(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and		
	(vii) the degree to which the impact and risk can be mitigated;		

(k)	(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;		
(l)	an environmental impact statement which contains-	7	76-78
	(i) a summary of the key findings of the environmental impact assessment:		
	(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and		
	(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;		
(m)	based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;		
(n)	the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Not applicable	
(o)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Not applicable	
(p)	a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	7	76-78
(q)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;		
(r)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not applicable	
(s)	an undertaking under oath or affirmation by the EAP in relation to-	Appendix G6 to the report	
	(i) the correctness of the information provided in the report;		
	(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties (I&APs);		
	(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and		
	(iv) any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs;		
(t)	where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning	Not applicable	

	management of negative environmental impacts;	
(u)	an indication of any deviation from the approved scoping report, including the plan of study, including-	Not applicable
	(i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and	
	(ii) a motivation for the deviation;	
(v)	any specific information that may be required by the CA; and	Not applicable
(w)	any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not applicable

2 ACTIVITY DESCRIPTION

This section aims to address the following requirements of the regulations:

Appendix 3.(3) An EIR (...) must include-
(b) the location of the activity, including-
(i) the 21 digit Surveyor General code of each cadastral land parcel;
(ii) where available, the physical address and farm name;
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;
(c) a plan which locates the proposed activity applied a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-
(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or
(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;
(d) a description of the scope of the proposed activity, including-
(i) all listed and specified activities triggered and being applied for; and
(ii) a description of the associated structures and infrastructure related to the development.

2.1 BACKGROUND TO THE DEVELOPMENT

The Tlokwe Spatial Development Framework (SDF) 2015/16 provides a description of the background to the development and its location within the broader strategic planning framework for housing in Potchefstroom. According to the Tlokwe SDF (2014/15) a relatively large percentage of households are still living in informal dwellings (Tlokwe SDF, 2014:38). Approximately 10.4% of households live in an informal dwelling (shack, not in backyard) and 7.4% live in an informal dwelling (shack, in backyard) (Tlokwe SDF, 2014:37). The greatest pressure for the provision of housing is experienced in the western urban areas. The waiting list for houses according to the Housing Sector Plan is estimated at 14 500 houses.

The location of the specific development to the east of Ikageng Extension 7 has long since been identified as the next phase in the future expansion of Ikageng (refer to Figure 3 for the SDF of Tlokwe). The need for the development is directly linked to the Council's aim to address the housing backlog and to avoid unofficial and informal housing developments through pro-active provision of sufficient number of formal erven.

From an environmental perspective the main conclusions emanating from the SDF are the following:

- The particular location has been earmarked through the IDP process for the next residential extension of Ikageng.
- The proposed development is located within the designated urban edge which suggests that it is in line with the principle to counter urban sprawl and creating compact quality urban spaces serving dense residential areas.

2.2 THE LOCATION OF THE ACTIVITY AND PROPERTY DESCRIPTION

The activity entails the establishment of a township (Ikageng Extension 13) on a Portion of Portion 2 and Portion 533 of the farm Town and Townlands of Potchefstroom 435, Registration Division IQ, North West, Registration Division IQ, North West situated within the Tlokwe City Council area of jurisdiction. The proposed development is located in the North West Province, in the northern central interior of South Africa (refer to Figure 2 for the regional map). The town of Potchefstroom is located approximately 6 km east of the proposed development. The site is located adjacent to and east of Ikageng Extension 7, between Lekhele/Mogolodi Street in the north and Ikageng Extension 3 in the south (refer to Figure 1 for the locality map). Table 2.1 below provides a summary of the general site information.

Table 2.1: General site information

Description of affected farm portions	Portion of Portion 2 of the farm Town and Townlands of Potchefstroom 435, Registration Division IQ, North West Portion 533 of the farm Town and Townlands of Potchefstroom 435, Registration Division IQ, North West
21 Digit Surveyor General codes	T0IQ00000000043500002 T0IQ00000000043500533
Coordinates (Middle point of the site)	26˚43' 43.10"S; 27˚01' 21.93"E
Title Deed	G105/1907 & T20450/1991 - refer to Appendix G5
Zoning	The site is zoned for “Agricultural” land uses but has not been used for this purpose in the preceding 10 years.
Photographs of the site	Refer to the Plates
Surface area to be covered	Approximately 48 hectares
Activity triggered	GNR984, Activity 15: *“The clearance of an area of 20 hectares or more of indigenous vegetation*.”

The site is bordered by residential development to the north (Mohadin), the west (Ikageng Extension 7) and to the south (Ikageng Extension 3). Municipal open space is located adjacent the eastern boundary of the site. The site survey revealed that the site currently consist of abandoned agricultural (open) fields. The vegetation at the site appears to be disturbed and edge effects of the surrounding settlements and residential areas are conspicuous (tracks, informal dumping, paint on rocks, burnt sites, informal sleeping sites) – refer to plates 1-18 for photographs of the development area. The property on which the township is to be established is owned by the Tlokwe City Council.

2.3 ACTIVITY AND LAYOUT DESCRIPTION

The activity entails the development of approximately 1 115 low cost residential erven with associated land uses at a gross density of ~36 units per hectare – refer to table 2.2. It comprises a green-fields area of approximately 48 hectares – refer to Appendix C for the layout plan.

Table 2.2: Proposed land uses

LAND USE	NUMBER	ERF NO.	AREA (ha)	%
Residential 1	1115	1-1115	25,7488	53.85%
Institutional	2	1116,1118	0,2747	0.58%
Business 3	1	1117	0,1519	0.32%
Educational	1	1119	0,0680	0.14%
Public Open Space	6	1120-1125	11,8237	24.73%
Public Roads	1	1126	9.7453	20.38%
Total	1126		47.8124	100

Due to the nature of the site, consisting almost exclusively of abandoned agricultural fields, there are very limited environmental features to be accommodated apart from the rocky ridge that runs parallel to the western border of the site (refer to the plates). The layout is also designed in a way to ensure that no storm-water runoff accumulates in the dolomite risk zone area adjacent to and east of the site and also makes provision for the maximum accessibility for pedestrians. The only other environmental feature which had to be considered was the rehabilitated closed municipal waste site located approximately 300m to the north east of the site. The distance of 300m away from the proposed development is deemed to be sufficient.

The proposed development will trigger activity 15 of GNR984: "*The clearance of an area of 20 hectares or more of indigenous vegetation*." The potentially most significant impacts will occur during the construction phase of the development, which will include the following activities:

- Site clearing and preparation

  Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled.

- Civil works

  The main civil works are:

  - Terrain levelling if necessary– Levelling will be minimised by locating the site on the flatter areas within the available 35 hectares.
  - Housing foundation- The exact method will depend on the detailed geotechnical analysis.
  - Construction of access and inside roads and pedestrian paths – existing paths will be used were reasonably possible.
  - Services – the majority of service infrastructure will be buried underground.

2.4 SERVICES PROVISION

Adequate provision of bulk infrastructure will be a prerequisite for the development and the bulk capacity to provide services to the development should be in place before the installation of services commences. Section 6.4 of this report confirm the status of infrastructure services and the extent of upgrading that will be required to ensure sustainable services delivery (also refer to Appendix D2 for the engineering services report). These services include road infrastructure, water provision, sewage, waste, electricity, and storm water. The Tlokwe City Council confirmed that they are in a position to provide the development with the required bulk and infrastructure services (refer to Annexure F for written feedback).

3 LEGISLATIVE AND POLICY CONTEXT

This section aims to address the following requirements of the regulations:

Appendix 3.(3) An EIR (...) must include-
(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.

3.1 INTRODUCTION

Environmental decision making with regards to township establishments is based on numerous policy and legislative documents. These documents inform decisions on project level environmental authorisations issued by the North-West Department of Rural, Environment and Agricultural Development as well as comments from local and district authorities. Moreover it is significant to note that they also inform strategic decision making reflected in IDPs and SDFs. Therefore to ensure streamlining of environmental authorisations it is imperative for the proposed activity to align with the principles and objectives of key national, provincial and local development policies and legislation. The following acts and policies are briefly summarised:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]
- National Water Act, 1998 (Act No. 36 of 1998)
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- North West Province Growth and Development Strategy, 2004-2014
- Dr. Kenneth Kaunda District Municipality Integrated Development Plan (IDP), 2012-2016
- Dr. Kenneth Kaunda Spatial Development Framework (District SDF), 2011
- Tlokwe Environmental Management Framework (EMF), 2010
- Tlokwe Integrated Development Plan (IDP), 2014/15 Review
- Tlokwe Spatial Development Framework (SDF), 2014
- Dolomite Risk Management Strategy (DRMS) Setting of Tlokwe City Council, 2011

The key principles and objectives of each of the legislative and policy documents are briefly summarised in Tables 3.1 and 3.2 to provide a reference framework for the implications for the proposed activity.

3.2 LEGISLATIVE CONTEXT

Table 3.1: Legislative context for the establishment of a township

LEGISLATION	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
The Constitution of South Africa (Act No. 108 of 1996)	National Government	1996	The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 states that "*everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*." The Constitution therefore, compels government to give effect to the people's environmental right and places government under a legal duty to act as a responsible custodian of the countries environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.
The National Environmental Management Act (Act No. 107 of 1998)	National and Provincial Department of Environmental Affairs	1998	NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice. The mandate for EIA lies with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 982, 983, 984 and 985 promulgated in terms of Section 24(5) and 44 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment. This EIA was triggered by activity 15 listed in

			Regulation R984, which requires a 'scoping and environmental impact assessment process.'
The National Water Act (Act No. 36 of 1998)	Department of Water Affairs (DWA)	1998	Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources. As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use. A Water Use License will not be required for the proposed development, since water will be obtained from the local municipality.
National Environmental Management: Waste Act (Act No. 59 of 2008)	Department of Environmental Affairs (DEA)	2008	NEMWA has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS). The objectives of the Act relate to the provision of measures to protect health, well-being and the environment, to ensure that people are aware of the impact of waste on their health, well-being and the environment, to provide for compliance with the measures, and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being. Regulations No. R921 (of 29 November 2013) promulgated in terms of Section 19(2) of the National Environmental Management: Waste Act (59 of 2008) determine that no person may commence, undertake or conduct a waste management activity listed in this schedule unless a license is issued in respect of that activity. A waste permit will not be required for the proposed development.
National Environment Management:	Department of Environmental Affairs (DEA)	2004	The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and

Air Quality Act (Act No. 39 of 2004)			social development. Regulations No. R893 (of 22 November 2013) promulgated in terms of Section 21(1)(b) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. An Atmospheric Emission License will not be required for the proposed development.
The National Heritage Resources Act (Act No. 25 of 1999)	South African Heritage Resources Agency (SAHRA)	1999	The Act aims to introduce an integrated and interactive system for the management of the heritage resources, to promote good government at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic. It also aims to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources, to set norms and maintain essential national standards and to protect heritage resources, to provide for the protection and management of conservation-worthy places and areas by local authorities, and to provide for matters connected therewith. The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a "heritage resource" includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected.

