

FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.



February 2017

CSIR Report Number:
CSIR/CAS/EMS/IR/2015/0016/A

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FINAL BASIC ASSESSMENT REPORT

March 2017

Prepared for:

Alphomega Farming Co-Operative (Pty) Ltd

Prepared by:

CSIR

P O Box 320, Stellenbosch, 7599

Tel: +27 21 888 2432

Fax: +27 21 888 2473

Lead Authors:

Minnelise Levendal and Reinett Mogotshi

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report details

Title:	Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng
Purpose of this report:	<p>The purpose of this BA Report is to:</p> <ul style="list-style-type: none"> • Present the proposed project and the need for the project; • Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the BA Process being followed, including public consultation; • Assess the predicted positive and negative impacts of the project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; • Provide an Environmental Management Programme (EMPr) for the proposed project. • Provide a Maintenance Management Plan (MMP) for the proposed project. <p>All comments submitted during the review of the BA Report were incorporated into the finalised BA Report as applicable and where necessary. This finalised BA Report is hereby submitted to the Gauteng Department of Agriculture and Rural development (GDARD) for decision-making.</p>
Prepared for:	Alphomega Farming Co-Operative (Pty) Ltd
Prepared by:	CSIR P O Box 320, Stellenbosch, 7599 Tel: +27 21 888 2432 Fax: +27 21 888 2473
Authors:	Minnelise Levendal and Reinett Mogotshi
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executive summary

INTRODUCTION AND BACKGROUND

Alphomega Farming Co-operative (Pty) Ltd is proposing the development of a **Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.**

The Alphomega Farming Co-Operative is a small scale commercial farming enterprise that was established in 2005 and comprises of 11 members. The farm currently has dilapidated buildings and a slurry dam. Furthermore there are 11 unidentified graves on site. The proposed development footprint is 4 hectare of land and consists of pig production, cultivation of yellow maize as well as the establishment of an agro-processing facility for slaughtering of pigs. Furthermore 7 units of pigs will be slaughtered per day when necessary, as well as cultivation of yellow maize on 3.5 ha land that was previously used for agriculture. The proposed development is for a 200 sow unit with a throughput of 2 122 pigs per to supply Stubbs Meat Supply and Distributors with pigs weekly.

ENVIRONMENTAL ASSESSMENT PROCESS

The Council for Scientific and Industrial Research (CSIR), appointed by National Department of Environmental Affairs (DEA), manages the Special Needs and Skills Development Programme which is aimed at providing Environmental Services, *pro-bono*, to small-scale businesses with special needs. The programme offers the undertaking of a Basic Assessment for projects that require this assistance in applying for Environmental Authorisation. The CSIR is currently undertaking a Basic Assessment Process for Alphomega Farming Co-operative (Pty) Ltd for their proposed development of a **Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.**

The development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations, Government Regulations (GNR) 983 and 985 of December 2014 promulgate under the National Environmental Management Act (NEMA) (Act no 107 of 1998). The development also triggers listed activities in terms of the National Environmental Management: Waste Act (NEMWA) (Act no 59 of 2008). In terms of these Regulations, a Basic Assessment (BA) and an application for a Waste Management Licence should be undertaken for the proposed project. The CSIR is the Environmental Assessment Practitioner (EAP) who will be managing the BA process.

In terms of the NEMA EIA Regulations published in GNR 983, 984 and 985 on the 4 December 2014 Government Gazette Number 38282, a BA process is required as the project triggers the following listed activities (detailed in Table 1 below).

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Table 1: Listed activities to be triggered

Relevant notice:	Activity No (s) (in terms of the relevant notice) :	Description of each listed activity as per the Government Notice:
GN. R 983, 4 December 2014	3 (ii)	The development and related operation of facilities or infrastructure for the slaughter of animals with a production throughput of- (ii) reptiles, game and red meat exceeding 6 units per day
GN. R 983, 4 December 2014	4	The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceeds- (ii) 8 square meters per small stock unit and; (a) More than 1 000 units per facility excluding pigs were (b) applies
GN. R 983, 4 December 2014	27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- the undertaking of a linear activity; or ii) maintenance purposes undertaken in accordance with a maintenance management plan.
GNR 921, 29 November 2013	Category (A) 1	The storage of general waste in lagoons

These listed activities require Environmental Authorisation from Gauteng Department of Agriculture and Rural Development (GDARD). The BA process that will be undertaken for this project is summarised in the following steps below:

PROJECT DESCRIPTION

The Alphomega Farming Co-Operative is a small scale commercial farming enterprise that was established in 2005. This Co-Operative comprises of 11 members and is proposing to establish a start-up enterprise comprising of a commercial pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng. The farm currently has dilapidated buildings and a slurry dam. Furthermore there are 11 unidentified graves on site.

The proposed development footprint is 4 hectare of land and consists of pig production, cultivation of yellow maize as well as the establishment of an agro-processing facility for slaughtering of pigs. Furthermore 7 units of pigs will be slaughtered per day when necessary, as well as cultivation of yellow maize on 3.5 ha land that was previously used for agriculture. The proposed development is for a 200 sow unit with a throughput of 2 122 pigs per to supply Stubbs Meat Supply and Distributors with pigs weekly.

There is a guaranteed market for pork meat in South Africa. The demand for pork meat has increased by 24% since 2007, while the domestic use of pork products has increased by almost 12% between 2010 and 2012. However the number of pigs producers has decreased by 14.41% from 2011 to 2012. The demand for pork meat continues to escalate, which allows Alphomega Farming Co-operative to realistically gain substantial milestones in the domestic market.

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The proposed infrastructure of the piggery will entail the following:

- 2x Sows and Boar house (12 x30m)
- 2x Farrowing, weaner and grower house (12 x30m)
- Abattoir (12 x30m)
- 170 m³ Slurry Dam

IMPACT ASSESSMENT

Two specialist studies were conducted as part of the BA Process. These studies included a Terrestrial Ecology Impact Assessment and Heritage Impact Assessment. The findings of these studies are summarised below. It is important to note that the impacts described below apply to the proposed alternative.

Table 2: Summary of Impacts

POTENTIAL IMPACTS	SIGNIFICANCE	SIGNIFICANCE
	RATING	RATING
<i>CONSTRUCTION</i>	Without Mitigation	With Mitigation
<i>Direct loss of terrestrial vegetation and faunal habitat</i>	High	Low
<i>Loss of Conservation Important (CI) or medicinal flora</i>	Medium	Low
<i>Introduction & proliferation of alien spp.</i>	High	Low
<i>Reduction in Woody Alien Species</i>	Medium	Medium
<i>Faunal Mortality and Displacement (including CI species)</i>	Medium	Low
<i>Increase in dust and erosion degrading habitat integrity</i>	Medium	Low
<i>Sensory disturbances</i>	Medium	Low
<i>Destruction of graves</i>	Medium	Very Low
<i>Emissions from construction vehicles and generation of dust</i>	Medium	Low
<i>Pollution caused by spillage or discharge of construction waste water</i>	Low	Very Low
<i>Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material</i>	High	Low
<i>Employment creation and skills development opportunities (Positive)</i>	Medium	High
<i>Visual intrusion of construction/demolition activities</i>	Low	Low
<i>Noise impact from the use of construction equipment</i>	Medium	Low
<i>Noise generation from demolition and construction work</i>	Medium	Low
<i>Health injuries to construction personnel as a result of construction work</i>	Medium	Low
<i>Construction safety injuries: potential impact on the safety of construction workers</i>	High	Medium
<i>Traffic, congestion and potential for collisions</i>	Low	Low
<i>OPERATION</i>		
<i>Environmental contamination</i>	Medium	Low
<i>Poor / Inappropriate control of invertebrate pests</i>	High	Low
<i>Poor / Inappropriate control of vertebrate pests</i>	Medium	Low
<i>Transmission of diseases</i>	Medium	Low
<i>Reduction in CI Species - Harvesting of CI or medicinal flora</i>	Medium	Low

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<i>Increased burning - degrading habitat integrity/ Destruction of Species</i>	High	Medium
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High	Low
<i>Sensory disturbances</i>	Medium	Low
<i>Destruction of graves</i>	Medium	Very Low
<i>Emissions from staff vehicles</i>	Low	Low
<i>Increased odours resulting from the pig production facility</i>	High	Medium
<i>Improved service delivery with regards to produce and pork products</i>	Medium	High
<i>Employment creation and skills development</i>	Medium	High
<i>Visual intrusion of structures and buildings</i>	Low	Low
<i>Night lighting of the development on the nightscape of the surrounding landscape</i>	Low	Low
<i>Noise impact from operations and road transport of products</i>	Low	Low
<i>Atmospheric pollution due to fumes, smoke from fires</i>	Medium	Low
<i>Groundwater contamination as a result of the storage of pig waste</i>	Medium	Low
<i>Health of operating personnel resulting in potential health injuries</i>	Medium	Low
<i>Minor accidents to the public and moderate accidents to operational staff</i>	Medium	Low
<i>Impact of extra operational vehicles on the road network</i>	Low	Low
DECOMMISSIONING		
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High	Low
<i>Sensory disturbances</i>	Low	Low
<i>Destruction of graves</i>	Medium	Very Low
<i>Discharge of contaminated stormwater into the surrounding environment</i>	Medium	Low
<i>Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste</i>	Medium	Low
<i>Emissions from decommissioning vehicles and generation of dust</i>	Low	Low
<i>Noise generation from demolition activities</i>	Medium	Low
<i>Potential health injuries to demolition staff during the decommissioning phase</i>	Medium	Low
<i>Heavy traffic, congestion and potential for collisions</i>	Medium	Low
<i>Demolition safety injuries</i>	High	Medium
<i>Pollution of the surrounding water and ground as a result of spillages, generation of building rubble and waste scrap material</i>	High	Low

EAP'S RECOMMENDATION

Based on the findings of this BA Process, it is therefore the opinion of the EAP that conducted this BA Process, that there are no negative impacts that should be considered as “fatal flaws” from an environmental perspective, and thereby necessitate the development of the piggery. Based on the findings of this Final BA Report, it is the opinion of the EAP that the project benefits outweigh the negative environmental impacts, and that the project will make a positive contribution towards skills development, women empowerment and economic growth in the Emfuleni Local Municipality. Environmental Management Programme (EMPr) has been compiled for the proposed project. This Draft EMPr captures the project specific information for all phases of the development and includes all mitigation actions identified in this BA Process. The Draft EMPr is a dynamic document that should be updated regularly and provide clear and implementable measures for the establishment and operation of the proposed project. It is our recommendation that all the mitigation measures stipulated in the BA Report, including the EMPr be implemented for the proposed project.

Concluding statement from EAP: Provided that the specified mitigation measures are applied effectively, it is proposed that the project receives Environmental Authorisation in terms of the EIA Regulations promulgated under the NEMA.



glossary

BA	Basic Assessment
BID	Background Information Document
CI	Conservation Importance
CSIR	Council for Scientific and Industrial Research
DEA	National Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EAPs	Environmental Assessment Practitioners
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
I&AP	Interested and Affected Party
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
NWA	National Water Act (Act 36 of 1998)
NEM: AQA	National Environment Management: Air Quality Act (Act 39 of 2004)
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:WA	National Environmental Management: Waste Act
NHRA	National Heritage Resources Act (Act 25 of 1999)
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SDF	Spatial Development Framework
TOR	Terms of Reference

Summary of where requirements of Appendix 1 of the 2014 NEMA EIA Regulations (GN R 982, as amended) are provided in this Basic Assessment Report

APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-		
(a) details of – i. the EAP who prepared the report; and	√	Appendix I
ii. the expertise of the EAP, including a curriculum vitae;	√	Appendix I
(b) the location of the activity, including i) the 21 digit Surveyor General code of each cadastral land parcel;	√	Section B
(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 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 (iii) is to be undertaken;	√	Section B
(d) a description of the scope of the proposed activity, including (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure ;	√	Executive summary
(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	√	Section A2

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APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	√	Section E9
(g) a motivation for the preferred site, activity and technology alternative;	√	Section A3
<p>(h) a full description of the process followed to reach the proposed preferred alternative within the site, including:</p> <ul style="list-style-type: none"> (i) details of all the 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 alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- <ul style="list-style-type: none"> (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 associated with the alternatives; (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; (ix) the outcome of the site selection matrix; (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 alternatives, including preferred location 	√	Section 3

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APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
of the activity;		
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	√	Section E Appendix H
(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 avoided, managed or mitigated;	√	Section E Appendix G
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	√	Appendix H
(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;	√	Section E5
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMP;	√	Section E
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	√	Section E8

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APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;		
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;		
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	✓	N/A
(r) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	✓	Appendix E4 and E5
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A	N/A
(t) any specific information that may be required by the competent authority; and	N/A	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.		

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

Kindly note that:

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

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DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

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

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500

(For official use only)

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

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

N/A

Is a closure plan applicable for this application and has it been included in this report?

No

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

The proposed development is not mining related.

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

Yes

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

Yes

If no, state reasons for not attaching the list.

[Redacted]

Have State Departments including the competent authority commented?

Yes

If no, why?

The report is yet to receive comments from state departments and the competent authority

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

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

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng

Select the appropriate box

The application is for an upgrade of an existing development

The application is for a new development

Other, specify

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

YES

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

The proposed project also requires a Waste Management License under the National Environmental Management: Waste Act (Act no. 59 of 2008), Category A (1) of GN. R 921 (29 November 2013) for the storage of general waste in lagoons.

If yes, have you applied for the authorisation(s)?

YES

If yes, have you received approval(s)? (attach in appropriate appendix)

NO

Note from CSIR: The Waste Management License was submitted on 14 December 2016 therefore no outcome has been reached to date.

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
National Water Act, 1998 (Act No. 36 of 1998) as amended	National	
National Environmental Management: Waste Act (Act no. 59 of 2008,) as amended	National & Provincial	10 March 2009
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	National & Provincial	1999
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	National & Provincial	2004
Environmental Impact Assessment Regulations, 2014	National	4 December 2014
DEA Guidelines on Public Participation	National (DEA)	10 October 2012
Emfuleni Local Municipality and Sedibeng District Municipality IDP and SDF	Provincial	2016/2017
National Development Plan	National	2012
National Environmental Management: Waste Act, as amended.	National and Provincial	29 November 2013

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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng

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

Legislation, policy of guideline	Description of compliance
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	The Environmental Authorisation for the proposed development is lawfully applied for in terms of the EIA Regulations, 2014, promulgated under NEMA. The conditions on the Environmental Authorisation, if approved, will be adhered to.
National Water Act, 1998 (Act No. 36 of 1998) as amended	Relevant legislation published under this act will be adhered to.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	An application for Heritage Resources review was submitted to SAHRA (CaseID: 9370) in terms and respect of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) as amended (NHRA).
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The fauna and flora that dominate the proposed project site will be assessed in terms of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the relevant legislation published in terms of this act.
Environmental Impact Assessment Regulations, 2014	Please see Chapter 6 relating to public participation, Appendix 1 relating to the content of the Basic Assessment Report as well as Appendix 4 relating to the content of the EMPr.
National Development Plan	<p>The South African Government through the Presidency has published a National Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people’s capabilities to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes to implement the following strategies to address the above goals:</p> <ol style="list-style-type: none"> 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces; 5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; and 8. Transforming society and uniting the nation.
Emfuleni Local Municipality and Sedibeng District Municipality IDP and SDF	The Spatial Development Framework (SDF) is the legislated component of the municipality’s IDP that prescribes development strategies and policy guidelines to restructure and reengineer the urban and rural form. The SDF is the municipality’s long-term vision of what it wishes to achieve spatially, and within the IDP programmes and projects. The SDF should not be interpreted as a blueprint or master plan aimed at controlling physical development, but rather the framework giving structure to an area while allowing it to grow and adapt to changing circumstances.

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Legislation, policy of guideline	Description of compliance
	The proposed project falls within the identified agricultural zone of the SDP and SDP as such the proposed development will not compromise the integrity of the SDF and IDP.
National Environmental Management: Waste Act, as amended.	An application for a Waste Management License will be submitted in terms of NEM:WA as the proposed activity pertains to the following activities included in the Act: Category A (1): The storage of general waste in lagoons.

3. ALTERNATIVES

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

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

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

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

The proposed alternative was considered based on the following: this is the only piece of land that is available to the applicant that was acquired through land reform processes, the site is within and surrounded by agricultural activities and the layout has been carefully informed by the sensitivities on site. Due to the nature of the industry, the support structures and the knowledge and experience of the applicant, the proposed project alternative is the only viable alternatives to take forward to the Impact Assessment phase.

Provide a description of the alternatives considered

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	Description
1	Proposal (preferred alternative)	<u>Project Details</u> The Alphomega Farming Co-Operative is a small scale commercial farming enterprise that was established in 2005. This Co-Operative comprises of 11 members and is proposing to establish a start-up enterprise comprising of a commercial pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng. The farm currently has dilapidated buildings and a slurry dam. Furthermore there are 11 unidentified graves on site. The proposed development footprint is 4 hectare of land and

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		<p>consists of pig production, cultivation of yellow maize as well as the establishment of an agro-processing facility for slaughtering of pigs. Furthermore 7 units of pigs will be slaughtered per day when necessary, as well as cultivation of yellow maize on 3.5 ha land that was previously cultivated. The proposed development is for a 200 sow unit with a throughput of 2122 pigs per to supply Stubbs Meat Supply and Distributors with pigs weekly.</p> <p>There is a guaranteed market for pork meat in South Africa. The demand for pork meat has increased by 24% since 2007, while the domestic use of pork products has increased by almost 12% between 2010 and 2012. However the number of pigs producers has decreased by 14.41% from 2011 to 2012. The demand for pork meat continues to escalate, which allows Alphomega Farming Co-operative to gain substantial milestones in the domestic market.</p> <p><u>The proposed infrastructure of the piggery will entail the following:</u> 2x Sows and Boar house (12 x30m) 2x Farrowing, weaner and grower house (12 x30m) Abattoir (12 x30m) 170 m³ Slurry Dam</p>
2	Property Alternative	The applicant can be classified as a special needs applicant who inherited the proposed development site though the Land Redistribution for Agricultural Development Programme in 2010. As such this is the only property that is available for the applicant to utilize.
3	Activity Alternative	The proposed development is within agricultural land and as such it is suitable for agricultural related projects such as piggeries. The nature of the project was determined based on the farming experience, demand for pork and knowledge of the applicant as well as funding opportunities available for the development. In other words the proposed development has been market driven.
4	Design or Layout Alternative	The layout of the proposed development has been informed by the recommendations of the specialists and sensitivities on site; therefore no other alternatives have been considered with regards to the project. Furthermore the layout of the site is mostly on transformed areas within the site thereby avoiding sensitive areas as much as possible.
5	Technology to be used	<p>The following technology will be used: <u>Heating efficiency</u> Heat lamps within the farrowing pens are known as significant contributors to energy usage as such the applicant shall install thermostats. Installation of the thermostats will ensure efficiency by controlling temperature in the pens. For example once the temperature rises to a set level the lights will automatically dim or switch off saving large amounts of energy.</p>

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		<p><u>Cooling efficiency</u> Large fans will be used as a method of cooling, mainly because they have the ability to move air faster than small fans. These fans will be maintained regularly to ensure that they operate efficiently.</p> <p><u>Lighting efficiency</u> Energy saving light bulbs will be used for the development; the use of this energy saving bulbs will improve the efficiency of the development. Furthermore in terms of lighting within the entire site, sensor lights will be used thus reducing the energy usage required for lighting.</p>
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In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

Motivation for the exclusion of alternatives:

Site location and layout alternatives

The DEA commissioned the CSIR to run the “Special Needs and Skills Development (SNSD) Programme” which is aimed at providing *pro bono* Environmental Impact Assessments (EIAs) for people who are classified as special needs clients/applicants, specifically Small, Medium and Micro Enterprises (SMMEs), Community Trusts, Individuals or Government Programmes. The CSIR received an application from Alphomega Cooperative under the SNSD Programme. The CSIR identified the Alphomega Cooperative (Pty) Ltd as a client or a special needs applicant and has agreed to assist them with acquiring Environmental Authorization for the project on a *pro bono* basis, including the cost of the basic assessment, specialist studies, site visits and human resources. Alphomega Cooperative is a 100% black owned entity supported by government funding. The proposed development site was acquired through the Land Redistribution for Agricultural Development programme in 2010. The applicant has applied for funding through Department of Rural Development and Land Reform which support previously disadvantaged individuals who do not have the startup capital to launch their own enterprise. Thus, the site which is being investigated in this report is the only site available to this entity and there are no available alternative sites to be considered.

The layout of the proposed project has been carefully informed by the findings of the Ecological Impact Assessment and the Heritage Impact Assessment (Appendix G) so as to avoid sensitive areas and loss of Species of Conservation Concern. Furthermore the development is within areas that have already been transformed previously to limit the disturbance of natural habitats.

Design, technology & operational alternatives

The proposed development is within agricultural land thus suitable for agricultural related projects such as piggeries. The nature of the project was determined based on the farming experience, need and knowledge of the applicant, the need of piggeries as well as funding opportunities available for the development. Furthermore the operating plan for the proposed project has been informed by extensive market research and an assessment of the need of the products that will be produced. In terms of the economic viability, the project does not make use of major technologies, which in turn results in the proposed development requiring very little energy. The following measures will be used as part of the resource efficiency of the proposed development:

Heating efficiency

Thermostats will ensure efficiency by controlling temperature in the pens

Cooling efficiency

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Large fans will be used as a method of cooling, mainly because they have the ability to move air faster than small fans. These fans will be maintained regularly to ensure that they operate efficiently.

Lighting efficiency

Energy saving light bulbs will be used for the development; the use of this energy saving bulbs will improve the efficiency of the development. Furthermore sensor lights will be used thus reducing the energy usage required for lighting.

All waste from the piggery will be re-cycled into fertilizer for the proposed maize fields. The pork will be sold 100% locally and the jobs being created by the proposed development will be sourced to local communities.

The operations of this facility will be under constant supervision. In addition, the project design, technology and operations will make use of Agricultural Technical Support of the South African Pork Producers Organisation (SAPPO). Thus, due to the nature of the industry, the support structures and the knowledge and experience of Alphomega, the proposed project alternatives are the only viable alternatives to take forward to the Impact Assessment phase.

4. PHYSICAL SIZE OF THE ACTIVITY

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

Size of the activity:

Proposed activity *(Total environmental (landscaping, parking, etc.) and the building footprint)* 4 Ha

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)

Ha/ m²

or, for linear activities:

Length of the activity:

Proposed activity

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)

m/km

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

Size of the site/servitude:

Proposed activity

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)

Ha/ m²

5. SITE ACCESS

Proposal

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

YES	
-----	--

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Describe the type of access road planned: _____

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

Alternative 1

Does ready access to the site exist, or is access directly from an existing road? _____

If NO, what is the distance over which a new access road will be built _____

Describe the type of access road planned: _____

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

Alternative 2

Does ready access to the site exist, or is access directly from an existing road? _____

If NO, what is the distance over which a new access road will be built _____

Describe the type of access road planned: _____

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

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

Section A 6-8 has been duplicated

0

Number of times

(only complete when applicable)

6. LAYOUT OR ROUTE PLAN

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

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
 - A4 size for activities with development footprint of 10sqm to 5 hectares;
 - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
 - A2 size for activities with development footprint of >20 hectares to 50 hectares);
 - A1 size for activities with development footprint of >50 hectares);
- The following should serve as a guide for scale issues on the layout plan:
 - A0 = 1: 500
 - A1 = 1: 1000
 - A2 = 1: 2000
 - A3 = 1: 4000
 - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
 - Rivers and wetlands;
 - the 1:100 and 1:50 year flood line;
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

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

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

- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

7. SITE PHOTOGRAPHS

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

Note from CSIR: Site photographs in the eight major compass directions have been included in Appendix B. Photographs indicating sensitive features on site can be found in the Ecological Specialist Report (NSS, May 2016) attached as **Appendix G**.

8. FACILITY ILLUSTRATION

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

Note from CSIR: A facility illustration can be seen in **Appendix C**.

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

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

Instructions for completion of Section B for linear activities

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

Section B has been duplicated for sections of the times route

Instructions for completion of Section B for location/route alternatives

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

Section B has been duplicated for times location/route alternatives (complete only when appropriate)

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

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

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

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

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

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1. PROPERTY DESCRIPTION

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

Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

2. ACTIVITY POSITION

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

Alternative:

Latitude (S):	Longitude (E):
26.429598 °	27.748232 °

In the case of linear activities:

Alternative:

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):	Longitude (E):

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

Addendum of route alternatives attached



The 21 digit Surveyor General code of each cadastral land parcel

PROPOSAL	T	0	I	Q	0	0	0	0	0	0	0	0	0	3	4	0	0	0	0	1	8
ALT. 1																					
ALT. 2																					
etc.																					

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3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

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

4. LOCATION IN LANDSCAPE

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

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
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5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

- Shallow water table (less than 1.5m deep)
- Dolomite, sinkhole or doline areas
- Seasonally wet soils (often close to water bodies)
- Unstable rocky slopes or steep slopes with loose soil
- Dispersive soils (soils that dissolve in water)
- Soils with high clay content (clay fraction more than 40%)
- Any other unstable soil or geological feature
- An area sensitive to erosion

	NO
	NO
	NO
	NO
	NO
	NO
	NO
YES	

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

b) are any caves located on the site(s)

NO

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

Latitude (S): _____ **Longitude (E):** _____

c) are any caves located within a 300m radius of the site(s)

NO

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

Latitude (S): _____ **Longitude (E):** _____

d) are any sinkholes located within a 300m radius of the site(s)

NO

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

Latitude (S): _____ **Longitude (E):** _____

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

6. AGRICULTURE

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

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

Note from CSIR: The site is within a moderate potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas.

7. GROUNDCOVER

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

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

Natural veld - good condition 42%		Veld dominated by alien species 9%	
	Cultivated land 19%	Building or other structure 2%	

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

Note from CSIR: For evidence of the above, please see Ecological Specialist study, including an indication of the groundcover, attached to this report as **Appendix G**.

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

If YES, specify and explain:

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According to the Ecological Specialist Report – Appendix G (NSS, 2016):

Conservation importance species were recorded on site during the field investigation. The map below depicts the distribution of these species within the proposed development site.



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A number of other species found within the Rocky Habitat are considered Protected species under the Nature Conservation Ordinance, 12 of 1983. These include the *Cheilanthes viridis*, *Cheilanthes* spp, *Pellaea calomelanos* and *Haemanthus cf. humilis* (Figure 1). Protected Species may not be cut, disturbed, damaged, and destroyed without obtaining a permit from Gauteng Province or a delegated authority. The survey was conducted in late summer, when a number of the species were not in their flowering time. However, some species such as *Lithops lesliei* were flowering as NSS had detected a population of them not to far from the site.



Adromischus umbraticola subsp. *umbraticola*



Haemanthus cf. humilis



Pellaea calomelanos



Cheilanthes cf. viridis

Figure 1: Protected Species under the Nature Conservation Ordinance

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Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

YES	NO
-----	----

If YES, specify and explain:

As described above

Are there any special or sensitive habitats or other natural features present on the site?

YES	
-----	--

If YES, specify and explain:

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According to the Ecological Specialist Report – Appendix G (NSS, 2016):

The study area was divided typically into steeper rockier slope habitat and lower lying grasslands. The majority of the northern section of the site was in a natural to near natural state with the southern section been transformed mainly through farming practices. The following habitat groups were defined:

Rocky Habitat and Drainage System

- Diospyros-Loudetia Rocky Ridge
- Plateau Grassland

Grassland habitat

- Scirpoides-Eragrostis Grassland
- Schizachyrium- Seriphium Rocky Grassland
- Eragrostis-Cynodon-Hyparrhenia Disturbed Grassland

Wooded Habitat

- Acacia bushclumps

Transformed Habitat

- Alien Bushclumps
- Built-up Areas
- Seriphium dominated Borrow Pit
- Melinis-Eragrostis Old Fields

Table 1: Broad habitat/ vegetation communities within the proposed development site

Vegetation Community	Conservation Significance	Area - Ha	Area - %
Rocky Habitats			
Diospyros-Loudetia Rocky Ridge	Very High	7.25	22.72
Plateau Grassland	Very High	6.42	20.12
Riparian/Drainage Habitat			
Drainage System	High	1.69	5.30
Grassland Habitat			
Schizachyrium- Seriphium Rocky Grassland	Moderate-High	2.35	7.37
Scirpoides-Eragrostis Grassland	Moderate	0.37	1.14
Eragrostis-Cynodon-Hyparrhenia Disturbed Grassland	Moderate	3.33	10.43
Wooded Habitat			
Indigenous Acacia Bushclumps	Moderate	0.11	0.33
Transformed Habitat			
Alien Bushclumps	Low		
Acacia mearnsii dominated Alien Bushclumps		0.57	1.78
Eucalyptus dominated Alien Bushclumps		1.89	5.92
Mixed Alien Bushclumps		0.42	1.31
Built-up Areas	Low	0.68	2.15
Seriphium dominated Borrow Pit	Low	0.75	2.34
Melinis-Eragrostis Old Fields	Moderate-Low	6.09	19.09

The three main grassland habitats (over 19% of the site) identified were the Schizachyrium-Seriphium Rocky Grassland; the Scirpoides-Eragrostis Grassland and the more disturbed and transformed Eragrostis-Cynodon-Hyparrhenia Grassland. The Scirpoides-Eragrostis Grassland had recently been mowed and therefore an accurate account of species therein was limited. In addition although this unit shows the presence of a wet indicator species (in the temporary zone), a number of soil samples

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Was a specialist consulted to assist with completing this section

YES	
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If yes complete specialist details

Name of the specialist:	Natural Scientific Services CC (NSS) Contributors and Authors: Susan Abell		
Qualification(s) of the specialist:	MSc Resource Conservation Biology (Ecology) (2000 – 2001) BSc Hons University of the Witwatersrand, Johannesburg (1999) BSc University of the Witwatersrand, Johannesburg (1998)		
Postal address:	126 Ballyclare Dr Morningside ext 40 Sandton, Johannesburg		
Postal code:	2196		
Telephone:	(011) 787-7400	Cell:	
E-mail:	susan@nss-sa.co.za	Fax:	
Are any further specialist studies recommended by the specialist?			NO
If YES, specify:			
If YES, is such a report(s) attached?	YES	NO	
If YES list the specialist reports attached below			

Signature of specialist: See below Date: _____

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

Note from CSIR: Please see the Specialist Declaration as per Appendix 6 of the NEMA EIA Regulations 2014) on Page 6 of the Ecological Specialist Report, attached as **Appendix G.**

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8. LAND USE CHARACTER OF SURROUNDING AREA

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

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

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

NORTH					
	1	5	5	5	5
	1	5	5	5	5
WEST	1	1	8	31	EAST
	7	7	1	7/8	7/8
	7	7	1	1	1
SOUTH					

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

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

Have specialist reports been attached
If yes indicate the type of reports below

NO

--

9. SOCIO-ECONOMIC CONTEXT

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

Social and environmental impacts of any development are generally not site specific; impacts of a development may reach far beyond the development footprint. In light of the above mentioned impacts it is therefore necessary to consider the social and economic impacts on the municipality as a whole. The baseline study of this project includes a brief overview of the socio-economic factors within the Emfuleni Local Municipality in Gauteng Province. This municipality is one of the three local municipalities comprising the Sedibeng district in Gauteng, South Africa. It is the western-most local municipality in the district, and covers an area of 987, 45 km². It consists of two main town centres, Vereeniging and Vanderbijlpark. The total population is 721,663, number of households is 220135. Figure 2 below depicts the population characteristics of the municipality. Black Africans are the most dominating group as 85.4% of the population is black.

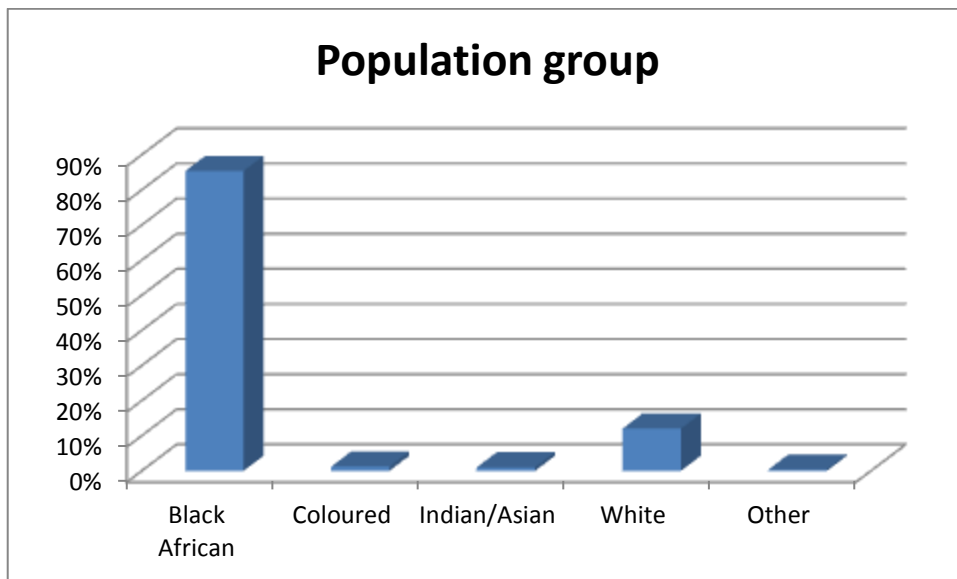


Figure 2: Population groups within the Emfuleni Local municipality

According to StatsSA (2011) the educational profile of the population within Emfuleni Local Municipality is as follows: no schooling rate is 2,4%, some primary education 35,8%, completed primary 5,2%, some secondary education 32,5%, completed secondary 19%, higher education 4,1%, not applicable 1%.

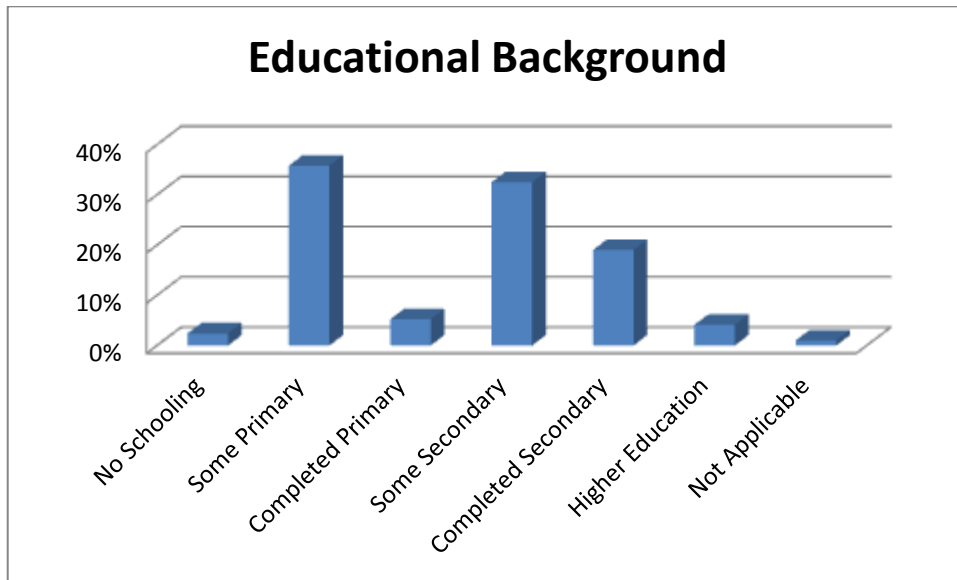


Figure 3: Population by educational background

According to Figure 4, the gender population of the Emfuleni Local Municipality is dominated by female with 50, 8% average and males averaged 49,2%. There are 220 135 households in the municipality, with an average household size of 3,1 persons per household. Of these households, 69,9% have access to piped water and 24,3% have water in their yard. Only 0,6% of households do not have access to piped water. Electricity for lighting is used by 92,2% of households. The area population of the Emfuleni Local Municipality is mainly dominated by Urban 99,4% and farm being farm 0,6%.

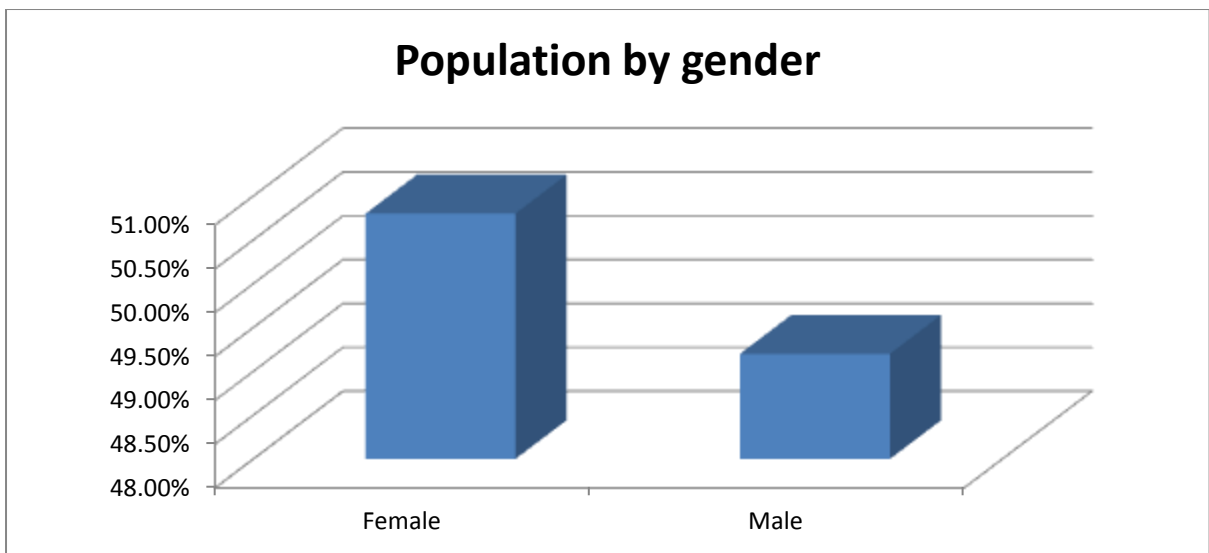


Figure 4: Population by gender

According to Statistics SA of the population in Emfuleni Local Municipality, 202 543 people are economically active (employed or unemployed but looking for work) and, of these, 34, 7% are unemployed. Of the 85 594 economically active youth (15–35 years) in the area, 45% are unemployed.

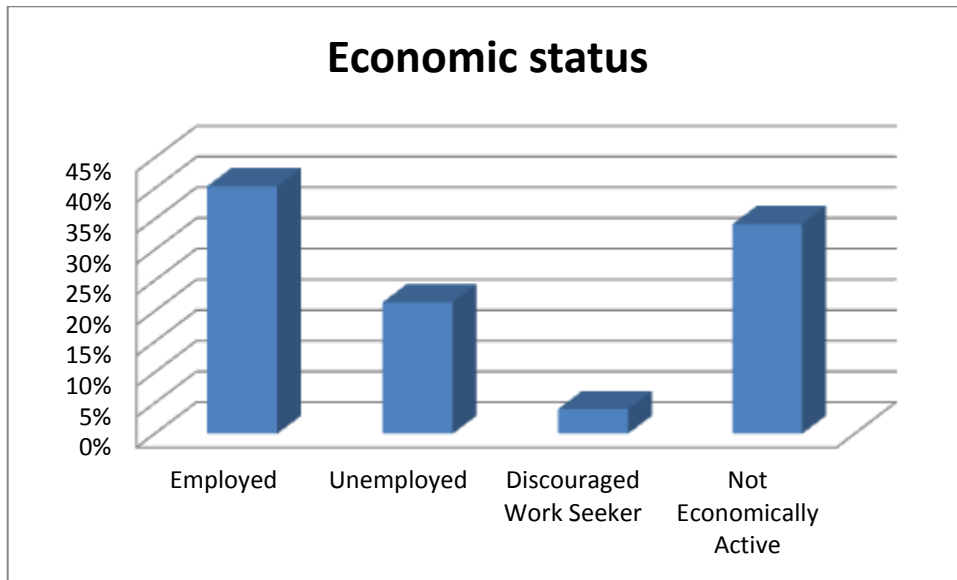


Figure 5: Population by economic status

10. CULTURAL/HISTORICAL FEATURES

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

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

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

YES	
-----	--

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If YES, explain:

A single unfenced cemetery was found close to the farm complex. It is most likely that the graves are no older than the earliest buildings on the farm. Their location in the corner of the tree lines (planted between 1952 and 1961) suggests they go back to the 1950s or 1960s. Because they are all located together they are treated as a single resource. This means that if the oldest pre-dated 1956 then they would be protected in terms of the NHRA. Although their age remains unknown, for the sake of prudence, the cemetery is regarded as a heritage resource. They may represent the graves of farm labourers. Although the cemetery is not a significant heritage resource, it should be treated as important because it contains human remains.



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

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

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According to the Heritage Impact Assessment– Appendix G (Asha Consulting, 2016):

Palaeontology

The bedrock in the study area is part of the Klapperkop Quartzite Member of the Timeball Hill Formation. The potentially fossiliferous lower shales/mudrocks of the Timeball Hill Formation lying stratigraphically beneath the Klapperkop quartzites and are unlikely to be impacted by the proposed farming development.

Archaeology

A gentle rocky slope extends from the central part of the study area in a north-westerly direction over about 2 km. A number of Iron Age settlements are visible on aerial photography along this rocky area but these have not been studied. However, on the south-eastern end of this alignment three stone-walled enclosures were located two of them in one location and a third some 25 m to the south. Both sites consisted of stone alignments only one rock high and were thus somewhat ephemeral

Grave

A single unfenced cemetery was found close to the farm complex. It is most likely that the graves are not older than the earliest buildings on the farm.

Built environment

A number of structures are present on the property and are in variable states of preservation. There are three residential dwellings and some outbuildings, all located in a cluster. None of these structures are older than 60 years and they may have been built in about the 1970s.

Cultural landscape

The site is in a degraded condition because of the poor state of preservation of some of the structures and because many of the windrow trees have been cut down recently. The broader landscape is an agricultural one with a rural feel, but windrows are generally rare.

Will any building or structure older than 60 years be affected in any way?

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

	NO
	NO

If yes, please attached the comments from SAHRA in the appropriate Appendix

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. THE ENVIRONMENTAL ASSESSMENT PRACTITIONER must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

2. LOCAL AUTHORITY PARTICIPATION

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

Was the draft report submitted to the local authority for comment?

YES	
-----	--

If yes, has any comments been received from the local authority?

	NO
--	----

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

The Draft report will be released on 14 December 2016 and no comments have been received to date.

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

3. CONSULTATION WITH OTHER STAKEHOLDERS

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

Has any comment been received from stakeholders?

YES	
-----	--

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

Comments were received in response to the circulation of the Background Information Document and are as follow:

Comment 1: Received from Aseef Ahmed, Chief Environmental Management Officer: Emfuleni Local Municipality stated that they would like to register as an Interested and Affected Party for this particular project.

Comment 2: Received from Ndumiso Mazibuko Economist: Statutory Measures National Agricultural Marketing Council stated that she does not have any concerns regarding the proposed project. "I would like to be registered as an I&AP for this project to receive further correspondence during the Basic Assessment Process".

Comment 3: Received from CA Van Jaarsveld (Private) raised the following issues with regards to

- Procedures in place for removal of solid waste, dead piglets, dead rats and dirty drains- what sewerage systems?
- How will the odour be prevented and what hygiene measures will be put in place
- What pest control program is in place to prevent rats+ flies from neighbours and what products will be used?
- Will appropriate disposal of dead animals + placenta be done?

Comment 4: Received from CA Van Jaarsveld (Private):

"Stated that they did not have the pleasure of a reply to our concerns as described in the attached document. Your urgent reply shall be highly appreciated"

Comment 5: Received from Malesela Sehona ,Gauteng Department of Agriculture and Rural Development:

The Department acknowledged having received the Application for Integrated Environmental Authorisation & Draft Basic Assessment Report for environmental authorisation.

Comment 6: Received from Aseef Ahmed, Chief Environmental Management Officer: Emfuleni Local Municipality: The Emfuleni Local Municipality's Section of Environmental Management acknowledged receipt of the draft Basic Assessment Report for the proposed pig production facility. They also stated that they appreciate being identified as an Interested and Affected Party and provided comments on this project.

Comment 7: Received from Xoliswa Bobelo, Gauteng Department of Agriculture and Rural Development: Stated that "The Draft Basic Assessment Report (DBAR) regarding the above - mentioned development received by the Department on 15 December 2016 has reference. The proposal entails 2 sows and boar house (12x30m), 2 farrowing, weaner and grower house (12x30m), abattoir (12x30m) and a 170m³ slurry dam on the above-mentioned site. The proposed site falls within critical biodiversity area, ecological support area, orange listed plant, primary vegetation, wetland, waterbody, Non-Perennial River, class 1 and 2 ridge according to the Geographic Information System (GIS). In terms of the Gauteng Environmental Management Framework, the proposed site falls within Environmental Management Zones 3 and 4 which are compatible with the proposed activity. The proposed development footprint is 4 hectares in extent. The Department provided comments for in relation to this project.

Please note that all comments provided by the Emfuleni Local Municipality and Gauteng Department of Agriculture and Rural Development have been summarised in this section and are included in full as part of Appendix E.5: Comments and Response Trail.

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

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

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

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

5. APPENDICES FOR PUBLIC PARTICIPATION

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

Appendix 1 – Proof of site notice

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

Appendix 3 – Proof of newspaper advertisements

Appendix 4 – Communications to and from interested and affected parties

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

Appendix 6 - Comments and Responses Report

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

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

Appendix 9 – Copy of the register of I&APs

SECTION D: RESOURCE USE AND PROCESS DETAILS

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

Instructions for completion of Section D for alternatives

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

Section D has been duplicated for alternatives

0

times

(complete only when appropriate)

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Section D [REDACTED] (complete only when Alternative No. [REDACTED] appropriate for above)

1. Waste, effluent, and emission management

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	[REDACTED]
-----	--

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

20 m ³

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

Construction solid waste will be stored in appropriate containers and disposed of at a registered Wastegroup landfill site
--

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

All construction waste will be collected in weather and scavenger proof containers on site and disposed of at a registered Wastegroup landfill site.
--

Will the activity produce solid waste during its operational phase?

YES	[REDACTED]
-----	--

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

Pig waste 50m ³ Other waste 10 m ³

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

All construction waste generated will be collected in weather and scavenger proof containers on site and disposed of at a registered Wastegroup landfill site. Pig waste will be stored in a slurry dam and used as fertilizers for the yellow maize planted on site
--

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?

[REDACTED]	NO
--	----

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

Solid waste will be disposed of at a registered Wastegroup landfill site
--

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

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

[REDACTED]	NO
--	----

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

Is the activity that is being applied for a solid waste handling or treatment facility?

[REDACTED]	NO
--	----

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

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

Solid waste will be divided into two i.e. recyclable waste and non-recycle waste. The recyclable materials shall be transported to the nearby recycling facility whereas the non-recyclable materials shall be disposed by Wastegroup (please see confirmation letter as part of Appendix F).

Liquid effluent (other than domestic sewage)
 Will the activity produce effluent, other than normal sewage, that will be disposed of

[REDACTED]	NO
--	----

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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng

in a municipal sewage system?

	NO

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

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?

Will the activity produce any effluent that will be treated and/or disposed of on site?

Yes	
50 m ³	

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

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

Effluent waste will be stored in a slurry dam; solid waste will be used as fertilizers for the agricultural fields.

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

Will the activity produce effluent that will be treated and/or disposed of at another facility?

	NO
--	----

If yes, provide the particulars of the facility:

Facility name:

Contact person:

Postal address:

Postal code:

Telephone:

E-mail:

Cell:

Fax:

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

Pig waste together with waste water will be transferred to the slurry dam. The water within the slurry dam will be used for irrigating the yellow maize fields.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

	NO
--	----

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

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?

	NO
--	----

Will the activity produce any effluent that will be treated and/or disposed of on site?

	NO
--	----

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

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	
	NO

If yes, is it controlled by any legislation of any sphere of government?

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

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

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Anticipated emission from the proposed piggery include

- Piggery odour resulting from the actual operation of the proposed piggery and the slurry dam onsite.
- Dust emissions from vehicles especially during construction phase and the use of the existing gravel road

The emissions which will be produced by the pig production facility do not require an Air Emissions License as per NEM:AQA. The relevant impacts of these emissions have been assessed in the Impact Assessment (Section E).

2. WATER USE

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

groundwater

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

20 000 liters

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

Does the activity require a water use permit from the Department of Water Affairs?

YES

If yes, list the permits required

If yes, have you applied for the water use permit(s)?

YES

If yes, have you received approval(s)? (attached in appropriate appendix)

NO

3. POWER SUPPLY

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

Eskom

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

4. ENERGY EFFICIENCY

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

Heating efficiency

Heat lamps within the farrowing pens are known as significant contributors to energy usage as such the applicant shall install thermostats. Installation of the thermostats will ensure efficiency by controlling temperature in the pens. For example once the temperature rises to a set level the lights will automatically dim or switch off saving large amounts of energy.

Cooling efficiency

Large fans will be used as a method of cooling, mainly because they have the ability to move air faster than small fans. These fans will be maintained regularly to ensure that they operate efficiently. Furthermore the fan components such as fan belts, pulleys etc. will be maintained. This will prevent performance reduction as such making them more efficient.

Lighting efficiency

Energy saving light bulbs will be used for the development; the use of this energy saving bulbs will improve the efficiency of the development. Sensor lights will be used thus reducing the energy usage required for lighting.

The proposed development will make use of solar PV powered pumps with regards to pumping of water. This will reduce the energy required.

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

The use of Solar PV powered pumps for water

SECTION E: IMPACT ASSESSMENT

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

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

The issues/comments that were raised by Interested and Affected Parties following the release of the Background Information Document (30 March 2016) and prior to the release of this Final Basic Assessment Report can be seen in the comments and responses report which is attached as **Appendix E5** and also in **Section 3** of this report:

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

The issues/comments that were raised by Interested and Affected Parties following the release of the Background Information Document (30 March 2016) and **prior** to the release of this Final Basic Assessment Report and the response given by the EAP can be seen in the comments and responses report which is attached as **Appendix E5**.

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

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

APPROACH TO THE BASIC ASSESSMENT

1) METHODOLOGY OF IMPACT ASSESSMENT

According to the DEA IEM Series guideline on "Impact Significance" (2002), there are a number of quantitative and qualitative methods that can be used to identify the significance of impacts resulting from a development. The process of determining impact significance should ideally involve a process of determining the acceptability of a predicted impact to society. Making this process explicit and open to public comment and input would be an improvement of the EIA/BA process. The CSIR's approach to determining significance is generally as follows:

- Use of expert opinion by the specialists ("professional judgement"), based on their experience, a site visit and analysis, and use of existing guidelines and strategic planning documents and conservation mapping (e.g. SANBI biodiversity databases);
- Review of specialist assessment by all stakeholders including authorities such as nature conservation officials, as part of the report review process (i.e. if a nature conservation official disagreed with the significance rating, then we could negotiate the rating); and
- Our approach is more a qualitative approach - we do not have a formal matrix calculation of significance as is sometimes done.

2) SPECIALIST CRITERIA FOR IMPACT ASSESSMENT

The following methodology has been provided by the CSIR to all specialists, for incorporation into specialist assessments:

Assessment of Potential Impacts

The assessment of impact significance is based on the following conventions:

Nature of Impact - this reviews the type of effect that a proposed activity will have on the environment and should include “what will be affected and how?”

Spatial Extent - this should indicate whether the impact will be:

- Site specific;
- Local (<2 km from site);
- Regional (within 30 km of site); or
- National.

Duration - The timeframe during which (lifetime of) the impact will be experienced:

- Temporary (less than 1 year);
- Short term (1 to 6 years);
- Medium term (6 to 15 years);
- Long term (the impact will cease after the operational life of the activity); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).

Intensity - it should be established whether the impact is destructive or innocuous and should be described as either:

- High (severe alteration of natural systems, patterns or processes such that they temporarily or permanently cease);
- Medium (notable alteration of natural systems, patterns or processes; where the environment continues to function but in a modified manner); or
- Low (negligible or no alteration of natural systems, patterns or processes); can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.

Probability - this considers the likelihood of the impact occurring and should be described as:

- Improbable (little or no chance of occurring);
- Probable (<50% chance of occurring);
- Highly probable (50 – 90% chance of occurring); or
- Definite (>90% chance of occurring).

Reversibility - this considers the degree to which the adverse environmental impacts are reversible or irreversible. For example, an impact will be described as low should the impact have little chance of being rectified to correct environmental impacts. On the other hand, an impact such as the nuisance factor caused by noise impacts from wind turbines can be considered to be highly reversible at the end of the project lifespan. The assessment of the reversibility of potential impacts is based on the following terms:

- High - impacts on the environment at the end of the operational life cycle are highly reversible;
- Moderate - impacts on the environment at the end of the operational life cycle are reasonably reversible;
- Low - impacts on the environment at the end of the operational life cycle are slightly reversible; or
- Non-reversible - impacts on the environment at the end of the operational life cycle are not reversible and are consequently permanent.

Irreplaceability - this reviews the extent to which an environmental resource is replaceable or irreplaceable. For example, if the proposed project will be undertaken on land that is already transformed and degraded,

this will yield a low irreplaceability score; however, should a proposed development destroy unique wetland systems for example, these may be considered irreplaceable and thus be described as high. The assessment of the degree to which the impact causes irreplaceable loss of resources is based on the following terms:

- High irreplaceability of resources (this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (this is the most favourable assessment for the environment).

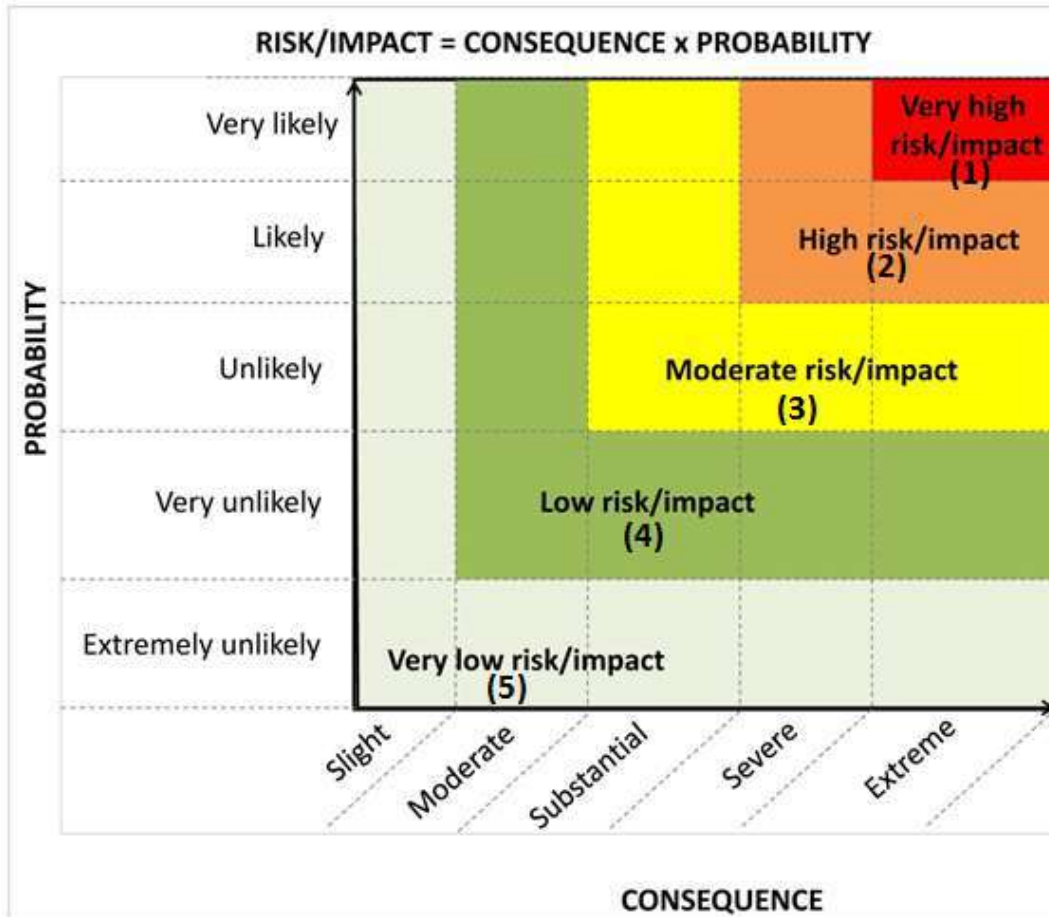


Figure 7: Guide to assessing risk/impact significance as a result of consequence and probability.

The status of the impacts and degree of confidence with respect to the assessment of the significance is stated as follows:

Status of the impact: A description as to whether the impact will be:

- Positive (environment overall benefits from impact);
- Negative (environment overall adversely affected); or
- Neutral (environment overall not affected).

Degree of confidence in predictions: The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as:

- High;
- Medium; or
- Low.

Based on the above considerations, the specialist provides an overall evaluation of the significance of the potential impact, which should be described as follows:

- **Low to very low:** the impact may result in minor alterations of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated;
- **Medium:** the impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated; or
- **High:** Where it could have a “no-go” implication for the project unless mitigation or re-design is practically achievable.

Furthermore, the following must be considered:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the construction, operation and decommissioning phases of the project, where relevant.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant.

Management Actions:

- Where negative impacts are identified, mitigatory measures will be identified to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Where positive impacts are identified, augmentation measures will be identified to potentially enhance these.
- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.

Monitoring:

Specialists should recommend monitoring requirements to assess the effectiveness of mitigation actions, indicating what actions are required, by whom, and the timing and frequency thereof.

Cumulative Impact:

Consideration is given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts are evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

Mitigation:

The objective of mitigation is to firstly avoid and minimise impacts where possible and where these cannot be completely avoided, to compensate for the negative impacts of the development on the receiving environment and to maximise re-vegetation and rehabilitation of disturbed areas. For each impact identified, appropriate mitigation measures to reduce or otherwise avoid the potentially negative impacts are suggested. All impacts are assessed without mitigation and with the mitigation measures as suggested.

Note from the CSIR: Feasible site alternatives (i.e. location and property alternatives) do not exist for the proposed project. The No-Go alternative will be considered.

Construction Phase

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

Alternative 1 (Preferred Alternative)

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
Direct loss of terrestrial vegetation and faunal habitat	High (Negative)	<ul style="list-style-type: none"> Restrict all habitat loss and disturbances from construction activities to within the proposed and agreed upon site layout. Maintain the viability of the indigenous seed bank in excavated soil so that this can be used for subsequent re-vegetation of any disturbed areas. No landscaping should be performed around the facilities. Avoid unnecessary loss of indigenous trees (The <i>Acacia</i> Indigenous Bushclumps) 	Low (Negative)
Loss / Reduction of CI or medicinal flora	Medium (Negative)	<ul style="list-style-type: none"> Submit permits for the removal of CI important species within the study site Prior to construction all CI and medicinally important floral specimens within the site layout footprint should be collected and replanted in the surrounding 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
		<p>areas.</p> <ul style="list-style-type: none"> Guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants is advised. 	
Introduction & proliferation of alien species leading to increased competition and change in habitat structure	High (Negative)	<ul style="list-style-type: none"> Regulate / limit access by potential vectors of alien plants. Maintain a tidy construction site By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit. 	Low (Negative)
Reduction in Woody Alien Species	Medium (Positive)	N/A	Medium (Positive)
Faunal Mortality and Displacement (including CI species)	Medium (Negative)	<ul style="list-style-type: none"> Adhere to law and best practice guidelines regarding the handling and relocation of CI fauna Appropriately deal with fauna on site Time construction activities to minimize faunal mortality. Limit unnecessary mortality, and persecution of fauna. Minimize displacement of fauna that utilize alien trees 	Low (Negative)
Increase in dust and erosion degrading habitat integrity	Medium (Negative)	<ul style="list-style-type: none"> Limit vehicles, people and materials to the construction site Commence (and preferably 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
		<p>complete) construction during winter, when the risk of erosion should be least.</p> <ul style="list-style-type: none"> • Revegetate denude areas with locally indigenous flora a.s.a.p. • Implement erosion protection measures on site to reduce erosion and sedimentation of downstream areas. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed. • Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting of the entrance road. 	
Sensory disturbances	Medium (Negative)	<ul style="list-style-type: none"> • Time construction activities to minimize sensory disturbance of fauna. • Limit disturbance from noise. • Limit disturbance from light. 	Low (Negative)
Destruction of graves	Medium (Negative)	<ul style="list-style-type: none"> • Erect fence 5 m from graves and respect 10 m buffer from fence. 	Very Low (Positive)
Disturbance to and damage to Heritage Artefacts	Medium (Negative)	<ul style="list-style-type: none"> • The construction workers must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African 	Very Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
		Heritage Resources Agency (SAHRA) must be immediately contacted	
Emissions from construction vehicles and generation of dust as a result of earthworks, demolition, as well as the delivery and mixing of construction materials.	Medium (Negative)	<ul style="list-style-type: none"> • Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. • Approved soil stabilisers may be utilised to limit dust generation. • Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour. • Limit vehicles, people and materials to the construction site • Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary • Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. • Noise should also be minimised throughout construction to limit the impact on sensitive fauna 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
		<p>such as owls and large terrestrial birds.</p> <ul style="list-style-type: none"> • Limit construction activities to day time hours. 	
Pollution caused by spillage or discharge of construction waste water into the surrounding environment.	Low (Negative)	<ul style="list-style-type: none"> • Ensure that adequate containment structures are provided for the storage of construction materials on site. • Ensure the adequate removal and disposal of construction waste and material, 	Very Low (Negative)
Socio-economic Impact: Employment creation and skills development opportunities during the construction phase, which is expected to give rise to approximately 6-12 new jobs. This impact is rated as positive.	Medium (Positive)	<ul style="list-style-type: none"> • Enhance the use of local labour and local skills as far as reasonably possible. • Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained. • Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract. • Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible. 	High (Positive)
Potential visual intrusion of	Low (Negative)	<ul style="list-style-type: none"> • No specific mitigation measures are 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
<p>construction/demolition activities on the views of sensitive visual receptors</p>		<p>required other than standard construction site housekeeping and dust suppression. These are included below:</p> <ul style="list-style-type: none"> ▪ The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste. ▪ Litter and rubble should be timeously removed from the construction site and disposed at a licenced waste disposal facility. ▪ The project developer should demarcate construction boundaries and minimise areas of surface disturbance. ▪ Appropriate plans should be in place to minimise fire hazards and dust generation. ▪ Night lighting of the construction site should be minimised within requirements of safety and efficiency. 	
<p>Potential noise impact from the use of construction equipment (for the construction of the proposed infrastructure and demolition of existing infrastructure).</p>	<p>Low (Negative)</p>	<ul style="list-style-type: none"> • Limit construction activities to day time hours 	<p>Low (Negative)</p>

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
Noise generation from demolition and construction work (e.g. grinding and use of angle grinders), as well as from the removal of waste material (e.g. crane and truck engines).	Medium (Negative)	<ul style="list-style-type: none"> • Construction personnel must wear proper hearing protection, which should be specified as part of the Construction Phase Risk Assessment carried out by the Contractor. • The Contractor must ensure that all construction personnel are provided with adequate Personal Protective Equipment (PPE), where appropriate. • The Contractor must prescribe, to construction personnel, what is required by Alphomega management permit to work system. 	Low (Negative)
Potential health injuries to construction personnel as a result of construction work (i.e. welding fumes).	Medium (Negative)	<ul style="list-style-type: none"> • The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate. 	Low (Negative)
Traffic, congestion and potential for collisions during the construction phase.	Low (Negative)	<ul style="list-style-type: none"> • During the construction phase, suitable parking areas should be created and designated for construction trucks and vehicles. • A construction supervisor should be appointed to co-ordinate construction traffic during the construction phase (by drawing up a traffic plan prior to construction). • Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the construction site. 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
<p>Construction safety injuries: potential impact on the safety of construction workers due to construction activities (such as welding, cutting, working at heights, lifting of heavy items etc.)</p>	<p>High (Negative)</p>	<ul style="list-style-type: none"> • Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards. • The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate. • The Contractor must undertake a Construction Phase Risk Assessment. • A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to coordinate the construction traffic. • Ensure that roads are not closed during construction, which may restrict access for emergency services. 	<p>Medium (Negative)</p>
<p>Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material.</p>	<p>High (Negative)</p>	<ul style="list-style-type: none"> • The amount of hazardous materials and liquids (such as cleaning materials) handled will be minimal. Fumes generated during welding will be minimal, within a well-ventilated area. • All construction waste (including rubble) should be frequently 	<p>Low (Negative)</p>

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
		<p>removed from site and correctly disposed by a suitable waste Contractor.</p> <ul style="list-style-type: none"> • The construction site should be cleaned regularly. • The Contractor should provide adequate waste skips (or similar) on site and the Construction Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips. 	
Indirect Impacts			
Socio-economic impact: Secondary industries may benefit from the proposed project in the form of the provision of produce and pork products. This impact is rated as positive.	Low (Positive)	<ul style="list-style-type: none"> • Ensure that local industries are utilised as suppliers, where applicable/practical. 	Medium (Positive)
No-go Alternative			
<p><i>Direct impacts:</i></p> <ul style="list-style-type: none"> • None of the impacts mentioned above will occur. • If the proposed project does not proceed, increased income and economic spin-off activities will not be realised. • Approximately 6-12 new jobs will not be created during the construction phase. • If the proposed project does not proceed, the industries that rely on the supply of fresh produce and pork products could experience hindered economic growth potential. <p><i>Indirect impacts:</i></p> <ul style="list-style-type: none"> • There are no indirect impacts during the construction phase for the No-go Option. <p><i>Cumulative impacts:</i></p>			

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
<ul style="list-style-type: none">• There are no cumulative impacts during the construction phase for the No-go Option.			

Operational Phase

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
Environmental contamination	Medium (Negative)	<ul style="list-style-type: none"> Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment. 	Low (Negative)
Poor / Inappropriate control of invertebrate pests	High (Negative)	<ul style="list-style-type: none"> Detect and control pest infestations before they become a problem through frequent and careful cleaning, monitoring and control. 	Low (Negative)
Poor / Inappropriate control of vertebrate pests	Medium (Negative)	<ul style="list-style-type: none"> Detect pest infestations before they become a problem through frequent and careful monitoring. 	Low (Negative)
Transmission of diseases	Medium (Negative)	<ul style="list-style-type: none"> Ensure that pests and other potential vectors are unable to enter areas where they might encounter production animals, carcasses, excrement or bedding, by thoroughly sealing these areas using effective, humane and environmentally-friendly means. 	Low (Negative)
Altered burning	High (Negative)	<ul style="list-style-type: none"> Ensure that flammable materials are stored in an appropriate safe house. Ensure that there are appropriate control measures in place for any accidental fires. If artificial burning is considered necessary to reduce risks to human and infrastructure safety 	Medium (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
		from wild fires, a fire management plan should be compiled with input from an appropriate floral specialist, and diligently implemented. Annual wild fires should be strictly prohibited.	
Introduction & proliferation of alien spp. - Competition and change in structure	High (Negative)	<ul style="list-style-type: none"> Regulate / limit access by potential vectors of alien plants Maintain a neat and tidy production facility By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit. 	Low (Negative)
Sensory disturbances	Medium (Negative)	<ul style="list-style-type: none"> Limit the effects of light pollution on nocturnal fauna (including numerous insects, bats and hedgehogs). Limit the effects of noise from pigs and operational activities on fauna such as carnivores, owls, korhaans and Secretarybirds. 	Low (Negative)
Destruction of graves	Medium (Negative)	<ul style="list-style-type: none"> Erect fence 5 m from graves and respect 10 m buffer from fence. 	Very Low (Positive)
Emissions from staff vehicles.	Low (Negative)	<ul style="list-style-type: none"> Efficient movement of traffic through the entrance and exit in order to reduce congestion and vehicle emissions. Ensure that the facility is operated in such a manner whereby potential odours are minimised. 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
Increased odours resulting from the pig production	High (Negative)	<ul style="list-style-type: none"> Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the air quality of the receiving environment. 	Medium (Negative)
Improved service delivery with regards to produce and pork products. This impact is rated as positive.	Medium (Positive)	<ul style="list-style-type: none"> Ensure that the proposed infrastructure is maintained appropriately to ensure that all facilities and infrastructure operate within its design capacity to deliver as the market requires. 	High (Positive)
Employment creation and skills development opportunities during the construction phase, which is expected to give rise to approximately 10 new jobs. This impact is rated as positive.	Medium (Positive)	<ul style="list-style-type: none"> Liaise with TNPA to maximise job creation opportunities during the construction phase. Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained. Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract. Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible 	High (Positive)
Potential visual intrusion of structures and	Low (Negative)	<ul style="list-style-type: none"> No specific mitigation measures are 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
buildings associated with the proposed development on existing views of sensitive visual receptors.		recommended.	
Potential impact of night lighting of the development on the nightscape of the surrounding landscape.	Low (Negative)	<ul style="list-style-type: none"> • No specific mitigation measures are recommended as it is assumed that night lighting of the proposed storage facility will be planned in such a manner so as to minimize light pollution such as glare and light spill (light trespass) by: <ul style="list-style-type: none"> ▪ Using light fixtures that shield the light and focus illumination on the ground (or only where light is required). ▪ Using minimum lamp wattage within safety/security requirements. ▪ Avoiding elevated lights within safety/security requirements. ▪ Where possible, using timer switches or motion detectors to control lighting in areas that are not occupied continuously (if permissible and in line with minimum security requirements). ▪ Switching off lights when not in use in line with safety and security. 	Low (Negative)
Potential noise impact from operations	Low (Negative)	<ul style="list-style-type: none"> • It is recommended that the drivers of 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
and road transport of products during the operational phase (i.e. increased road traffic).		<p>the vehicles be discouraged from using air brakes at night.</p> <ul style="list-style-type: none"> Limit the effects of noise associated disturbances from pigs and operational activities on sensitive fauna such as owls and medium-large mammals (especially carnivores), potentially occurring hedgehogs and large terrestrial birds such as Korhaans and Secretarybirds. 	
Atmospheric pollution due to fumes, smoke from fires (involving plant and vegetable oils or MEG).	Medium (Negative)	<ul style="list-style-type: none"> Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the terminal as required. Mobile fire-fighting equipment should be provided at the berths as a safety precaution during the vessel offloading process. It should be noted that the products planned to be stored at the terminal have high flash points and low volatility. As a result, fires are unlikely, unsustainable, and can be extinguished with basic fire water and portable fire extinguishers. 	Low (Negative)
Groundwater contamination as a result of the storage of pig waste in the proposed cement lagoon.	Medium (Negative)	<ul style="list-style-type: none"> Ensure that that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic, or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms. 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
		<ul style="list-style-type: none"> Personnel should ensure careful transportation of waste from the pig facilities to the lagoon as to avoid spillage. Adequate infrastructure should ensure waste will not exit the lagoon in an extreme weather event. Ensure adequate treatment of the waste to avoid extreme odours and contaminations. 	
Potential impact on the health of operating personnel resulting in potential health injuries.	Medium (Negative)	<ul style="list-style-type: none"> Operational personnel must wear basic PPE (e.g. gloves, goggles etc.) as necessary during the operational phase. 	Low (Negative)
Minor accidents to the public and moderate accidents to operational staff (e.g. fires).	Medium (Negative)	<ul style="list-style-type: none"> An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site. Scheduled inspections should be implemented by operating personnel in order to assure and verify the integrity of hoses, piping and storage lagoon. Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required. 	Low (Negative)
Impact of extra operational vehicles on the	Low (Negative)	<ul style="list-style-type: none"> Undertake re-calibration of existing 	Low (Negative)

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Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
road network.		traffic signals if required.	
<i>Indirect Impacts</i>			
Socio-economic impact: Secondary industries may benefit from the proposed project in the form of the provision of produce and pork products. This impact is rated as positive.	Low (Positive)	<ul style="list-style-type: none"> Ensure that local industries are utilised as suppliers, where applicable/practical. 	Medium (Positive)
No-go alternative			
<p><i>Direct impacts:</i></p> <ul style="list-style-type: none"> None of the impacts mentioned above will occur. The existing site will remain uncleared which will result in no clearance of indigenous vegetation and in addition, no clearance of present alien species. If the proposed project does not proceed, increased income and economic spin-off activities will not be realised. Approximately 6-12 new jobs will not be created during the construction phase. Customers of the proposed pig and vegetable facility will not be provided with an increase of produce and pork products on a local scale. If the proposed project does not proceed, the industries that rely on the supply of fresh produce and pork products could experience hindered economic growth potential. <p><i>Indirect impacts:</i></p> <ul style="list-style-type: none"> There are no indirect impacts during the construction phase for the No-go Option. <p><i>Cumulative impacts:</i></p> <p>There are no cumulative impacts during the operational phase for the No-go Option</p>			

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

Ecological opinion/scan for a proposed development of a pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng- Natural Scientific Services– **Attached as Appendix G.**

Heritage Impact Assessment: Basic Assessment for a proposed piggery on Portion 18 of Portion 13 of Poortje 340-IQ, Gauteng. ASHA Consulting (Pty) Ltd and Heritage Contracts Archaeological Consulting- **Attached as Appendix G.**

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

Heritage Impact Assessment

The study is carried out at the surface only and hence any completely buried archaeological sites will not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. Although a detailed site development plan was not available, we do not believe that this will have impacted on the outcome of the assessment.