3.3 POLICY CONTEXT

Table 3.2: Policy context for the establishment of a township

POLICY	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
North West Province Growth and Development Strategy	North West Provincial Government	2004 - 2014	The Strategy (PGDS) provides a framework for integrated and sustainable growth and economic development for the province and its people over the next ten years. It addresses the formulation of a common vision, goals and objectives of what should be achieved and how the provincial government and its social partners should achieve its objectives. The PGDS notes that the NWP is a medium-size province, covering ~10% of the total national surface area, accounting for ~8% of the national population, and contributing ~7% to the national economy. With the exception of the mining sector (~23.5% of provincial GDP in 2002), private sector activity in the NWP is very modest. Other development challenges include low population densities; inadequate infrastructure, and enormous service delivery backlogs; a predominantly poor population with high levels of illiteracy and dependency; great inequalities between rich and poor, and disparities between urban and rural; and the HIV/Aids pandemic. Both the primary immediate and long term objectives of the PGDS are therefore to address poverty and unemployment, while simultaneously improving the low level of expertise and skills. Additional objectives include promoting equal and fair access to opportunities and assets; enhancing competitiveness, profitability and SMME development; and ensuring sustainable development.
Dr. Kenneth Kaunda District Municipality Integrated Development Plan (IDP)	Dr. Kenneth Kaunda District Municipality (District SDF)	2012 - 2016	The IDP serves as the basic developmental framework and the basis for annual reviews of municipal performance for the period up to 2016. The IDP is explicitly aligned with the requirements of the Municipal Systems Act (2000) and the developmental objectives outlined in the National Priority Outcomes, amongst others. The IDP identifies a number of strategic goals and objectives, which were broken down into the following core strategic objectives:

			• Financial viability and management • Infrastructure development and service delivery • Good governance and public participation • Institutional development and transformation • District economic development A situation analysis of the DM indicates, amongst others, that 17.4% of households in the DM still live in informal dwellings in informal settlements (IDP, 2012/16).
Dr. Kenneth Kaunda Spatial Development Framework (District SDF)	Dr. Kenneth Kaunda DM	2011	The District SDF is to a large extent based on the proposals of the Provincial SDF (Macro SDF framework for the District) as well as inputs from existing municipal SDFs. As far as Tlokwe is concerned some of the broader proposals were incorporated (such as the urban edge) – special emphasis was placed on the development of the N12 Treasure Corridor between Matlosana and Tlokwe in terms of the optimization of benefits that could emanate from potential projects on the corridor.
Tlokwe Environmental Management Framework (EMF)	Tlokwe Local Municipality	2010	The Tlokwe EMF (2010) mentioned the delineation of management zones that compares the various layers of 'status quo' and 'desired state' information to highlight specific points or areas of convergence between land uses or particular features that retain a high resource value. Six management zones are identified. The proposed site falls within the Urban Zone (Potchefstroom) where residential development is preferred.
Tlokwe Integrated Development Plan (IDP) Review	Tlokwe Local Municipality	2014/ 2015 review	The following environmental initiatives (aligned to NEMA and Local Agenda 21 principles) is identified in the IDP for Tlokwe: • Concentrate on future sustainable development approaches in terms of sustainable development spending. • Encourage environmentally sustainable land development practices and processes; • To being mindful of environmental care and thinking in the development planning and growth of

			sustainable human settlements, economic growth, service provision, the conservation of ecologically sensitive areas and scarce resources, public safety risk minimization, reduction of pollution and carbon emissions and environmental legal compliancy. • Ensure continuous alignment of the SDF with other sector plans and development policies pertaining to transportation, LED, environmental protection, water provision and disaster management. • Advocate the incorporation of environmental thinking into all development plans and policies of Council based on Local Agenda 21 principles. • Ensure compliance with environmental legislation by both the private and public sector. • Monitor key environmental indicators especially water and air pollution. • Promote the "green city" theme. • Ensure that land is used or developed only in accordance with the law • Take into account disaster management • Create synergy between economic, social and environmental concerns • Protect natural, environmental and cultural resources • Preserve the use of prime agricultural land and permit a change only in the public interest
Tlokwe Spatial Development Framework (SDF)	Tlokwe Local Municipality	2014 review	The Tlokwe Spatial Development Framework can be described as an indicative plan showing the desired patterns of land use, direction of growth, special development areas and conservation-worthy areas. The SDF needs to be informed by the vision of the municipal area, the development objectives, as well as the strategies and outputs identified by the ID. The SDF provides spatial guidance in the form of maps and spatial development plans. The Tlokwe SDF (IDP, 2014/15) reveals the following spatial development principles for the municipality: • Containing urban sprawl by providing development guidelines for the creation of compact quality urban spaces serving dense residential areas.

			• Urban integration and urban infilling through the enhancement of urban linkages along mixed land-use corridors and nodes in order to reduce long-distance travel. • Residential intensification through more efficient use of urban land and higher density residential development. • Creating quality well balanced urban environments, which are convenient, attractive and safe. The Tlokwe SDF allocates the proposed site to future residential development (Ikageng Extension 13) (SDF, 2014:47) – refer to figure 3.
Dolomite Risk Management Strategy (DRMS) Setting of Tlokwe City Council	Tlokwe City Council	2011	As part of the Tlokwe City Council (TCC) Dolomite Risk Management Strategy (DRMS) the municipality has developed by-laws regarding dolomite to be adopted and implemented. It is important to note that the design and construction of all existing and new infrastructure and residential developments on dolomite must comply with relevant standards and frameworks as a minimum. The TCC Dolomite Risk Management Strategy indicates that the proposed site is not located in a dolomite risk area.

4.1 OTHER LEGISLATION

Other legislation mainly refers to the following:

- Planning legislation governing the rezoning process and approval of the layout plan.
- Design standards and legislation for services provision such as water, sewerage, electricity, etc.
- Municipal bylaws related to building plans, building regulations, etc.

4.2 RELEVANT GUIDANCE

The following guidance was considered in conducting the EIA:

- DEA, (2012), Guideline 7 – Public participation in the Environmental Impact Assessment process
- DEAT, (2006), Guideline 3 – General guide to the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 4 – Public participation in support of the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 5 – Assessment of alternatives and impacts in support of the Environmental Impact Assessment Regulations

4.3 CONCLUSION

The Environmental Impact Assessment was undertaken in accordance with the Environmental Impact Assessment Regulations (2014) published in GNR 982, in terms of Section 24(5) and 44 of the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended as well as all relevant National legislation, policy documents, and national guidelines.

4 THE NEED AND DESIRABILITY

This section aims to address the following requirements of the regulations:

> Appendix 3.(3) An EIR (...) must include-
>
> (f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;

4.1 THE NEED FOR THE PROPOSED ACTIVITY

The proposed development on the preferred location is a direct result of the urgent housing need experienced in Ikageng. The establishment of the proposed residential area will assist in alleviating the immediate housing shortage. According to the Tlokwe SDF (2014/15) a relatively large percentage of households are still living in informal dwellings (Tlokwe SDF, 2014:38). Approximately 10.4% of households live in an informal dwelling (shack, not in backyard) and 7.4% live in an informal dwelling (shack, in backyard) (Tlokwe SDF, 2014:37). The greatest pressure for the provision of housing is experienced in the western urban areas. The waiting list for houses according to the Housing Sector Plan is estimated at 14 500 houses.

Based on population projections, the total population of Tlokwe municipal area can also increase from 170 868 people in 2013 to 192 945 people in 2018 (5 years) and 218 874 in 2023 (10 years). The number of households can increase from 57 754 in 2013 to 73 176 in 2018 and 92 716 in 2023. According to this projection it is expected that the need for housing will continue to grow. Development of the area concerned will, in closing, not only provide in a tangible housing need, but will also form an important link to ensure the future integrated and long term sustainable development of the urban area – refer to Table 3.2 for the objectives identified by the Tlokwe SDF.

4.2 THE DESIRABILITY OF THE PROPOSED ACTIVITY

The proposed development's contribution towards sustainable development and the associated benefits to society in general is discussed below:

- Alternative land uses - The desirability of the proposed residential extension may be motivated in view of the ideal location of the concerned land, currently vacant and available for development, accessible within the larger urban area and in proximity of employment opportunities. Furthermore the land area proposed for the development consists almost exclusively of abandoned agricultural fields, and nothing of note was identified from an ecological or conservation perspective (apart from the ridge).
- Provision of formal housing - The proposed development will avoid unofficial and informal housing developments through pro-active provision of sufficient number of formal erven.
- Micro-economy - The proposed development will support and promote opportunities for economic development and growth for the society in general, since the proposed development will provide a number of direct and indirect part-time employment opportunities and capacity generation. There are basically two phases of the proposed development, of which each will have a significant impact on the micro economy of the

region. The first being the construction phase, which will positively affect the micro economy, as most of the required building material, labour force, etc. will be obtained from Potchefstroom and surrounding areas. The second phase is the township itself, which will require back-up services for e.g. maintenance, daily necessities, etc. The Township will thus have a long-term positive effect on the micro economy of the Potchefstroom region. Where possible, local people will be employed as maintenance workers, cleaning staff, security personal, etc., which in turn will enrich and benefit the local community.

- Provision of services - The sustainable provision of services such as roads, water, sanitation and waste will be a prerequisite for the development. The minimum standards in respect of service provision are to be adhered to. This implies that the quality of service expected would have to be high and satisfactory.
- Counter urban sprawl and create compact urban spaces - The proposed development is located within the designated urban edge which suggests that it is in line with the principle to counter urban sprawl and to create compact quality urban spaces serving dense residential areas.
- Quality urban environment – The proposed development will create a quality well balanced urban environment, which is convenient, attractive and safe.

5 DESCRIPTION OF ENVIRONMENTAL ISSUES

This section aims to address the following requirements of the regulations:

Appendix 3.(3) An EIR (...) must include-
(g) A motivation for the preferred development footprint within the approved site
(h) a full description of the process followed to reach the proposed development footprint, within the approved site, including –
(i) details of all the development footprint alternatives considered;
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and
(xi) a concluding statement indicating the preferred alternative development location within the approved site.

5.1 CONSIDERATION OF DEVELOPMENT FOORPRINT ALTERNATIVES

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, location, activity, and design alternatives. It is however, important to note that the guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal. Various types of alternatives in relation to the proposed activity were considered as part of the scoping process.