Terrestrial Impact Study

It is important to note that the absence of species on site does not conclude that the species is not present at the site. Reasons for not finding certain species during the late summer site visit may be due to:

- The short duration of fieldwork as well as the timing of the fieldwork (which occurred close to the end of the growing season). At the end of summer many species have died back and retracted making it difficult to confirm identification. The 2015/2016 season also experienced below average rainfall in the beginning of the season.
- Some plant species, which are small, have short flowering times, rare or otherwise difficult to detect may not have been detected even though they were potentially present on site.
- Vegetation mapping was based on the brief in-field survey as well as aerial imagery. Positioning of the vegetation units may not be exact due to potential georeferencing errors displayed in Google Earth, GPS accuracy in field as well as the age of the aerial image.

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

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

Potential impacts:	Significance rating of impacts(positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:
Introduction & proliferation of alien spp. - Competition and change in structure	High (Negative)	<ul style="list-style-type: none"> • Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment. • Ensure that there are appropriate control measures in place for any contamination event 	Low (Negative)
Sensory disturbances	Low (Negative)	<ul style="list-style-type: none"> • Time demolition / rehabilitation activities to minimize sensory disturbance of fauna • Limit disturbance from noise. • Limit disturbance from light. • Effectively control dust. 	Low (Negative)
Destruction of graves	Medium (Negative)	<ul style="list-style-type: none"> • Erect fence 5 m from graves and respect 10 m buffer from fence. 	Very low (Positive)
Potential spillage of effluent to the surrounding environment (from portable sanitation facilities for decommissioning personnel).	Medium (Negative)	<ul style="list-style-type: none"> • Normal sewage management practises should be implemented. These include ensuring that portable sanitation facilities are regularly emptied and the resulting sewage is transported safely (by an appointed service provider) for correct disposal at an appropriate, licenced facility. Proof of disposal (in the form of waste disposal slips or waybills) should be retained on file for auditing purposes. 	Low (Negative)
Discharge of contaminated stormwater into the surrounding environment. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Medium (Negative)	<ul style="list-style-type: none"> • The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase. • Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff. 	Low (Negative)
Pollution of the surrounding	Medium (Negative)	<ul style="list-style-type: none"> • General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, 	Low (Negative)

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<p>environment as a result of the handling, temporary storage and disposal of solid waste.</p>		<p>tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored <u>temporarily</u> on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.</p> <ul style="list-style-type: none"> • Should the on-site storage of general waste and hazardous waste exceed 100 m³ and 80 m³ respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to. • Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal. • Ensure that sufficient general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis. • Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna. 	
<p>Air Quality Impact: Emissions from decommissioning vehicles and generation of dust as a result of earthworks and demolition.</p>	<p>Low (Negative)</p>	<ul style="list-style-type: none"> • Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. • Approved soil stabilisers may be utilised to limit dust generation. • Ensure that decommissioning vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour. 	<p>Low (Negative)</p>
<p>Potential visual intrusion of decommissioning activities on the existing views of sensitive visual receptors.</p>	<p>Low (Negative)</p>	<ul style="list-style-type: none"> • No specific mitigation measures are required other than standard site housekeeping and dust suppression. These are included below: <ul style="list-style-type: none"> ▪ The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste. ▪ Litter and rubble should be timeously removed from the work site and disposed at a licenced waste disposal facility. ▪ The project developer should demarcate decommissioning boundaries and 	<p>Low (Negative)</p>

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		<ul style="list-style-type: none"> minimise areas of surface disturbance. <ul style="list-style-type: none"> ▪ Appropriate plans should be in place to minimise fire hazards and dust generation. ▪ Night lighting of the decommissioning site should be minimised within requirements of safety and efficiency. • Limit the effects of light pollution on nocturnal fauna (e.g. The potentially occurring Hedgehog and Rusty Pipistrelle but also various invertebrate species) 	
Noise generation from demolition activities (e.g. grinding, steel falling, use of angle grinders) during the decommissioning phase.	Medium (Negative)	<ul style="list-style-type: none"> • A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks. • Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor. • The Contractor must ensure that all decommissioning personnel are provided with adequate PPE, where appropriate. 	Low (Negative)
Potential health injuries to demolition staff during the decommissioning phase.	Medium (Negative)	<ul style="list-style-type: none"> • The Contractor must ensure that all decommissioning personnel are provided with adequate PPE for use where appropriate. 	Low (Negative)
Heavy traffic, congestion and potential for collisions.	Medium (Negative)	<ul style="list-style-type: none"> • Suitable parking areas should be created and designated for trucks and vehicles. • A supervisor should be appointed to co-ordinate traffic during the decommissioning phase. • Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the site. 	Low (Negative)
Demolition safety injuries.	High (Negative)	<ul style="list-style-type: none"> • Ensure that a skilled and competent Contractor is appointed. The Contractor must be evaluated during the tender/appointment process in terms of safety standards. • The Contractor must ensure that all decommissioning personnel are provided with adequate PPE for use where appropriate. • The Contractor must undertake a Decommissioning Phase Risk Assessment. 	Medium (Negative)

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		<ul style="list-style-type: none"> • A Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the decommissioning phase. This could be the same person that is assigned to co-ordinate the decommissioning traffic. 	
Pollution of the surrounding water and ground as a result of spillages, generation of building rubble and waste scrap material.	High (Negative)	<ul style="list-style-type: none"> • The amount of hazardous materials and liquids (such as cleaning materials) handled will be minimal. Fumes generated during welding will be minimal, within a well-ventilated area. • All demolition waste (including rubble) should be frequently removed from site and correctly disposed by a suitable waste Contractor. • The work area should be cleaned regularly. • The Contractor should provide adequate waste skips (or similar) on site and the contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips. 	Low (Negative)

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

Ecological opinion/scan for a proposed development of a pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng- Natural Scientific Services– **Attached as Appendix G.**

Heritage Impact Assessment: Basic Assessment for a proposed piggery on Portion 18 of Portion 13 of Poortje 340-IQ, Gauteng. ASHA Consulting (Pty) Ltd and Heritage Contracts Archaeological Consulting- **Attached as Appendix G.**

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



4. CUMULATIVE IMPACTS

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

The surrounding communities mainly use groundwater as their source of water; this can lead to the reduction in water availability due to heavy reliance on ground water supply. A borehole test will be undertaken to determine the availability of water within the development site to meet the required capacity of the proposed development. The proposed development has the potential to also create employment, increase pork production and boost economic development in the area. This impact can also provide employment opportunities at various levels of production i.e. producers, distributors etc. As such the impact does not require any mitigation as it will improve the socio economic status of the surrounding areas. The odour from the piggery will also contribute to the existing localised cattle farming practices in the area. It is therefore important to ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the air quality of the receiving environment and that best practice pig husbandry and waste disposal norms are adhered to.

5. ENVIRONMENTAL IMPACT STATEMENT

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

Proposal

The proposed area is mostly transformed as a result of past agricultural practices. The main environmental impacts associated with the proposed project include:

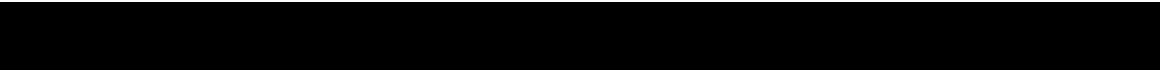
Site clearance and preparation of site for the pig facility and crop production may destroy medically important and CI species found on site. CI species within the Ridge habitats are considered not to be affected by the development during the construction phase; however they may be reduced due to harvesting by those entering the site. The probability is however, considered to be low.

Earth-moving activities during the clearing of vegetation for the piggery and the tilling of land for vegetable production is likely to increase bare ground, dust and the land's susceptibility to erosion. The potential impact of continued and increased dust during construction was rated of **Medium** significance.

There may be a further loss of Moderate-High and Moderate Significance habitat due to clearing and tilling of the site for the pig facility and crop production. Although habitats may be lost, the overall fragmentation of these habitats as a whole is seen as negligible due to the scale of the development and the current transformations on site. Habitat loss within the development footprint is also considered unlikely to affect potentially occurring CI faunal species due to the current disturbed nature of the site. The Very High rated Ridge communities are not within the footprint of the development and therefore no direct loss is expected. However, the drainage system exiting the Ridge habitat fields may continue to be impacted upon if farming of this field is planned for the development.

Waste will be generated through-out the life cycle of the development. However with proper waste disposal measures, waste impacts will be of low probability post mitigation. Please see Appendix I for full impact assessment and their significance.

Alternative 1



Alternative 2



No-go (compulsory)

The 'No-Go' option assumes a conservative approach that would ensure that the environment is not disturbed. It is important to state that this assessment is informed by the current condition of the area. Should the Competent Authority decline the application, the 'No-Go' option will be followed and the status quo of the site will remain.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

Table 3: Summary of Impacts and Significance with Mitigation

POTENTIAL IMPACTS	SIGNIFICANCE	SIGNIFICANCE
	RATING	RATING
CONSTRUCTION	Without	With
<i>Direct loss of terrestrial vegetation and faunal habitat</i>	High (-)	Low (-)
<i>Loss of CI or medicinal flora</i>	Medium (-)	Low (-)
<i>Introduction & proliferation of alien spp.</i>	High (-)	Low (-)
<i>Reduction in Woody Alien Species</i>	Medium (+)	Medium (+)
<i>Faunal Mortality and Displacement (including CI species)</i>	Medium (-)	Low (-)
<i>Increase in dust and erosion degrading habitat integrity</i>	Medium (-)	Low (-)
<i>Sensory disturbances</i>	Medium (-)	Low (-)
<i>Destruction of graves</i>	Medium (-)	Very Low (+)
<i>Emissions from construction vehicles and generation of dust</i>	Medium (-)	Low (-)
<i>Pollution caused by spillage or discharge of construction waste water</i>	Low(-)	Very Low (-)
<i>Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material</i>	High (-)	Low (-)
<i>Employment creation and skills development opportunities</i>	Medium (+)	High (+)
<i>Visual intrusion of construction/demolition activities</i>	Low (-)	Low (-)
<i>Noise impact from the use of construction equipment</i>	Medium (-)	Low(-)
<i>Noise generation from demolition and construction work</i>	Medium (-)	Low(-)
<i>Health injuries to construction personnel as a result of construction work</i>	Medium (-)	Low(-)
<i>Construction safety injuries: potential impact on the safety of construction workers</i>	High (-)	Medium(-)
<i>Traffic, congestion and potential for collisions</i>	Low (-)	Low (-)
OPERATION		
<i>Environmental contamination</i>	Medium (-)	Low (-)
<i>Poor / Inappropriate control of invertebrate pests</i>	High (-)	Low (-)
<i>Poor / Inappropriate control of vertebrate pests</i>	Medium (-)	Low (-)
<i>Transmission of diseases</i>	Medium (-)	Low (-)
<i>Reduction in CI Species - Harvesting of CI or medicinal flora</i>	Medium (-)	Low (-)
<i>Increased burning - degrading habitat integrity/ Destruction of Species</i>	High (-)	Medium (-)
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High (-)	Low (-)
<i>Sensory disturbances</i>	Medium (-)	Low (-)
<i>Destruction of graves</i>	Medium (-)	Very Low (-)
<i>Emissions from staff vehicles.</i>	Low (-)	Low (-)
<i>Increased odours resulting from the pig production facility.</i>	High (-)	Medium (-)
<i>Improved service delivery with regards to produce and pork products</i>	Medium (+)	High (+)

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<i>Employment creation and skills development</i>	Medium (+)	High (+)
<i>Visual intrusion of structures and buildings</i>	Low (-)	Low (-)
<i>Night lighting of the development on the nightscape of the surrounding landscape</i>	Low (-)	Low (-)
<i>Noise impact from operations and road transport of products</i>	Low (-)	Low (-)
<i>Atmospheric pollution due to fumes, smoke from fires</i>	Medium (-)	Low (-)
<i>Groundwater contamination as a result of the storage of pig waste</i>	Medium (-)	Low (-)
<i>Health of operating personnel resulting in potential health injuries</i>	Medium (-)(-)	Low (-)
<i>Minor accidents to the public and moderate accidents to operational staff</i>	Medium (-)	Low (-)
<i>Impact of extra operational vehicles on the road network</i>	Low (-)	Low (-)
DECOMMISSIONING		
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High (-)	Low (-)
<i>Sensory disturbances</i>	Low (-)	Low (-)
<i>Destruction of graves</i>	Medium (-)	Very Low (+)
<i>Discharge of contaminated stormwater into the surrounding environment</i>	Medium (-)	Low (-)
<i>Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste</i>	Medium (-)	Low (-)
<i>Emissions from decommissioning vehicles and generation of dust</i>	Low (-)	Low (-)
<i>Noise generation from demolition activities</i>	Medium (-)	Low (-)
<i>Potential health injuries to demolition staff during the decommissioning phase</i>	Medium (-)	Low (-)
<i>Heavy traffic, congestion and potential for collisions</i>	Medium (-)	Low (-)
<i>Demolition safety injuries</i>	High (-)	Medium (-)
<i>Pollution of the surrounding water and ground as a result of spillages, generation of building rubble and waste scrap material</i>	High (-)	Low (-)

For alternative:



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

The proposed development is for a development of a piggery. All the proposed structures associated with the development are designed to follow guidelines in terms of best practices associated with pig farming, and to adhere to environmental legislation advocating minimal environmental impacts. The proposed location of the piggery will ensure that development occurs in previously transformed land, minimising impact on ridge habitat within the remainder of the site. The preferred site is feasible for the proposed development provided that the management methods measures stipulated in this report are implemented.

7. SPATIAL DEVELOPMENT TOOLS

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

The spatial development tools were used to assess the suitability of the proposed development. The Emfuleni SDF promotes agricultural practices on the land that has been identified through land suitability criteria. The proposed development is within the area that has been demarcated as agricultural zone as such the propose development aligns with the objectives of the IDP (see figure 8).

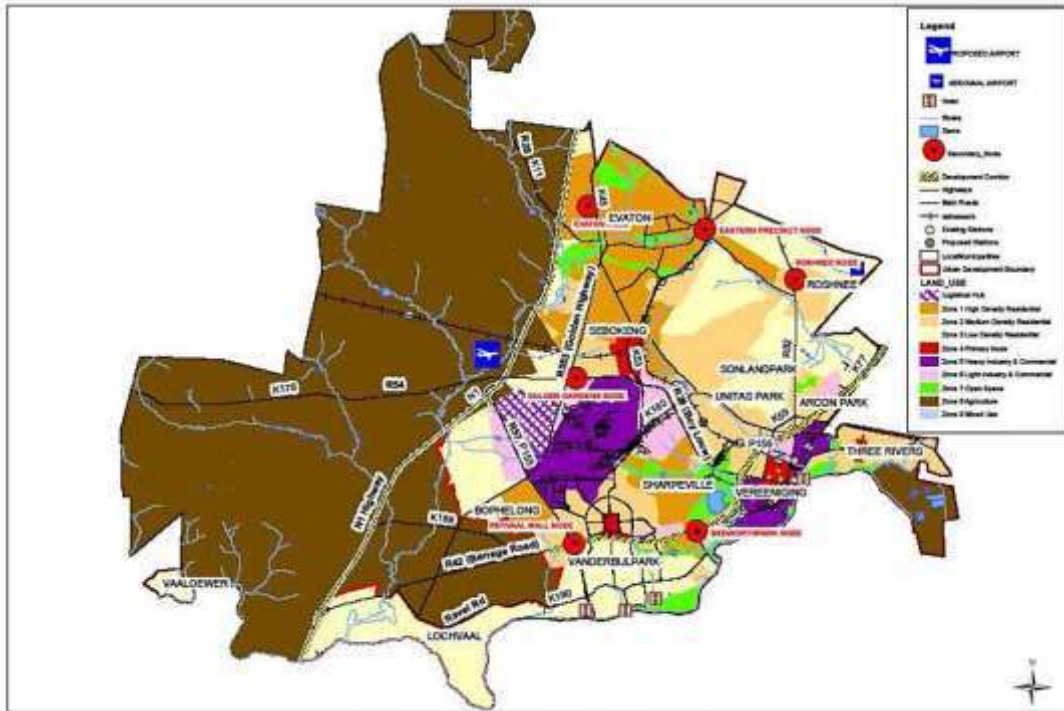


Figure 8: The land use structure of the Emfuleni Local municipality

Furthermore Gauteng has established agricultural hubs in order to boost agricultural economy and job creation. This led to the identification of the Emfuleni agricultural Hub, adjacent to the proposed development. These agricultural hubs are aimed at boosting agricultural products for local, national and international markets. The SDF further outlines the need for sustainable development of agricultural land which is driven by the following factors:

- Agricultural land is a limited natural resource
- Food security
- Climate change

It is therefore necessary to preserve land with high-potential agricultural solids based on the principles of sustainable development. This will ensure food security, even if such land is not currently used for agricultural purposes and also create awareness about the value of agricultural land and the need to preserve it.

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).

YES	
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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng

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



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

This Final BA Report has investigated and assessed the significance of the predicted positive and negative impacts associated with the proposed development of a piggery. No negative impacts have been identified within this BA that, in the opinion of the Environmental Assessment Practitioner who conducted this BA Process, should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. The fact that development occurs on previously transformed land minimises the impacts on the proposed development site.

Taking into consideration the findings of the BA Process, including the findings of the specialist studies, it is the opinion of the Environmental Assessment Practitioner, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable economic growth, skills development and employment opportunities in the Emfuleni Local Municipality.

It is recommended that the project receives Environmental Authorisation in terms of the EIA Regulations promulgated under the National Environmental Management Act (Act 107 of 1998, as amended) subjected to the following conditions:

- The EMPr of the proposed development must be adhered to during all phases of the development.
- A waste management Licence and a Water use license must be obtained.
- All the recommendations of the specialists must be implemented for the proposed project.

In order to ensure the effective implementation of the mitigation and management actions, an updated EMPr has been compiled and is included in Appendix F of this Final BA Report. The mitigation measures necessary to ensure that the project is planned, constructed, operated and decommissioned in an environmentally responsible manner are listed in this Draft EMPr. The EMPr is a dynamic document that should be updated regularly and provides clear and implementable measures for the development of the proposed piggery.

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9. THE NEEDS AND DESIRABILITY OF THE PROPOSED DEVELOPMENT (as per notice 792 of 2012, or the updated version of this guideline)

PART I: NEED		
1.	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	In terms of the Land Use Management Zone of the Emfuleni Local Municipality SDF, the proposed development site falls within Zone 8 (Agricultural zone) which has the aim to “Protect high-potential agricultural soils and allow of low-intensity residential uses where applicable” commercial farming has been described as the typical land use within this zone.
2.	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	Yes, according to the Spatial Development framework, the proposed project falls within an agricultural zone as well as an area which is demarcated as “rural”, and the intention of development in this area is to create sustainable rural development which provides food and work opportunities.
3.	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	The South African pork industry contributes around 2.15% to the primary agricultural sector. As such the proposed project will contribute towards local economic development in the area and poverty alleviation. Furthermore, the increase in produce within the pork industry will have a positive effect on South Africa’s poverty and food crisis, and thus aid in the National priority of boosting local economic development to improve the standard of living for communities.
4.	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	Yes. The proposed project will be using water directly from the registered borehole and will not rely on municipal water services. The site also has access to the municipal electricity. The site is within close proximity to R28 which is a regional road thus; additional capacity does not need to be created for the development.
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	The development is not provided for in the infrastructure planning of the municipality as it is a small development of local importance. Thus, the proposed project will not have any implications for the infrastructure planning, as no services and/or infrastructure needs to be upgraded or created to cater for this development. The current status of the infrastructure in the area will suffice for the proposed development.
6.	Is the project part of a national programme	The proposed development aims to maintain

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	to address an issue of national concern or importance?	and increase South Africa's ability to meet its national food requirements, and also seeks to eliminate inequalities and poverty amongst households. According to Stats SA, about 14.3 million South Africans are vulnerable to food insecurity. As such the proposed development feeds into the food security stream. In addition, the main goals highlighted in the NDP which relate to the proposed project are employment and adequate nutrition. Chapter 6 of the National Development Plan highlights an “inclusive rural economy” and the objectives of this plan are to create jobs in agriculture, maintain a positive trade balance for primary and processed agricultural products and activating rural economies through service to small and micro farmers. As such the proposed development of the piggery aligns with these goals.
PART II: DESIRABILITY		
1.	Is the development the best practicable environmental option for this land/site?	Yes. This site is located on a non-arable; moderate potential grazing land has moderate agricultural potential according to the Gauteng Agricultural Potential Atlas (GAPA 4) this is not seen as significant due to the fact that the proposed development is for agricultural purposes i.e. piggery and maize plantation, which makes the site ideal for this development. Furthermore the piggery will be located on the area that is modified already and where there are existing structures.
2.	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No. The proposed project aligns itself with the vision of Emfuleni Local Municipality which is to create a city that is developing in order to continuously improve the quality of life of the community. The proposed development will contribute towards poverty alleviation by creating employment for the people in the municipality. It will also contribute towards financial sustainability of the municipality.
3.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	No, the development will not compromise the integrity of the existing environmental management priorities for the area will not be compromised by this development. The Sedibeng district municipality has identified three “hubs” for agricultural development. The proposed establishment of the piggery is adjacent to the proposed Vaalcon Freight logistic Hub. The following environmental constrains were evaluated in the SDF: <ul style="list-style-type: none"> • The site is not within protected natural area

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		<ul style="list-style-type: none"> • The site is within vulnerable and mixed bio sensitivity class • The site is within medium alien plant invasion suitability • The site also has very low ground water vulnerability. <p>Piggeries have been identified as potential projects that may stimulate economic opportunities for growth within the municipality.</p>
4.	Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	Yes, this area has been demarcated for agricultural development in the greater context of the district municipality due to its location and adjacency to the proposed Vaalcon Freight Logistic Hub, which is expected to attract investors and assist with transportation of meat to the market.
5.	How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	<p>The development of the proposed development will have an impact on the environment. However the findings of the Ecological Impact Assessment (Appendix G), recommends that the envisioned proposed development impacts can be mitigated to an acceptable level (Low, Low-Medium).</p> <p>Please refer to Section E for a list of all identified impacts of the proposed project on the environment.</p>
6.	How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	<p>Kindly see Section E of this Report with regards to the Impact Assessment. In summary, impacts on well-being of the proposed development, following mitigation, will be as follows:</p> <p>Visual: Low Odours: Medium Noise: Low Sense of place: Low</p>
7.	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No. The pork industry in South Africa is developing rapidly. pork production increased by an annual average of 4.5%.
8.	Will the proposed land use result in unacceptable cumulative impacts?	No. The identified cumulative impacts of the proposed project can be mitigated to an acceptable level. The measures outlined in the EMPr attached will serve as a method to keep the proposed project from having any serious long term cumulative impacts on the receiving environment.

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10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

(consider when the activity is expected to be concluded)

The Environmental Authorisation is required for a minimum of 20 years.

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached

Yes

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Declaration Forms

ADDENDUM 2

15. DECLARATIONS

DECLARATION OF THE APPLICANT

JACOB OUPA NATABOSE declare under oath that I

- am, or represent, the applicant in this application;
- have appointed / will appoint (delete that which is not applicable) an Environmental Assessment Practitioner (EAP) to act as the independent EAP for this application
- will provide the EAP and the competent authority with access to all information at my disposal that is relevant to the application;
- will be responsible for the costs incurred in complying with the Regulations, including but not limited to –
 - costs incurred in connection with the appointment of the EAP or any person contracted by the EAP;
 - costs incurred in respect of the undertaking of any process required in terms of the Regulations;
 - costs in respect of any fee prescribed by the Minister or MEC in respect of the Regulations;
 - costs in respect of specialist reviews, if the competent authority decides to recover such costs; and
 - the provision of security to ensure compliance with conditions attached to an environmental authorisation, should it be required by the competent authority;
- will ensure that the EAP is competent to undertake the EIA process with respect to this application and that the EAP:
 - o know the Act and the regulations, and how they apply to the proposed development
 - o know any applicable guidelines and policies
 - o performs the work objectively, even if the findings do not favour the applicant
 - o disclose all information which is important to the application and the proposed development
- will inform all registered I&AFs of any decisions taken by the competent authority in this regard;
- am responsible for complying with the conditions of any environmental authorisation issued by the competent authority;
- hereby indemnify the Government of the Republic, the competent authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action which the applicant or EAP is responsible for in terms of these Regulations;
- will not hold the competent authority responsible for any costs that may be incurred by the applicant in proceeding with an activity prior to obtaining an environmental authorisation or prior to an appeal being decided in terms of these Regulations;
- will perform all other obligations as expected from an applicant in terms of the Regulations;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of the EIA Regulations, 2014 and the NEMA.

[Signature]
Signature of the applicant/ Signature on behalf of the applicant:

(28 October 2016) Alphomega
Name of company (if applicable):

2016-10-28
Date:

[Signature]
Signature of the Commissioner of Oaths:

2016-10-28
Date:

W/OFF
Designation:

Commissioner of Oaths Official stamp (below)



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ADDENDUM 3

DECLARATION OF THE EAP

I, Mashedi Reinet Moyo, declare that -

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation, policies and guidelines;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public at large and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties, state department and competent authority will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and

Mashedi Reinet Moyo

Signature of the Environmental Assessment Practitioner:

Council for Scientific and Industrial Research
Name of company:

06 November 2016
Date:

[Signature]
Signature of the Commissioner of Oaths:

8/11/2016
Date:

Branch Manager
Designation:

Commissioner of Oaths Official stamp (below)



In the event where the EAP or specialist is not independent (Regulation 13(2) and (3) of the EIA Regulations, 2014), the proponent or applicant must, prior to conducting public participation, appoint another EAP or specialist which meets all the general requirements including being independent, to externally review all work undertaken by the EAP or specialist, at the applicant's cost appointed to manage the application.

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APPENDICES



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SECTION F: APPENDICES

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

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

APPENDIX A:	Site plan(s) – (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)
APPENDIX B:	Photographs
APPENDIX C:	Facility illustration(s)
APPENDIX D:	Route position information
APPENDIX E:	Public participation information
APPENDIX F:	Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information
APPENDIX G:	Specialist reports
APPENDIX H:	EMPr
APPENDIX I:	Other information

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APPENDICES



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APPENDICES

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
DRAFT BASIC ASSESSMENT REPORT

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APPENDIX C:	Facility illustration(s)
APPENDIX D:	Route position information
APPENDIX E:	Public participation information <ul style="list-style-type: none">• Appendix E.1 – Proof of site notice• Appendix E.2 – Written notices issued as required in terms of the regulations• Appendix E.3 – Proof of newspaper advertisements• Appendix E.4 – Communications to and from interested and affected parties• Appendix E. 5 - Comments and Responses Report• Appendix E.6 – Copy of the register of I&APs
APPENDIX F:	Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information
APPENDIX G:	Specialist reports
APPENDIX H:	EMPr
APPENDIX I:	Other information

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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion
13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
DRAFT BASIC ASSESSMENT REPORT

BASIC ASSESSMENT REPORT

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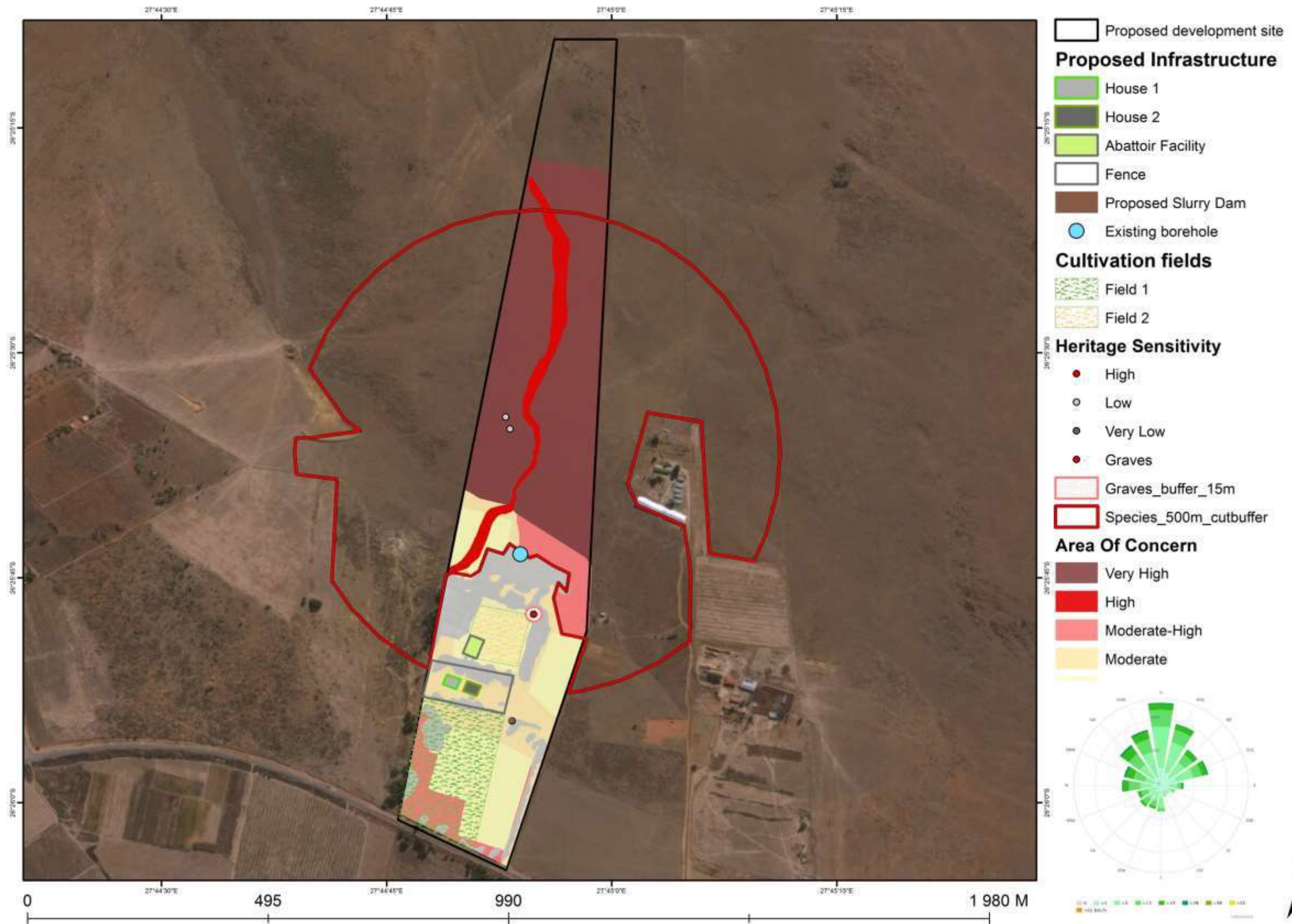
APPENDICES

Map A.1: Site layout of the proposed development (as received from the project applicant)