It was concluded that from an environmental perspective the proposed site is considered highly desirable for residential development due to its location within the urban edge (i.e. service provision), environmental conditions (i.e. geology, agricultural potential, ecological and archaeology sensitivity), as well as site access (i.e. to facilitate the movement of people during the operational phase). The only environmentally significant aspect that had to be taken into consideration was the rocky ridge at the western limits of the site. The rocky ridge at the site is part of a conservation corridor of considerable importance in the area and the specialist recommended that it should be viewed as a no-go zone for any developments. One protected tree species, Boscia albitrunca (Shepherd's Tree), is also present at the rocky ridge– refer to Appendix D4 for the Ecological Fauna and Flora Habitat Survey.

The Tlokwe City Council indicated that they require a township establishment of approximately 1200 erven at a gross density of 36 units per hectare in order to address the current housing

backlog. The challenge was therefore to identify a development footprint of approximately 48 hectares while avoiding the environmentally sensitive areas. Since the developable area is more than approximately 48 hectares in extent development footprint alternatives were considered. The process to reach the proposed development footprint, within the approved site, was as follow:

- A site visit was conducted on 24 February 2015 to assess the site.
- A meeting was scheduled shortly after the site visit to discuss the proposed development with the town planner.
- After identifying the potential significant issues, specialists were appointed. A geotechnical study was conducted in order to determine whether the geotechnical conditions at the site are favorable for a township establishment, a heritage study to determine whether the proposed activity will impact on any heritage or archeological artifacts, and ecological fauna and flora habitat survey to determine what the impact of the proposed activity will be on the ecology (fauna and flora) in the area.
- The results of the specialist studies were communicated to the town planner who amended the draft layout plan to incorporate the mitigation and management measures proposed by the specialists.

After the systematic exclusion of the environmentally sensitive areas such as the rocky ridge (as explained above), only approximately 48 hectares remained available for the proposed development. The preferred development footprint is therefore confined to the areas with only gentle slopes where the development will not result in any loss of any particular sensitive species or heritage resources – refer to Appendix A, Figure 4 which illustrates the preferred alternative development location within the approved site. No other development footprints could therefore be considered.

5.2 PUBLIC PARTICIPATION PROCESS

The following sections provide detailed information on the public participation process conducted in terms of Regulations 39 to 44.

5.2.1 General

The public participation process was conducted strictly in accordance with Regulations 39 to 44. The following three categories of variables were taken into account when deciding the required level of public participation:

- The scale of anticipated impacts
- The sensitivity of the affected environment and the degree of controversy of the project
- The characteristics of the potentially affected parties

Since the scale of anticipated impacts is low, the site already being degraded and the fact that no conflict were foreseen between potentially affected parties, no additional public participation mechanisms were considered at this stage of the process. The following actions have already been taken:

- Newspaper advertisement

  Since the proposed development is unlikely to result in any impacts that extent beyond the municipal area where it is located, it was deemed sufficient to advertise in a local newspaper. An advertisement was placed in English in the local newspaper (Herald) on the 2 April 2015 (see Appendix G1) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Environamics Environmental Consultants. I&APs were given the opportunity to raise comments within 30 days of the advertisement.

- Site notices

  Site notices were placed on site in English on the 1 April 2015 to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs were given the opportunity to raise comments by 5 May 2015. Photographic evidence of the site notices is included in Appendix G2.

- Direct notification of identified I&APs

  Identified I&APs, including key stakeholders representing various sectors, were directly informed of the proposed development via email on 2 April 2015 and were requested to submit comments by 5 May 2015. For a complete list of stakeholder details see Appendix G3 and for proof of the emails see Appendix G4. The consultees included:

  - North West Department: Rural, Environment and Agricultural Development (READ)
  - The Department of Water and Sanitation – Gauteng Region
  - The North West Department of Agriculture
  - The South African Heritage Resources Agency (SAHRA)
  - The Provincial Heritage Resources Agency (PHRA), North West
  - Department of Public Works, Roads and Transport, North West
  - The Department of Mineral Resources
  - ESKOM
  - The Dr. Kenneth Kaunda District Municipality
  - The Municipal Manager at the Tlokwe City Council
  - The Local Councilor at the Tlokwe City Council
  - The Ratepayers association

  It was expected from I&APs to provide their inputs and comments by 5 May 2015.

- Direct notification of surrounding land owners and occupiers

  Written notices were also provided to all surrounding land owners and occupiers on 31 March 2015 – refer to Appendix G4 for the proof of correspondence. The surrounding land owners were given the opportunity to raise comments by 5 May 2015.

- Circulation of draft scoping report

The following registered I&APs and State Department were informed of the availability of the Draft Scoping Report:

- NW:READ
- The Department of Water and Sanitation – Gauteng Region
- The North West Department of Agriculture
- The South African Heritage Resources Agency (SAHRA)
- The Provincial Heritage Resources Agency (PHRA), North West
- Department of Public Works, Roads and Transport, North West
- The Department of Mineral Resources
- ESKOM
- The Dr. Kenneth Kaunda District Municipality
- The Municipal Manager at the Tlokwe City Council
- The Local Councilor at the Tlokwe City Council
- The Ratepayers association

It was expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or copy of the Draft report (by 5 May 2015). To date only the Tlokwe City Council provided comments – refer to Appendix E for the Comments and Response Report.

- Circulation of Draft EIR

The following registered I&APs and State Department were informed of the availability of the Draft EIR:

- NW:READ
- The Department of Water and Sanitation – Gauteng Region
- The North West Department of Agriculture
- The South African Heritage Resources Agency (SAHRA)
- The Provincial Heritage Resources Agency (PHRA), North West
- Department of Public Works, Roads and Transport, North West
- The Department of Mineral Resources
- ESKOM
- The Dr. Kenneth Kaunda District Municipality
- The Municipal Manager at the Tlokwe City Council
- The Local Councilor at the Tlokwe City Council
- The Ratepayers association

It was expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or copy of the Draft report (by 31 July 2015). To date only the NW:READ provided comments – refer to Appendix E for the Comments and Response Report.

5.2.2 Consultation process

Regulation 41 requires that the municipality, relevant ward councillor and any organ of state having jurisdiction in respect of any aspect of the activity should be given written notice of the activity. A complete list of all the consultees who received written notice as well as proof of correspondence is attached as Appendices G3 and G4.

5.2.3 Registered I&APs

I&APs include all stakeholders who deem themselves affected by the proposed activity. According to Regulation 43(1) "*A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application*." All registered I&APs had the opportunity to review the Draft EIR that was made available.

5.2.4 Issues raised by IAPs and consultation bodies

Table 5.1 summarizes the comments received from consultation bodies. The full wording and original correspondence is included in Appendix E.

Table 5.1: Issues raised by key consultation bodies

Organisation	Person	Written comment (see Appendix E)	Manner in which the issues were incorporated
Tlokwe City Council	Dr. NE Blaai-Mokgethi	The Tlokwe City Council stated in a letter dated 23 June 2015 that the proposed development is a project of the local municipality and that the municipality will be responsible for the internal and external services of the proposed township and has the capacity for the installation of the services.	The comments received from the municipality were incorporated in the EIR in order to confirm that the municipality will have the capacity to provide the proposed development with the required services.

NW:READ	Mr. Robert Nemanashi	In a letter dated 22 July 2015 the NW:READ provided the following comments on the draft EIR: • The declaration forms from the NW:READ should be signed and completed by all specialists. • The impacts of the nearby waste site were not identified or assessed in the EIR. • All comments received from the I&Aps must be addressed and included in the FEIR.	The Final EIR addressed all the issues raised by the NW:READ.

5.3 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE DEVELOPMENT FOOTPRINT

The following sections provide general information on the biophysical and socio-economic attributed associated with the preferred development footprint.

5.3.1 Biophysical environment

The biophysical environment is described with specific reference to geology and soils, vegetation and landscape features, climate and general biodiversity. However, due to the fact that the area proposed for development is surrounded by residential development and consist exclusively of abandoned agricultural (open) fields, nothing of note was identified from an ecological or conservation point of view apart from the dolomite in the area and the sensitive rocky ridges located on the western border of the site.

5.3.1.1 Geology and soils

According to the AGES (2015) the study area is mainly underlain by ferruginous shale, hornfels and ferruginous quartzite from the Timeball Hill Formation of the Pretoria Group, which forms part of the Transvaal Supergroup. This material is underlain by dolomite from the Malmani Subgroup (Chuniespoort Group, at the base of the Transvaal Supergroup) in depth.

During the Dolomite Risk Management Programme conducted by Messrs. it was determined that the vacant land directly adjacent the project area towards the east is classified as “dolomitic land”, with dolomite occurring up to a depth of 60 m. This portion of land reflects a risk for the formation of sinkholes or subsidences caused by the presence of dolomite. Land towards the west of this 60 m dolomite-land boundary line is deemed “non-dolomitic land”, provided that the Tlokwe City Council continues with active dolomite risk management and groundwater control in the larger dolomite-affected area (AGES, 2015).

5.3.1.2 Vegetation and landscape features

In terms of vegetation type the site falls within the Andesite Mountain Bushveld vegetation type (Mucina and Rutherford, 2006). Andesite Mountain Bushveld vegetation type, is described by Mucina and Rutherford (2006) as 'least threatened'. Andesite Mountain Bushveld vegetation covers areas of Gauteng, North-West, Mpumalanga and Free State Provinces. The region is characterised by dense, medium-tall thorny bushveld with a well-developed grass layer on hill slopes and some valleys with undulating landscape.

It should be noted that the site is also located in close proximity to the Rand Highveld Grassland vegetation type (Mucina and Rutherford, 2006). The Rand Highveld Grassland vegetation type is described by the National list or ecosystems that are threatened and in need of protection (South Africa, 2011) as 'vulnerable'.

According to the ecological habitat survey (refer to Appendix D4) indigenous grass species on the proposed development site include Eragrostis lehmanniana, Melinis repens, Aristida congesta, Themeda triandra, Panicum coloratum and Urochloa mocambicensis. Shrubs and dwarf-shrubs such as Lippia scaberimma, Felicia muricata and Ziziphus zeyheriana are found on the disturbed gentle slopes. Exotic plant species include Opuntia ficus-indica (Prickly Pear) and numerous weed species such as Datura ferox, Schkuhria pinnata,Tagetes minuta and Bidens species. Rocky Ridge: Indigenous tree species such as Dombeya rotundifolia, (Wildpear), Searsia leptodictya (Mountain Karree), Ehretia rigida nervifolia (Puzzlebush), Pavetta zeyheri (Small-leaved Bride's Bush), Acacia robusta (Broadpod Robust Thorn) and Boscia albitrunca (Shepherd's Tree) are present on the rocky ridge. Most of these trees are just above shrub-height. Few shrubs and grassy patches are also present on the rocky ridge. Vegetation is overall disturbed.