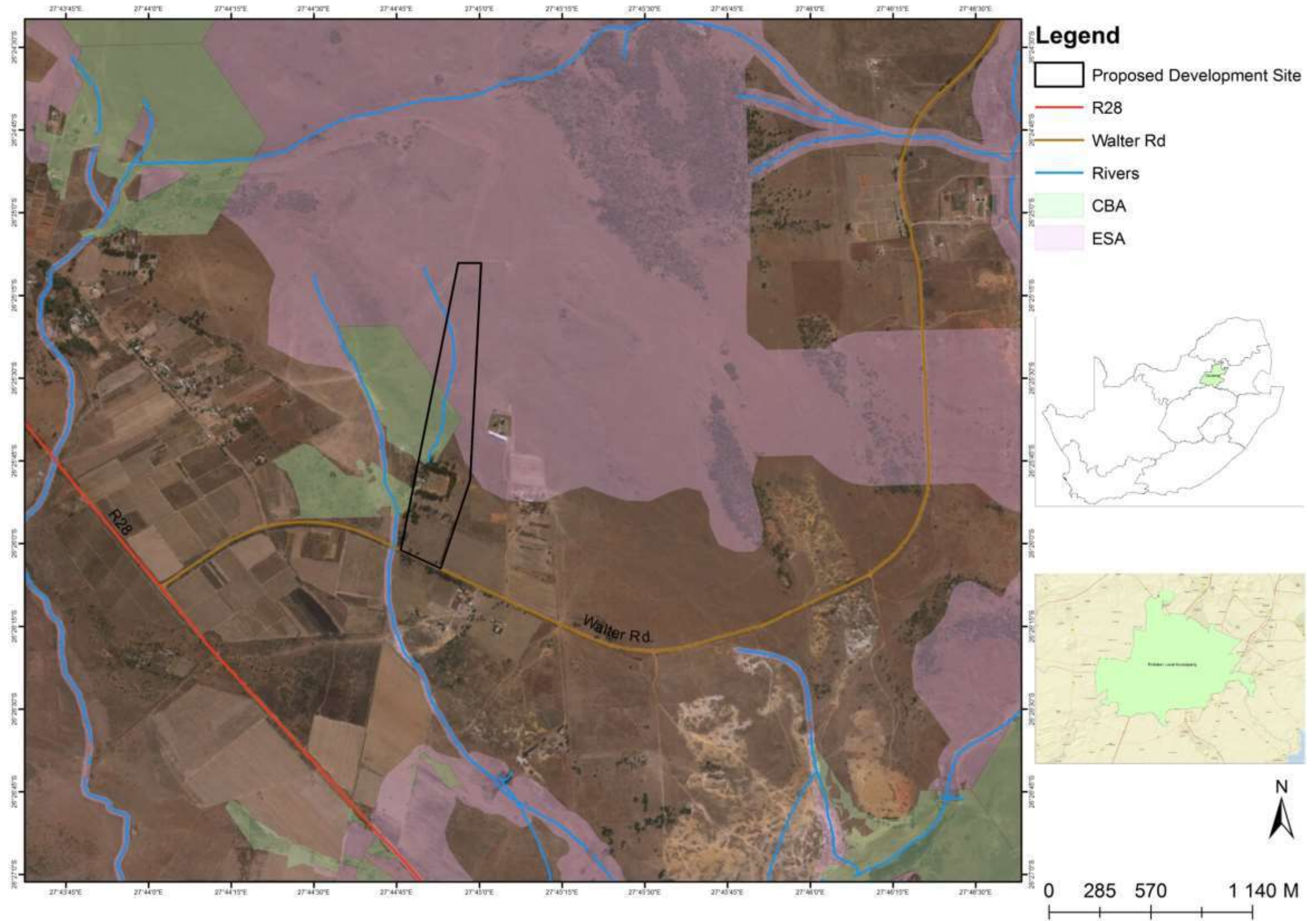
APPENDICES

Map A.2: Proposed layout superimposed on the sensitivities of the site

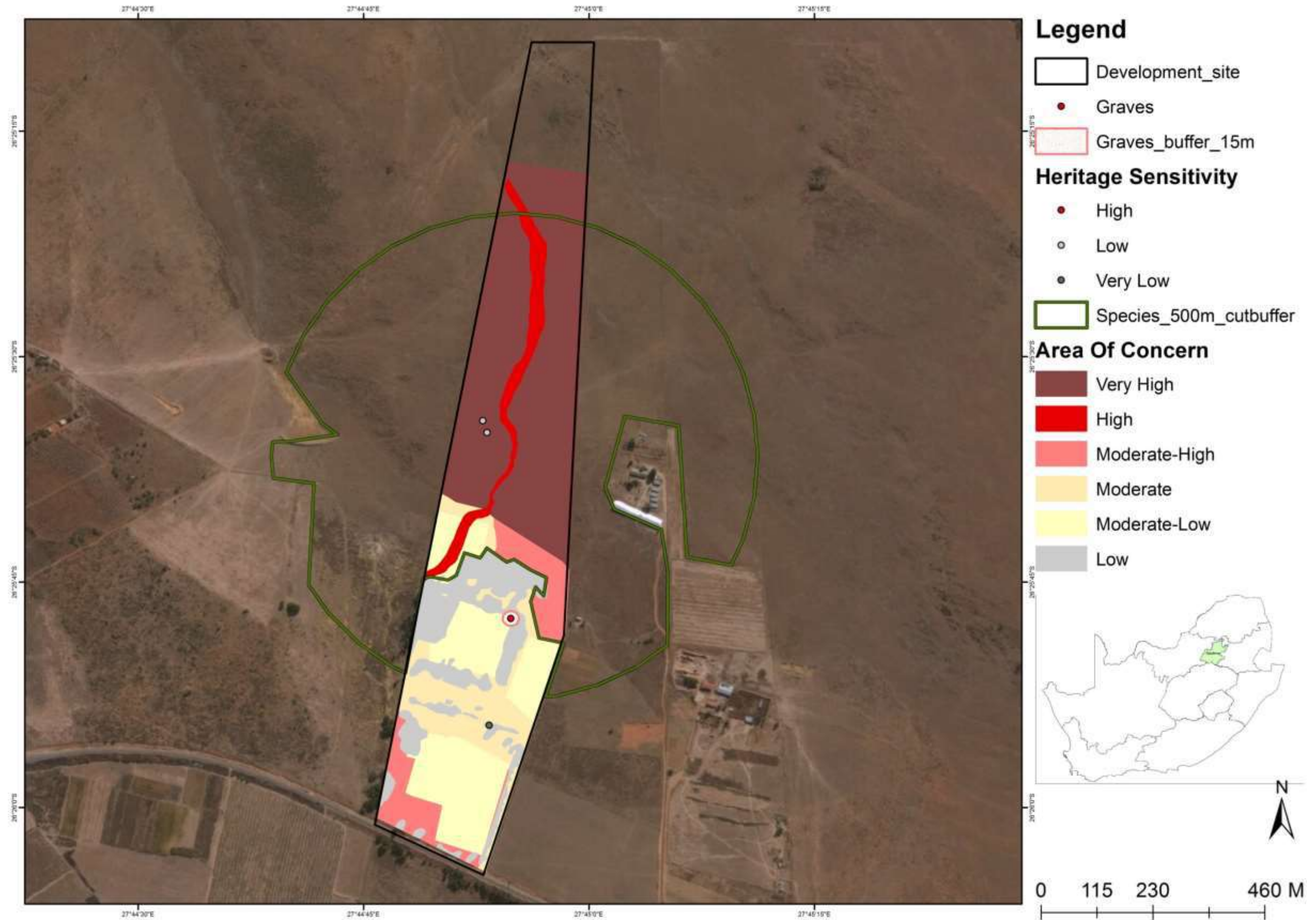


APPENDICES

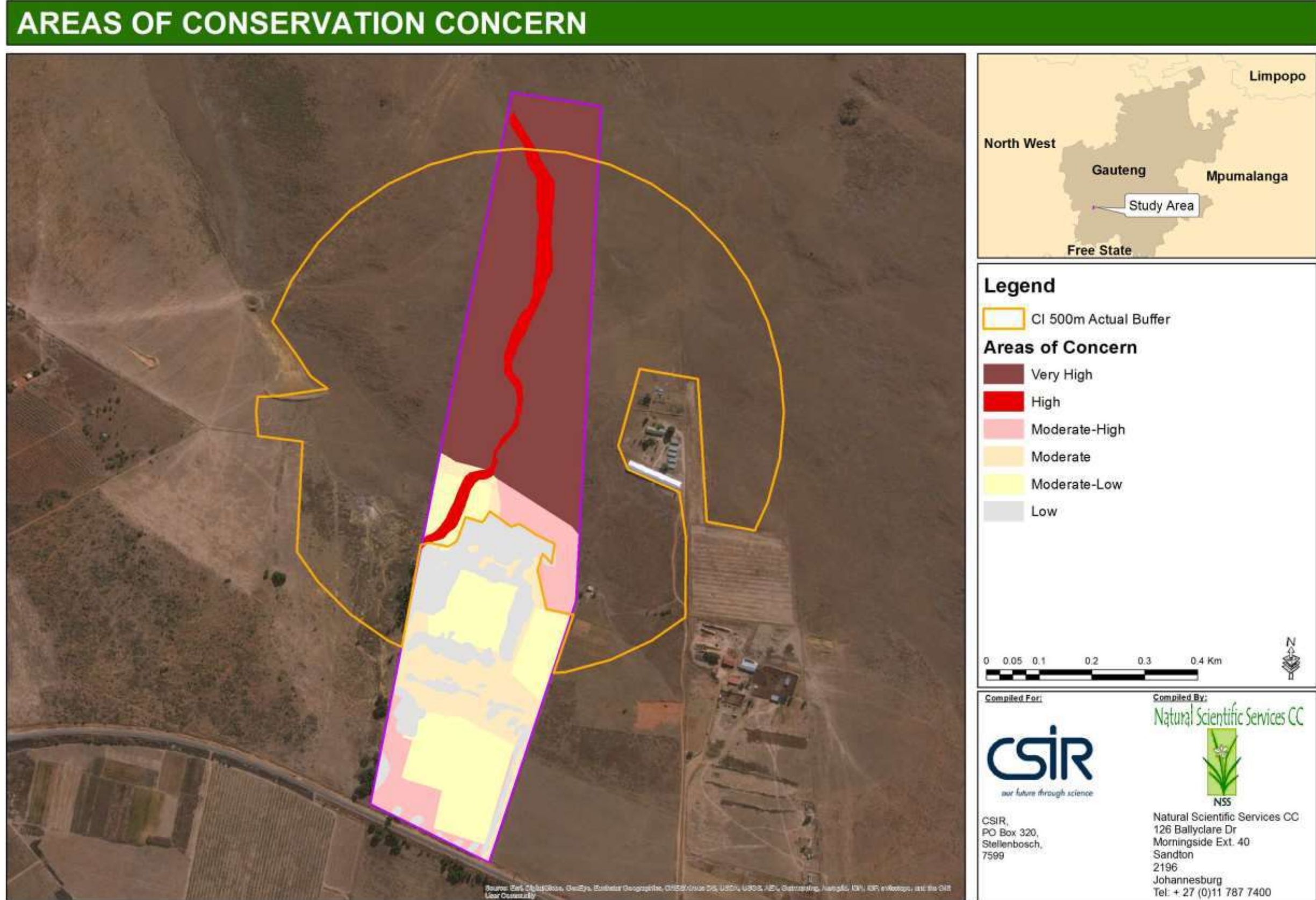
Map A.3: The biodiversity of the proposed development site



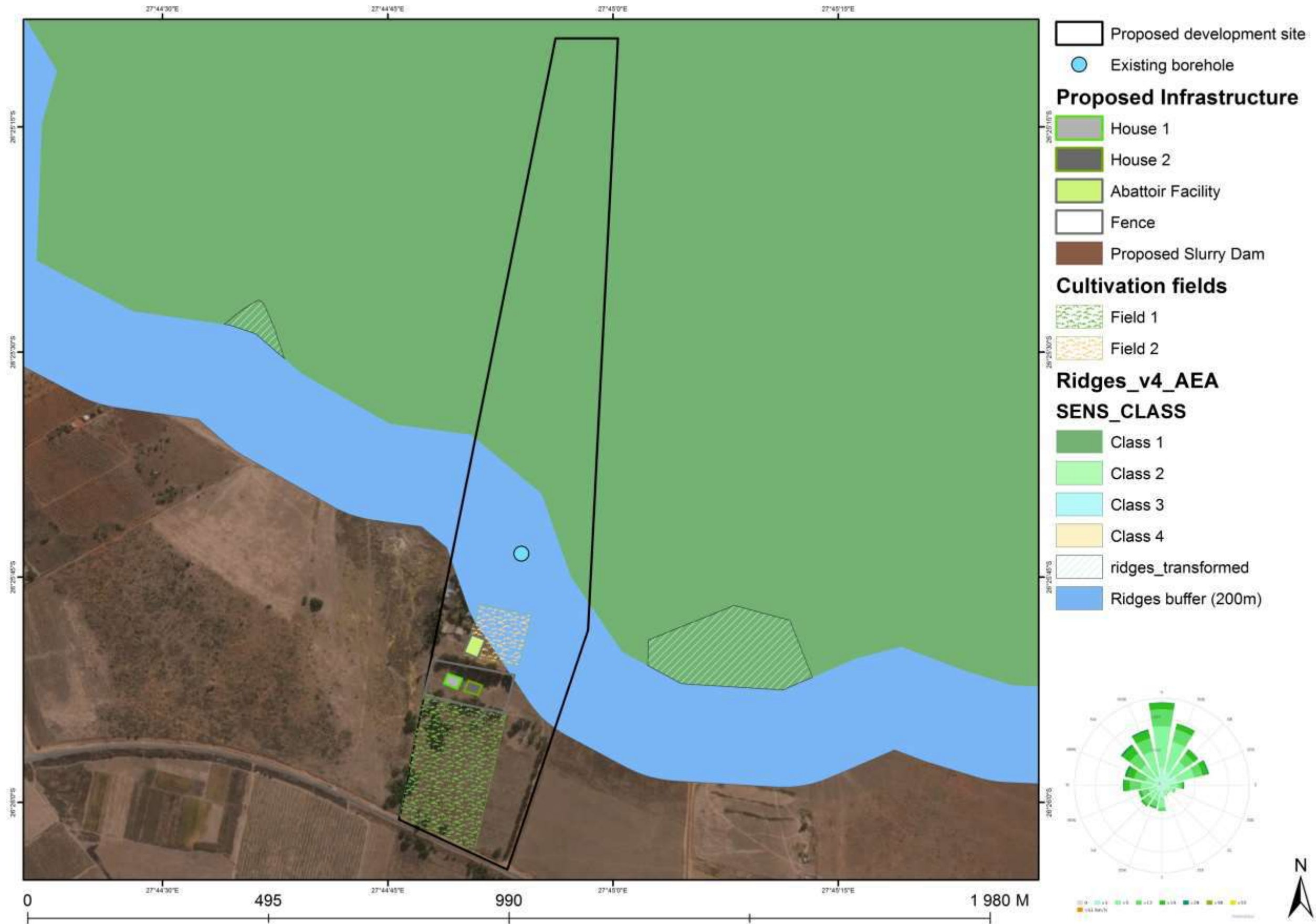
Map A.4: Areas of conservation concerns as identified by (NSS, 2016)



Map A.5: Site sensitivities of the proposed development site



Map A.6: Ridges map of the proposed development site



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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion
13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
FINAL BASIC ASSESSMENT REPORT

BASIC ASSESSMENT REPORT

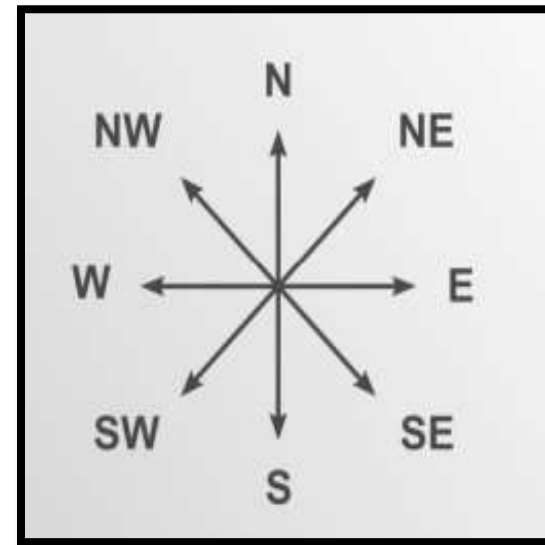
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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion
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FINAL BASIC ASSESSMENT REPORT

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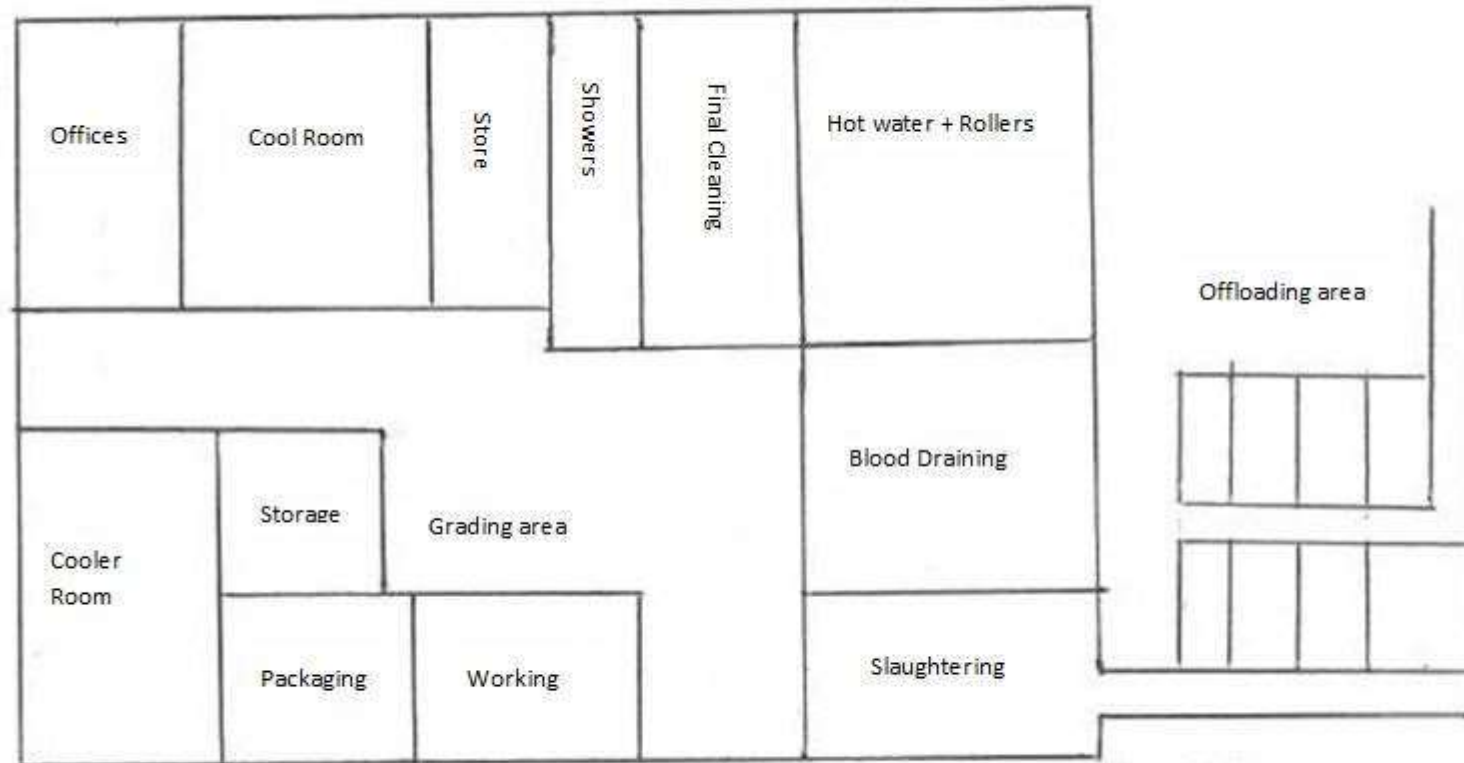
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Facility Illustration _____ 2

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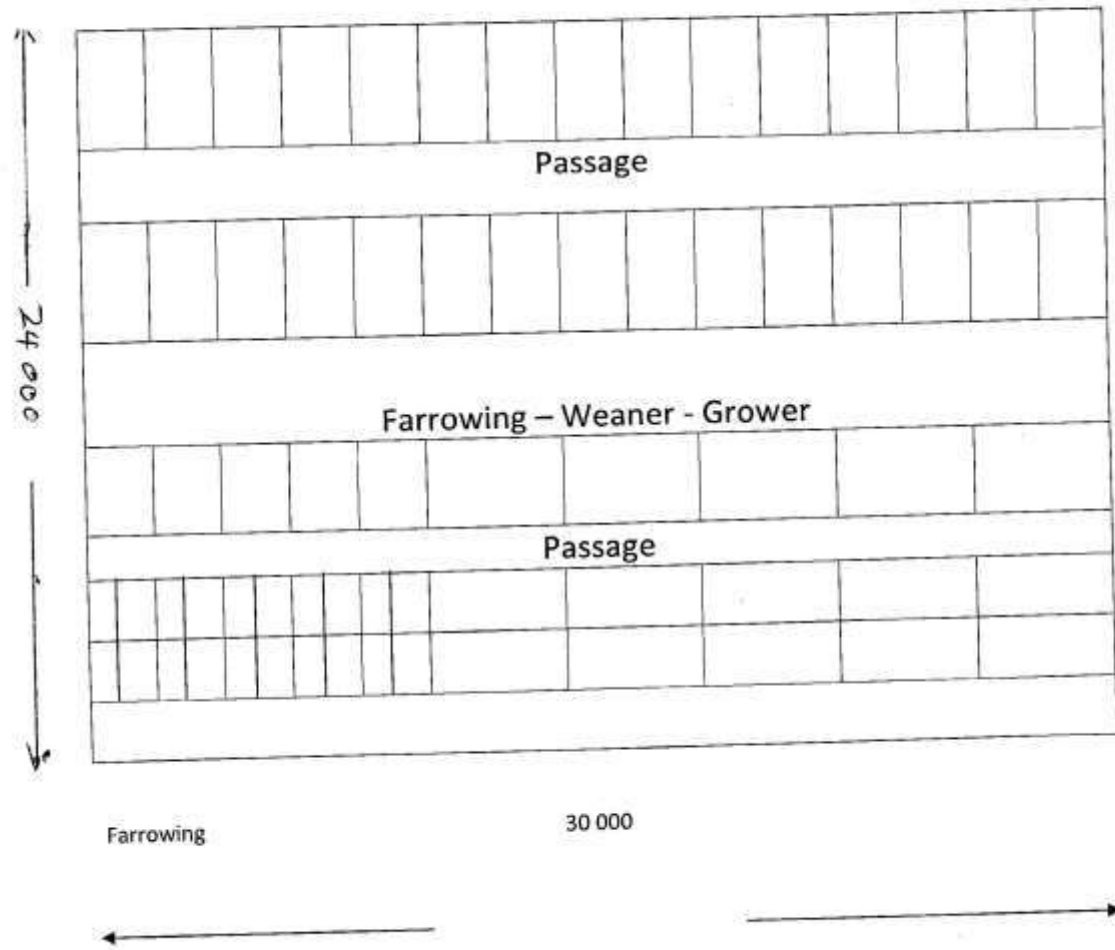
Facility Illustration



BUILDING PLAN 1

Boar & Sows

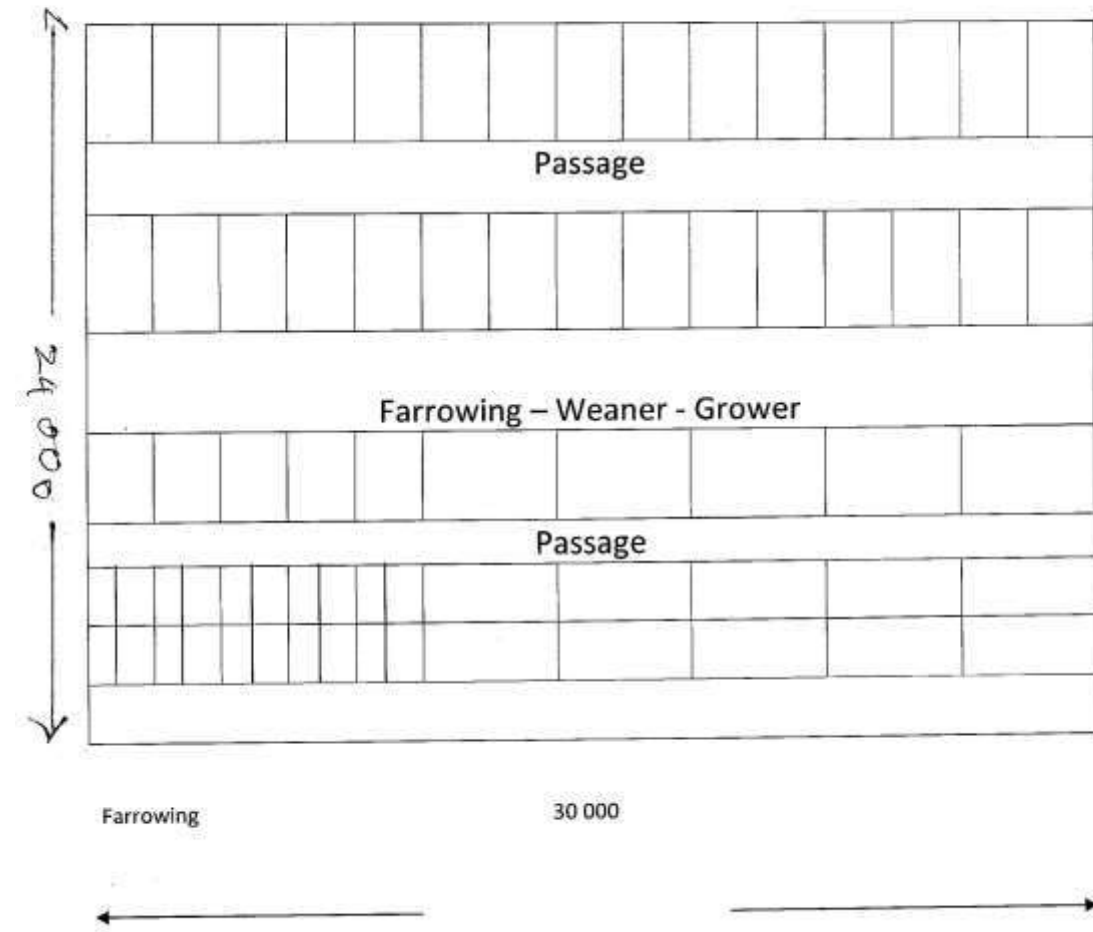
Scale 1: 2000 mm



BUILDING PLAN 2

Boar & Sows

Scale 1: 2000 mm



APPENDICES

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion
13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
FINAL BASIC ASSESSMENT REPORT

BASIC ASSESSMENT REPORT

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N/A

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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
FINAL BASIC ASSESSMENT REPORT

BASIC ASSESSMENT REPORT

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

Appendix E.1 – Proof of site notice



APPENDICES

Contents of the site notices (English) placed at the fence of the proposed development site (Co-ordinates: 26° 26' 04.0" S and 27° 44' 52.7" E)

Alphomega Farming Co-Operative Limited Project Site (Gauteng)

NOTICE OF A BASIC ASSESSMENT (BA) & WASTE MANAGEMENT LICENCE PROCESS


Notice is hereby given, in terms of the Environmental Impact Assessment (EIA) Regulations, under sub-regulation 41(1) and sub-regulation 41(4), published in Government Gazette No 38282 of 4 December 2014, of the National Environmental Management Act, 1998 (Act No 107 of 1998), that the **Alphomega Farming Co-operative Ltd**, proposes the development of a pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.
(CSIR Reference Number: CSIR/CAS/EMS/IR/2015/0016/A)

The Council for Scientific and Industrial Research (CSIR), as the independent Environmental Assessment Practitioner, will manage the required Basic Assessment process for the proposed project. The project will be registered with the Gauteng Department of Agriculture and Rural Development (GDARD). The need for a Basic Assessment is triggered by the following activity listed in Government Notice Regulations (GNR) 985 of 4 December 2014:

Government Notice	Listed Activity Number
GNR 983, 4 December 2014	3(ii)
GNR 983, 4 December 2014	4 (ii)(a)
GNR 983, 4 December 2014	27
GNR 985, 4 December 2014	12(a)(ii)
GNR 921, 29 November 2013	Category A (1)

To obtain further information with regards to the project and Basic Assessment process, or to register as Interested and Affected Party (I&AP), please contact the Project Manager below, and quote the CSIR Reference Number:

Project Manager
Ms. Reinet Mogotshi
PO Box 320, Stellenbosch,
7599
Tel: 021 888 2432
Fax: 021 888 2693
Email: rmogotshi@csir.co.za






Figure 1: Locality Map depicting the location of the Proposed Project

APPENDICES

Contents of the site notices (Sesotho) placed at the fence of the proposed development site (Co-ordinates: 26° 26' 04.0" S and 27°

Alphomega Farming Co-Operative Limited Project Site (Gauteng)

TSEBISO YA HLAHLOBO YA MOTHEO LE TAOLO YA PHUMANTSHO YA LENGOLO LA DIKGWEREKGWERE.

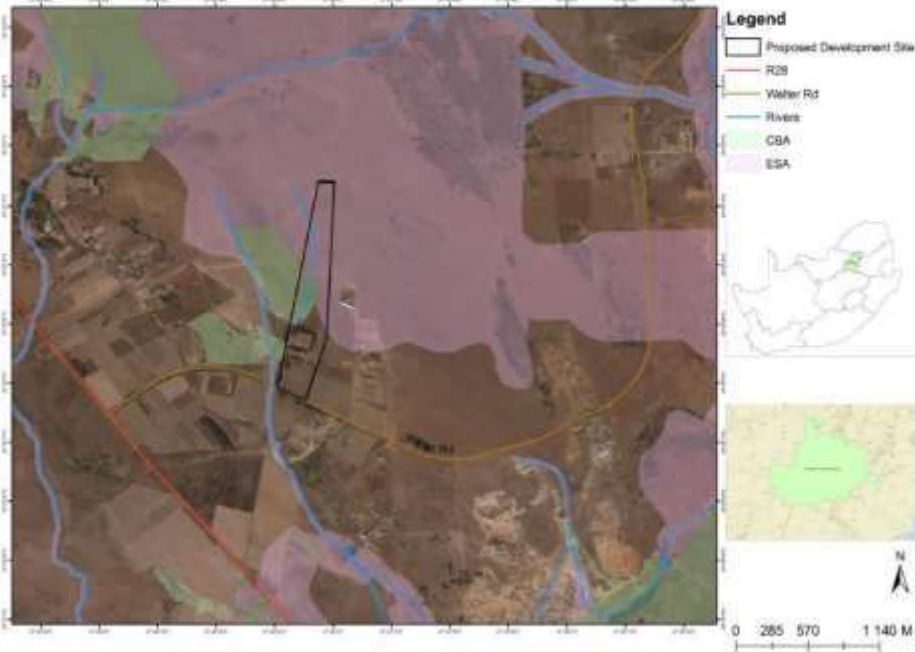
Ho fanwa ka tsebiso mabapi le tsusumetso ya ho hlahloba tokoloho, tiasa melawana tsamamaiso 41(1) le 41(4) e phatlaladitsweng lesedinyaneng la mmuso Nomorong ya 38282 ya Tshitwe 2014, Tsamaiso ya semmuso ya tikoloho, e entsweng 1998 (Kesto No. 107 ya 1998) hore Alphomega Farming Co-Operative, e sisinya ntshetso pele ya tihahiso ya dikolobe mo Kabelo 18 ya Kabelo 13 ya Farm Poortje 340-IQ, Poortje, Gauteng, e sisinya ntshetso pele ya tihahiso ya dikolobe mo Kabelo 18 ya Kabelo 13 ya Farm Poortje 340-IQ, Poortje, Gauteng.
(Nomoro ya CSIR : CSIR/CAS/EMS/IR/2015/0016/A)

Lekgotla la thuto ya mahiale le la diphuputso tsa industeri, e le mohlahloli wa tikoloho, ota laola motheo wa phuputso hlahlohang bakeng la ntshetso pele ya projeke. Projeke e tla ngodiswa le lefapha la provinsi ya Gauteng la Temo le Ntshetsopela tsa Mahaeng. Tihokeho ya motheo wa hlahlobo ena e bakwa ke mesebatsi e radilweng lesedinyaneng la ditsebiso la mmuso, la molao wa tsamaiso, 985 ya 4 Tshitwe 2014.

Tsebiso sa Mmuso	Thathamisitsoeng; Nomoro ya mosebetsi
GNR 983, 4 Tshitwe 2014	3(ii)
GNR 983, 4 Tshitwe 2014	4 (ii)(a)
GNR 983, 4 Tshitwe 2014	27
GNR 985, 4 Tshitwe 2014	12(a)(ii)
GNR 921, 29 Pudungwana 2013	Category A (1)

Ho fumana tihakisetso mabapi le projeke le tsamaiso ya motheo wa tihathobo, kapa ho ingodisa jwalo ka motho yanang le kgahleho le mokgatio o emahehang, kakopa ikopanye le Motsamaisi wa projeke a boletsweng tiasa, kapa o qolle nomoro ya CSIR ikgethileng.

Mookemedi oa mosebetsi
Mof. Reinett Mogotshi
PO Box 320, Stellenbosch,
7599
Tel: 021 888 2432
Fax: 021 888 2693
Email: rmogotshi@csir.co.za



Setshwantsho sa pele: Map o bontsang sebaka se sa mosebetsi oo sisintsweng)

APPENDICES

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

Letter sent (30/03/16) to I&APs as part of Project Announcement



CSIR Environmental Management Services
PO Box 320
Stellenbosch
7599
South Africa
Tel: +27 21 888 2432
Fax: +27 21 888 2473
Email: rmogotshi@csir.co.za

31 March 2016

Dear Interested and Affected Party

THE PROPOSED DEVELOPMENT OF A PIG PRODUCTION FACILITY ON PORTION 18 OF PORTION 13 OF THE FARM POORTJE 340-IQ, POORTJE, GAUTENG (CSIR REFERENCE NO: CSIR/CAS/EMS/IR/2015/00016/A).

The National Department of Environmental Affairs (DEA) and the Council for Scientific and Industrial Research (CSIR) have initiated the Special Needs and Skills Development Programme, whereby small-medium micro-enterprises and community trusts who are lacking financial means are provided with *pro-bono* environmental services.

Alphomega Farming Co-Operative has been identified as an eligible client for this service and is proposing to establish a start-up enterprise comprising of a commercial pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng. The development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations, Government Regulations (GNR) 983 and 985 of December 2014. The development also triggers listed activities in terms of the National Environmental Management: Waste Act (NEMWA) (Act no 59 of 2008). In terms of these Regulations, a Basic Assessment (BA) and an application for a Waste Management Licence should be undertaken for the proposed project. The Council for Scientific and Industrial Research (CSIR) is the Environmental Assessment Practitioner (EAP) who will be managing the process. The project is being assessed in terms of the Government Notice Regulations (GNR) 983 and 985 of 4 December 2014 of the National Environmental Management Act (Act 107 of 1998 and GNR 921 of 29 November 2013 of the National Environmental Management: Waste Act (NEMWA) (Act no 59 of 2008).

Please find enclosed, a Background Information Document (BID) that will assist in your further understanding of the project as well as a Registration and Comment form. A comment period of 30 days has been allocated for the review and the provision of comments to the EAPs as well as for registering as an Interested and Affected Party that will be kept informed of the project for the remainder of the EIA process. Please submit your comments before or on 28 April 2016.

Should you have any project related queries, please feel free to contact the undersigned.

Yours sincerely,

Ms. Reinett Mogotshi (Project Manager)

Contact: **Ms. Reinett Mogotshi**
Postal address: PO Box 320, Stellenbosch, 7599, South Africa
Tel: 021 888 2432
Fax: 021 888 2473
E-mail: rmogotshi@csir.co.za
Website: <http://www.csir.co.za/ems/specialneeds/>

Board members: Prof.T. Majod (Chairperson), Adv.G. Badae, Ms P. Baleni, Dr P. Gonyo, Dr A. Lobell, Dr R. Masango, Ms M. Maseko, Mr J. Nkshitenzhe, Ms A. Noah, Prof.M. Ebekang, Dr S. Sibisi (CEO)

www.csir.co.za

APPENDICES

Letter 2 to I&AP's – release of Draft Basic Assessment Report for comment (13 December 2016)



CSIR Specialist Services
PO Box 320
Stellenbosch
7599
South Africa
Tel: +27 21 888 2432
Fax: +27 21 888 2893
Email: rmogotshi@csir.co.za

13 December 2016

Dear Interested and/or Affected Party,

NOTICE OF RELEASE OF DRAFT BASIC ASSESSMENT REPORT FOR A 30-DAY REVIEW PERIOD

BASIC ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A PIG PRODUCTION FACILITY ON PORTION 18 OF PORTION 13 OF THE FARM POORTJE 340-IQ, POORTJE, GAUTENG.

CSIR REFERENCE NO: CSIR/CAS/EMS/IR/2015/00016/A

The National Department of Environmental Affairs (DEA) and the Council for Scientific and Industrial Research (CSIR) have initiated the Special Needs and Skills Development Programme, whereby small-medium micro-enterprises and community trusts who are lacking financial means are provided with *pro-bono* environmental services to decrease the burden of the cost associated with starting a business. Alphomega Farming Co-Operative (Pty) Ltd has been identified as an eligible client for this service and is proposing to develop a pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

In terms of Government Notice Regulations (GNR) 983, 984 and 985 of 4 December 2014 of the National Environmental Management Act (Act 107 of 1998) published in Government Gazette 38282, Environmental Authorisation from the Competent Authority, in this case the Gauteng Department of Agriculture and Rural Development (GDARD), is required prior to the undertaking of any activity triggered within GNR 983, 984 and/or 985. The CSIR, as the independent Environmental Assessment Practitioner (EAP), will be managing the Basic Assessment and Public Participation Process for this proposed project.

In line with the Environmental Impact Assessment requirements of 4 December 2014, Interested and Affected Parties (I&APs) are hereby notified of the release of the Draft BA Report for a 30-day review period, which will extend from 14 December 2016 to 03 February 2017. Please submit any review comments on the Draft BAR by 03 February 2017 to the CSIR Project Manager via email or post at the contact details above.

A hard copy of the Draft BA Report is available for public viewing at the Residensia Library (Ezidivhezeni Street, Sebokeng, 1983). The Draft BA Report can also be downloaded from the following project website:
<https://www.csir.co.za/environmental-impact-assessment>

The next step in the BA Process will entail compiling the Final BA Report and including all comments received from I&APs during the 30-day review period of the Draft BA Report. Once finalised, the Final BA Report will be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) for decision making. As a registered I&AP on the project database, you will be notified in writing of the submission of the Final BA Report, as well as the outcome of the decision making process.

Should you have any queries or require additional information please do not hesitate to contact the undersigned using the contact details provided above.

Sincerely,

Ms. Reinett Mogotshi (Project Manager)

Board members: Prof T. Majozi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Llobell, Dr R. Masango, Ms M. Maseko, Mr J. Netshitenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

www.csir.co.za

APPENDICES

Email sent (30/03/16) to I&APs as part of Project Announcement

From: Reinett Mogotshi

To:

BC advocacy@birdlife.org.za; mashuduma@daff.gov.za; thokob@daff.gov.za;
ncamisile.nkabinde@drdlr.gov.za; MusekeneM@dwa.gov.za; RakgothoT@dwa.gov.za;
amandao@emfuleni.gov.za; georgez@emfuleni.gov.za; mrabothata@environment.gov.za;
SHlela@environment.gov.za; tnamarude@environment.gov.za; ewt@ewt.org.za;
karabo.mohatla@gauteng.gov.za; khalele.njoni@gauteng.gov.za; phuti.matlamela@gauteng.gov.za;
steven.mukhola@gauteng.gov.za; Tebogo.molokomme@gauteng.gov.za;
Zingisa.Smale@gauteng.gov.za; info@geoscience.org.za; lindy1975@gmail.com; T.B. TRADER;
johan.vanjaarsveld@lonmin.com; ndumiso@namc.co.za; howard.hendricks@sanparks.org;
hoffman@sapork.com ; colettee@sedibeng.gov.za; Juliar@sedibeng.gov.za; yunusc@sedibeng.gov.za;
tumi.lehabe@wessa.co.za; musam@sedibeng.gov.za; lilom@sedibeng.gov.za

Date: 30/03/2016 12:49

Subject: Notification of Release of BID for Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

Attachments: Comments & Reg Form.docx; I&APs Cover Letter_Draft_ENGLISH.docx; BID_Final.pdf

Good Afternoon

You are hereby notified about the release of the Background Information Document (BID) for the Basic Assessment for development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng. Please find attached the BID, which has been released for 30 day review, and the Registration/ Comment Form. Please return or before 28 April 2016. Should the contents of this project not pertain to you, kindly forward the documents to the person in your department that is affected. Additionally, please forward their contact details to the CSIR Project Manager or ask the affected party to contact the CSIR Project Manager. Should you wish to be registered or de-registered from receiving any further information during the Basic Assessment and Public Participation Process, kindly contact the CSIR Project Manager. Correspondence in this regard should preferably be via a hard copy, i.e. Email, Fax or Letter.

Contact via: Ms. Reinett Mogotshi

Email: rmogotshi@csir.co.za

Tel: 021 888 2432

Fax: 021 888 2693

Postal: PO Box 320

Stellenbosch

7599

South Africa

Regards,

CSIR Project Manager

Ms. Reinett Mogotshi

APPENDICES

Proof email delivery sent on 30 March 2016

Recipients: 31 Response Pending: 30, Undelivered: 1

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lilom@sedibeng.gov.za		Transferred

APPENDICES

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Delivered	30/03/2016 12:53	
BC: tbtrader4@gmail.com		

APPENDICES

Tebogo.molokomme@gauteng.gov.za Transferred
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 BC: Tebogo.molokomme@gauteng.gov.za
 thokob@daff.gov.za Transferred
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 tnemarude@environment.gov.za Transferred
 Transferred 30/03/2016 12:50
 Delivered 30/03/2016 12:51
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 tumi.lehabe@wessa.co.za Transferred
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 BC: yunusc@sedibeng.gov.za
 Zingisa.Smale@gauteng.gov.za Transferred
 Transferred 30/03/2016 12:50
 Delivered 30/03/2016 12:53
 BC: Zingisa.Smale@gauteng.gov.za
Attachments: User: 3, System: 2

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Comments & Reg Form.docx	147 KB (150947 Bytes)	30/03/2016 09:55
I&APs Cover Letter_Draft_ENGLISH.docx	156 KB (160388 Bytes)	30/03/2016 09:50
MESSAGE	3 KB (3814 Bytes)	30/03/2016 12:49
TEXT.htm	5 KB (5276 Bytes)	30/03/2016 12:49

Send Options:

APPENDICES

Email 2 to I&APs: release of Draft Basic Assessment Report for comment (14 December 2016)

From: Reinett Mogotshi
Date: 14/12/2016 09:20
Subject: Notice of Release of the Draft Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.
Bc: advocacy@birdlife.org.za; mashuduma@daff.gov.za; thokob@daff.gov.za; ...
Attachments: Letter to I&APs_DBAR.docx

Dear Stakeholder

In terms of Government Notice Regulations (GNR) 983, 984 and 985 of 4 December 2014 of the National Environmental Management Act (Act 107 of 1998) published in Government Gazette 38282 on 4 December 2014, Environmental Authorisation from the Competent Authority, in this case the Gauteng Department of Agriculture and Rural development, is required prior to the undertaking of any activity triggered within GNR 983, 984 and/or 985. The CSIR, as the independent Environmental Assessment Practitioner (EAP), will be managing the Basic Assessment and Public Participation Process for this proposed project.

In line with the above, as a registered Interested and Affected Party (I&AP) on the project database, you are hereby notified of the release of the Draft BA Report to all I&APs for a 30-day review period, which will extend from from **14 December 2016 to 03 February 2017** (excluding public holidays). Please submit any comments on the Draft BA Report to the CSIR Project Manager at the contact details provided above by **03 February 2017**. A hard copy of the Draft BA Report is available for public viewing at the Residencia Library (Ezidivhezeni Street, Sebokeng).

The Draft BA Report can also be downloaded from the following website:

<https://www.csir.co.za/environmental-impact-assessment>

Kind Regards

Reinett Mogotshi

Environmental Management Services

CSIR

APPENDICES

Email 3 to I&APs: Reminder about public comment period for Draft Basic Assessment Report for comment (8 September 2016)

From: Reinett Mogotshi
Date: 31/01/2017 09:11
Subject: Notice of Release of the Draft Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.
Bc: advocacy@birdlife.org.za; amandao@emfuleni.gov.za; colettee@sedibeng.g...

Dear Stakeholders

Reminder: Public Comment Period for Draft Basic Assessment Report

Please note that the public comment period for the below-mentioned project ends on **Friday 03 February 2017**.

A hard copy of the Draft BA Report is available for public viewing at the Residensia Library (Ezidivhezeni Street, Sebokeng). The Draft BA Report can also be downloaded from the following website:

<https://www.csir.co.za/environmental-impact-assessment>

Please send through any comments on the Draft Report by the end of the above mentioned date to:

Ms. Reinett Mogotshi (Project Manager)
Postal address: PO Box 320, Stellenbosch, 7599, South Africa
Tel: 021 888 2432
Fax: 021 888 2693
E-mail: Rmogotshi@csir.co.za

Kind Regards

Reinett Mogotshi

Environmental Management Services
CSIR

APPENDICES

Proof of delivery of email (Draft Basic Assessment Report public comment period– 1 August 2016)

Recipients: 33 Response Pending: 30, Undelivered: 3

advocacy@birdlife.org.za		Transferred
Transferred	14/12/2016 09:20	
BC: advocacy@birdlife.org.za		
amandao@emfuleni.gov.za		Transferred
Transferred	14/12/2016 09:21	
BC: amandao@emfuleni.gov.za		
colettee@sedibeng.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: colettee@sedibeng.gov.za		
ewt@ewt.org.za		Transferred
Transferred	14/12/2016 09:20	
BC: ewt@ewt.org.za		
georgez@emfuleni.gov.za		Transferred
Transferred	14/12/2016 09:21	
BC: georgez@emfuleni.gov.za		
hoffman@sapork.com		Transferred
Transferred	14/12/2016 09:20	
BC: hoffman@sapork.com		
howard.hendricks@sanparks.org		Transfer Delayed
Transfer Delayed	14/12/2016 09:20	
Transferred	14/12/2016 09:41	
BC: howard.hendricks@sanparks.org		
info@geoscience.org.za		Transferred
Transferred	14/12/2016 09:20	
BC: info@geoscience.org.za		
johan.vanjaarsveld@lonmin.com		Transferred
Transferred	14/12/2016 09:20	
BC: johan.vanjaarsveld@lonmin.com		
Juliar@sedibeng.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: Juliar@sedibeng.gov.za		
karabo.mohatla@gauteng.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: karabo.mohatla@gauteng.gov.za		
khalele.njoni@gauteng.gov.za	Undelivered	550 Invalid Recipient - https://community.mimecast.com/docs/DOC-1369#550
Transferred	14/12/2016 09:20	
Undeliverable	14/12/2016 09:20	550 Invalid Recipient - https://community.mimecast.com/docs/DOC-1369#550
BC: khalele.njoni@gauteng.gov.za		
Len Palmer		Transferred
Transferred	14/12/2016 09:20	
BC: len@monitorpumps.co.za		
lindy1975@gmail.com		Transferred
Transferred	14/12/2016 09:20	
BC: lindy1975@gmail.com		
mashuduma@daff.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: mashuduma@daff.gov.za		

APPENDICES

mrabothata@environment.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: mrabothata@environment.gov.za		
mulaudzic2@dws.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: mulaudzic2@dws.gov.za		
MusekeneM@dwa.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: MusekeneM@dwa.gov.za		
ncamisile.nkabinde@drdlr.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: ncamisile.nkabinde@drdlr.gov.za		
ndumiso@namc.co.za		Transferred
Transferred	14/12/2016 09:20	
BC: ndumiso@namc.co.za		
NHLANHLA (GDARD) MAKHATHINI		Transferred
Transferred	14/12/2016 09:20	
BC: Nhlanhla.Makhathini@gauteng.gov.za		
phuti.matlamela@gauteng.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: phuti.matlamela@gauteng.gov.za		
RakgothoT@dwa.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: RakgothoT@dwa.gov.za		
SHlela@environment.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: SHlela@environment.gov.za		
steven.mukhola@gauteng.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: steven.mukhola@gauteng.gov.za		
T.B. TRADER		Transferred
Transferred	14/12/2016 09:20	
BC: tbtrader4@gmail.com		
Tebogo.molokomme@gauteng.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: Tebogo.molokomme@gauteng.gov.za		
thokob@daff.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: thokob@daff.gov.za		
tnemarude@environment.gov.za		Transferred
Transferred	14/12/2016 09:20	
BC: tnenarude@environment.gov.za		
tumi.lehabe@wessa.co.za	Undelivered	550 5.4.1 [tumi.lehabe@wessa.co.za]: Recipient address rejected: Access denied
Transfer Failed		
	14/12/2016 09:20	
Undeliverable	14/12/2016 09:20	550 5.4.1 [tumi.lehabe@wessa.co.za]: Recipient address rejected: Access denied
BC: tumi.lehabe@wessa.co.za		
yunusc@sedibeng.gov.za		Transferred
Transferred	14/12/2016 09:20	

APPENDICES

yunusc@sedibeng.gov.za

Transferred

BC: yunusc@sedibeng.gov.za

zanim@emfuleni.gov.za

Transferred

Transferred

14/12/2016 09:21

BC: zanim@emfuleni.gov.za

Zingisa.Smole@gauteng.gov.za

Transferred

APPENDICES

List for mail sent 31 March 2016: Project Announcement documents (BID, Letter dated 31 March 2016, and Registration/Comment Form)

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender: CSIR STELLENBOSCH
 Naam en adres van afstuurder: RENETT MOGOTSHI
P.O. Box 320

Enquiries/Navrae
ShareCall
number/nommer
0800 141 502
www.postoffice.co.za

	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Kliëntafskrif
1	<u>Dr. Howard Hovocikos (SANPAKS)</u> <u>P.O. Box 787, Pretoria, 0001</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 617 ZA CUSTOMER COPY 301012
2	<u>EMFUDINI LOCAL MUNICIPALITY-MANAGER</u> <u>P.O. Box 3, Vanderbijlpark, 1900</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 625 ZA CUSTOMER COPY 301012
3	<u>M. MURGO, CIVIC ENGINEER & CONSULTANT</u> <u>MANNING STR. VANDERBIJLPARK, 1900</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 634 ZA CUSTOMER COPY 301012
4	<u>SEDIBENG DISTRICT MUNICIPALITY-MANAGER, MR YUNIAS</u> <u>CHAMOA, P.O. BOX 471, VEREBENING, 1930</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 648 ZA CUSTOMER COPY 301012
5	<u>JACOB RATHBOGE, 5th MILARO STR</u> <u>MOHLAKENG, RAINFONTEIN, 1759</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 722 ZA CUSTOMER COPY 301012
6	<u>DAFF. MASHUNI MARUBINI</u> <u>PRIVATE BAG X 138, PRETORIA, 0001</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 719 ZA CUSTOMER COPY 301012
7	<u>C.A. VAN JAARSVELD</u> <u>P.O. Box 303, WESTONIA, 1780</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 705 ZA CUSTOMER COPY 301012
8	<u>MARTIN VAN DER MERWE</u> <u>P.O. Box 563, WESTONIA, 1780</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 696 ZA CUSTOMER COPY 301012
9	<u>COUNCIL FOR GEOSCIENCE, DR. SEWNET FOYA</u> <u>PRIVATE BAG X 112, PRETORIA, 0001</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 682 ZA CUSTOMER COPY 301012
10	<u>THABO LUTHOLEZI, DAFF.</u> <u>PRIVATE BAG X 120, PRETORIA, 0001</u>					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 679 ZA CUSTOMER COPY 301012
	Total Totaal	R	R	R	R	

Number of letters posted
Getal briewe gepos

Signature of client
Handtekening van klient

Signature of accepting officer
Handtekening van aanneembeampte

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

Date stamp

S.A. POST OFFICE
STELLENBOSCH 7599

31 MAR 2016

FOLIO 6

Date stamp

GOOD IMPRESSIONS

701248

APPENDICES

List of REGISTERED LETTERS Lys van GEREĞISTREERDE BRIEWE (with an insurance option/met 'n versekeringsopsie)

Full tracking and tracing/Volledige volg en spoor



Name and address of sender: C/SIR STELLENBOSCH
 Naam en adres van afsender: HEINETT MOGOTSHI

Enquiries/Navrae
ShareCall
number/nommer
0800 111 502
www.postoffice.co.za

	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Klientafskrif
1	DEP OF AGRICUL, FOREST & FISH, MASHUQUU MASHUQUU, P/BAG X 138, PRETORIA, 0001					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 381 ZA CUSTOMER COPY 301012
2	DEP OF RURAL DEVELOP AND LAND REFORM, BONGIBONGI ZULU, P/BAG X 833, PRETORIA, 0001					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 370 ZA CUSTOMER COPY 301012
3	NAT. DEP OF WATER & SANIT., NAILEKA MOHAPI PRIVATE BAG X 313, PRETORIA, 0001					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 366 ZA CUSTOMER COPY 301012
4	NAT. DEP OF WATER & SANIT., NAMISHA MUTHRAMMOED PRIVATE BAG X 313, PRETORIA, 0001					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 352 ZA CUSTOMER COPY 301012
5	BIRALIFE, AMANUELINE SMIT-ROBINSON, P/BAG X 5000, PARKLANDS, 2121, JOHANNESBURG					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 349 ZA CUSTOMER COPY 301012
6	AGRIANO, AMANUELA COLLETT, PRIVATE BAG X 120, PRETORIA, 0001					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 335 ZA CUSTOMER COPY 301012
7	DEP OF AGRICUL & RURAL DEVELOP., STEVEN MUKHOLA, P.O. BOX 8769, JOBURG, 2000					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 321 ZA CUSTOMER COPY 301012
8	TERBOEG McCOMME, AND FER, SURREY HOUSE Bldg., 25 RISSIK STREET, JOBURG, 2000					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 318 ZA CUSTOMER COPY 301012
9	KARABO MOHOTLA, 1st FUR CNR SWART AND PRESIDENT KOUGER STR. VANDERBIJLPARK, 1911					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 304 ZA CUSTOMER COPY 301012
10	KHALELE NGONI, 1st FUR CNR SWART AND PRESIDENT KOUGER STR. VANDERBIJLPARK, 1911					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 433 430 295 ZA CUSTOMER COPY 301012
	Total Totaal	R	R	R	R	

Number of letters posted
Getal briewe gepos

Signature of client
Handtekening van klient *[Signature]*

Signature of accepting officer
Handtekening van aanneembeampte

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

GOOD IMPRESSIONS



APPENDICES

List of REGISTERED LETTERS Lys van GEREGISTREERDE BRIEWE (with an insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender: REINETI MOCOTSHI
 Naam en adres van afsender: CSIR STELLENBOSCH, P.O. Box 320, STELLENBOSCH, 7599
11 SAN CILLIERS STREET.

Enquiries/Navrae
ShareCall
number/nummer
0800 141 502
www.postoffice.co.za

	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Klientafskrif
1	JACOB MATABOGE, 544 NHALAPO STREET, MOHLAKENG, RANDFONTEIN, 1759.					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 665 ZA CUSTOMER COPY 301012
2	(SAHRA), MARIE SOUTH, P.O. BOX 4637, CAPE TOWN, 8000					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 651 ZA CUSTOMER COPY 301012
3	THE ENLIGHTENED WILDLIFE TRUST, ADAMS PIERS P/BAG X11, MOSSBERG, JOHANNESBURG, 1609					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 550 ZA CUSTOMER COPY 301012
4	WASTE MANAGEMENT, ZINGISA SIMALE, P.O. BOX 8769, JOBURG, 2000.					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 563 ZA CUSTOMER COPY 301012
5	SEBIRENG SIST. MUNICHA, MUSA MARAJI P.O. BOX 471, VEREENIGING, 1930					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 577 ZA CUSTOMER COPY 301012
6	SEP. of AGRI. & RURAL DEV. PHUTI MATHAMELA P.O. BOX 8769, JOBURG, 2000					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 585 ZA CUSTOMER COPY 301012
7	NAT. AGRI. MARKET COUNCIL, NONTSI MABUKO PRIVATE BAG X 935, PRETORIA, 0001					INSURED PARCEL ShareCall 0800 111 502 www.postoffice.co.za PA 424 543 603 ZA CUSTOMER COPY 301012
8						
9						

Date of delivery Datumstempel van aflewering	REGISTERED LETTER GEREGISTREERDE BRIEF 971080 (with an insurance option/met 'n versekeringsopsie)	Date Stamp of delivery Datumstempel van aflewering	
	Addressed to/Geadresseer aan <u>CSIR.</u>		
	Signature of recipient Handtekening van ontvanger <u>Seben</u>	Date of delivery Datumstempel van aflewering 31 MAR 2016	
Initial of delivery office Paraf van afleweringkantoor	Postcode Poskode	Track and Trace reference No Volg-en-Spoor-verwysingsno	Initial of receiving office Paraf van ontvangskantoor
Official proof of identification essential Amptelike bewys van identiteit noodsaaklik		Please collect at Haal asseblief af by _____ Post Office, counter/No Poskantoor, toonbank	
within 30 days of date received at delivery office/ binne 30 dae vanaf datum ontvang by afleweringkantoor		701280	

S.A. POST OFFICE
 STELLENBOSCH 7599
 FOLIO 6

PICE
 17599
 npel

binnelandse geregistreerde briewe van toepassing.

GODD IMPRESSIONS

701248

Appendix E.3 – Proof of newspaper advertisements

12 Vaalweekblad, 30 Maart - 1 April 2016

Nuus



Die hele 0-15-span kon uiteindelik darem met kaalgeskeerde koppe spog vir hul rugbytoer wat verlede Donderdag begin het.

Kragonderbreking knip massahaarsny kort

VANDEBILPARK. - 'n Massahaarsny het verlede week vir 'n kommerwekkende tydjie vir sommige skoolseuns (en baie skaterlag vir die toekouers) gesorg toe hul hare te midde van 'n kragonderbreking geskeer moes word.

Juan Loggenberg, haarstilist van *Hair by Juan Luke*, het sy deure verlede week in Rossini-boulevard, Vanderbijlpark geopen. As

deel van die openingspromosies het die salon aangebied om die hare van die Hoerskool Transvalia se 0-15-rugbyspan te skeer voordat hulle die volgende dag op 'n toer moes vertrek.

Na die span se oefening Woensdagmiddag, het die Groot Skeer by die skool begin, totdat 'n kragonderbreking die planne in die wiele gary het.

Die seuns is met verskeie voertuie na die salon in Rossini-boulevard vervoer, net om met hul aankoms te beseef dat die krag daar ook af was.

Sommige van die seuns het skielik met 'n skok beseef dat hul hare net halfpad geskeer was... 'n kostelike, lagwekkende gesig!

Juan het die span se angsvlakke verder opgejaag met 'n gefabriseerde SMS dat die krag

- en dus ook sy elektriese skeertoerusting - "vir twee dae af gaan wees". Die span sou maar soos narre op toer moes gaan! Nadat almal behoorlik vir mekaar gelag en selfs geneem het, kon die hele span teen die einde van die dag darem met kaalgeskeerde koppe spog.

* Juan nooi alle potensieële kliënte om hom by Rossini-boulevard 45 te kom ontmoet.



Foto 1: Martin de Jager, een van die lede van Transvalia se 0-15-rugbyspan, loop stap-vir-stap onder Juan Loggenberg se skeermes deur, terwyl sy spanmaats foto's vir Facebook neem.



Foto 2.



Foto 3.



Foto 4.

Notice of Basic Assessment and Waste Management Licence for the proposed development of Pig farming enterprise on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng
 CSIR Reference No: CSIR/CAS/EHS/IR/2015/00016/A

Notice is given of a Basic Assessment (BA) and Waste Management Licence process being undertaken on behalf of Alphameta Farming Cooperative Ltd (the Project Applicant) for the proposed development of Pig farming enterprise on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

In terms of the NEMA EIA Regulations published in Government Notice Regulation (GNR) 983 and 985 on 4 December 2014 (Government Gazette No. 38282), and NEMA/WA Regulation published in GNR 921 on the 29 November 2013 (Government Gazette No. 37083), a BA process is required as the project triggers the following listed activities: GNR 983 Activity 2 (i), GNR 983 Activity 4(i)(ii), GNR 983 Activity 27, GNR 985 Activity 12(a) and GNR 921 Category A 1. The Council for Scientific and Industrial Research (CSIR) is the Environmental Assessment Practitioner (EAP) who will be managing the process.

You are invited to register as an interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and/or to register as an I&AP, please cite the CSIR Reference Number and provide your full name, full postal address, phone numbers, email address and state your area of interest and/or concern to: **Ms. Reinaldt Magothsho, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2093 or Email: rmagothsho@csir.co.za** You have until on or before **03 May 2016** to do so (30 days from the date of this publication - including weekends, but excluding public holidays).

CSIR

Book May 20 for golf day in aid of Wings For Life School



SASOLBURG. - The Wings for Life School's fifth annual charity golf day will be held at Heron Banks Golf Club in Vaalpark on May 20.

Entry fee is R400 per player. Tee-off time is 12:00 (shotgun-start) and registration from 11:00. The competition is a *Four Ball Alliance Scramble Drive*, two scores to count.

The entry fee includes a round of golf, grab and go halfway house, a dinner at the prize giving and ample water holes at R1 600 (it excludes golf carts). There are no caddies available at the venue. Golf carts should be booked directly from the clubhouse on 078 052 4083. The day represents the opportunity for social interaction and networking amongst friends and companies. This will ensure maximum exposure to sponsors as well as the opportunity to entertain their clients and friends.

The banking details should you prefer to make an electronic transfer is Wings for Life Institute for the Disabled, bank: ABSA, account no: 407 534 2037, branch code: 6302005. Include "golf" and your surname or name of the company as reference when you make a deposit and proof of payment should be e-mailed to wingssec@elcsant.org. All funds generated on the day will go towards the much needed additional funds to ensure a productive learning environment at Wings For Life School for Special Education. **Contact person: Jannet 071 127 8564**



PLACE YOUR ADD FOR SALE

Karmen Du Plessis
 Karmen, Vanwee Klad, Vaal Ster,
 Sediberg and Special Projects.
 071 240 6222 / 016 950 7035
 karmenduplessis@woolco.co.za

Esther Properties
 Eiendomme

TEL/FAX: (016) 454-0179 / 083 306 4850
 E-MAIL: estherp@woolco.za
 2 Villa Riviera, Three Rivers, VEREENIGING, 1929
 FOR PROFESSIONAL SERVICE IN BUYING, SELLING &
 LETTING IN ALL AREAS

HOUSES: 3 RV EAST (R16 000), 3 RV PROP (R15 572)
FALGON R: (R3 454), ANCONP (R7 786) VERG A1
 (R5 506, R4 400) 3 RV (R15 000) **TOWNHOUSE/FLATS:**
KUBALI: (R17 797) 3 RV (R5 343, R6 300, R4 895)
3 RV PROP: (R7 230, R7 110, R6 110, R4 450, R4 200)
RIVERSDALE: (R5 197), WALLONP (R15 000), PEACEN
 (R3 580) VERG (R2 800) **BLUESIDE/STREET:**
VER: (R15 000 Per Top) 3 RV (R6 340), GARDEN FLATS:
SONLANDP: (R4 450) RBIV (R2 800)
AMANDA 073 288 2607
NOTE: * Properties marked with an asterisk are for sale

BUTSCILLA PLOT: REE 000, A 2.5 ha plot with 2 boreholes, irrigation over the whole plot, and a dam. 3 Motor's rooms, lock-up carport for 4 cars, alarm and electronic gate. A 4 bedroom house with 2 bathrooms and oak kitchen. If you love the soil come and farm here. **URGENT!**
ROBINVILLE: LONGING FOR A HOME OF YOUR OWN? Then see this 4 bedroom, 2 bathroom house situated close to the school. At R1,99 million you can enjoy a lifestyle with all the facilities a home can offer - TV room, study, Cherry Wood kitchen, spa and pool. Call today!
THREE RIVERS PROPER TOWNHOUSE, UPMARKET COMPLEX.
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 Houties & Nieme Ooms, Hermitaan Ave.
 016 455 2093
john@cashcrusaders.co.za

Notice of Basic Assessment and Waste Management Licence for the proposed development of Pig farming enterprise on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng

CSIR Reference No: CSIR/CAS/IEHS/IR/2015/00016/A

Notice is given of a Basic Assessment (BA) and Waste Management licence process being undertaken on behalf of Alphonsus Farming Co-operative Ltd (the Project Applicant) for the proposed development of Pig farming enterprise on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

In terms of the NEMA EIA Regulations published in Government Notice Regulation (GNR) 983 and 985 on 4 December 2014 Government Gazette No 38282, and NEM:WA Regulation published in GNR 921 on the 29 November 2013 Government Gazette No 37063, a BA process is required as the project triggers the following listed activities: GNR 983 Activity 3 (i), GNR 983 Activity 4(i)(a), GNR 983 Activity 27, GNR 985 Activity 12 (a) and GNR 921 Category A 1. The Council for Scientific and Industrial Research (CSIR) is the Environmental Assessment Practitioner (EAP) who will be managing the process.

You are invited to register as an Interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and/or to register as an I&AP please cite the CSIR Reference Number and provide your full name, full postal address, phone numbers, email address and state your area of interest and/or concern to: **Ms. Reineet Mogotshi, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2093 or Email: rmogotshi@csir.co.za**. You have until on or before **03 May 2016** to do so [30 days from the date of this publication - including weekends, but excluding public holidays].

CSIR
 www.csir.co.za

**Notice of Basic Assessment and Waste Management
Licence for the proposed development of Pig
farming enterprise on Portion 18 of Portion 13 of the
Farm Poortje 340-IQ, Poortje, Gauteng**

CSIR Reference No: CSIR/CAS/EMS/IR/2015/00016/A

Notice is given of a Basic Assessment (BA) and Waste Management Licence process being undertaken on behalf of Alphomega Farming Co-operative Ltd (the Project Applicant) for the **proposed development of Pig farming enterprise on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.**

In terms of the NEMA EIA Regulations published in Government Notice Regulation (GNR) 983 and 985 on 4 December 2014 Government Gazette No 38282, and NEM:WA Regulation published in GNR 921 on the 29 November 2013 Government Gazette No 37083, a BA process is required as the project triggers the following listed activities: *GNR 983 Activity 3 (ii), GNR 983 Activity 4(ii)(a), GNR 983 Activity 27, GNR 985 Activity 12.a) and GNR 921 Category A 1.* The Council for Scientific and Industrial Research (CSIR) is the Environmental Assessment Practitioner (EAP) who will be managing the process.

You are invited to register as an Interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and/or to register as an I&AP, please cite the CSIR Reference Number and provide your full name, full postal address, phone numbers, email address and state your area of interest and/or concern to: **Ms. Reinett Mogotshi, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2693 or Email: rmogotshi@csir.co.za.** You have until on or before **03 May 2016** to do so (30 days from the date of this publication - including weekends, but excluding public holidays).



APPENDICES

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

(In response to Project Announcement documents)

From: "Aseef Ahmed" <AseefA@emfuleni.gov.za>
To: <rmogotshi@csir.co.za>
Date: 31/03/2016 18:05
Subject: Registering as an I&AP
Attachments: Comments & Reg Form BAR Pig Farm Poortje.docx; Aseef Ahmed.vcf

Good day.

Please note that the Section of Environmental Management of the Emfuleni Local Municipality would like to register as an Interested and Affected Party for this particular project.

Regards,

Aseef Ahmed
Chief Environmental Management Officer
Section of Environmental Management
016 930-5448 (t)
086 457 2208 (f)
AseefA@emfuleni.gov.za

This e-mail and any file attachments transmitted with it are intended solely for the addressee(s) and may be legally privileged and/or confidential. If you have received this e-mail in error, please destroy it. If you are not the addressee you may not disclose, copy, distribute or take any action based on the contents hereof. Any unauthorized use or disclosure is prohibited and may be unlawful. The views and opinions expressed in this e-mail message may not necessarily be those of the Emfuleni Local Municipality.

APPENDICES

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

March 2016

COMMENT AND REGISTRATION FORM

Name: Aseef Ahmed	
ID no: -	Telephone: 016 930 5448
Organisation: Emfuleni Local Municipality – Section of Environmental Management	Fax:
Position: Chief Environmental Management Officer	Email: AseefA@emfuleni.gov.za
Physical address: c/o Klasie Havenga Street and Frikkie Meyer Boulevard, Vanderbijlpark	Postal address:

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.	
YES	X
NO	
Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation:	

Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

Ms. Reinett Mogotshi P O Box 320, Stellenbosch, 7599 Tel: 021 888 2432 Fax: 021 888 2473 E-mail: rmogotshi@csir.co.za
--



Board members: Prof T. Majazi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Llobell, Dr R. Masango, Ms M. Maseko, Mr J. Netshitenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

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APPENDICES

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

March 2016

COMMENT AND REGISTRATION FORM

Name: Ndlumiso Mazanku	Telephone: 012-4410596
ID no: 8510315362087	Fax: 012-3411831
Organisation: National Agricultural Marketing Council	Email: ndlumiso@namc.co.za
Position: Economist: Statutory Measures	Postal address:
Physical address: Block A, 1 st Floor Meintjiesplein Building 530 Frazer's Barossa Street Arcadia, Pretoria, 0002	Private Bag 935 Pretoria 0001

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.

YES

NO

Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation:

None

Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.

I do not have any concerns, regarding the proposed project.

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

Ms. Reinett Mogotshi
P O Box 320,
Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2473
E-mail: rmogotshi@csir.co.za



Board members: Prof T. Majosi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Lobell, Dr R. Masango, Ms M. Maseko, Mr J. Netshitenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

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APPENDICES

From: "Len Palmer" <len@monitorpumps.co.za>
To: <rmogotshi@csir.co.za>
Date: 05/04/2016 09:59
Subject: Poortje farm 340-IQ

Dear Mz Mogotshi

We would like to register as an I&PA for this project

Monitor Engineering represents technology for the complete mixing and heating of Anaerobic digesters and can offer advise on co generation .

Best Regards Len

Len Palmer

Monitor Pumps & Systems
a Division of Monitor Engineering (Pty) Ltd
132 Main Reef Rd. Benrose, Johannesburg, 2094
P.O. Box 7844, Johannesburg, 2000
Tel: +27 11 618 3860
Fax: +27 11 614 0021
Cell: +27 82 895 1023
e-mail: len@monitorpumps.co.za
web: www.monitorpumps.co.za

From: "Helen van Jaarsveld" <helenvanjaarsveld@gmail.com>
To: <rmogotshi@csir.co.za>
CC: <Johan.VanJaarsveld@lonmin.com>
Date: 28/04/2016 09:28
Subject: FW: Notification of Release of BID for Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.
Attachments: CSIR COMMENT AND REGISTRATION FORM.pdf

Good day,

Please find attached hereto our comment and registration form in light of the abovementioned project.

Please keep us informed with regards to the progress of the matter.

We trust you find the above in order.

Your sincerely
Helen on behalf of
CA VAN JAARVELD
082 852 9874

APPENDICES

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

March 2016

COMMENT AND REGISTRATION FORM

Name: CA VAN JAARSVELD	
ID no: 1953-12-14	Telephone: 011 751 5610/082 852 9874
Organisation:	Fax:
Position:	Email: helenvanjaarsveld@gmail.com
Physical address: Portion 21 of Portion 13 of the Farm Poortje 340	Postal address:

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.

YES	<input checked="" type="checkbox"/>
NO	<input type="checkbox"/>

Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation:

Personal Interest

Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.

1. What procedures are in place for removal of solid waste, dead piglets, dead rats and dirty drains - what sewerage system?
2. How will the odor be prevented and what hygiene measurements will be put in place
3. What Pest control program is in place to prevent rats + flies from neighboring and which products will be used
4. Will appropriate disposal of dead animals + placentas be done?

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

<p>Ms. Reinett Mogotshi P O Box 320, Stellenbosch, 7599 Tel: 021 888 2432 Fax: 021 888 2473 E-mail: rmogotshi@csir.co.za</p>
--



Board members: Prof T. Majazi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Libell, Dr R. Masango, Ms M. Maseko, Mr J. Netshitenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

www.csir.co.za

APPENDICES

(In response to the Draft Basic Assessment Report)

From: "Helen van Jaarsveld" <helenvanjaarsveld@gmail.com>
To: <rmogotshi@csir.co.za>
Date: 31/01/2017 12:21
Subject: FW: Notification of Release of BID for Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.
Cc: <Johan.VanJaarsveld@lonmin.com>, <jacovj@mweb.co.za>
Attachments: CSIR COMMENT AND REGISTRATION FORM.pdf

Good day,

Our email below and the attached document refer.

We have not had the pleasure of a reply to our concerns as described in the attached document.

Your urgent reply shall be highly appreciated.

Kind regards
Helen van der Walt on behalf of
CA VAN JAARVELD
082 852 9874



**agriculture and
rural development**

Department: Agriculture and Rural Development
GAUTENG PROVINCE

11 Diagonal, Diamond Building, Newtown, Johannesburg
P O Box 8769, Johannesburg, 2000

Telephone: (011) 240-2500

Fax: (011) 240-2700

Website: <http://www.gdard.gpg.gov.za>

Reference:	002/16-17/10004
Enquiries:	Malesela Sehona
Telephone:	(011) 240-3048
Email:	malesela.sehona2@gauteng.gov.za

Council for Scientific and Industrial Research

Email/Fax. rmogotshi@csir.co.za

Dear Sir / Madam

**Application for Integrated Environmental Authorisation & Draft Basic Assessment Report:
The proposed development of a pig production facility on Portion 18 of Portion 13 of the
Farm Poortje 340-IQ, Poortje, Gauteng**

The Department acknowledges having received the Application for Integrated Environmental Authorisation & Draft Basic Assessment Report for environmental authorisation of the above-mentioned project on 15/12/2016.

You are required to submit five (5) copies (3 full colour hard copies and 2 CDs-PDF) of the Final Basic Assessment Report as well as a copy of the previously submitted application form for environmental authorisation.

In terms of Regulation 45 of the EIA Regulations 2014, this application will lapse should you fail to meet any of the time-frames prescribed in terms of these regulations, unless an extension has been granted in terms of regulation 3(7).

APPENDICES

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours faithfully



Boniswa Belot

Deputy Director: Strategic Administration Support

Date: 10/02/2017

CC: Alphomega Farming Primary Co-Operative Att: J Mataboge
Limited Email/Fax: tbtrader4@gmail.com

APPENDICES



EMFULENI
LOCAL MUNICIPALITY

Vaal River City, the Cradle of Human Rights

OFFICE OF THE ASSISTANT MANAGER: ENVIRONMENTAL MANAGEMENT

Tel: +27 18 930 5590
Fax: +27 18 988 1531
E-mail: zamanim@emfuleni.gov.za

P.O. Box 3
C/o KlasieHavenga Street and
Frikkie Meyer Boulevard
VANDERBIJLPARK
1811

Web: www.emfuleni.gov.za

File: Comments - BAR

Date: 21 February 2017

CSIR
P.O Box 320
Stellenbosch
7599

By Email

Attention: Reinett Mogotshi

Dear Madam,

SUBJECT: COMMENTS ON THE BASIC ASSESSMENT REPORT FOR THE PROPOSED DEVELOPMENT OF A PIG PRODUCTION FACILITY ON PORTION 18 OF PORTION 13 OF THE FARM POORTJE 340 IQ, EMFULENI LOCAL MUNICIPALITY

The above matter has reference. The Emfuleni Local Municipality's Section of Environmental Management acknowledges receipt of the draft Basic Assessment Report for the proposed pig production facility. We also appreciate you identifying us as an Interested and Affected Party. For this particular project our comments are as follows:

The Receiving Environment

Size of the site

-The site measures approximately 4 hectares in extent.