The majority of the slopes in the project area are classified as most suitable for development with calculated slopes of between 2 and 6°. Localised and scattered portions throughout the project area have a calculated slope of less than 2° (i.e. very gentle). The central portions of the project area along a north-eastern strike have a calculated slope of between 6 and 12° (intermediately favourable for development). Slopes along the western boundary and localised portions in the central regions of the site have a calculated slope in excess of 12° (least favourable for residential development) (AGES, 2015).

5.3.1.3 Climate

The study area is located in the Summer Rainfall Zone of the Republic of South Africa in quaternary catchment C23L within the Vaal River Catchment Management area. The area is expected to receive a mean annual precipitation of approximately 610 mm.

The climatic N-value (Weinert, 1980) of the area is less than 5, indicating that chemical decomposition of the constituent minerals of the underlying bedrock, rather than mechanical disintegration, is the dominant mode of weathering.

5.3.1.4 Biodiversity

The ecological habitat survey (refer to Appendix D4) lists the possible presence or absence of threatened mammals, birds, reptiles, amphibians and butterflies and concludes that no threatened species are likely to be present at the site.

5.3.2 Description of the socio-economic environment

The socio-economic environment is described with specific reference to social, economic, heritage and cultural aspects.

5.3.2.1 Socio-economic conditions

The Tlokwe Local Municipality is situated in the eastern part of the Dr. Kenneth Kaunda District Municipality which is situated in the south-eastern side of the North West Province. Tlokwe is located on the N12 Treasure Corridor, linking Gauteng with Kimberley in the Northern Cape. The municipal area comprises a total area of 264684,08 km² and is home to a total population of ±170 668 people which amounts to ±57 306 households (Tlokwe SDF, 2014:12).

The Tlokwe City Council contributed 23.2% to the local economy of the Dr Kenneth Kaunda District Municipality. Local economic development has been growing from 1998 to 2011. Table 5.1 below provides a summary of the key socio-economic indicators of the Tlokwe City Council.

VARIABLE	MARKET CHARACTERISTICS
Population size	170 688 people
Household Size	57 306 households 3.0 people/ household
Age profile	12.1% - between 20 and 24 years 33.9% - younger than 20 36.3% - between 20 and 39 years 21.1% - between 40 and 59 years 8.7% - 60 years and older
Level of education (Population segment 20 years and older)	31.5% - some secondary schooling 30.4% - Grade 12 14.3% - higher education Only 7.0% have no schooling
Level of employment	58.6% Economically active of which 78.4% are employed and 21.6% are unemployed
Average household income	All LSM Groups: R141 719 per annum – 2013 R11 810 per month – 2013
Average household income	LSM 4-10+ Groups: R156 298 per annum – 2013 R13 025 per month – 2013
LSM profile	31.7% LSM 1 – 3 68.3% LSM 4 – 10+
Racial profile	African Black – 71.6% White – 20.7% Coloured – 6.8% Indian / Asian – 1.0%
Tenure status	Owned and fully paid off – 42.5% Rented – 34.9% Owned, but not yet fully paid off – 11.8% Occupied rent-free – 10.8%
Dwelling type	64.4% - House or brick structure on separate stand 10.4% - Informal dwelling (shack, not in backyard) 8.6% - Flat or apartment in a block of flats 7.4% - Informal dwelling (shack, in backyard)

Table 5.1: Key socio-economic indicators of Tlokwe City Council (Tlokwe SDF, 2014)

The Tlokwe City Council's SDF (2014:37) also reveals the following positive and negative trends within the local municipality:

<u>Positive Trends:</u>

- The study area population expanded from 128 354 people in 2001, to approximately 170 688 people in 2013.
- The area experienced general improvements in various quality of life and related indicators. In terms of education, the number of people without basic education decreased from 12.5% in 2001 to 7.0% in 2011.

- Unemployment decreased from 36.9% in 2001 to 21.6% in 2011. This is also lower than the national average of 25.6%. However, the number of people that are economically active has decreased, which may point to various underlying factors, which may include inter alia ageing population and / or the large student population.
- Average household income increased from R5 800 in 2001 to R11 810 per month in 2013.
- The percentage of households living a house or brick structure on a separate stand has increased slightly.

Negative trends:

- In spite of the aforementioned improvements, there is a persistently large number of people that are not economically active.
- The LSM 1 – 3 group remains relatively large (31.7%).
- There is still a relatively large percentage of households living in informal dwellings.

5.3.2.2 Cultural and heritage aspects

Special attention was given to the identification of possible cultural or heritage resources on site. The initial site investigation concluded that there are no obvious heritage resources located on the site earmarked for development. However a Heritage Impact Assessment has been conducted to ensure that there would be no impact on cultural or historical features as a result of the proposed development (refer to Appendix D3).

The cultural landscape qualities of the region is made up of a pre-colonial element consisting of Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component. The study found that apart from a few tracks and quarries, very little development existed in the region in earlier times. From this it is deduced that few if any cultural resources dating to the historic period would be found in the study area. Apart from a very low density of Stone Age tools identified in the north-western corner of the study area, no other sites, features or objects of cultural significance have been identified.

6 DESCRIPTION OF THE IMPACTS AND RISKS

This section aims to address the following requirements of the regulations:

Appendix 3.(3)(h) An EIR (...) must include-
(h) a full description of the process followed to reach the proposed development footprint, within the approved site, including –
(v) the impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; and
(viii) the possible mitigation measures that could be applied and level of residual risk.
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-
(i) a description of all environmental issues and risks that were identified during the EIA process; and
(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.
(j) an assessment of each identified potentially significant impact and risk, including-
(i) cumulative impacts;
(ii) the nature, significance and consequences of the impact and risk;
(iii) the extent and duration of the impact and risk;
(iv) the probability of the impact and risk occurring;
(v) the degree to which the impact and risk can be reversed;
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
(vii) the degree to which the impact and risk can be mitigated;
(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;

6.1 SCOPING METHODOLOGY

The contents and methodology of the scoping report aims to provide, as far as possible, a user-friendly analysis of information to allow for easy interpretation.

- Checklist (see section 6.1.1): The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.

- Matrix (see section 6.1.2): The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies, which will be submitted as part of the Environmental Impact Report in order to address the potentially most significant impacts.

6.1.1 Checklist analysis

The independent consultant conducted a site visit on 24 February 2015. The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. Table 6.1 provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format in section 6.2.

Table 6.1: Environmental checklist

QUESTION	YES	NO	Un-sure	Description
1. Are any of the following located on the site earmarked for the development?				
I. A river, stream, dam or wetland		✕		None.
II. A conservation or open space area	✕			Municipal open space is located adjacent the eastern boundary of the site. This area has been identified as a Dolomite Risk Management Zone.
III. An area that is of cultural importance		✕		The Heritage Impact Assessment (refer to Appendix D3) concluded that there would be no impact as a result of the proposed development.
IV. Site of geological significance		✕		None.
V. Areas of outstanding natural beauty		✕		None.
VI. Highly productive agricultural land		✕		None.
VII. Floodplain		✕		None.
VIII. Indigenous forest		✕		None.
IX. Grass land		✕		None.
X. Bird nesting sites		✕		None.
XI. Red data species		✕		None.
XII. Tourist resort		✕		None.
2. Will the project potentially result in potential?				
I. Removal of people		✕		None.
II. Visual Impacts		✕		None.

III. Noise pollution		✕		Construction activities will result in the generation of noise over a period of months. The noise impact is unlikely to be significant.
IV. Construction of an access road	✕			Main access to the development will be via Mogolodi Street on the north and Kgatliso Street which links up with Sarafina Street. The layout plan is included in Appendix C.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		✕		The sewerage system design should ensure that no sewage effluent impacts on the surrounding environment. The Engineering Services report (refer to Appendix D2) provides specifications for the internal sewer system.
VI. Accumulation of large workforce (>50 manual workers) into the site.	✕			Approximately 150 employment opportunities will be created during the construction phase of the project. Although the exact number of workers is uncertain, the construction EMPr stipulates proper management arrangements for the workforce.
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.	✕			The construction EMP stipulates proper management arrangements.
VIII. Job creation	✕			Approximately 170 employment opportunities will be created during the construction and operational phases.
IX. Traffic generation	✕			During operation the development will generate additional traffic, mostly pedestrian, which is provided for in the layout plan.
X. Soil erosion		✕		The site will need to be cleared or graded, which may potentially result in a degree of dust being created, increased runoff and potentially soil erosion. Management measures for soil erosion during construction are included in the EMPr.
XI. Installation of additional bulk telecommunication transmission lines or facilities		✕		None.
3. Is the proposed project located near the following?				
I. A river, stream, dam or wetland	✕			The Spitskopspruit and dam is located approximately 1.5km north of the site.
II. A conservation or open space area		✕		None.
III. An area that is of cultural importance		✕		None.
IV. A site of geological significance	✕			According to the SDF the area north east of the site has been identified as a dolomite aquifer. The proposed development footprint is deemed “non-dolomitic land” – refer to Appendix D1 for the geotechnical report.
V. An area of outstanding natural beauty		✕		None.

VI. Highly productive agricultural land		✕		None.
VII. A tourist resort		✕		None.
VIII. A formal or informal settlement	✕			The existing Mohadin and Ikageng low income residential areas are located directly to the north, west and south of the study area – refer to Figures 1.

6.1.2 Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts, and the mitigation of the potential impacts. The matrix also highlights areas of particular concern (see Table 6.2), which requires more in depth assessment (refer to section 6.7). An indication is also provided of the specialist studies which were conducted. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

In order to conceptualise the different impacts the matrix specify the following:

- Stressor: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- Receptor: Highlights the recipient and most important components of the environment affected by the stressor.
- Impacts: Indicates the net result of the cause-effect between the stressor and receptor.
- Mitigation: Impacts need to be mitigated to minimise the effect on the environment.