Character of the Surrounding Area

- The site lies in an area surrounded by agricultural holdings, vacant land and a ridge.

Sensitive Features

- Ridge (Class 1)
- Vegetation (primary)
- River (non-perennial)
- Agricultural potential (moderate)
- Graves

APPENDICES

Infrastructure and Services

The relevant departments within the municipality must be contacted to ensure that the service needs of the proposed development are addressed.

Waste Management

Construction phase

- Adequate waste skips to be provided around the construction camp and site.
- Waste is to be removed regularly and disposed of at a licensed municipal landfill site.
- Builder's rubble must be disposed of at a licensed municipal landfill site.
- No illegal burning of waste should take place on site.
- Hazardous waste and waste contaminated with oil and other hazardous chemicals must be separated from general waste and disposed of at a designated hazardous landfill site.

Operational phase

- Waste must be handled in the correct manner following the principles enshrined within the 'Cradle to Grave' concept.
- Clear records must be kept of the removal and correct disposal of solid waste, especially of potentially infectious waste.

Air Quality

- Emfuleni Local Municipality falls within the Vaal-Triangle Airshed Priority Area. It is declared as such due to the very poor quality of ambient air in the region.
- The construction and operation of the proposed development will impact on the air quality of the area.
- Since excavation involves removal of soil cover and leaving bare soil, it is recommended that dust suppression be conducted at all times to reduce particulate matter (PM10).
- Odour and the nuisances arising thereof must be adequately managed.
- No burning of waste or other materials is permitted on site.

Other Recommendations

The following is further recommended:

- A WML and WUL must be obtained. All conditions within these must be implemented accordingly.
- It must be ensured that no groundwater contamination takes place as a result of the slurry dam and pig waste.
- It is recommended that a storm water management plan be put in place in order to ensure that the river, storm water and groundwater remain free from contamination.
- All floral species with ecological value and importance must be protected.
- All recommendations made in the specialist reports must be stringently implemented. Furthermore, development must be kept out of the sensitive areas identified such as the ridge, river and cemetery.
- Mitigation measures attached to the EMPr must be adhered to.
- Compliance with all other legislation, policy, governance and developmental frameworks within the Emfuleni Local Municipality.

APPENDICES

On the basis of the above key factors, Environmental Management does not object to the proposed development provided that the above factors are carefully considered, addressed and stringently implemented. Furthermore, this is dependent on the Environmental Authorisation being obtained from the GDARD.

Please note that Environmental Management Inspectors of the Municipality will be regularly visiting the site to ensure monitoring and compliance of the proposed development should authorisation be granted.

Kind regards,

APPENDICES



GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

FAX COVER

TO:	FROM:
Reinett Mogotshi	Xoliswa Bobelo
COMPANY:	DATE:
Csir	2017
EMAIL:	TOTAL NO. OF PAGES, INCLUDING COVER:
rmogotshi@csir.co.za	4
TEL:	CC:
021 888 2432	
RE:	YOUR REFERENCE NUMBER:
Comments on a Draft Basic Report: Proposed Development of a pig production facility on Portion 18 of Portion 13 at Poortjie 340-1Q, City Of Johannesburg Metropolitan Municipality	Gaut 002/16-17/0004

URGENT FOR REVIEW PLEASE COMMENT PLEASE REPLY

Tel: +27 (0) 11 "[Insert number]" Fax: +27 (0) 11 "[Insert number]"
"[Click here to type Physical Address]" | "[Click here to type Postal Address]"
www.gautengonline.gov.za

APPENDICES



CSIR
P.O. Box 320
Stellenbosch
7599

Attention: Reinett Mogotshi
Tel No: 021 888 2432
Fax No: 021 888 2473
E-Mail: rmogotshi@csir.co.za

Reference: Gaut 002/16-17/0004
Enquiries: Xoliswa Bobelo
Telephone: 011 240 3391
E-mail: Xoliswa.Bobelo@gauteng.gov.za

Dear Madam,

COMMENTS ON A DRAFT BASIC REPORT: THE PROPOSED DEVELOPMENT OF A PIG PRODUCTION FACILITY ON PORTION 18 OF PORTION 13 AT POORTJIE 340-IQ, CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY

The Draft Basic Assessment Report (DBAR) regarding the above -mentioned development received by the Department on 15 December 2016 has reference.

The proposal entails 2 sows and boar house (12x30m), 2 farrowing, weaner and grower house (12x30m), abattoir (12x30m) and a 170m³ slurry dam on the above-mentioned site. The proposed site falls within critical biodiversity area, ecological support area, orange listed plant, primary vegetation, wetland, waterbody, Non-Perennial River, class 1 and 2 ridge according to the Geographic Information System (GIS). In terms of the Gauteng Environmental Management Framework, the proposed site falls within Environmental Management Zones 3 and 4 which are compatible with the proposed activity. The proposed development footprint is 4 hectares in extent.

The Department will like to comment as follows:

1. Alignment of the activity with applicable legislations and policies

The development has a direct bearing on the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended), National Water Act, 1998 (Act No. 36 of 1998), National Waste Act, 2008 (Act No. 59 of 2008) and Occupational Health and Safety Act, 1983 (Act 85 of 1983, as amended) at both national and provincial levels. The proposed development corresponds with the activity applied for under the Environmental Impact Assessment (EIA) Regulations, 2014, (GN R.983). This activity is listed under Notice 1 activities 3 (ii), 4 and 27 published under the National Environmental Management Act (NEMA) (Act No. 107 of 1998) (as amended).

APPENDICES

2. Guidelines GDARD requirements

In addition to what is listed in the DBAR that will be incorporated in the final BAR, the Department would require the following documents in order to undertake a thorough review and reach a credible Environmental Authorisation:

A detailed storm water management plan for the site (including storm water management measures to be implemented temporarily during the construction phase and permanent measures to be installed for the operational phase) must be developed by a suitably qualified engineer and approved by the Local Municipality.

3. Alternatives

Feasible and reasonable alternatives based on the different types/categories of alternatives including, design and energy saving technologies have been identified and assessed. They must still be included in the final BAR so that the Department can be able to make an informed.

4. Significant rating of impacts

The identification, assessment and rating of impacts that has been provided are sufficiently reliable to enable sound conclusion on the mitigation to be employed in order to reduce impacts to acceptable levels.

5. Locality map and layout plans or facility illustrations

The locality maps overlain by a composite sensitivity map that meets the "GDARD minimum requirements" for Biodiversity Assessment are attached to the Draft Basic Assessment Report and reflect the proper legends. The facility illustrations are also attached and they must still be attached in the final BAR.

6. EMPr

A site (project) specific Environmental Management Programme (EMPr) is attached, practical and enforceable and in line with the content requirements as stipulated in Appendix 4 of the Environmental Impact Assessment (EIA) Regulations, 2014. It must still be attached in the final BAR.

7. Public participation process

It is noted that the Draft Basic Assessment Report (DBAR) is currently being circulated for comment and that part of the public participation process is undertaken in accordance with the requirements of the regulations in that the site notices were placed on strategic locations and the newspaper advert was placed in the Vereeniging Star newspaper from 29 March to 4 April 2016. All public participation information including, but not limited to, comments and responses report must be attached in the appropriate Appendices in the final report.

8. Any other issues noted

- a. According Department Geographic Information System, the proposed activity is located within the City of Johannesburg Metropolitan Municipality whereas in the report it is said to be within Emfuleni Local Municipality. Therefore an amendment must be made on the final BAR.
- b. All specialist studies as attached and indicated in the Draft Basic Assessment Report must be included in the appropriate Appendices in the final report.
- c. A biosecurity plan for the proposed piggery production and abattoir facilities must be implemented and included in the final basic assessment report.

APPENDICES

- d. A full services report to ascertain services demand and availability with more emphasis on water must be attached in the Final Basic Assessment Report.
- e. The draft basic assessment report states that the proposed activity will require a Waste Management License and Water Use License, therefore separate applications must be lodged with the Waste Directorate of this Department and Department of Water and Sanitation (DWS).
- f. Land use zoning or zoning certificate of the property must be attached in the final basic assessment report.
- g. A 200 metre buffer zone must be constructed away from the ridges.

If you have any queries regarding this letter, contact the official at the contact details provided above.

Yours faithfully



Mr. T. Leku
Acting Director: Impact Management
Date: 28/2/2017

APPENDICES

Email to Mr Siyethemba Mdletshe Manager Roads and Storm Requesting comments on the Draft BAR

From: Reinett Mogotshi
To: siyethembam@emfuleni.gov.za
Date: 02/03/2017 10:01
Subject: Request for comments on the Draft Basic Assessment Report
Attachments: Comments BAR pig facility Pootje 340IQ.docx;
Draft_Basic_Assessment_Report_Alphomega.compressed.pdf

Good day

As per our telephonic conversation, kindly find the attached Draft Basic Assessment Report for comments. The environmental section of the Emfuleni Local Municipality in a letter dated 21 February 2017 requested that the relevant departments within the municipality be contacted in terms of the services needs for the proposed development.

I humbly request to receive the comments by the **9th of March 2017**. This is mainly the Final BAR needs to be submitted by the **13th of March** (latest) to GDARD in order to meet the prescribed timeframes. Failure to submit this application on time will lead to the lapsing of the application and the applicant will have to lodge a new application and he will not have the financial resources to do so.

My sincere apologies for the inconvenience

I look forward to hearing from you

Kind Regards

Reinett Mogotshi

Junior Environmental Assessment Practitioner

Environmental Management Services

CSIR

021 888 2432

APPENDICES

Appendix E.5 – Comments and Responses Report

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
Please note that the Section of Environmental Management of the Emfuleni Local Municipality would like to register as an Interested and Affected Party for this particular project.	Aseef Ahmed Chief Environmental Management Officer Emfuleni Local Municipality (Email)	31 March 2016	Noted. The Environmental Management section has been registered on the project database.
We would like to register as an IA&P for this project. Monitor Engineering represents technology for the complete mixing and heating of Anaerobic digesters and can offer advice on co-generation.	Len Palmer (Private)	05 April 2016	Noted, the applicant will not generate electricity from the pig waste. This is something that the applicant might be interested in as soon as he has financial means to generate electricity.
I do not have any concerns regarding the proposed project. I would like to be registered as an I&AP for this project to receive further correspondence during the Basic Assessment Process.	Ndumiso Mazibuko Economist: Statutory Measures National Agricultural Marketing Council (Email)	26 April 2016	Noted, you have been added to the database.
<p>Good day, Please find attached hereto our comment and registration form in light of the abovementioned project. Please keep us informed with regards to the progress of the matter. We trust you find the above in order.</p> <ol style="list-style-type: none"> 1. What procedures are in place for removal of solid waste, dead piglets, dead rats and dirty drains- what sewerage systems? 2. How will the odour be prevented and what hygiene measures will be put in place 3. What pest control program is in place to prevent rats+ flies from neighbours and what products will be used? 4. Will appropriate disposal of dead animals + placenta be done? 	CA Van Jaarsveld Private (Email)	24 April 2016	<p>Thank you for your comments</p> <p>1. <u>Solid waste</u> Solid waste will be stored in a lagoon and will also be used as manure for the maize fields</p> <p><u>Dead pigs and rats</u> Dead pigs will be buried in a mortality pit on site; however should pigs be infected; they will be transported to the nearby landfill site and classified as hazardous waste.</p> <p>Septic tanks will be used for the proposed development site.</p> <p>2. The facility will be cleaned daily using Handy Andy and Pine gel, crushed</p>

APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
			<p>eucalyptus leaves will be used for odour control. Best practice guidelines will be adhered to. Good housekeeping practises will be applied.</p> <p>3. Electrocutation rats control will be used as a pest control for the development furthermore Adulticide and Larvacide control treatment products will be used for the flies.</p> <p>4. Dead animals plus placenta will be buried in a mortality pit on site; however should pigs be infected; they will be transported to the nearby landfill site and classified as hazardous waste.</p>
<p>Good day, Our email below and the attached document refer. We have not had the pleasure of a reply to our concerns as described in the attached document. Your urgent reply shall be highly appreciated. Kind regards Helen van der Walt on behalf of CA VAN JAARVELD 082 852 9874</p>	<p>CA Van Jaarsveld Private (Email)</p>	<p>31 January 2017</p>	<p>Thank you for your comment. The concerns raised have been addressed in the comments and response trail; please refer to page 126 and 127 of the attached Draft Basic Assessment Report.</p>

APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>The Department acknowledges having received the Application for Integrated Environmental Authorisation & Draft Basic Assessment Report for environmental authorisation of the above- mentioned project on 15/12/2016.</p> <p>You are required to submit five (5) copies (3 full colour hard copies and 2 CDs-PDF) of the Final Basic Assessment Report as well as a copy of the previously submitted application form for environmental authorisation.</p> <p>In terms of Regulation 45 of the EIA Regulations 2014, this application will lapse should you fail to meet any of the time-frames prescribed in terms of these regulations, unless, an extension has been granted in terms of regulation 3(7).</p> <p>Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.</p>	<p>Malesele Sehona GDARD (Email)</p>	<p>10 February 2017</p>	<p>Noted, 5 copies of the Final Basic Assessment Report as well as the copy of the previously submitted application form shall be submitted to the department.</p>
<p>The above matter has reference. The Emfuleni Local Municipality's Section of Environmental Management acknowledges receipt of the draft Basic Assessment Report for the proposed pig production facility. We also appreciate you identifying us as an Interested and Affected Party. For this particular project our comments are as follows:</p> <p>1. <u>The Receiving Environment</u></p> <p>1.1. Size of the site -The site measures approximately 4 hectares in extent.</p> <p>1.2. Character of the Surrounding Area The site lies in an area surrounded by agricultural holdings, vacant land and a ridge. Sensitive Features - Ridge (Class 1)</p>	<p>Aseef Ahmed Chief Environmental Management Officer Emfuleni Local Municipality (Email)</p>	<p>21 February 2017</p>	<p>Thank you for your comments</p> <p>1. 1.1 Noted and correct, The proposed development footprint is 4 hectare of land</p> <p>1.2 Noted and correct, the site lies in an area surrounded by agricultural activities and a Class 1 Ridge is present on site.</p> <p>2. Noted, Mr Siyethemba Mdletshe, Manager Roads and Storm water, has been send an email on the 2nd of March 2017 requesting comments on the Draft Basic Assessment Report. He will be asked to provide comments if he has any</p>

APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<ul style="list-style-type: none"> - Vegetation (primary) - River (non-perennial) - Agricultural potential (moderate) - Graves <p>2. <u>Infrastructure and Services</u> The relevant departments within the municipality must be contacted to ensure that the service needs of the proposed development are addressed.</p> <p>3. <u>Waste Management</u> <u>Construction phase</u></p> <p>3.1. Adequate waste skips to be provided around the construction camp and site.</p> <p>3.2. Waste is to be removed regularly and disposed of at a licensed municipal landfill site.</p> <p>3.3. Builder’s rubble must be disposed of at a licensed municipal landfill site.</p> <p>3.4. No illegal burning of waste should take place on site.</p> <p>3.5. Hazardous waste and waste contaminated with oil and other hazardous chemicals must be separated from general waste and disposed of at a designated hazardous landfill site.</p> <p><u>Operational phase</u></p> <p>3.6. Waste must be handled in the correct manner following the principles enshrined within the ‘Cradle to Grave’ concept.</p> <p>3.7. Clear records must be kept of the removal and correct disposal of solid waste, especially of potentially infectious waste.</p>			<p>directly to GDARD.</p> <p>3.</p> <p>3.1 Correct, adequate waste skips will be provided on site during construction by the contractor.</p> <p>3.2 Correct, the waste from the site will be disposed of at the Ennerdale Landfill site.</p> <p>3.3 Noted and correct, construction rubble will be disposed of at Ennerdale landfill site.</p> <p>3.4 Noted, The applicant has been advised with regards to this issue and there will be no burning of waste on site.</p> <p>3.5 Noted, The hazardous waste will be separated from general waste and be disposed of at a designated hazardous landfill site.</p> <p>3.6 Noted, adequate measures will be taken to ensure the disposal of waste in a correct manner that adheres to the principles of ‘Cradle to Grave’ concept.</p> <p>3.7 Noted, record of waste disposal will be kept.</p> <p>4.</p> <p>4.1 Noted</p> <p>4.2 Noted</p>

APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>4. Air Quality</p> <p>4.1. Emfuleni Local Municipality falls within the Vaal-Triangle Airshed Priority Area. It is declared as such due to the very poor quality of ambient air in the region.</p> <p>4.2. The construction and operation of the proposed development will impact on the air quality of the area.</p> <p>4.3. Since excavation involves removal of soil cover and leaving bare soil, it is recommended that dust suppression be conducted at all times to reduce particulate matter (PM10).</p> <p>4.4. Odour and the nuisances arising thereof must be adequately managed.</p> <p>4.5. No burning of waste or other materials is permitted on site.</p> <p><u>Other Recommendations</u></p> <p>The following is further recommended:</p> <p>5. A WML and WUL must be obtained. All conditions within these must be implemented accordingly.</p> <p>6. It must be ensured that no groundwater contamination takes place as a result of the slurry dam and pig waste.</p> <p>7. It is recommended that a storm water management plan be put in place in order to ensure that the river, storm water and groundwater remain free from contamination.</p> <p>8. All floral species with ecological value and importance must be protected.</p> <p>9. All recommendations made in the specialist reports must be stringently implemented. Furthermore, development must be kept out of the sensitive areas identified such as the ridge, river and cemetery.</p> <p>10. Mitigation measures attached to the EMPr must be adhered to.</p> <p>11. Compliance with all other legislation, policy, governance and developmental frameworks within the Emfuleni Local Municipality.</p>			<p>4.3 Noted, dust control measures such as mulching or periodic wetting will be implemented.</p> <p>4.4 Noted, please refer to the EMPr for detailed mitigation measures for odour control.</p> <p>4.5 Noted, The applicant has been advised with regards to this issue and there will be no burning of waste on site.</p> <p>5. Noted, an Integrated Environmental authorisation for Both EA and waste license has been submitted to GDARD on the 15th of December 2016. Furthermore the applicant has lodged a WULA application with Department of Water and Sanitation (DWS). Please refer to appendix F for acknowledgment of application from DWS.</p> <p>6. Noted, please refer to the EMPr for specific measures to be undertaken to ensure that there is no groundwater contamination.</p> <p>7. Noted, the Storm water management plan has been drafted and is included as part of the EMPr.</p> <p>8. Noted, the EMPr outlines specific mitigation measures for the protection of flora species on site.</p>

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ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>On the basis of the above key factors, Environmental Management does not object to the proposed development provided that the above factors are carefully considered, addressed and stringently implemented. Furthermore, this is dependent on the Environmental Authorisation being obtained from the GDARD.</p> <p>Please note that Environmental Management Inspectors of the Municipality will be regularly visiting the site to ensure monitoring and compliance of the proposed development should authorisation be granted.</p> <p>Kind regards,</p>			<p>9. Noted, the layout of the proposed development has been informed by the sensitivities on site.</p> <p>10. Noted, the applicant will dhere to the recommended mitigation measures.</p> <p>11. Noted, the applicant will comply with all the relevant legislations.</p>
<p>The Draft Basic Assessment Report (DBAR) regarding the above - mentioned development received by the Department on 15 December 2016 has reference. The proposal entails 2 sows and boar house (12x30m), 2 farrowing, weaner and grower house (12x30m), abattoir (12x30m) and a 170m³ slurry dam on the above-mentioned site. The proposed site falls within critical biodiversity area, ecological support area, orange listed plant, primary vegetation, wetland, waterbody, Non-Perennial River, class 1 and 2 ridge according to the Geographic Information System (GIS). In terms of the Gauteng Environmental Management Framework, the proposed site falls within Environmental Management Zones 3 and 4 which are compatible with the proposed activity. The proposed development footprint is 4 hectares in extent.</p> <p>The Department will like to comment as follows:</p> <p>1. Alignment of the activity with applicable legislations and policies</p>	<p>Xoliswa Bobelo GDARD (email)</p>	<p>28 February 2017</p>	<p>1. Noted, the proposed development is listed under Notice 1 activities 3 (II), 4 and 27 published under the National Environmental Management Act (NEMA) (Act No. 107 of 1998) (as amended). And Category (A) 1 listed activity in terms of the National Environmental Management: Waste Act (NEMWA) (Act no 59 of 2008).</p> <p>2. Noted, a detailed Stormwater Management Plan has been drafted and is included as Section 6 of the EMPr (Appendix H of the FBAR). The applicant shall submit the Stormwater management plan to the municipality prior to commencement of the development. This stormwater management plan has not been drafted by a qualified engineer due to the fact that this is a small scale project and the applicant is a rural SMME and does not have financial</p>

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ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>The development has a direct bearing on the National Environmental Management Act (NEMA) (Act No.107 of 1998, as amended), National Water Act, 1998 (Act No. 36 of 1998), National Waste Act, 2008 (Act No. 59 of 2008) and Occupational Health and Safety Act, 1983 (Act 85 of 1983, as amended) at both national and provincial levels. The proposed development corresponds with the activity applied for under the Environmental Impact Assessment (EIA) Regulations, 2014, (GN R983). This activity is listed under Notice 1 activities 3 (II), 4 and 27 published under the National Environmental Management Act (NEMA) (Act No. 107 of 1998) (as amended).</p> <p>2. Guidelines GDARD requirements In addition to what is listed in the DBAR that will be incorporated in the final BAR, the Department would require the following documents in order to undertake a thorough review and reach a credible Environmental Authorisation:</p> <p>A detailed storm water management plan for the site (including storm water management measures to be implemented temporarily during the construction phase and permanent measures to be installed for the operational phase) must be developed by a suitably qualified engineer and approved by the Local Municipality.</p> <p>3. Alternatives Feasible and reasonable alternatives based on the different types/categories of alternatives including, design and energy saving technologies have been identified and assessed. They must still be included in the final BAR so that the Department can be able to make an informed.</p> <p>4. Significant rating of impacts The identification, assessment and rating of impacts that has been provided are sufficiently reliable to enable sound conclusion on</p>			<p>means to appoint an engineer.</p> <p>3. Noted</p> <p>4. Noted</p> <p>5. Noted, the facility illustrations and locality map are included in the Final BAR.</p> <p>6. Noted, the EMPr has been included in the Final BAR</p> <p>7. Noted, All public participation information including, but not limited to, comments and responses report have been attached in the Final BAR as Appendix E4 and E5.</p> <p>8. (a) The proposed development is within the Emfuleni local municipality. This was determined after a lengthy consultation with Emfuleni Local municipality, City of Johannesburg and West rand District Municipality. Please see the email dated 20 February 2017 attached as Appendix I3 confirming this.</p> <p>(b) Noted, all the Specialist studies have been included as appendix G of the Final BAR</p> <p>(c) Noted, a Biosecurity plan has been compiled and is included as section 7 of the</p>

APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>the mitigation to be employed in order to reduce impacts to acceptable levels.</p> <p>5. Locality map and layout plans or facility illustrations The locality maps overlain by a composite sensitivity map that meets the “GDARD minimum requirements” for Biodiversity Assessment are attached to the Draft Basic Assessment Report and reflect the proper legends. The facility illustrations are also attached and they must still be attached in the final BAR.</p> <p>6. EMPr A site (project) specific Environmental Management Programme (EMPr) is attached, practical and enforceable and in line with the content requirements as stipulated in Appendix 4 of the Environmental Impact Assessment (EIA) Regulations, 2014. It must still be attached in the final BAR.</p> <p>7. Public participation process It is noted that the Draft Basic Assessment Report (DBAR) is currently being circulated for comment and that part of the public participation process is undertaken in accordance with the requirements of the regulations in that the site notices were placed on strategic locations and the newspaper advert was placed in the Vereeniging Star newspaper from 29 March to 4 April 2016. All public participation information including, but not limited to, comments and responses report must be attached in the appropriate Appendices in the final report.</p> <p>8. Any other issues noted a. According Department Geographic Information System, the proposed activity is located within the City of Johannesburg Metropolitan Municipality whereas in the report it is said to be within Emfuleni Local Municipality. Therefore an amendment must be made on the final BAR.</p>			<p>EMPR which is contained in Appendix H of the Final BAR.</p> <p>(d) Noted, a Services Report has been compiled and is included as part of Appendix F of the Final BAR.</p> <p>(e) Noted, an Integrated Environmental authorisation for Both EA and waste license has been submitted to GDARD on the 15th of December 2016. Furthermore the applicant has lodged a WULA application with Department of Water and Sanitation. Please refer to appendix F for acknowledgment of application from DWS.</p> <p>(f) Noted, a zoning certificate for the property has been included as Appendix I of the Final BAR</p> <p>(g) Noted, a 200m buffer ridges map has been included in the Final BAR. Please refer to Appendix A.</p>

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ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>b. All specialist studies as attached and indicated in the Draft Basic Assessment Report must be included in the appropriate Appendices in the final report.</p> <p>c. A biosecurity plan for the proposed piggery production and abattoir facilities must be implemented and included in the final basic assessment report.</p> <p>d. A full services report to ascertain services demand and availability with more emphasis on water must be attached in the Final Basic Assessment Report.</p> <p>e. The draft basic assessment report states that the proposed activity will require a Waste Management License and Water Use License, therefore separate applications must be lodged with the Waste Directorate of this Department and Department of Water and Sanitation (DWS).</p> <p>f. Land use zoning or zoning certificate of the property must be attached in the final basic assessment report.</p> <p>g. A 200 metre buffer zone must be constructed away from the ridges.</p> <p>If you have any queries regarding this letter, contact the official at the contact details provided above.</p> <p>Yours faithfully</p>			

APPENDICES

Appendix E.6 – Copy of the register of I&APs

Name	Surname	Organisation
<i>National</i>		
Mmatlala	Rabothata	Department of Environmental Affairs
Sibusisiwe	Hlela	Department of Environmental Affairs
Takalani	Nemarude	Department of Environmental Affairs
Thoko	Buthelezi	Department of Agriculture, Forestry and Fisheries
Mashudu	Marubini	Department of Agriculture, Forestry and Fisheries
<i>Provincial</i>		
Steven	Mukhola	Department of Agriculture and Rural Development
Phuti	Matlamela	Department of Agriculture and Rural Development
Karabo	Mohatla	Department of Agriculture and Rural Development
Ms M	Musekene	Department of Water and Sanitation
Ms T	Rakgotho	Department of Water and Sanitation
<i>Local Authorities</i>		
Thomas	Mkaza	Sedibeng District Municipality
Aseef	Ahmed	Emfuleni Local Municipality
Ati	Moleko	Emfuleni Local Municipality
<i>Landowners</i>		
Yunus	Chamda	Neighbour
Musa	Mahlatji	Neighbour
Jacob	Mataboge	Applicant
Martin	Van der Merwe	Neighbour
C A	Van Jaarsveld	Neighbour
<i>Other Interested and Affected Parties</i>		
Tebogo	Molokomme	SAHRA
Jacobus	Hoffman	Premier Pork Producers
Ndumiso	Mazibuko	National Agricultural Marketing Council
Hanneline	Smit-Robinson	Birdlife
Anneliza	Collett	AgriLand
Stewart	Foya	Council for Geoscience
Dr. Howard	Hendricks	South African National Parks
Adams	Pires	The Endangered Wildlife Trust
Len	Palmer	Monitor Pumps & Systems

APPENDICES

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion
13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
FINAL BASIC ASSESSMENT REPORT

BASIC ASSESSMENT REPORT

APPENDIX F:

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

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Letter from SAHRA

Proposed development of a pig production facility, Poortje, Gauteng.

Our Ref: 9370



in a partnership with
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 1111 Hemington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Andrew Salomon
Tel: 021 462 4502
Email: asalomon@sahra.org.za
CaseID: 9370

Date: Thursday April 28, 2016
Page No: 1

Letter

In terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999)

Attention: Mr Jacob Mataboge
Alphomega Farming Co-Operative

The Alphomega Farming Co-Operative is a small scale commercial farming enterprise that was established in 2005. This Co-Operative is proposing to establish a 14 hectare start-up enterprise comprising of a commercial pig production facility including plantation of yellow maize on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng (co-ordinates 26°25'48.48"S and 27°44'53.313"E). Furthermore there are 11 unidentified graves on site.

Thank you for your notification regarding this development.

In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that prior to development it is incumbent on the developer to ensure that a **Heritage Impact Assessment** is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.

The quickest process to follow for the archaeological component is to contract an accredited specialist (see the web site of the Association of Southern African Professional Archaeologists www.asapa.org.za) to provide a Phase 1 Archaeological Impact Assessment Report. This must be done before any large development takes place.

The Phase 1 Impact Assessment Report will identify the archaeological sites and assess their significance. It should also make recommendations (as indicated in section 38) about the process to be followed. For example, there may need to be a mitigation phase (Phase 2) where the specialist will collect or excavate material and date the site. At the end of the process the heritage authority may give permission for destruction of the sites.

Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in

APPENDICES

Proposed development of a pig production facility, Poortje, Gauteng.

Our Ref: 9370



an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4505 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. box 4627 | Cape Town | 8001
www.sahra.org.za

Enquiries: Andrew Salomon
Tel: 021 462 4502
Email: asalomon@sahra.org.za
CaseID: 9370

Date: Thursday April 28, 2016
Page No: 2

potentially fossiliferous superficial deposits, a Palaeontological Desk Top study must be undertaken to assess whether or not the development will impact upon palaeontological resources - or at least a letter of exemption from a Palaeontologist is needed to indicate that this is unnecessary. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment will be required and if necessary a Phase 2 rescue operation might be necessary. Please note that a nationwide fossil sensitivity map is now available on SAHRIS to assist with this.

If the property is very small or disturbed and there is no significant site the heritage specialist may choose to send a letter to the heritage authority motivating for exemption from having to undertake further heritage assessments.

Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Andrew Salomon
Heritage Officer: Archaeology
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/361252>

APPENDICES

Proposed development of a pig production facility, Poortje, Gauteng.

Our Ref: 9370



an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4506 | E: info@sahra.org.za
South African Heritage Resources Agency, 111 Hamlyn Road, Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Andrew Salomon
Tel: 021 462 4502
Email: asalomon@sahra.org.za
CaseID: 9370

Date: Thursday April 28, 2016

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Final Decision from SAHRA

Proposed development of a pig production facility, Poortje, Gauteng.

Our Ref: 9370



an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4502 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Hankey Street | Cape Town
P.O. Box 4627 | Cape Town | 8001
www.sahra.org.za

Enquiries: Andrew Salomon
Tel: 021 462 4502
Email: asalomon@sahra.org.za
CaseID: 9370

Date: Friday November 18, 2016
Page No: 1

Final Decision

In terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999)

Attention: Mr Jacob Mataboge
Alphomega Farming Co-Operative

The Alphomega Farming Co-Operative is a small scale commercial farming enterprise that was established in 2005. This Co-Operative is proposing to establish a 14 hectare start-up enterprise comprising of a commercial pig production facility including plantation of yellow maize on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng (co-ordinates 26°25'48.48"S and 27°44'53.313"E). Furthermore there are 11 unidentified graves on site.

Orton, J. & Van der Walt, J. May 2016. Heritage Impact Assessment: Basic Assessment For A Proposed Piggery On Portion 18 Of Portion 13 Of Poortje 340-IQ, Gauteng

The proposed development entails a piggery on Portion 18 of Portion 13 of Poortje 340-IQ in Gauteng. The site measures 35.0667 ha in extent and lies 3 km northwest of the small town of Poortje.

A number of finds were made across the property including several structures, a cemetery and some Late Iron Age stone-walled enclosures. Historical imagery and maps revealed that none of the standing structures is greater than 60 years of age and none of the runs is greater than 100 years of age.

The authors see the only possible impact on heritage resources as accidental damage to the graves during the construction phase, and recommend that: a fence should be erected around the graves allowing at least 5 m of space between the graves and the fence and a buffer of 10 m should be respected around the fence line.

Final Comment

Considering that no significant archaeological heritage resources occur within the study area, and that the nature and extent of the development is unlikely to disturb possible palaeontological resources, the SAHRA Archaeology, Palaeontology and Meteorites Unit has no objections to this proposed development on the following conditions:

- If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments and charcoal/ash concentrations), fossils or other categories of heritage resources are found during the proposed activities, SAHRA must be alerted

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Proposed development of a pig production facility, Poortje, Gauteng.

Our Ref: 9370



an Agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Hanby Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Andrew Salomon
Tel: 021 462 4502
Email: asalomon@sahra.org.za
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Date: Friday November 18, 2016
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immediately, and a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance a Phase 2 rescue operation might be necessary.

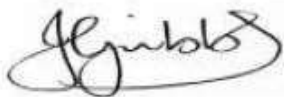
- The recommendations in the heritage report relating to the graves present within the study area must be followed.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully



Andrew Salomon
Heritage Officer: Archaeology
South African Heritage Resources Agency



John Gribble
Manager: Maritime and Underwater Cultural Heritage Unit / Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/361252>

APPENDICES

Services Report

Services Report for the proposed development for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng:

The proposed development site is on a small scale and shall require services such as water, waste removal, roads for transportation of goods and electricity. The proposed development site falls on the rural outskirts of the Emfuleni local municipality, as such the municipality does not provide all the services required in this area.

1.1 Water

The source of water for the project will be ground water, the applicant has submitted an application for Water use licence with the Department of Water and Sanitation (DWS) to extract and use water from the borehole. The DWSs has acknowledged the Application for Water Use License and are awaiting additional information. Please see the attached acknowledgment letter from the DWS.

1.2 Waste

The proposed project also requires a Waste Management License under the National Environmental Management: Waste Act (Act no. 59 of 2008), Category A (1) of GN. R 921 (29 November 2013) for the storage of general waste in lagoons. The Waste Management License was submitted on 14 December 2016 therefore no outcome has been reached to date.

The waste from the piggery will be re-cycled into fertilizer for the proposed maize fields. Solid waste will be divided into two i.e. recyclable waste and non-recyclable waste. The recyclable and non-recyclable materials will be transported to the nearby Wastegroup recycling facility. Please see the attached letter dated 27 March 2017, from the Wastegroup confirming that they have capacity to dispose both general and hazardous waste generated from the proposed facility.

1.3 Electricity

Eskom will provide electricity for the proposed development. The applicant has approached Eskom to apply for supply of electricity of the proposed development. The applicant has not been able to submit the application due to the fact that the application requires the appointment of the electrician for the project. At this stage the electrician cannot be appointed mainly as the applicant is a rural SMME and does not have the financial means to appoint the electrician yet. The appointment of the electrician is based on the funding that the applicant has applied for through the Department of Rural Development and Land Reform and other agencies. It should be noted that these funding agencies have requested the applicant to obtain environmental authorisation before he can acquire any funds. With that said, the application form that has been completed and has been attached to this Basic Assessment Report, however it will only be submitted for approval upon receipt of funding for the project. The applicant will consider solar energy as an alternative source of energy should there be delays with the application.

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1.4 Infrastructure

There will be no construction of new roads or upgrading of existing roads required for the proposed development site as there is currently an existing tarred access road adjacent to the site that serves as a direct link to R28 (Randfontein road) and R558 (Lenasia Drive).

APPENDICES

Letter from Department of Water and Sanitation



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Office of the Actlg CEO: Vaal Proto CMA
Bothongo East Building , 285 Schoeman Street, Pretoria

Enq: Mulaudzi Aluwani
E-mail: mulaudzi2@dws.gov.za

Fax: (012) 392-1408

Tel: (012) 392 1310
Ref: L615

Registered Mail

Alphomega Farming Primary Co-Operative Limited
554 Nhlapo Street
Mohlakeng
Randsontein
1759

Dear Sir/Madam

APPLICATION FOR A WATER USE LICENCE IN TERMS OF SECTION 40 OF THE NATIONAL WATER ACT (ACT NO. 36 OF 1998): FARM RONDAVEL 403 IS PORTION 5, 6 AND 9

The Department acknowledges receipt of the above mentioned water use licence application dated 26 May 2016.

The department has assessed the application and conducted the site inspection and noted that some information required to process this application is not available. In order for application to be processed further, the Department is requesting the following outstanding information to be submitted:

- 1) A draft business plan or a summary of what the project is all about (see the attached brief application report guideline)
- 2) Draft EIA report
- 3) Pump test report
- 4) Section 27(1) motivation; see the attached document for guide.
- 5) Fill in the form for section 21(b) for storing water (also attached).

Please be informed that should a response not be received within 30 days of the date of this letter, your application will be decided on the basis of the available information.

Should there be a need for clarity regarding the content of this letter, contact the Department at the above mentioned contact details.

.....
MR MOKGWABONE MIKE
DEPUTY DIRECTOR: ABSTRACTION AUTHORISATION

DATE: 12 July 2016

APPENDICES

Waste Disposal



Managing Waste For A Friendlier Environment

PRETORIA HEAD
OFFICE
Plot 35, Old Watterbos Road
Pretoria, South Africa
P.O. Box 314, Ben Accord, 0009
Tel: 012 562 0330
Fax: 012 562 0335
Email:

admin@wastegroup.co.za

JOHANNESBURG
Moolplaats Landfill Site
Tel: 08612 WASTE (92783)
Fax: 08613 WASTE (92783)
Email:

admin@wastegroup.co.za

NORTH WEST
Tel: 08612 WASTE (92783)
Fax: 08613 WASTE (92783)
Email:

admin@wastegroup.co.za

MARGATE
Airport Park, Lot 37-14
Isiziba Road, Margate
Tel: 08612 WASTE (92783)
Fax: 08613 WASTE (92783)
Email:

natal@wastegroup.co.za

DURBAN
399 North Coast Road
Springfield Park, Durban
Kwazulu Natal, South Africa
Tel: 08612 WASTE (92783)
Fax: 08613 WASTE (92783)
Email:

mark@wastegroup.co.za

EMPANGENI
1240 Ngwelezane Road
Unit 1.3 King Fisher Park, Empangeni
Kwazulu Natal, South Africa
Tel: 035 794 1431
Fax: 035 794 1623
Email:

antoinette@wastegroup.co.za

VAAAL
7 Jacin Kriese Street

27.03.2017

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Ryan Schmidt
New Business Manager
016 4285236 Office
016 428 5315 Office Fax
078 460 9919 Mobile
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www.wastegroup.co.za

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Reg. No: 980150707



FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

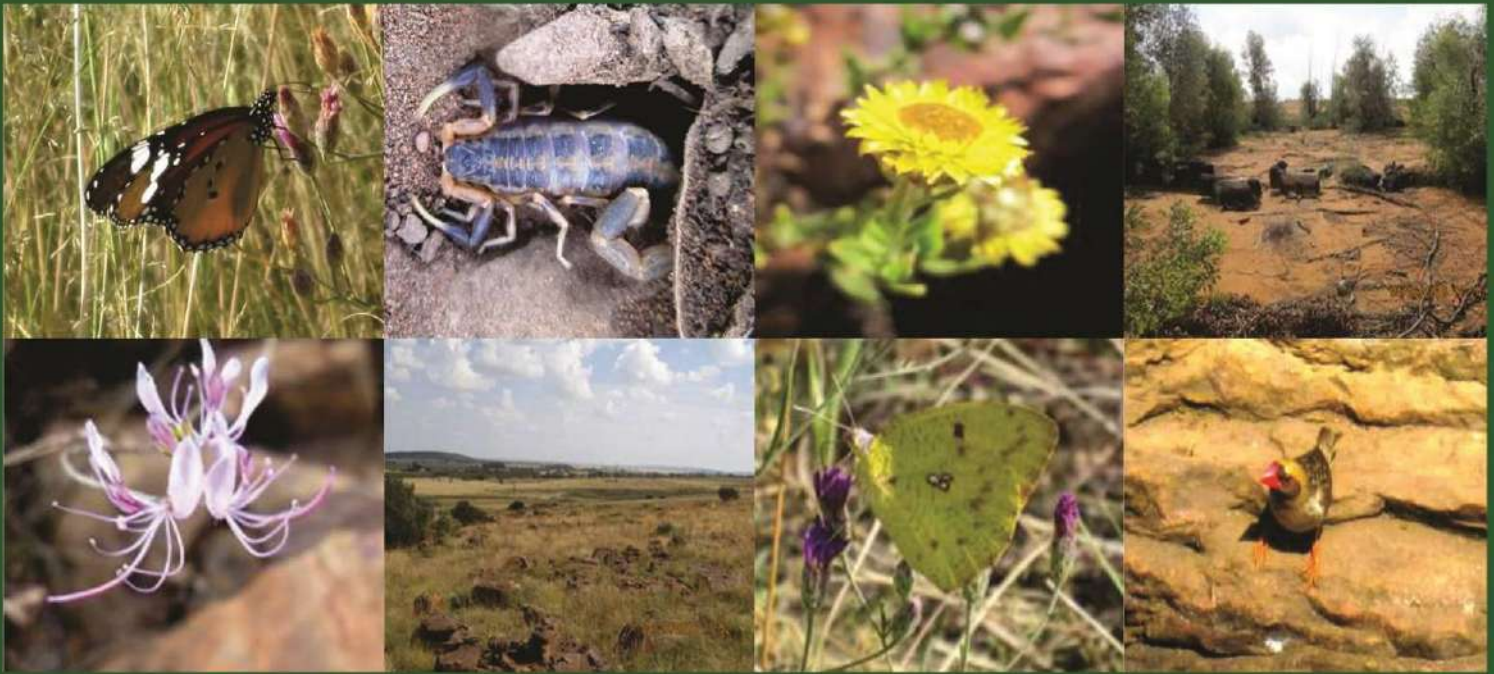
ECOLOGICAL OPINION/SCAN FOR A PROPOSED DEVELOPMENT OF A PIG PRODUCTION FACILITY ON PORTION 18 OF PORTION 13 OF THE FARM POORTJE 340-IQ, POORTJE, GAUTENG



CSIR

our future through science

SPECIALIST REPORT



ECOLOGICAL OPINION/SCAN

FOR A PROPOSED PIG PRODUCTION FACILITY ON PORTION 18 OF PORTION 13
OF THE FARM POORTJIE 340 - IQ, POORTJIE, GAUTENG



Compiled By:

Natural Scientific Services



126 Ballyclare Drive
Morningside
Sandton
2196
Johannesburg
Tel: (011) 787-7400
Fax: (011) 784-7599

NSS Ref No: 2262
Date: June 2016

Compiled For:

CSIR (Council for Scientific and Industrial Research)
CAS - EMS unit



11 Jan Celliers Street
Stellenbosch
7600

Tel: (021) 888 2432
Fax: (021) 888 2473

All pictures taken on site

**ECOLOGICAL OPINION/SCAN FOR A PROPOSED DEVELOPMENT OF A
PIG PRODUCTION FACILITY ON PORTION 18 OF PORTION 13 OF THE
FARM POORTJE 340-IQ, POORTJE, GAUTENG**

Compiled For:

CSIR Stellenbosch (CAS, EMS)

11 Jan Cilliers Street
Stellenbosch, 7600
Western Cape, South Africa
Tel: (021) 888 2432
Fax: (021) 888 2473

Compiled By:



Natural Scientific Services CC

126 Ballyclare Dr
Morningside ext 40
Sandton, Johannesburg
Tel: (011) 787-7400
Fax: (011) 784-7599

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Ref No: 2262
Date: June 2016

Declaration of Independence by Ecologist

I, Susan Abell, in my capacity as a specialist consultant, hereby declare that I -

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.



10/06/2016

Susan Abell Pr.Sci.Nat.
SACNASP Reg. No. 400116/05
Ecology & Environmental Science

Date

EXECUTIVE SUMMARY

Natural Scientific Services CC was approached by the Council for Scientific and Industrial Research to perform a terrestrial ecoscan (a brief floral and faunal assessment) for a proposed commercial pig production facility on the Farm Poortjie 340-IQ, Poortjie, Gauteng. Desktop research and findings from the site visit indicated that the proposed development area comprises mainly fallow weedy and alien-dominated fields, farm buildings and other infrastructure. North of the proposed development area, rocky grassland with a narrow ephemeral / seasonal drainage line is regarded as the most significant and conservation important area for native biodiversity. Within this area, conservation important (CI) plants including the Near Threatened (NT) *Adromischus umbraticola* subsp. *umbraticola* and a number of Protected species were found. The rocky grassland area also provides habitat that is considered to be suitable for the globally Endangered Highveld Blue butterfly, the Vulnerable Blue Korhaan and Secretarybird, and the Near Threatened Coppery Grass Lizard and Southern African Hedgehog, among others.

Potential impacts from the development on the biodiversity and ecology of the site and surrounds were identified and are highlighted in the Summary Table below. Without mitigation, the most significant potential impacts of the proposed project on biodiversity include:

- Potential disturbance of the rocky grassland area and its associated CI species due to increased noise, dust, and human activity.
- The introduction of alien flora with the influx of vehicles, people, construction and operation materials, and their proliferation in the absence of effective control measures.
- Poor or inappropriate control of invertebrate pest species due to substandard animal husbandry / hygiene and waste management.
- Altered burning of the surrounding natural environment during operation, which could adversely affect CI species such as the potentially occurring Highveld Blue.
- Environmental contamination from poor waste management and accidental spills.

With the implementation of the mitigation measures suggested in this report, the significance of most impacts on site from an ecological perspective are considered to be of **Low Significance**.

Table A A Summary of Impacts and Significance with Mitigation

POTENTIAL IMPACTS	SIGNIFICANCE	SIGNIFICANCE
	RATING	RATING
CONSTRUCTION	With	Without
<i>Direct loss of terrestrial vegetation and faunal habitat</i>	High	Low
<i>Loss of CI or medicinal flora</i>	Medium	Low
<i>Introduction & proliferation of alien spp.</i>	High	Low
<i>Reduction in Woody Alien Species</i>	Medium	Medium
<i>Faunal Mortality and Displacement (including CI species)</i>	Medium	Low
<i>Increase in dust and erosion degrading habitat integrity</i>	Medium	Low

POTENTIAL IMPACTS	SIGNIFICANCE	SIGNIFICANCE
	RATING	RATING
<i>Sensory disturbances</i>	Medium	Low
OPERATION		
<i>Environmental contamination</i>	Medium	Low
<i>Poor / Inappropriate control of invertebrate pests</i>	High	Low
<i>Poor / Inappropriate control of vertebrate pests</i>	Medium	Low
<i>Transmission of diseases</i>	Medium	Low
<i>Reduction in CI Species - Harvesting of CI or medicinal flora</i>	Medium	Low
<i>Increased burning - degrading habitat integrity/ Destruction of Species</i>	High	Medium
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High	Low
<i>Sensory disturbances</i>	Medium	Low
DECOMMISSIONING		
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High	Low
<i>Sensory disturbances</i>	Low	Low

Based on the information available to date, with the brief field scan of the site, it is NSS's opinion that there are no fatal flaws to the project and that provided the mitigation set out is adhered to NSS have no objections to the project going forward. This includes the rehabilitating of the fields to the north and protection of the ridge system. A drainage system flows through these areas and will need to be protected from further development. If the developer would like to develop on this area, a further wetland delineation will be required.

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LIST OF ACRONYMS

ACRONYM	DESCRIPTION
AoC	Areas of Concern
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CBA	Critical Biodiversity Areas
CI	Conservation Important
CR	Critically Endangered – a Red Data classification used by the IUCN for describing species in serious danger of facing extinction
CR PE	Critically Endangered, Possibly Extinct
CSIR	The Council for Scientific and Industrial Research
DD	Data Deficient – a Red Data classification used by the IUCN for describing species for which there is inadequate data available to assess their danger of facing extinction
DDD	Data Deficient - Insufficient Information
DDT	Data Deficient - Taxonomically Problematic
DEA	Department of Environmental Affairs
Dec	Declining

ACRONYM	DESCRIPTION
DWA	Department of Water Affairs (Previously known as DWAF)
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation (Previously known as DWA)
ECA	Environmental Conservation Act (Act 73 of 1989)
EI	Ecological Importance
EI&S	Ecological Importance and Sensitivity
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
EMPR	Environmental Management Programme Report
EN	Endangered – a Red Data classification used by the IUCN for describing species in danger of facing extinction
ES	Ecological Sensitivity
ESA	Ecological Support Area
EW	Extinct in the Wild
EX	Extinct
FEPA	Freshwater Ecosystem Priority Areas
GDACE	Gauteng Department of Agriculture, Conservation and Environment (GDACE)
GDARD	Gauteng Department of Agriculture and Rural Development (formally GDACE)
GG	Government Gazette
GN	Government Notice
GPS	Global Positioning System
IA	Impact Assessment
IBA	Important Bird Area
IUCN	International Union for the Conservation of Nature, based in Gland, Switzerland
LC	Least Concern – a Red Data classification used by the IUCN for describing species not in danger of facing extinction
LoO	Likelihood of Occurrence
NAEHMP	National Aquatic Ecosystem Health Monitoring Programme
NBSAP	National Biodiversity Strategy and Action Plan
NEM:AQA	National Environmental Management: Air Quality Act (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NEPAD	
NFA	National Forest Act (Act 48 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act (Act 25 of 1999)
NMPRD	National Mineral and Petroleum Resources Development Act (Act 28 of 2002)
NRF	National Research Foundation
NSBA	National Spatial Biodiversity Assessment
NSS	Natural Scientific Services CC
NT	Near Threatened – a Red Data classification used by the IUCN for describing species not yet in danger of facing extinction, but close to such a state

ACRONYM	DESCRIPTION
NVFFA	National Veld and Forest Fire Act (Act 101 of 1998)
NVFFA	National Veld and Forest Fire Act (Act 101 of 1998)
NWA	National Water Act (Act 36 of 1998)
PES	Present Ecological State
POSA	Plants of South Africa
PRECIS	National Herbarium Pretoria Computerised Information System
PrSciNat	Registration as a Professional Natural Scientist
PS	Protected Species
QDGS	Quarter Degree Grid Square – the basic unit used by the Surveyor General for creation of 1:50 000 topographical maps
RHP	River Health Programme
SABAP1/2	First Southern African Bird Atlas Projects
SAIAB	South African Institute for Aquatic Biodiversity
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SASS5	South African Scoring System version
SMP	Strategic Management Plans
SoW	Scope of Work
ToPS	Threatened or Protected Species
ToR	Terms of Reference
TSP	Threatened Species Programme – a programme managed by SANBI to assess the Red Data status of South African plants
VU	Vulnerable – a Red Data classification used by the IUCN for describing species in danger of facing extinction
WMA	Water Management Area
WQ	Water Quality
WRC	Water Research Commission
WSA	Water Service Act (Act 108 of 1997)
WWF	Worldwide Fund for Nature
WWTW	Waste Water Treatment Works

1. Introduction

At least 40 per cent of the world's economy and 80 per cent of the needs of the poor are derived from biological resources. In addition, the richer the diversity of life, the greater the opportunity for medical discoveries, economic development, and adaptive responses to such new challenges as climate change (The Convention about Life on Earth, Convention on Biodiversity). The importance of biodiversity conservation cannot be stressed enough in an ever changing and pressure filled environment, where resources are fast diminishing.

In light of this, South African legislation has affirmed the country's commitment to conservation. Section 24 of the Bill of Rights in the Constitution states that: "*Everyone has the right:*

- *To an environment that is not harmful to their health or well-being; and*
- *To have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that –*
 - *Prevent pollution and ecological degradation;*
 - *Promote conservation; and*
 - *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.*

Biodiversity is defined as "...**the variability among living organisms from all sources including...terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems**" (The Convention of Biological Diversity, 1992). In other words, plants, animals and micro-organisms, their genes, and the ecosystems that living organisms inhabit, are all facets of biodiversity.

The National Environmental Management Act, 1998 (Act 107 of 1998) speaks of "the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations". The objective of the more recently gazetted National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004) is to provide for, amongst others the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species

and ecosystems that warrant national protection; and the sustainable use of indigenous biological resources.

In line with the country's legislation, the Council for Scientific and Industrial Research (CSIR) is undertaking the necessary environmental authorisations for the development of the proposed start-up enterprise comprising of a commercial pig production facility for the AlphaMega Farming Co-Operative. The facility will be approximately eight hectares in extent on the Farm Poortje 340-IQ, Poortje, Gauteng (**Figure 3-1**). The CSIR is undertaking the work *pro-bono* as part of the "Special Needs Skills and Development Programme". As part of NSS's contribution to

community related projects, services for this project have been provided at a reduced rate. This, did, in no way affect NSS's ability to produce a sound report.

2. Terms of Reference

As agreed between the CSIR and NSS, our assessment was performed according to the methodology described in **Section 6**, and this report includes:

- A broad description of the biophysical attributes of the study area (relevant to an eco assessment);
- A list of any applicable legislation, guidelines, standards and criteria to be considered in project planning (e.g. whether permits required for removal of certain species);
- Broad determination of the conservation importance (in terms of national and provincial priorities) of the sampled area;
- The different vegetation types found, including overview on structure, dominant plant composition and condition;
- Species of Conservation Concern, if any, (Red Data / endemics / medicinal value) that could potentially occur in the site and surrounds
- An assessment of the potential impacts and a list of mitigation measures that will be required to reduce these impacts.
- Identification of any potential future work that may be required on site through the assessment and motivation as to why.

3. Project Team

All aspects of the ecoscan were performed by NSS (**Table 3-1**). The NSS team has extensive experience in completing biodiversity assessments involving floral, faunal, wetland and aquatic work, as well as Environmental Impact Assessments, Environmental Management Programme Reports, Strategic Management Plans and Environmental Management Plans for the conservation, mining, waste, commercial and industrial sectors.

In terms of accreditation and professional registrations the following is applicable to NSS:

- Senior team members are registered Professional Natural Scientists in the ecological, environmental, zoological and aquatic science fields.
- The senior wetland team member is acknowledged by the Department of Water and Sanitation (DWS) as a competent wetland delineator.
- The aquatics specialist is accredited with the DWS to perform the SASS5 macro-invertebrate monitoring method in South Africa.

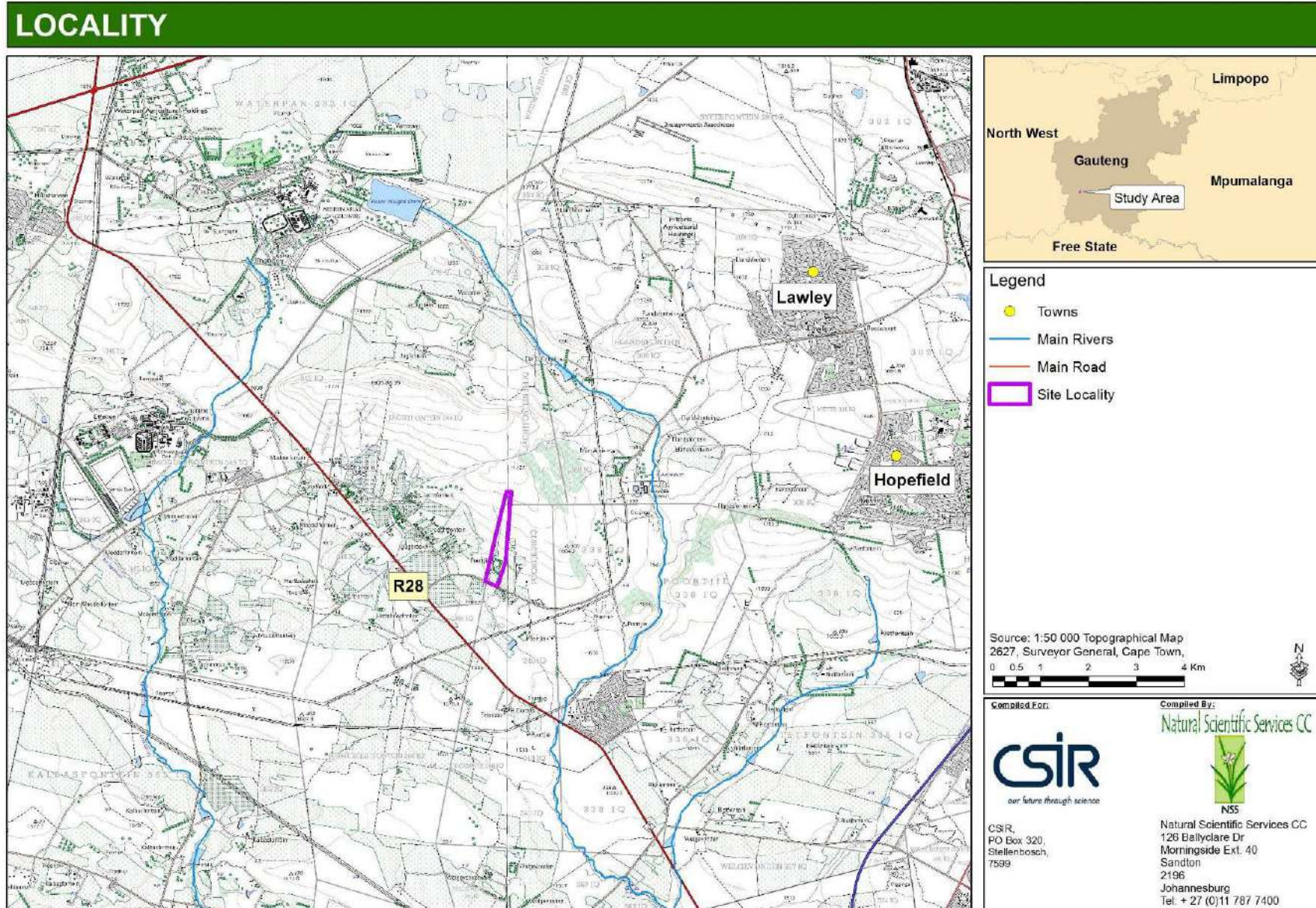


Figure 3-1 Locality Map of the Study Area

Table 3-1 NSS project team

ASPECT INVESTIGATED	SPECIALIST	QUALIFICATIONS
Flora & project management	Susan Abell	M.Sc. Resource Conservation Biology (WITS). <i>PrSciNat</i> Registered (400116/05) – Ecology & Environmental Science
Fauna	Dr Caroline Lötter	Ph.D. – Zoology (UP). <i>PrSciNat</i> Registered (400182/09) – Zoology.
GIS mapping	Tim Blignaut	B.Sc. Honours - Geography (UJ)

4. Applicable Legislation

Legislation, policies and guidelines, which could apply to impacts of the proposed project on biodiversity, are listed below. Although the list is comprehensive, additional legislation, policies and guidelines that have not been mentioned may apply.

International Agreements

- (Bonn) Convention on the Conservation of Migratory Species of Wild Animals.
- Convention on Biological Diversity including eco-systems and genetic resources.
- Agenda 21 regarding the sustainable development at global and national levels.
- Johannesburg Declaration and Plan of Implementation for sustainable development.

Regional Agreements

- Action Plan of the Environmental Initiative of NEPAD for sustainable development in Africa.

National Legislation

- Conservation of Agricultural Resources Act (Act 43 of 1983).
- Environmental Conservation Act (Act 73 of 1989).
- Constitution of the Republic of South Africa (Act 108 of 1996).
- Water Services Act (Act 108 of 1997).
- National Water Act (Act 36 of 1998).
- National Forests Act (Act 84 of 1998) and Protected Tree Species.
- National Veld and Forest Fire Act (Act 101 of 1998).
- National Environmental Management Act (NEMA; Act 107 of 1998).
- National Heritage Resources Act (Act 25 of 1999).
- National Mineral and Petroleum Resources Development Act (Act 28 of 2002).
- National Environmental Management: Protected Areas Act (Act 57 of 2003).
- National Environmental Management: Biodiversity Act (NEM:BA; Act 10 of 2004):
 - Threatened, Protected, Alien and Invasive Species Regulations (2007).

- Alien and Invasive Species Regulations (Government Gazette [GG] 37885, 1 August 2014).
- National list of Ecosystems Threatened and in need of Protection under Section 52(1) (a) of NEM: BA (GG 34809, Government Notice [GN] 1002, 9 December 2011).
- National Environmental Management: Air Quality Act (Act 39 of 2004).

National Policies, Guidelines & Programmes

- National Spatial Biodiversity Assessment (Driver *et al.* 2004) including Priority Areas and Threatened Ecosystems.
- National Biodiversity Strategy and Action Plan (DEA 2005).
- National Aquatic Ecosystem Health Monitoring Program including the River Health Programme (initiated by the DWAF, now the DWA).
- National Freshwater Ecosystem Priority Areas project (Driver *et al.* 2011).
- Mining and Biodiversity Guideline (DEA *et al.* 2013).
- National Water Resource Strategy (DWAF 2013).

Provincial Legislation, Policies & Guidelines

- Gauteng Nature Conservation Ordinance (Ordinance 12 of 1983), amended by the Gauteng General Law Amendment Act (Act 4 of 2005).
- Gauteng Nature Conservation Bill (2014) – to repeal the Gauteng Nature Conservation Ordinance (Ordinance 12 of 1983).
- Gauteng Conservation Plan (C-Plan). Version 3.3 (GDARD 2011).
- Gauteng Protected Areas Expansion Strategy (GDARD 2011).
- GDARD Requirements for Biodiversity Assessments. Version 3 (GDARD 2014).

5. Project Description

5.1. Location and Site Description

The AlphaMega Farming Co-Operative is a small-scale commercial farming enterprise, which was established in 2005 and is now proposing to establish a start-up enterprise comprising of a commercial pig production facility on the Farm Poortje 340-IQ, Poortje, Gauteng (**Figure 3-1**). The farm currently has old building structures and a (disused) slurry dam. The proposed development entails the plantation of yellow maize on 8ha of land, and the construction of a pig production facility with the capacity to produce 2,122 pigs in total per annum.

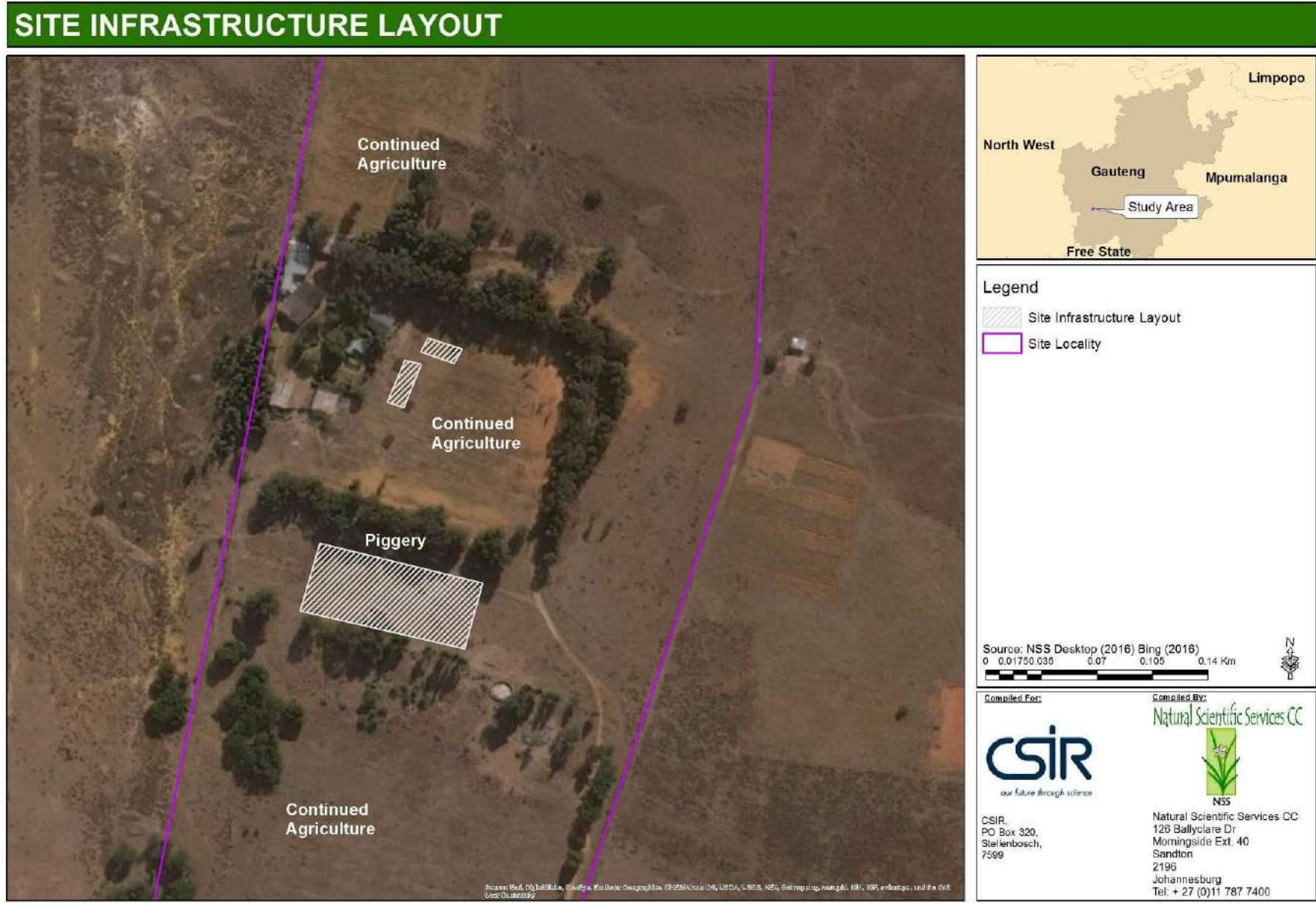


Figure 5-1 Proposed Infrastructural areas

The site and surrounding study area is positioned within two main habitats – the lower lying grasslands and the rocky ridge system. Over the last 10 to 11 years there has been limited changes to the study area (as per the historical imagery- **Figure 5-2**), and therefore the site has remained underutilised with limited management.



Figure 5-2 Historical Changes on Site (2005 – 2015)



Figure 5-3 Images of the landuses of the study area

5.2. Climate

The regional climate features effectively three seasons, namely a cool dry season from May to mid–August, a hot dry season from mid–August to about October, and a hot wet season from about November to April. Frost is fairly infrequent (Mucina & Rutherford 2006). According to the current climate data, from the period January 2015 – May 2016, the hottest time of year occurred between December and February, with the coldest month being June (www.accuweather.co.za) (**Figure 5-4**).

The regional vegetation type is characterised by mean annual precipitation of 500mm-700mm, and mean monthly maximum and minimum temperatures of approximately 35.3°C and -3.1°C for November and June, respectively. In terms of rainfall, the wettest month of the last year was January 2015 (156 mm) with a high annual rainfall of 379 mm (www.accuweather.co.za; www.weathersa.co.za) (**Figure 5-4**). In April 2016, prior to the ecoscan, the area received relatively little (18 mm) rainfall. However, the rainfall in January and March 2016 was considered significant (approximately 140mm each month).

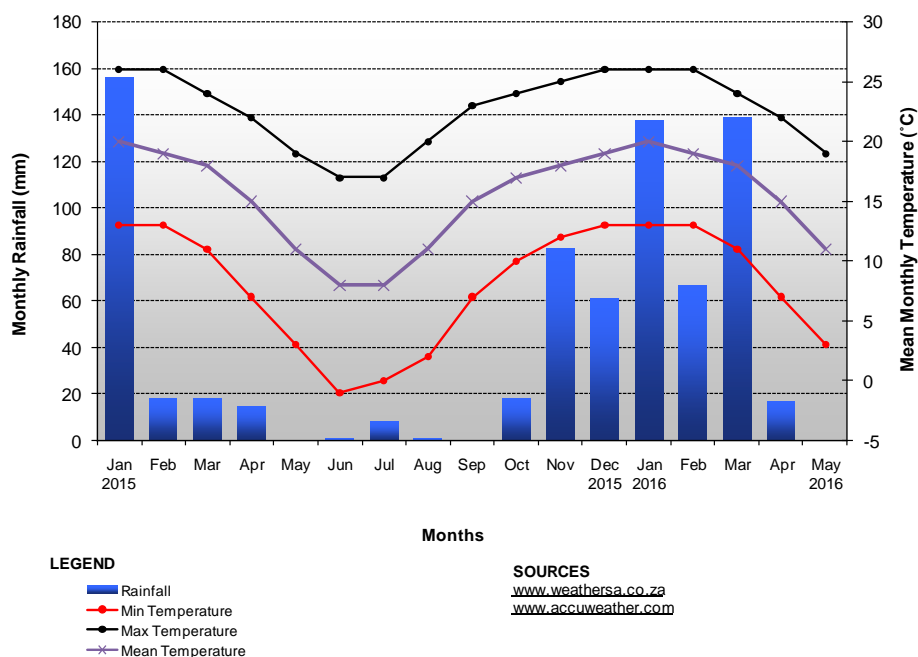


Figure 5-4 Monthly rainfall (mm) and temperature (°C) for Johannesburg from January 2015 until May 2016

5.3. Geology and Soils

The geology of the southern half of the study site predominantly comprises quartzite, shale, slate, sandstone, diabase and lava of the Witwatersrand Supergroup, the Black Reef Formation and Pretoria Group of the Transvaal Sequence as well as chert and dolomite of the Chuniespoort Formation of the Transvaal Sequence. The northern section predominantly comprises quartzite, shale and slate. Hekpoort lava occurs in places with sporadic occurrences of dolomite and diabase. Crests and scarps are usually on quartzite, whilst the foot slopes occur on shale, slate or diabase covered by mixed colluvium (AGIS 2014). According to AGIS (2014), the study site is situated in land types¹ Ba1 and Fb5 as indicated in **Figure 5-5**. Across a landscape, usually five terrain units can be identified. The catena within land types Ba1 and Fb5 incorporates four of the five terrain units 1, 3, 4 and 5, as shown in **Figure 5-5**. Presented in **Table 5-1** is an overview of the soil forms and their extent of coverage, which can be expected within different terrain units in land types Ba1 and Fb5.

¹ Land types represent areas that are uniform with respect to climate, terrain form, geology and soil.

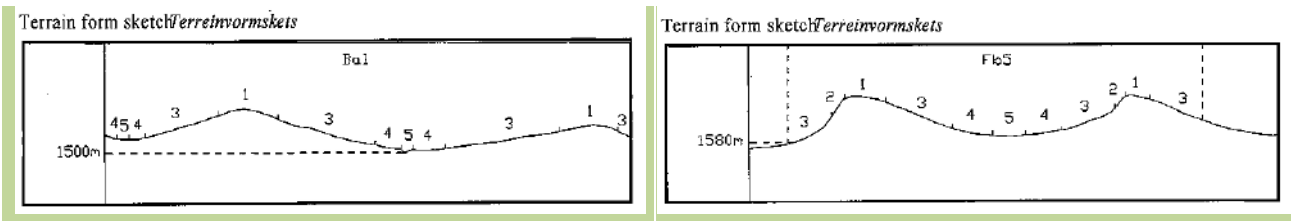


Figure 5-5 Terrain units occurring within land type Ba1 and Fb5 (AGIS, 2014)

Table 5-1 Soil forms, their wetland potential, coverage, and erodibility classes within the terrain units of land type Ba1 (AGIS, 2014)

SOIL-ROCK COMPLEX	Depth (mm)	% COVER PER TERRAIN UNIT			
		1	3	4	5
SLOPE (%)		0-8%	3-8%	0-5%	0-1%
Rock/Rots		5			
Msinga Hu26, Shorrocks Hu36, Makatini Hu37	200-450				
Mispah Ms10	100-400	10			
Msinga Hu26, Shorrocks Hu36	600-1200+	10	40	40	
Msinga Hu26, Shorrocks Hu36	400-600	10	20		
Mispah Ms10, Klipfontein Ms11	200-400	20	10	5	
Mkantini Hu 37, Doveton Hu27	400-900	20	10	10	
Glencoe Gc26, Leslie Gc36	500-750	10	5	5	
Southwold Cv26, Blinkklip Cv36	600-900	5	5	5	
Trevanian Gs17, Williamson Gs16	200-400	5	5		
Avalon Av26, Soetmel Av36, Bezuidenhoud Av37	750-900	5	5	10	
Lindley Va41	300-400			10	10
Rensburg Rg20, Sarasdale Wo20, Chinyika Wo21	450-700				30
Jozini Oa36, Dundee Du10	>1200			5	30
Glengazi B031, Bonheim Bo41	>1200				10
Mkambati Kd14, Kroonstad					

Table 5-2 Soil forms, their wetland potential, coverage, and erodibility classes within the terrain units of land type Fb5 (AGIS, 2014)

SOIL FORM	Depth (mm)	% COVER PER TERRAIN UNIT				
		1	2	3	4	5
SLOPE (%)		0-8%	0-100%	6-15%	3-6%	0-2%
Rock/Rots		40	70	21	5	12
Mispah Ms10		33	20	25	11	16
Williamson Gs16, Trevanian Gs17		23	10	29	12	
Msinga Hu26, Hutton Hu16		4		23	48	
Leeufontein Oa16, Jozini Oa36, Highflats Oa17, Dundee Du10					9	10
Gelykvlakte Ar20, Rensburg Rg20					6	52
Southwold Cv26, Oatsdale Cv16					3	
Doveton Hu27, Glendale Sd21				2	4	

SOIL FORM	Depth (mm)	% COVER PER TERRAIN UNIT				
		1	2	3	4	5
Ofazi Cv23, Vidal Cv13					2	
Avalon Av26						10
Atream beds						

5.4. Vegetation

The study area is situated in the Grassland Biome, and more specifically the *SVcb 10 Gauteng Shale Mountain Bushveld* (Table 5-3) in the North and *Gm11 Rand Highveld Grassland* (Table 5-4) in the South of the study area.