Table 6.2: Matrix analysis

LISTED ACTIVITY (The Stressor)	ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS			SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS			MITIGATION OF POTENTIAL IMPACTS			SPECIALIST STUDIES / INFORMATION
			Receptors	Risk / Impact description	Minor	Major	Duration	Possible Mitigation	Mitigation measures provided in EMPr	Level of residual risk	
PLANNING AND DESIGN & CONSTRUCTION PHASE											
Activity 15 (Regulation 984): *"The clearance of an area of 20 hectares or more of indigenous vegetation."*	The potentially most significant impacts will occur during the construction phase of the development, which will include the following activities: • Site clearing and preparation Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled. • Civil works The main civil works are: o Terrain levelling if necessary– Levelling will be minimised by locating the site on the flatter areas within the available 35 hectares. o Housing foundation- The exact method will depend on the detailed geotechnical analysis. o Construction of access and inside roads and pedestrian paths – existing paths will be used were reasonably possible. o Services – the majority of service infrastructure will be buried underground.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Loss or fragmentation of indigenous natural vegetation. • Loss of sensitive species. • Loss or fragmentation of habitats.		-	S	Yes	Table 2.3 & 2.4	Minor	Ecological Fauna and Flora Habitat Survey
			Air	• Air pollution due to the increase of traffic of construction vehicles.	-		S	Yes	Table 2.4	Minor	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Physical and chemical degradation of the soils by construction vehicles (hydrocarbon spills).	-		S	Yes	Table 2.4	Minor	-
			Geology	• Collapsible soil. • Seepage (shallow water table). • Active soil (high soil heave). • Erodible soil. • Hard/compact geology. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to dolomitic risks. • Areas subject to flooding.		-	S	Yes	Table 2.4	Minor	Geotechnical Study
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the local sewage plant. • Increase in construction vehicles on existing roads.		-	S	Yes	-	Minor	Confirmation from the Local Municipality
			Ground water	• Pollution due to construction vehicles.	-		S	Yes	Table 2.4	Minor	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion.	-		S	Yes	Table 2.4	Minor	-
		SOCIO ECONOMIC ENVIR	Local unemployment rate	• Job creation. • Business opportunities. • Skills development.		+	S	Yes	Table 2.4	Minor	-

			Visual landscape	• Potential visual impact on residents and motorists in close proximity to proposed facility.	-		S	Yes	Table 2.4	Minor	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	Table 2.4	Minor	-
			Health & Safety	• Air/dust pollution. • Road safety. • Impacts associated with the presence of construction workers on site and in the area.	-		S	Yes	Table 2.4	Minor	-
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery such as drills and people working on the site.	-		S	Yes	Table 2.4	Minor	-
			Tourism industry	• Since there are no tourism facilities in close proximity to the site, the proposed activities will not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	N/A	Minor	-
			Heritage resources	• Removal or destruction of archaeological and/or palaeontological sites. • Removal or destruction of buildings, structures, places and equipment of cultural significance. • Removal or destruction of graves, cemeteries and burial grounds.		-	S	Yes	Table 2.4	Minor	Heritage Impact Assessment
	OPERATIONAL PHASE										
-	The following activities will take place during the operational phase of the proposed development: • <u>Township</u> – Residential and associated land uses are proposed on the site. • <u>Supporting Infrastructure</u> - Bulk services infrastructure (water, sewage, waste, electricity) will need to be provided in order to ensure the sustainability of the proposed development. • <u>Roads</u> – A new access road(s) and an internal road network will be provided.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Fragmentation of habitats. • Establishment and spread of declared weeds and alien invader plants (operations).	-		L	Yes	Table 2.5	Minor	-
			Air quality	• The proposed development will not result in any air pollution during the operational phase.	N/A	N/A	N/A	N/A	N/A	Minor	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Physical and chemical degradation of the soils.	-		L	Yes	Table 2.5	Minor	-
			Geology	• Collapsible soil. • Seepage (shallow water table). • Active soil (high soil heave). • Erodible soil. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to dolomitic risks. • Areas subject to flooding.		-	S	Yes	Table 2.5	Minor	Geotechnical Study
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increased consumption of water. • Increase in storm water. • Increased consumption of electricity.		-	L	Yes	Table 2.5	Minor	Confirmation from the Local Municipality & services report

				• Impacts of the rehabilitated closed municipal waste site on the proposed development.						
			Ground water	• Leakage of hazardous materials. Leakage of household oils can contaminate water supplies.	-		L	Yes	Table 2.5	Minor	-
			Surface water	• Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion. • Leakage of hazardous materials.	-		L	Yes	Table 2.5	Minor	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. • Skills development.	+		L	Yes	Table 2.5	Minor	-
			Visual landscape	• Since the site is located in an area characterised by residential developments, visual impacts will not be applicable.	N/A	N/A	N/A	N/A	N/A	Minor	-
			Traffic volumes	• Increased traffic from households located in the area.	-		L	Yes	Table 2.5	Minor	-
			Health & Safety	• Services (waste, water, storm water, sewerage) design failures occur.		-	L	Yes	Table 2.5	Minor	Engineering Services Report
			Noise levels	• The proposed development will not result in any noise pollution during the operational phase.	N/A	N/A	N/A	N/A	N/A	Minor	-
			Tourism industry	• Since there are no tourism facilities in close proximity to the site, the proposed activities will not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	N/A	Minor	-
			Heritage resources	• It is not foreseen that the proposed activity will impact on heritage resources or vice versa.	N/A	N/A	N/A	N/A	N/A	Minor	-
			Local community	• Quality well balanced urban environment, which are convenient, attractive and safe.		+	L	Yes	N/A	N/A	-

(N/A) No impact (+) Positive Impact (-) Negative Impact (S) Short Term (M) Medium Term (L) Long Term

6.2 KEY ISSUES IDENTIFIED

From the above it is evident that mitigation measures are available for potential impacts associated with the proposed activity and development phases. The scoping methodology identified the following key issues which are addressed in the EIA report:

6.2.1 Impacts during the construction phase

During the construction phase the following listed activity will have various potential impacts on the biophysical and socio-economic environment:

- Activity 15 (Regulation 984): *""The clearance of an area of 20 hectares or more of indigenous vegetation."*

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The potentially most significant impacts relate to the impacts on the fauna and flora, geology, existing service infrastructure, socio-economic impacts such as the provision of temporary employment and other economic benefits, and the impacts on heritage resources.

6.2.2 Impacts during the operational phase

During the operational phase the study area will serve as a residential extension of Ikageng. The potential impacts during this phase of the development will be permanent in nature. The negative impacts generally relate to impacts associated with the geology, existing service infrastructure, and potential health and safety impacts. The operational phase will have a direct positive impact through the provision of employment opportunities for its duration, and the provision of quality housing.

6.2.3 Cumulative impacts

Cumulative impacts could arise if other similar projects are constructed in the area. According to the SDF (2014:68) the following areas may also be considered for residential development:

- Area north of Promosa (New township establishment is earmarked for this area)
- Area west of Dassierand (Area earmarked for future development)
- Portions of the farm Vyfhoek (Area proposed for an integrated human settlement development)
- Area south of the urban area (vicinity of sewer works) – This area must accommodate future extension of sewer works as well as a proposed new regional cemetery.

Given the location of the sites all located within the Tlokwe City Council area of jurisdiction the potential for cumulative impacts associated with the provision of bulk services is rated as high. The potential cumulative impacts will be considered during the significance rating of the potential impacts (refer to Section 6.7 of this report).

6.3 ASPECTS TO BE ASSESSED

Table 6.3 below provides a summary of the aspects that need to be assessed as part of the EIR. The aspects are also linked to specialist information that has been obtained.

Aspects / potential impacts	Description of the aspect	Specialist studies / technical information
Impacts during construction phase:		
• Impacts on the fauna and flora	Refer to table 6.2	Ecological Fauna and Flora Habitat Survey
• Impacts associated with the geology of the site	Refer to table 6.2	Geotechnical study
• Impacts on existing services infrastructure	Refer to table 6.2	Confirmation from the Local Municipality
• Temporary employment and other economic benefits	Refer to table 6.2	EAP assessment
• Impacts on heritage resources	Refer to table 6.2	Heritage Impact Assessment
Impacts during the operational phase:		
• Impacts associated with the geology of the site	Refer to table 6.2	Geotechnical study
• Health and safety impacts	Refer to table 6.2	Engineering Services Report
• Pressure on existing services infrastructure	Refer to table 6.2	Confirmation from the Local Municipality
• Impacts of the rehabilitated closed municipal waste site on the proposed development.	Refer to table 6.2	EAP assessment
• Provision of quality housing	Refer to table 6.2	EAP assessment
• Cumulative biophysical impacts resulting from similar developments in close proximity to the proposed activity.	Refer to table 6.2	EAP assessment

Table 6.3: Aspects to be assessed

6.4 SUMMARY OF RECOMMENDATIONS FROM SPECIALIST STUDIES

To address the key issues highlighted in the previous section the following specialist studies and processes were commissioned:

- Geotechnical report - conducted by AGES (see Appendix D1).
- Engineering services report - conducted by Moedi (see Appendix D2).
- Heritage report - conducted by Mr. J.A. van Schalkwyk (see Appendix D3).
- Ecological fauna and flora habitat survey - conducted by Anthene Ecological CC (see Appendix D4).

The following sections summarise the main findings and recommendations from the specialist reports in relation to the key issues raised during the scoping phase. It will also provide an indication as to how these finding and recommendations have been included in the final assessment report.

Issue 1: Geotechnical suitability

The geotechnical suitability of the site for the proposed development needed to be determined. The main question which needed to be addressed was: Will the geotechnical conditions at the site be favorable for a township establishment? The geotechnical investigation (refer to Appendix D1) confirmed the following:

- Slope stability and erosion: No significant effect is expected due to erosion over the majority of the site. The areas with steeper slopes may be prone to erosion. Specialised methods for the stabilisation of cuts into the natural slopes are not deemed necessary.

- Excavation classification – Bulk services: No significant problems are foreseen within the soil material to a depth of between 0.80 and 3.00 m (mean 1.85 m) over the majority of the project area during the excavation of foundation trenches by means of pick-and-shovel or a light mechanical excavator (soft excavation class). However some excavation difficulty is foreseen in the three rocky ridges. The following additional comments on excavation of service trenches apply:

    - Trenches may have to be dewatered, due to the seasonal formation of perched water table in localised areas of the site at relatively shallow depth, especially after heavy precipitation events.
    - The sidewalls of excavations in excess of 1.0 m should be shored to prevent injury or death due to the high risk and probability of sidewall failure by collapse and/or overbreak.

- Geotechnical constraints: The geotechnical characteristics exhibited by the soil material covering the study area will have the following effects with regard to implementation of subsidy housing developments:

    - *Seepage / groundwater*: The area exhibits the potential for the seasonal occurrence of a seasonal perched groundwater table. Surface and/or subsurface drainage and improved damp proofing measures to be considered for implementation beneath structures. Service trenches may have to be dewatered during construction
    - *Erodability of soil*: The average slope measured in any direction is less than 10%. No significant effect expected over the majority of the site. Localised effect is expected in areas with steeper slopes
    - *Difficulty of servicing of land due to slopes*: The general slope within the study area is deemed suitable for the servicing of land. Cut and fill techniques are expected for the footprints of houses.
    - *Difficulty of excavation*: The average slope within the study area is less than 10%. Steeper slopes can be expected in localised areas characterised by rocky ridges. All of

the material occurring to a depth of between 0.80 and 3.00 m (mean 1.85 m) classifies as soft excavation.

- *Precautionary measures in sites underlain by dolomite/limestone*: Dolomite occurs beneath the project area at depths in excess of 60 m and as such is classified as "*non-dolomitic land".* The area directly towards the east of the project area is classified as "*dolomite land*" (i.e.: dolomite within the first 60 m). Due cognisance should be given during the planning and design of all services and storm water plans for the development, in order not to have a negative impact on the adjacent dolomitic land.
- *Founding conditions*: The soil material covering and underlying the area is slightly compressible and moderately expansive. Localised shallow bedrock outcrops and sub-outcrops occur across the site. Masonry houses will require foundation design, building procedures and precautionary measures.

Issue 2: Services provision

The engineering services report needed to investigate the capacity of the existing service infrastructure. The main question which needed to be addressed was: What is the status of infrastructure services and to what extent will upgrading be required to ensure sustainable services delivery? The engineering services report (refer to Appendix D2) confirmed the following with regards to Bulk and Link Services:

- Water: Raw water for the urban areas of the Greater Potchefstroom/Tlokwe is abstracted from the Mooi River catchment and purified at the Lakeside Treatment Works as well as at the "Old Works". The Lakeside Treatment Works has a theoretical design capacity of 60Mℓ/day although the plant currently only delivers approximately 50Mℓ/day during peak demand periods. The Old Plant with a design treatment capacity of 13Mℓ/day currently delivers approximately 5Mℓ/day.

  Water for the proposed development will be pumped from the Potchefstroom Water Treatment Works to the Ventersdorp Road Pumping Station and will be further transferred via a 600mm steel rising main to the Eersterandjies Reservoirs. The Eersterandjies storage system consists of 5Mℓ and 10Mℓ reservoirs. The Municipality is in the process of upgrading the water treatment capacity. Sufficient bulk water treatment and supply capacity will therefore be available. Adequate network pressure will also be available during peak demand periods.

- Sewer: The Tlokwe Waste Water Treatment Plant (WWTP) is a Class A facility with hydraulic capacity of close to 50Mℓ/day. The plant is currently treating an average of 33 – 34 Mℓ/day which implies that it has spare capacity of between 12 – 15 Mℓ/day. The topography dictates division of the proposed development area into two primary sewage drainage zones – refer to the services report for a description of the two zones.

  All sewerage runoff will therefore be handled by gravity flow. The existing infrastructure has sufficient capacity to handle the anticipated additional hydraulic effluent load to be generated by the proposed development. Sufficient link sewer infrastructure and bulk treatment capacity is therefore available to accommodate the development.

- Access: Main access to the development will be via Mogolodi Street on the north and Kgatliso Street which links up with Sarafina Street. Both Mogolodi- and Sarafina Streets are primary access collector roads that links-up with the N12 by means of formalized intersections.
- Storm-water: The topography of the site has a fairly steep natural fall towards the eastern side. Storm-water runoff will therefore drain towards the natural water course on the eastern side through open storm-water path-ways provided in the township layout.
- Refuse: Refuse from the proposed development will be spoiled at the existing municipal solid waste facility. The Municipal dumping site is operated and maintained by the Tlokwe City Council in accordance with the requirements of the Department of Water & Sanitation (DWS).
- Electricity: The existing Substation S2 in Ikageng Ext. 7 does have the required capacity to feed the proposed development with 2000kVA. The City Council will consider the installation of a ring feed if further development in the greater area justifies the need. This will improve availability of power to the development.

The engineering services report (refer to Appendix D2) confirmed the following with regards to internal services:

- Water: The internal water supply network will consist of PVC pipes of varying diameter according to designs of the Civil Engineer. The internal network will be designed to ensure ample capacity to comply with fire flow demands. Bulk water meters for purposes of water management will be provided. Consumer water meters will be installed by the municipality according to municipal policy.
- Sewer: An internal sewer network of 160mm diameter pipes will be installed. Manholes and rodding eyes will be constructed at necessary positions to allow for effective maintenance. The internal sewer system will be connected to the existing main gravity sewer systems of the municipality.
- Roads: The proposed township layout makes provision for internal connector roads providing access to each individual property as shown on the plan – refer to Appendix C. The design of the internal access roads shall provide for an appropriate road surface.
- Storm-water: The internal roads of the Proposed Township shall be designed as water carriers to prevent ponding and flooding with associated damage to properties. Storm-water will generally be handled as surface flow to follow the natural runoff patterns as far as possible.
- Refuse: Refuse removal is conducted by the Local Authority and their services will be extended to the proposed development.
- Electricity: Overhead reticulation shall be provided to the proposed development area. Low voltage overhead reticulation shall be provided from the Low voltage distribution kiosk mounted below the pole transformers. Street lights shall be installed on LV poles at intervals of not greater than 30meter. The entire electrical network shall be taken over by the Tlokwe City Council for purposes of operation and energy billing.

All municipal services namely water, sewer, roads, storm-water and electricity infrastructure as well as refuse removal functions shall be taken over by the municipality who will be responsible for the operation and maintenance thereof.

Issue 3: Heritage resources

The heritage assessment needed to determine whether the proposed activity will impact on any heritage or archeological artifacts.

The heritage assessment (refer to Appendix D3) confirmed that the cultural landscape qualities of the region is made up of a pre-colonial element consisting of Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component. Apart from a very low density of Stone Age tools identified in the north-western corner of the study area, no other sites, features or objects of cultural significance have been identified. There would be no impact as a result of the proposed development.

Therefore, from a heritage point of view it is recommended that the proposed development continue on condition that if archaeological sites or graves are exposed during development activities, it should immediately be reported to a heritage consultant so that an investigation and evaluation of the finds can be made.

Issue 4: Ecological impacts

The ecological fauna and flora habitat survey (refer to Appendix D4) needed to investigate the ecological value of the site. The main question which needed to be addressed was: What will the impact of the proposed activity be on the ecology (fauna and flora) in the area?

The survey concluded that the vegetation at the site appears to be disturbed and edge effects of the surrounding settlements and residential areas are conspicuous (tracks, informal dumping, paint on rocks, burnt sites, informal sleeping sites). The narrow rocky ridge directly adjacent to residential areas and settlements on the western side still harbours some diversity of trees, plants and invertebrates. One protected tree species, *Boscia albitrunca* (Shepherd's Tree), is present at the rocky ridge at the western limits of the site. This tree species does not fall on the actual proposed footprint at the site which excludes the rocky ridge at the western boundary of the site and is unlikely to be impacted given the present proposed footprint. If the development is approved at the gentle slopes at the site that excludes the rocky ridge, it is unlikely that there will be loss of any particular ecosystem or corridor of special conservation concern. The rocky ridge at the site is part of a conservation corridor of considerable importance in the area and should be viewed as a no-go zone for any developments.

There appears to be no loss of any particular sensitive species, if the site is developed according to a footprint that is confined to the gentle slopes at the site. Whilst the sensitivity on the flatter terrain is low to medium the rocky ridge at the site should be regarded as of high sensitivity. If the development is approved at the flatter terrain at the site no loss of sensitive species is anticipated.

Site is in an area with dense residential areas and ecological disturbances are visible. Conservation planning in the area should be viewed within the frame of urban biodiversity conservation. Therefore if the development is approved at the flatter terrain an opportunity presents

itself to cultivate indigenous plant species and contribute to the biodiversity conservation of the larger area with its important conservation corridor.

6.5 METHOD OF ENVIRONMENTAL ASSESSMENT

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed activity. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in Table 6.4.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

6.5.1 Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table 7.2: The rating system

NATURE
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.
GEOGRAPHICAL EXTENT

This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).

4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.

IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.

29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

6.6 CONSIDERATION OF CUMULATIVE IMPACTS

Section 2 of the NEMA requires the consideration of cumulative impacts as part of any environmental assessment process. The EIA Regulations (2014) determine that cumulative impacts, *"in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*". Cumulative impacts can be incremental, interactive, sequential or synergistic. EIAs have traditionally failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires coordinated institutional arrangements;
- Complexity - dependent on numerous fluctuating influencing factors which may be completely independent of the controllable actions of the proponent or communities; and
- Project level investigations are ill-equipped to deal with broader biophysical, social and economic considerations.

Despite these challenges, cumulative impacts have been afforded increased attention in this EIR and for each impact a separate section has been added which discusses any cumulative issues, and where applicable, draws attention to other issues that may contextualise or add value to the interpretation of the impact. Finally, comment is provided on the potential cumulative impacts which could result should this development, and others like it in the area, be approved.

6.7 SIGNIFICANCE OF POTENTIAL IMPACTS

The following sections present the outcome of the significance rating exercise. The results suggest that none of the key issues identified as part of the scoping process had a negative high environmental significance after mitigation. Instead the overall score indicate a low environmental significance score.

5.1.1 Impacts that may result from the construction phase

Direct impacts: During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The potentially most significant impacts relate to the impacts on the fauna and flora, geology, existing service infrastructure, socio-economic impacts such as the provision of temporary employment and other economic benefits, and the impacts on heritage resources. The abovementioned impacts are discussed in more detail below:

- Loss or fragmentation of habitats – The project will comprise a green-fields area of approximately 48 hectares and may therefore result in the loss of habitat. The narrow rocky ridge directly adjacent to residential areas and settlements on the western side still harbours some diversity of trees, plants and invertebrates. If the development is approved at the gentle slopes at the site that excludes the rocky ridge, it is unlikely that there will be loss of any particular ecosystem or corridor of special conservation concern. The rocky ridge at the site is part of a conservation corridor of considerable importance in the area (refer to Appendix D4 for the fauna and flora ecological habitat survey).

Loss or fragmentation of habitats	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	High (3)	High (3)
Duration	Permanent (4)	Permanent (4)
Magnitude	Medium (2)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Low cumulative impact (2), since township are usually located within the urban edge where environmental sensitivity is less significant.	
Significance	Negative Medium (34)	Negative Low (17)
Can impacts be mitigated?	Yes. If the development is approved, contractors must ensure that no animal species are disturbed, trapped, hunted or killed. The narrow rocky ridge at the site should be conserved as a no-go zone for any developments. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for development in order to have the least possible edge effects on the ecosystem. Table 2.3 and 2.4 in the EMPr also provides numerous mitigation	

	measures related to fauna and flora– refer Appendix F.

- Loss of sensitive species - In terms of vegetation type the site falls within the Andesite Mountain Bushveld vegetation type which is described by Mucina and Rutherford (2006) as 'least threatened'. The ecological habitat survey (refer to Appendix D4) confirmed that none of the threatened and near-threatened plant species are likely to occur at the plains on the site. None of the other declining, data deficient other plant species of particular conservation priority occur on the plains at the site. One protected tree species, Boscia albitrunca (Shepherd's Tree), is present at the rocky ridge at the western limits of the site. This tree species does not fall on the actual proposed footprint at the site which excludes the rocky ridge at the western boundary of the site and is unlikely to be impacted given the present proposed footprint. Protected tree species under the National Forests Act No. 84 of 1998. In terms of a part of section 51(1) of Act No. 84 of 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister. No threatened species are likely to be present at the site.

Loss or sensitive species	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Permanent (4)	Permanent (4)
Magnitude	Medium (2)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Low cumulative impact (2), since township are usually located within the urban edge where environmental sensitivity is less significant.	
Significance	Negative Medium (30)	Negative Low (14)
Can impacts be mitigated?	Yes. If the development is approved, contractors must ensure that no animal species are disturbed, trapped, hunted or killed. The rocky ridge at the site should be viewed as a no-go zone for any developments. If the development is approved, contractors must ensure that no mammalian species are disturbed, trapped, hunted or killed during the construction phase. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for the development and have the least possible edge effects on the surrounding area. The EMPr also provides numerous mitigation measures – refer to table 2.3 and 2.4 of the EMPr Appendix F.	

- Loss of habitat connectivity and open space – The project will comprise a green-fields area of approximately 48 hectares and may therefore result in the loss of habitat connectivity and open space. The narrow rocky ridge directly adjacent to residential areas and settlements on the western side still harbours some diversity of trees, plants and invertebrates. If the development is approved at the gentle slopes at the site that excludes the rocky ridge, it is unlikely that there will be loss of any particular ecosystem or corridor of special conservation concern (refer to Appendix D4 for the fauna and flora ecological habitat survey).

Loss or habitat connectivity and open space	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	High (3)	High (3)
Duration	Permanent (4)	Permanent (4)
Magnitude	Medium (2)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resource (2)	Local (2)
Cumulative impact	Low cumulative impact (2), since township are usually located within the urban edge where environmental sensitivity is less significant.	
Significance	Negative medium (34)	Negative low (17)
Can impacts be mitigated?	Yes. If the development is approved, contractors must ensure that no animal species are disturbed, trapped, hunted or killed. The narrow rocky ridge at the site should be conserved as a no-go zone for any developments. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for development in order to have the least possible edge effects on the ecosystem. Table 2.3 and 2.4 in the EMPr also provides numerous mitigation measures related to fauna and flora– refer Appendix F.	

- Impacts of the geology on the proposed development – A geotechnical investigation was conducted in order to assess the geological character of the area in which the site is located and to assess the suitability of the area with regard to residential development, amongst others – refer to the Appendix D1 for the geotechnical investigation. The results of the investigation reveal that although the study area exhibits some geotechnical characteristics deemed to have an adverse effect on residential development; these characteristics do not disqualify the area from being used for the proposed development, but rather require the implementation of site-specific precautionary measures with regard to design and construction of the proposed structures. The site is therefore classified as marginally and conditionally favourable for residential development, provided that specific attention is given to the mentioned geotechnical constraints as well as the specified dolomitic land precautions.

Geological impacts	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Negligible cumulative impact (1).	
Significance	Negative low (16)	Negative low (7)
Can impacts be mitigated?	The geotechnical investigation (refer to Appendix D1) provides recommendations with regards to design and construction for each of the geological zones identified. The following generalized recommendations are proposed for implementation across the entire study area: • Excavated material was backfilled with the TLB, and as such not re-compacted into layers. Due cognisance should be given to the following adverse conditions: o It should be noted that if structured are considered to be positioned across or over excavated test pits, the material must be properly compacted in order to prevent differential settlement from occurring; o The same applies for structures positioned across or over existing septic tanks, where excavations for the removal of large trees took place, waste pits, swimming pools, old foundations and the like. • Proper site drainage, including water runoff from roofs, must be implemented to prevent ponding of surface water and large-scale changes in soil moisture beneath the structures and near foundations on a seasonal basis. • Care must be taken to prevent the ponding of storm water in those areas where drainage structures cross underneath roads. • The gentle slopes generally exhibited	

	throughout the project area may require the use of terracing beneath structures and additional masonry units in foundation walls. Very occasional nearly flat-lying portions will present difficulties with the provision of water-borne sanitation, as well as site drainage, with highly localized ponding of surface water expected after heavy precipitation events. • Adequate damp proofing will be required beneath foundations and floor slabs. • The following additional comments on excavation of service and/or foundation trenches apply: o Trenches may have to be dewatered after heavy precipitation events; o The sidewalls of excavations in excess of 1.0 m should be shored to prevent injury or death due to the risk and probability of sidewall failure by collapse and/or overbreak. • It is recommended that sealed on-site sanitation systems that do not rely on seepage for the disposal of liquid wastes (e.g.: septic tanks that drain into "French Drain"-type soak-away) be utilized in the proposed development, mainly due to: o The difficulty of excavating the soak-always into the weathered bedrock occurring at relatively shallow depth; o A possible risk of groundwater pollution. It is also recommended that • A GFSH-2 Phase 2 geotechnical investigation be conducted for NHBRC enrolment prior to the construction phase of the investigation (bulk services and foundations), in order to refine the estimations made in excavatability depths, per-erf site class designation and subsidy variation calculations. • An engineering geologist or geotechnical engineer should inspect all foundation- and service trenches prior to construction, in order

	to verify and evaluate any soil characteristics in variance with that found during this investigation. • Detailed site-specific geotechnical investigations are recommended in order to adequately determine site-specific geotechnical characteristics and founding conditions with regard to specific land uses (e.g.: multi-storey buildings, filling stations, etc.). • It is recommended that further groundwater contamination be prevented by means of sustainable mitigation and management measures of all sanitation systems. Table 2.4 in the EMPr also provides mitigation measures related to the geology of the site – refer Appendix F.

- Temporary noise disturbance - Construction activities will result in the generation of noise over a period of months. Sources of noise are likely to include vehicles, the use of machinery and people working on the site. The noise impact is unlikely to be significant; but construction activities should be limited to normal working days and hours (7:00 – 17:00).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Probable (3)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	The impact would result in negligible to no cumulative effects (1).	
Significance	Negative low (20)	Negative low (9)
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in tables 2.4 of the EMPr.	

- Generation of waste - general waste, construction waste, sewage and grey water - The workers on site are likely to generate general waste such as food wastes, packaging, bottles, etc. Construction waste is likely to consist of packaging, scrap metals, waste cement, etc. The general and construction waste must be appropriately disposed of i.e. taken to the nearest licensed landfill. Sufficient ablution facilities will have to be provided, in

the form of portable/VIP toilets. No pit latrines, French drain systems or soak away systems shall be allowed.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local/district (2)	Local/district (2)
Probability	Definite (4)	Definite (4)
Duration	Short term (1)	Short term (1)
Magnitude	Low (1)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community.	
Significance	Negative medium (13)	Negative low (13)
Can impacts be mitigated?	Yes, it is therefore important that all management actions and mitigation measures included in the EMPr are implemented – refer to table 2.4.	

- Impacts on heritage objects – In accordance with Section 38 of the NHRA, an independent heritage consultant was therefore appointed to conduct a Heritage Impact Assessment (HIA) to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the township. The Heritage Impact Assessment (Refer to Appendix D3) concluded that there would be no impact as a result of the proposed development.

Impacts on heritage objects	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Low cumulative impact (2). Should these impacts occur, there may be a cumulative impact on the preservation of heritage objects in the area.	
Significance	Negative low (24)	Negative low (12)
Can impacts be mitigated?	If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and	

	evaluation of the finds can be made. Also refer to the mitigation measures provided in table 2.4 of the EMPR – Appendix F.

- Temporary employment and other economic benefits (business opportunities and skills development) – Approximately 150 temporary job opportunities will be created to undertake the construction activities. It is likely that local construction companies will be partnered with. The construction period is expected to extend over a period of ~12 months. It is also likely that some materials such as construction related consumables will be sourced locally.

Temporary employment and other economic benefits	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Extent	Local (2)	Local (2)
Probability	Probable (3)	Definite (4)
Duration	Short term (1)	Short term (1)
Magnitude	Low (1)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - The community will have an opportunity to better their social and economic well-being, since they will have the opportunity to upgrade and improve skills levels in the area.	
Significance	Positive Low (14)	Positive Medium (30)
Can impacts be mitigated?	In order to enhance local employment and business opportunities associated with the construction phase the following measures should be implemented: • Where reasonable and practical local contractors should be appointed and a 'locals first' policy should be implemented, especially for semi and low-skilled job categories. • Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria; Also refer to table 2.4 of the EMPr for mitigation measures related to employment.	

Indirect impacts: The nuisance aspects generally associated with the installation of infrastructure will also be applicable to this development, which relates primarily to the increase in construction vehicle traffic, impact of construction workers on local communities, and increased risk of veld fires.

- Increase in construction vehicle traffic – Building materials will be transported to site on a daily basis and there will be an increase in construction vehicles on access roads. The movement of heavy construction vehicles during the construction phase has the potential to damage local roads and create dust and safety impacts for other road users in the area. Main access to the site will be via Mogolodi Street on the north and Kgatliso Street which links up with Sarafina Street on the south. Both Mogolodi- and Sarafina Streets are primary access collector roads that links-up with the N12 by means of formalized intersections. The movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users. The contractor should be required to ensure that damage to the road is repaired before the handover of the project.

Increase in construction vehicle traffic	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Probable (3)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3). If damage to roads is not repaired then this will result in higher maintenance costs for vehicles and other road users. The costs will be borne by road users who were no responsible for the damage.	
Significance	Negative low (22)	Negative low (11)
Can impacts be mitigated?	The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include: • The contractor must ensure that damage caused by construction related traffic is repaired before the completion of the construction phase. The costs associated with the repair must be borne by the contractor; • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers; • All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict	

	speed limits. Also refer to table 2.4 of the EMPr for mitigation measures related to social impacts

- Impact of construction workers on local communities - The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks.

Impacts of construction workers on local communities	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (1)	Local (1)
Probability	Probable (3)	Probable (3)
Duration	Short term for community as a whole (1) Long term-permanent for individuals who may be affected by STDs etc. (4)	Short term for community as a whole (1) Long term-permanent for individuals who may be affected by STDs etc. (4)
Magnitude	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STDs etc. (10)	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STDs etc. (10)
Reversibility	Completely reversible (1) but not in case of HIV and AIDS	Completely reversible (1) but not in case of HIV and AIDS
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative effects (3), impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.	
Significance	Low for the community as a whole (13) Medium for specific	Low for the community as a whole (13) Medium for specific

	individuals who may be affected by STDs etc. (52)	individuals who may be affected by STDs etc. (52)
Can impacts be mitigated?	Yes, the potential risks associated with construction workers can be effectively mitigated. The detailed mitigation measures are outlined in the EMPr for the Construction Phase. Aspects that should be covered include: • Where possible a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories should be implemented; • A code of conduct should be developed for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation; • An HIV/AIDS awareness programme for all construction workers should be implemented at the outset of the construction phase; • The contractor should provide transport to and from the site on a daily basis for low and semi-skilled construction workers. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site; • It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site. Also refer to table 2.4 of the EMPr for mitigation measures related to social impacts.	

- Increased risk of veld fires - The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could in turn pose a threat to residents in the area. The potential risk of grass fires is heightened by the windy conditions in the area, especially during the dry, windy winter months.

Increased risk of veld fires	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)

Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Negligible cumulative effects (1), provided losses are compensated for.	
Significance	Negative low (18)	Negative low (7)
Can impacts be mitigated?	The mitigation measures include: • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas; • Contractor to provide adequate fire fighting equipment on-site; • Contractor to provide fire-fighting training to selected construction staff; • No construction staff, with the exception of security staff, to be accommodated on site overnight. Also refer to table 2.4 of the EMPr for mitigation measures related to social impacts	

5.1.2 Impacts that may result from the operational phase

Direct impacts: During the operational phase the study area will serve as a residential extension of Ikageng. The potential impacts during this phase of the development will be permanent in nature. The negative impacts generally relate to impacts associated with the geology, existing service infrastructure, and potential health and safety impacts. The operational phase will have a direct positive impact through the provision of employment opportunities for its duration, and the provision of quality housing. The abovementioned impacts are discussed in more detail below:

- Development of sinkholes – Dolomite occurs beneath the project area at depths in excess of 60 m and as such is classified as "non-dolomitic land". The area directly towards the east of the project area is classified as "dolomite land" (i.e.: dolomite within the first 60 m). Due cognisance should be given during the planning and design of all services and storm water plans for the development, in order not to have a negative impact on the adjacent dolomitic land (refer to the geotechnical investigation attached as Appendix D1).

Development of sinkholes	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of	Marginal loss of

	resources (2)	resources (2)
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
Significance	Negative medium (30)	Negative low (20)
Can impacts be mitigated?	Yes. Due cognisance should be given during the planning and construction of the proposed housing development to prevent the encroachment of development towards the east and onto dolomite land. Furthermore, the design and management of storm water and bulk services must be adequately designed to prevent the localised and concentrated discharge of water (or fluids) onto the dolomite land towards the east (refer to the geotechnical investigation attached as Appendix D1). Table 2.5 in the EMPr also provides mitigation measures related to the geology of the site – refer Appendix F.	

- Pressure on existing service infrastructure and potential health and safety impacts – The Services Report (refer to Appendix D2) confirms that sufficient bulk water treatment and supply capacity will be available. The report also confirms that sufficient link sewer infrastructure and bulk treatment capacity is available to accommodate the development. The local Municipality also confirmed in a letter dated 23 June 2015 that the proposed development is a project of the local municipality and that the municipality will be responsible for the internal and external services of the proposed township and has the capacity for the installation of the services – refer to Appendix E for a copy of the letter.

Pressure on existing service infrastructure	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3) - Should these impacts occur, there will be a cumulative impacts on the wider area.	
Significance	Negative medium (30)	Negative low (13)
Can impacts be mitigated?	Yes. It is therefore important that all management	

	actions and mitigation measures included in the EMPr are implemented to ensure that these impacts do not occur – refer to table 2.5 of the EMPr.

- Increase in storm water runoff – The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion, especially where vegetation will be cleared. The topography of the site has a fairly steep natural fall towards the eastern side. Storm-water runoff will therefore drain towards the natural water course on the eastern side through open storm-water path-ways provided in the township layout.

Increase in storm water runoff	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Unlikely (1)
Duration	Long term (3)	Long term (3)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3) - Should these impacts occur, there will be a cumulative impacts on the wider area.	
Significance	Negative medium (30)	Negative low (13)
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in the EMPr are implemented to ensure that these impacts do not occur – refer to table 2.5 of the EMPr.	

- Generation of waste – General waste will be generated by households, which will be stored on the site and removed on a weekly basis. The proposed development will make use of the municipality for waste removal. The local Municipality confirmed in a letter dated 23 June 2015 that the proposed development is a project of the local municipality and that the municipality will be responsible for the internal and external services of the proposed township and has the capacity for the installation of the services – refer to Appendix E for a copy of the letter.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)

Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space.	
Significance	Negative Medium (30)	Negative low (15)
Can impacts be mitigated?	Yes, management actions related to waste management are included in table 2.5 of the EMPr.	

- Impacts associated with the existing waste site on the proposed development – The rehabilitated closed municipal waste site is located ~300m to the north east of the site. The distance of 300m away from the proposed development is deemed to be sufficient. Due to the distance the waste site will not have any adverse effects on residential development.

Geological impacts	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)
Duration	Permanent (4)	Permanent (4)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Negligible cumulative impact (1).	
Significance	Negative low (20)	Negative low (7)
Can impacts be mitigated?	Measures (such as demolishment or removal of structures) will have to be taken by the TLM so that informal residential development is not allowed to extent towards the waste site – refer to Table 2.5 in the EMPr, Appendix F.	

- Permanent employment – It is estimated that the proposed development would create ~20 employment opportunities during the operational phase.

Permanent employment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Extent	Local (2)	Local (2)
Probability	Probable (3)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	Low (1)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)

Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2) – Creation of permanent employment and skills and development opportunities for members of the local community and creation of additional business and economic opportunities in the area.	
Significance	Positive Low (15)	Positive Low (16)
Can impacts be mitigated?	The enhancement measures listed for the temporary employment opportunities during the construction phase to enhance local employment and business opportunities, also apply to the operational phase. Also refer to table 2.5 of the EMPr for mitigation measures related to employment.	

Indirect impacts: The operational phase will have an indirect positive impact through the provision of quality housing to address the housing backlog of the local municipality.

- Provision of quality housing - The proposed development is a direct result of the urgent housing need experienced in Ikageng. The establishment of the proposed residential area will assist in alleviating the immediate housing shortage. The proposed development will avoid unofficial and informal housing developments through pro-active provision of sufficient number of formal erven. The sustainable provision of services such as roads, water, sanitation and waste will be a prerequisite for the development. The minimum standards in respect of service provision are to be adhered to. This implies that the quality of service expected would have to be high and satisfactory. The proposed development will therefore create a quality well balanced urban environment, which is convenient, attractive and safe.

Provision of quality housing	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Extent	Local (2)	Local (2)
Probability	Probable (3)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	Low (1)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	No loss of resources (1)	No loss of resources (1)
Cumulative impact	Medium cumulative impact (3) Sustainable housing provision with associated benefits in terms of service provision.	
Significance	Positive Low (16)	Positive Medium (34)
Can impacts be mitigated?	The establishment of the proposed facility is a mitigation measure in itself. In order to maximise	

	the benefits of the proposed project the minimum standards in respect of service provision are to be adhered to. Also refer to table 2.5 of the EMPr for mitigation or enhancement measures related to social impacts

5.1.3 Impacts that may result from the decommissioning and closure phase

No impacts, since the proposed development will not be decommissioned.

7 ENVIRONMENTAL IMPACT STATEMENT

This section aims to address the following requirements of the regulations:

Appendix 3.(3) An EIR (...) must include- (l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment: (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;
(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;
(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;
(r) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;

7.1 SUMMARY OF KEY FINDINGS AND ASSESSMENT RESULTS

Based on the contents of the report the following key environmental issues were identified, which were addressed in this EIA report:

- Impacts during the construction phase.
    - Loss or fragmentation of habitats (- Low)
    - Loss of sensitive species (- Low)
    - Loss of habitat connectivity and open space (- Low)
    - Generation of waste (-Low)
    - Temporary employment opportunities (+ Medium)
    - Impact of construction workers on local communities (- Medium for specific individuals who may be affected by STDs etc.)

- Impacts during the operational phase, which include:
    - Development of sinkholes (- Low)
    - Pressure on existing service infrastructure and potential health and safety impacts (- Low)
    - Increase in storm water runoff (- Low)
    - Provision of quality housing (+ Medium)

It is important to note that based on the assessment, the ecological fauna and flora habitat survey recommended that the rocky ridge be viewed as a no-go zone for any developments in order to preserve the ridge as part of a conservation corridor of considerable importance in the area. This recommendation is reflected in the layout plan (refer to Appendix A, figure 4 for the environmental sensitivity map) and has also been incorporated as a condition in the EMPR.

7.2 DESCRIPTION OF UNCERTAINTIES AND GAPS IN KNOWLEDGE

The uncertainties in results are mostly related to the availability of information, time available to gather the relevant information as well as the sometimes subjective nature of the assessment methodology. In terms of addressing the key issues the EAP is satisfied that there are no major gaps in knowledge and that the specialist reports provide sufficient information to conduct the significance rating and provide the environmental authority with sufficient information to make an informed decision.

7.3 RECOMMENDATION OF EAP

The final recommendation by the EAP considered firstly if the legal requirements for the EIA process had been met and secondly the validity and reliability of the substance of the information contained in the EIA report. In terms of the legal requirements it is concluded that:

- The scoping phase complied with the agreement and specification set out in Regulation 21 and Appendix 2 of the 2014 EIA RegulationS – already approved by the environmental authority.
- All key consultees have been consulted as required by Chapter 6 of the 2014 EIA Regulations - already approved by the environmental authority.
- The EIA process has been conducted as required by the 2014 EIA Regulations, Regulations 23 and Appendix 3.
- The EMPr has been compiled in accordance with Appendix 4 of the 2014 EIA Regulations.
- The proposed mitigation measures will be sufficient to mitigate the identified impacts to an acceptable level.
- No additional specialist studies are proposed on any environmental issue raised and thus, no terms of reference are provided for such studies.

In terms of the contents and substance of the EIA report the EAP is confident that:

- All key environmental issues were identified during the scoping phase.
- These key issues were adequately assessed during the EIA phase to provide the environmental authority with sufficient information to allow them to make an informed decision.

The final recommendation of the EAP is that:

It is the opinion of the independent EAP that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources. All negative environmental impacts can further be effectively mitigated through the proposed mitigation measures. Based on the contents of the report it is proposed that an environmental authorisation be issued, which states (amongst other general conditions) that the township (Ikageng Extension 13) on a Portion of Portion 2 and Portion 533 of Town and Townlands of Potchefstroom 435, Registration Division IQ, North West be approved subject to the following conditions:

- Implementation of the proposed mitigation measures set out in the EMPr.
- Implementation of the proposed mitigation measures set out in the specialist studies.
- The proposed township establishment must comply with all relevant national environmental laws and regulations.

We trust that the department find the report in order and eagerly await your final decision in this regard.

Carli Steenkamp

Environamics - Environmental Consultants

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