5.4.1 Gauteng Shale Mountain Bushveld

This unit represents the arid western part of the ridges of Rocky Highveld Grassland (Low & Rebelo 1996) or Bankenveld (Acocks 1988). In species composition and vegetation structure it is similar to and positioned adjacent to *SVcb 11 Andesite Mountain Bushveld*. It occurs in low, broken ridges frequently on warmer north-facing slopes varying in steepness and with high surface rock cover. Vegetation is a short (3-6 m tall), semi-open thicket dominated by a variety of woody species as indicated in Table 5-3. The understorey is dominated by a variety of grasses and some of the ridges form plateaus above the northern slopes that carry scrubby grassland with high surface rock cover (Mucina & Rutherford, 2006).

The conservation status of this vegetation unit is **Vulnerable (V)** as less than 1% of this vegetation unit is statutorily conserved. Approximately 21% is mainly transformed by urban and built-up areas, mines and quarries, cultivation and plantations (Mucina & Rutherford, 2006).

5.4.2 Rand Highveld Grassland

An **Endangered (EN)** vegetation unit occurring in a highly variable landscape with extensive sloping plains and a series of ridges slightly elevated over undulating surrounding plains. As indicated in Table 5-4, the vegetation comprises species-rich, wiry, sour grassland alternating with low, sour shrub land on rocky outcrops and steeper slopes. Most common grasses on the plains belong to the genera *Themeda*, *Eragrostis*, *Heteropogon*, and *Elionurus*. High diversity of herbs, many of which belong to the Asteraceae, is also a typical feature. Rocky hills and ridges carry sparse (savannoid) woodlands with *Protea caffra* subsp. *caffra*, *Protea welwitschii*, *Acacia caffra* and *Celtis africana*, accompanied by a rich suite of shrubs among which the genus *Searsia* (especially *S. magalismontana*) is most prominent (Mucina & Rutherford, 2006). Small patches of this unit is protected by statutory reserves and in private conservation areas. However, almost half has been transformed mostly by cultivation, plantations and urbanization. In addition, incorrect cover classifications and poor land management has led to degradation of significant portions of the remainder of this unit (Mucina & Rutherford, 2006).

Table 5-3 Dominant floral species – Gauteng Shale Mountain Bushveld

Vegetation Type	Gauteng Shale Mountain Bushveld
Trees:	<i>Acacia caffra</i> , <i>Dombeya rotundifolia</i> , <i>Acacia karoo</i> , <i>Celtis africana</i> , <i>Combretum molle</i> , <i>Cussonia spicata</i> , <i>Englerophytum maglismontanum</i> , <i>Protea caffra</i> , <i>Searsia leptodictya</i> , <i>Vangueria infausta</i> , <i>Zanthoxylum capense</i> , <i>Ziziphus mucronata</i> .
Tall Scrubs:	<i>Asparagus larycinus</i> , <i>Canthium gilfillanii</i> , <i>Chrysanthemoides monilifera</i> , <i>Dichrostachys cinerea</i> , <i>Diospyros austro – africana</i> , <i>Diospyros lycioides</i> subsp. <i>lycioides</i> , <i>Ehretia rigida</i> subsp. <i>rigida</i> , <i>Euclea crispa</i> subsp. <i>crispa</i> , <i>Grewia occidentalis</i> , <i>Gymnosporia polyacantha</i> , <i>Olea europaea</i> subsp. <i>africana</i> .
Low Shrubs:	<i>Acalypha angustata</i> , <i>Asparagus suaveolens</i> , <i>Athrixia elata</i> , <i>Felicia muricata</i> , <i>Indigofera cosmosa</i> , <i>Searsia magalismontana</i> subsp. <i>magalismontana</i> .
Succulent Shrub:	<i>Kalanchoe rotundifolia</i>
Geophytes:	<i>Elephantorrhiza elephantina</i>
Woody Climbers:	<i>Ancylobotrys capensis</i>
Graminoids: (grasses):	<i>Hyparrhenia dregeana</i> , <i>Cymbopogon caesius</i> , <i>Cymbopogon pospischilii</i> , <i>Digitaria eriantha</i> subsp. <i>eriantha</i> , <i>Eragrostis curvula</i> .
Geophytic Herbs:	<i>Cheilanthes hirta</i> , <i>Pellaea calomelanos</i> , <i>Scadoxus puniceus</i>
Succulent Herb:	<i>Aloe greatheadii</i> var. <i>davyana</i>
Herbs:	<i>Dicoma zeyheri</i> , <i>Helichrysum nudifolium</i> , <i>Helichrysum rugulosum</i> , <i>Hermannia lancifolia</i> , <i>Hibiscus pusillus</i> , <i>Selaginella dregei</i> , <i>Senecio venosus</i> , <i>Vernonia natalensis</i> , <i>Vernonia oligocephala</i> .

Source: Mucina & Rutherford (2006)

Table 5-4 Dominant floral species – Rand Highveld Grassland

Vegetation Type	Rand Highveld Grassland
Low Shrubs:	<i>Anthospermum rigidum</i> subsp. <i>pumilum</i> , <i>Indigofera comosa</i> , <i>Searsia magalismontana</i> , <i>Seriphium plumosa</i>
Succulent Shrub:	<i>Lopholaena coriifolia</i>
Geoxylic Suffrutex:	<i>Elephantorrhiza elephantina</i> .
Graminoids (grasses):	<i>Ctenium concinnum</i> , <i>Cynodon dactylon</i> , <i>Digitaria monodactyla</i> , <i>Diheteropogon amplexens</i> , <i>Eragrostis chloromelas</i> , <i>Heteropogon contortus</i> , <i>Loudetia simplex</i> , <i>Monocymbium ceresiiforme</i> , <i>Panicum natalense</i> , <i>Schizachyrium sanguineum</i> , <i>Setaria sphacelata</i> , <i>Themeda triandra</i> , <i>Trachypogon spicatus</i> , <i>Tristachya biseriata</i>
Biographically Important Taxa (all Northern sourveld endemics)	
Geophytic Herbs:	<i>Boophone disticha</i> , <i>Cheilanthes hirta</i> , <i>Haemanthus humilis</i> subsp. <i>humilis</i> , <i>Hypoxis rigidula</i> var. <i>pilosissima</i> , <i>Ledebouria ovatifolia</i> , <i>Oxalis corniculata</i> .
Succulent Herb:	<i>Aloe greatheadii</i> var. <i>davyana</i>
Herbs:	<i>Acanthospermum australe</i> , <i>Justicia anagalloides</i> , <i>Pollichia campestris</i>
Endemic Taxa:	
Geophytic Herbs:	<i>Agapanthus inapertus</i> subsp. <i>pendulus</i> , <i>Eucomis vandermerwei</i>
Succulent Herb:	<i>Huernia insigniflora</i>
Low Shrub:	<i>Melhanian randii</i>
Herbs:	<i>Melanospermum rudolfii</i> , <i>Polygala spicata</i> .
Succulent Herbs:	<i>Anacampteros subnuda</i> subsp. <i>lubersii</i> , <i>Frithia humilis</i>

Vegetation Type	Rand Highveld Grassland
Succulent Shrubs:	<i>Crassula arborescens, subsp. undulatifolia, Delosperma purpureum</i>
Small Trees:	<i>Encephalartos lanatus, Encephalartos middelburgensis</i>

Source: Mucina & Rutherford (2006)

5.5. Hydrology

The study area is located within the Highveld Eco-region (11.01), the Upper Vaal Water Management Area (WMA) 8, quaternary catchment C22H, and approximately 6.5 km west of the Leeuspruit (quaternary catchment C22J) and 2.9 km east from the tributary of the Rietspruit (**Figure 5-7**), respectively. The perennial/seasonal East-Leeuspruit and a tributary of the Rietspruit are Upper Foothills and **Endangered** (EN) but not protected (Nel & Driver, 2012; Driver *et al.* 2011). **Table 5-5** includes a summary of the Ecstatus and current impacts on the East-Leeuspruit and the tributary of the Rietspruit.

Table 5-5 Ecstatus and impacts of the East-Leeuspruit and Rietspruit (DWS, 2014)

Quaternary Catchment	Water Resource	Present Ecological State (PES)	Ecological Importance (EI)	Ecological Sensitivity (ES)	Current Impacts
C22H	East-Leeuspruit	D Largely modified	MODERATE	MODERATE	Agriculture, instream dams and trampling
C22H	Tributary of the Rietspruit	E Seriously Modified	LOW	MODERATE	Sebokeng WWTW, increased flows, grass growing (kikuyu) and urban areas

Source: DWS (2014)

The PES of the East-Leeuspruit is largely modified (a D category- Desktop level) and large losses of natural habitats, biota and basic ecosystem functions have occurred. The Ecological Importance (EI) and Ecological Sensitivity (ES) of the East-Leeuspruit are moderate, because 33 species and two special species occur in this sub-quaternary catchment. The main habitats of this river are an incised channel with surface flows, grassy edges, riparian trees and shrubs, seepage and oxbow wetlands. The main impacts identified are agriculture, instream dams and trampling of river bed (DWS, 2014).

The PES of a tributary of the Rietspruit is seriously modified (an E category-- Desktop level) and an extensive loss of natural habitats, biota basic ecosystem functions have occurred. The EI and ES, of the tributary of the Rietspruit are low and moderate, respectively, with 74 species and 3 special species occur in this sub-quaternary catchment. The main habitats of this river are an incised channel with surface flows, grassy edges, riparian trees and shrubs, seepage and oxbow wetlands. The main impacts are on the riparian in instream habitat are Sebokeng Waste Water Treatment Works (WWTW), increased flows, grass growing (kikuyu) and urban areas (DWS, 2014).

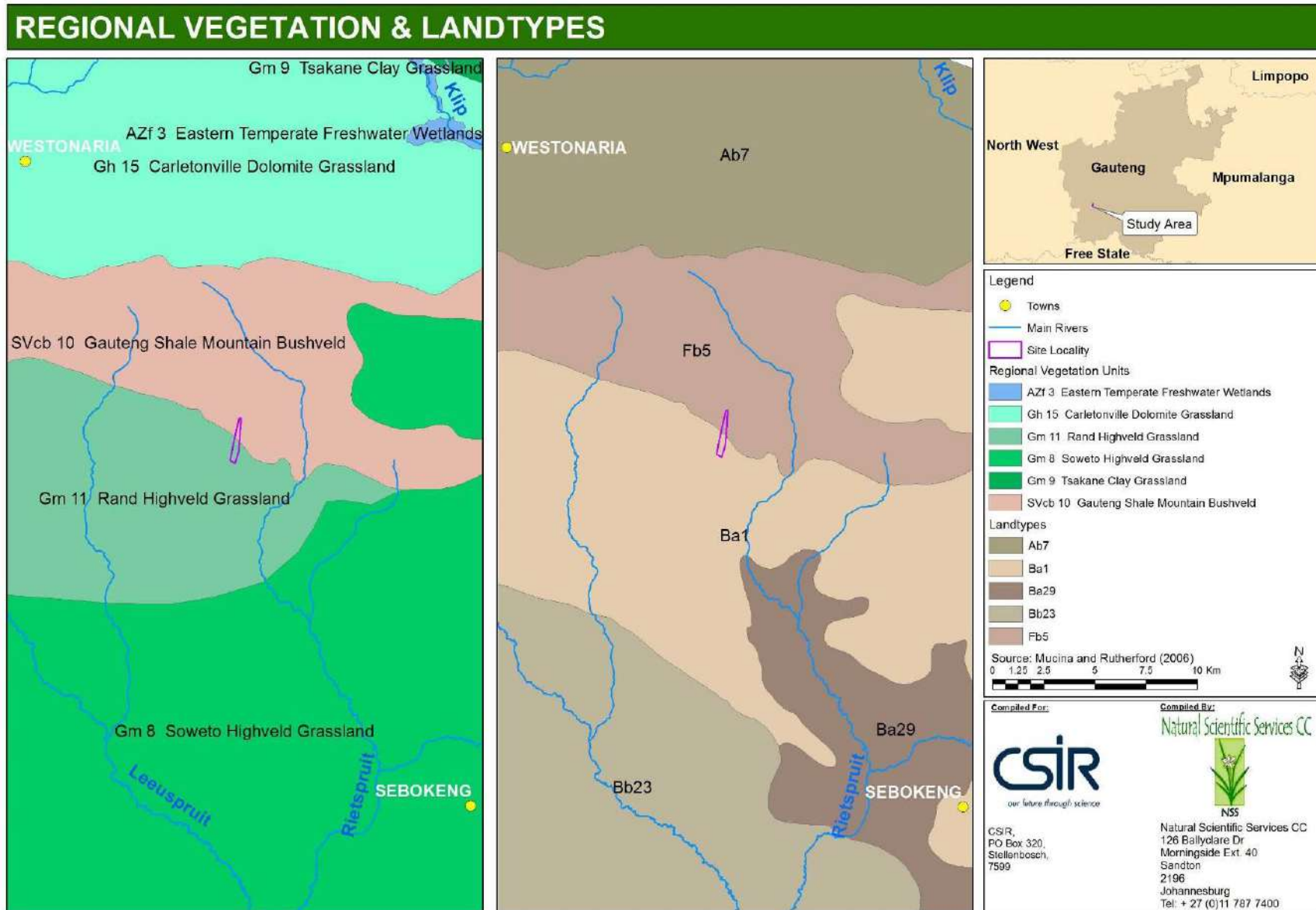


Figure 5-6 Regional Vegetation Units and Land Types

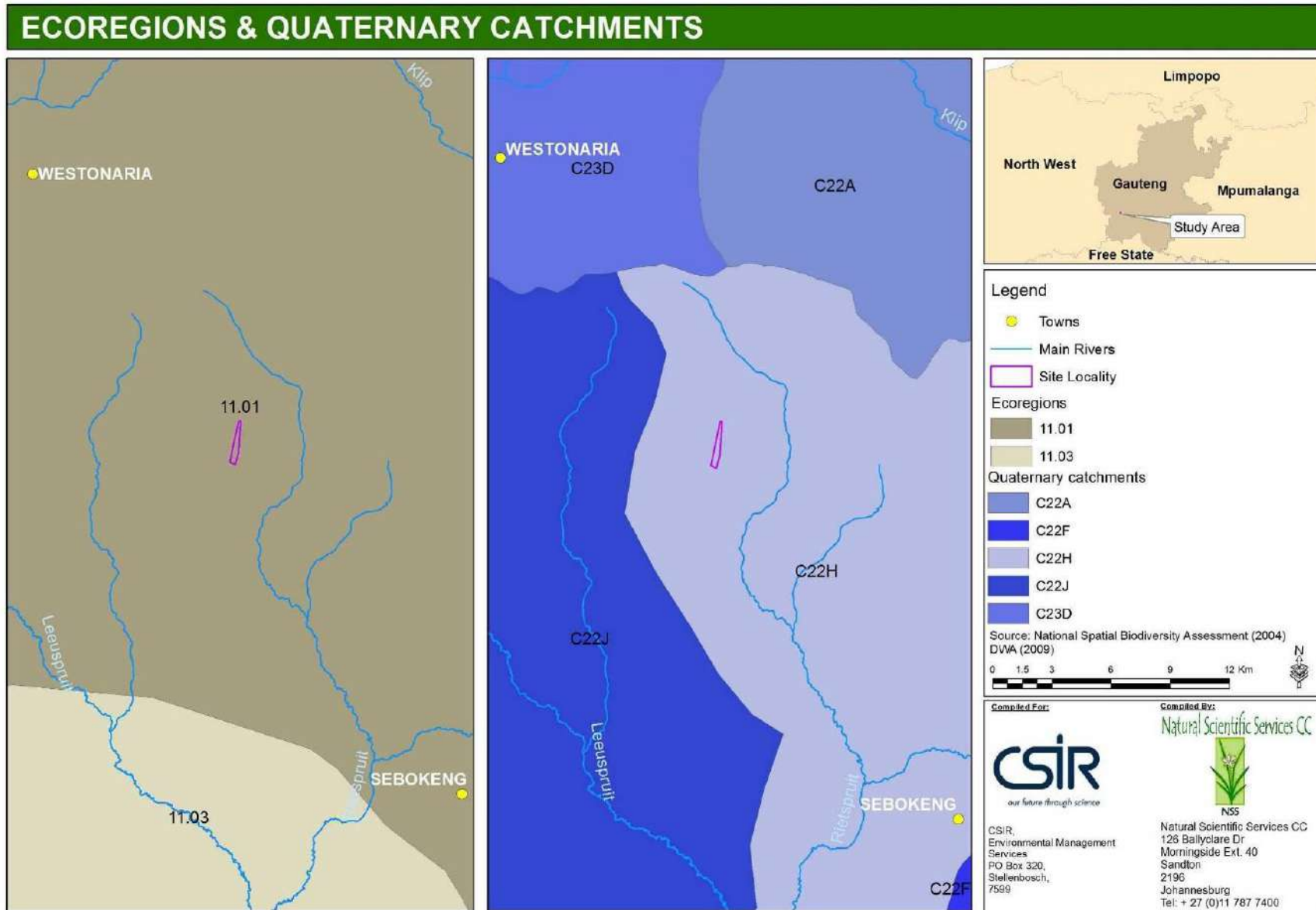


Figure 5-7 Eco-region and Quaternary Catchment

6. Methodology

The ecological scan involved desktop research and fieldwork, which was performed during a site visit on 26 April 2016.

6.1. Vegetation & Floral Communities

Due to the small extent of the site and the homogeneous nature, the sampling methods such as Braun-Blanquet cover-abundance approach (Mueller-Dombois & Ellenberg, 1974) was used as a basis to form broader habitat units but the data was not analysed using TWINSPLAN. The vegetation component therefore included:

- A desktop assessment of the vegetation within the region and potential community structure based on the information obtained from:
 - SANBI's² Plants of South Africa (POSA) 2528CA QDS
 - Mucina & Rutherford's (2006) vegetation map of southern Africa.
 - The current Gauteng C-Plan.
 - CI plant species records in the study region (mainly obtained through POSA)
- A one day field investigation walking transects through the site:
 - Noting species, habitats and cover abundance. Sampling points are presented in **Figure 6-1**. Plant taxa were identified to species level (some cases, *cf* would be used if identification was limiting – *cf* means 'confer' or 'looks like'). Scientific names follow POSA (Accessed, May 2016).
 - Recording any observed alien and invasive plant species on site was also conducted. The identification of declared weeds and invader species as promulgated under: the NEMBA August 2014 regulations (GG37885); and the amended regulations (Regulation 15) of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Reporting including vegetation community descriptions, mapping of broad habitat types / vegetation communities and CI species analysis. For CI floral species, Likelihood of Occurrence (LO) rating is assigned to each species based on the availability of suitable habitat using the following scale: Present; Highly likely; Possible; Unlikely or No Habitat available.

² The South African National Biodiversity Institute



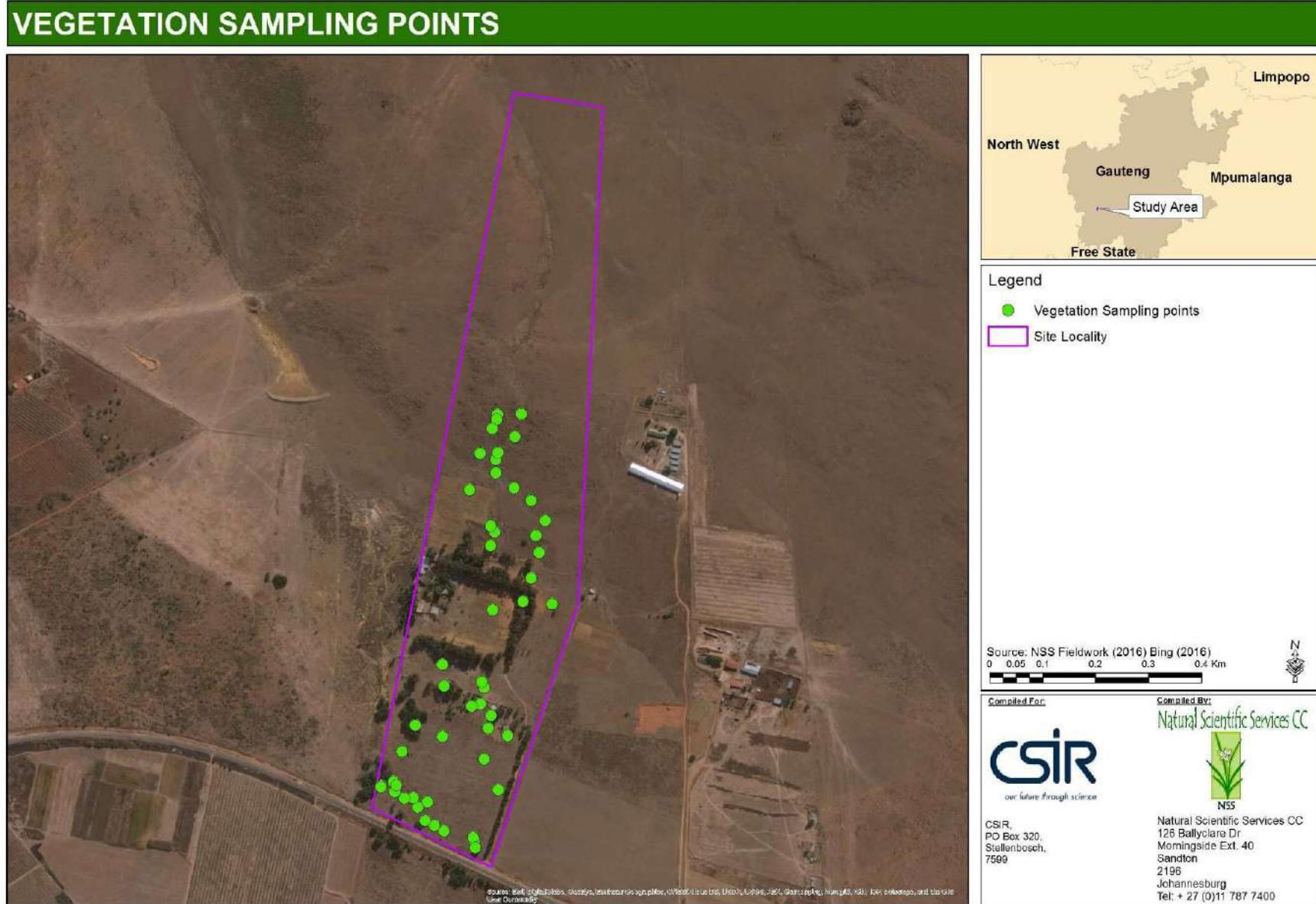


Figure 6-1 Main vegetation sampling points

6.1.1 Limitations

It is important to note that the absence of species on site does not conclude that the species is not present at the site. Reasons for not finding certain species during the late summer site visit may be due to:

- The short duration of fieldwork as well as the timing of the fieldwork (which occurred close to the end of the growing season). At the end of summer many species have died back and retracted making it difficult to confirm identification. The 2015/2016 season also experienced below average rainfall in the beginning of the season.
- Some plant species, which are small, have short flowering times, rare or otherwise difficult to detect may not have been detected even though they were potentially present on site.
- Vegetation mapping was based on the brief in-field survey as well as aerial imagery. Positioning of the vegetation units may not be exact due to potential georeferencing errors displayed in Google Earth, GPS accuracy in field as well as the age of the aerial image.

6.2. Fauna

6.2.1 Desktop Research

A list of species potentially occurring in the study area was compiled for:

- Mammals, including bats, using the published species distribution maps in Friedmann & Daly (2004) and Stuart & Stuart (2007), and Monadjem *et al.* (2010), respectively, and online species distribution data from MammalMAP (2016).
- Birds, using the latest online list of bird species from the second Southern African Bird Atlas Project (SABAP 2) for pentad 2625_2740, which included records of bird species that were observed in QDS 2627BC during the first SABAP (SABAP 1). Bird species were classified according to a modified version of Newman's (2002) 12 bird categories, which are described under **Appendix 12.4**.
- Reptiles, using the published species distribution maps in Bates *et al.* (2014), and online species distribution data from ReptileMAP (2016).
- Frogs, using the published species distribution maps in Minter *et al.* (2004), and online species distribution data from FrogMAP (2016).
- Butterflies, using LepiMAP's (2016) online list of recorded butterfly species from QDS 2627BC, and supplemental information published in Mecenero *et al.* (2013).
- Odonata, using the published distribution maps in Samways (2008), and online species distribution data from OdonataMAP (2016).
- Scorpions, using the published species distribution maps in Leeming (2003). Currently, ScorpionMAP cannot be used to generate geographic species lists.

The lists were refined based on our field observations, where the Likelihood of Occurrence (LoO) of each species was rated using the following scale:



- 1 Present: the species, or signs of its presence, was observed on or adjacent to the site by NSS, or in the region by SABAP observers.
- 2 High: the species is highly likely to occur, based on available distribution data, and observed habitats.
- 3 Moderate: the species may occur, based on available distribution data, and observed habitats and disturbances.
- 4 Low: the species is unlikely to occur, based on observed habitats and disturbances.
- 5 Managed.

6.2.2 Fieldwork

Faunal observations were made while driving, walking, and inspecting different habitats in and adjacent to the study site. Taxa were identified based on their calls and/or observations of dead or live specimens, spoor, droppings, burrows and other evidence. Rocks and logs were turned to find reptiles and scorpions. A sweep net was used to catch butterflies.

6.2.3 Conservation Status of Species

In the appended faunal lists:

- The global Red List status of species is provided, as determined by the IUCN.
- The status of species under the National Environmental Management: Biodiversity Act (NEM:BA 2004) is given, as indicated for mammals, birds, reptiles and scorpions in the 2015 list of Threatened or Protected Species (ToPS), and as indicated for frogs and butterflies in the 2007 ToPS list.
- The regional or national Red Data status is provided for:
 - Mammals as stated in Friedmann & Daly (2004).
 - Birds as stated in Taylor *et al.* (2015).
 - Reptiles as stated in Bates *et al.* (2014).
 - Frogs as stated in Minter *et al.* (2004).
 - Butterflies as stated in Mecenero *et al.* (2013).
 - Dragonflies and damselflies (i.e. odonata) as stated in Samways (2006).

An atlas and Red Data book for South African scorpion species has not yet been published. Due to spatio-temporal variation in human disturbances, the conservation status of some species differs between the IUCN, the relevant national Red Data assessment publication, and the NEM:BA. *Unless otherwise stated, the most threatened status of a species is provided in text, whether this is at a global or other spatial scale.*

6.2.4 Limitations

- The site visit was limited to the day and, therefore, not all potentially occurring (especially nocturnal) species were likely to be detected.
- Although still performed within the stipulated summer period, the site visit was performed in late summer (i.e. April), when many animal species may become less active or migrate.



- Some species, which are uncommon, small, secretive or otherwise difficult to detect may not have been detected even though they were potentially present.
- As the list of potentially occurring bird species was derived from the latest online list of bird species for pentad 2625_2740 from the SABAP 2 (2016), some additional bird species that are not listed could occur in the area.
- As the list of potentially occurring butterfly species was obtained from LepiMAP's (2016) online list of recorded butterfly species from 2627BC, some additional butterfly species that are not listed may occur in the area.

6.3. Impact Assessment

The Impact Assessment (IA) was performed according to the CSIR's IA methodology, which takes into account:

- Impact nature (direct, indirect and cumulative);
- Impact status (positive, negative or neutral);
- Impact spatial extent (**Table 6-1**);
- Impact duration (**Table 6-2**);
- Potential impact intensity (**Table 6-3**);
- Impact reversibility (high, moderate, low or irreversible);
- Irreplaceability of the impacted resource (high, moderate, low or replaceable);
- Impact probability (**Table 6-4**);
- Our confidence in the ratings (high, moderate or low);

Overall impact significance (**Table 6-5**) is calculated as:

Impact significance = Impact magnitude x Impact probability
--

where

Impact magnitude = Potential impact intensity + Impact duration + Impact extent
--

Table 6-1 Rating of impact spatial extent

EXTENT DESCRIPTION	SCORE
Site specific	1
Local (<2km from site)	2
Regional (within 30km of site)	3
National	4
International/Global	5

Table 6-2 Rating of impact duration

DURATION DESCRIPTION	SCORE
Temporary (less than 2 years) or duration of the construction period. This impact is fully reversible. <i>E.g. the construction noise temporary impact that is highly reversible as it will stop at the end of the construction period</i>	1
Short term (2 to 5 years). This impact is reversible.	2

DURATION DESCRIPTION	SCORE
Medium term (5 to 15 years). The impact is reversible with the implementation of appropriate mitigation and management actions.	3
Long term (>15 years but where the impact will cease after the operational life of the activity). The impact is reversible with the implementation of appropriate mitigation and management actions. <i>E.g. the noise impact caused by the desalination plant is a long term impact but can be considered to be highly reversible at the end of the project life, when the project is decommissioned</i>	4
Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient). This impact is irreversible. <i>E.g. The loss of a palaeontological resource on site caused by construction activities is permanent and would be irreversible.</i>	5

Table 6-3 Rating of potential impact intensity

NEGATIVE POTENTIAL INTENSITY DESCRIPTION	RATING	SCORE
Potential to severely impact human health (morbidity/mortality); or to lead to loss of species ³ (fauna and/or flora)	Very High/Fatal Flaw	16
Potential to reduce faunal/flora population or to lead to severe reduction/alteration of natural process, loss of livelihoods / sever impact on quality of life ⁴ , individual economic loss	High	8
Potential to reduce environmental quality – air, soil, water. Potential Loss of habitat, loss of heritage, reduced amenity	Medium	4
Nuisance	Medium-Low	2
Negative change – with no other consequence	Low	1
POSITIVE POTENTIAL INTENSITY DESCRIPTION	RATING	SCORE
Potential Net improvement in human welfare	High	8
Potential to improve environmental quality – air, soil, water. Improved individual livelihoods	Medium	4
Potential to lead to Economic Development	Medium-Low	2
Potential positive change – with no other consequence	Low	1

“Irreplaceable loss of a resource” must be factored into the potential intensity rating of an impact

Table 6-4 Rating of impact probability

PROBABILITY DESCRIPTION	SCORE
Improbable (little or no chance of occurring <10%)	0.1
Low probability(10 - 25% chance of occurring)	0.25
Probable (25 - 50% chance of occurring)	0.5
Highly probable (50 – 90% chance of occurring)	0.75
Definite (>90% chance of occurring).	1

³Note that a loss of species is a global issue and is differentiated from a loss of “floral/faunal” populations.

⁴Note that a visual impact or air emissions for example could be considered as severely impacting on quality of life should it constitute more than a nuisance but not being life threatening.

Table 6-5 Rating of overall impact significance

SCORE	RATING	SIGNIFICANCE DESCRIPTION
18-26	Fatally flawed	The project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating.
10-17	High	The impacts will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making.
5-9	Medium	The impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated.
<5	Low	The impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.

7. Results

7.1. Vegetation Structure

7.1.1 Comparative Regional Vegetation

SANBI frequently collect/collate floral data within Southern Africa and update their PRECIS database system (National Herbarium Pretoria (PRE) Computerised Information System) which is captured according to quarter degree squares (QDSs). This is referred to the POSA database. For this study, the Site falls on the boundary of 2627BC. This QDG yielded 148 species within 48 families. The dominant families being FABACEAE, ASTERACEAE, APOCYNACEAE and POACEAE (**Table 7-1**), with the Herbs representing 29.25%, succulents representing 11.56%, and Dwarf Shrubs representing over 10% of the total species listed for the area (**Table 7-1**). Wooded species in total constitute 8.16% of the species within the larger study region. In terms of the site, structural representation was following the trend presented within the larger region, with forb (herbaceous) species and graminoids being dominant with pockets of succulents, wooded vegetation within the rocky areas typical of grassland habitats (**Table 7-1**).

Table 7-1 Top 12 dominant families and most dominant growth forms obtained from the POSA website for the QDS 2627BC/BD and on site

IMPORTANT FAMILIES	No. OF SPP	GROWTH FORMS	% TOTAL SPP	ON SITE
FABACEAE	20	Herb	29.25	26.8
ASTERACEAE	13	Succulent	11.56	3.09
APOCYNACEAE	12	Dwarf shrub	10.2	5.15
POACEAE	11	Geophyte	8.84	12.37
CYPERACEAE	6	Shrub	8.16	10.31

IMPORTANT FAMILIES	No. OF SPP	GROWTH FORMS	% TOTAL SPP	ON SITE
CUCURBITACEAE	5	Graminoid	7.48	30.93
ASPHODELACEAE	5	Shrub, tree	6.8	5.15 % Alien trees
ANACARDIACEAE	5	Cyperoid	4.08	4.12
SCROPHULARIACEAE	4	Parasite	4.08	1.03
IRIDACEAE	4	Hydrophyte	3.4	-
FABACEAE	20	Climber	-	1.03
ASTERACEAE	13			

*mainly dominated by alien species

7.1.2 On Site - Vegetation Communities

From the field investigations the study area was divided typically into steeper rockier slope habitat and lower lying grasslands. The majority of the northern section of the site was in a natural to near natural state (**Figure 7-1** and **Figure 7-3**) with the southern section been transformed mainly through farming practices. The following habitat groups were defined:

- Rocky Habitat and Drainage System
 - *Diospyros-Loudetia* Rocky Ridge
 - Plateau Grassland
- Grassland habitat
 - *Scirpoides-Eragrostis* Grassland
 - *Schizachyrium- Seriphium* Rocky Grassland
 - *Eragrostis-Cynodon-Hyparrhenia* Disturbed Grassland
- Wooded Habitat – *Acacia* bushclumps
- Transformed Habitat
 - Alien Bushclumps
 - Built-up Areas
 - *Seriphium* dominated Borrow Pit
 - *Melinis-Eragrostis* Old Fields

Table 7-2 Broad Habitat/Vegetation communities

Vegetation Community	Conservation Significance	Area - Ha	Area -%
Rocky Habitats			
<i>Diospyros-Loudetia</i> Rocky Ridge	Very High	7.25	22.72
Plateau Grassland	Very High	6.42	20.12
Riparian/Drainage Habitat			
Drainage System	High	1.69	5.30
Grassland Habitat			
<i>Schizachyrium- Seriphium</i> Rocky Grassland	Moderate-High	2.35	7.37
<i>Scirpoides-Eragrostis</i> Grassland	Moderate	0.37	1.14
<i>Eragrostis-Cynodon-Hyparrhenia</i> Disturbed Grassland	Moderate	3.33	10.43
Wooded Habitat			

Vegetation Community	Conservation Significance	Area - Ha	Area -%
Indigenous <i>Acacia</i> Bushclumps	Moderate	0.11	0.33
Transformed Habitat			
Alien Bushclumps	Low		
<i>Acacia mearnsii</i> dominated Alien Bushclumps		0.57	1.78
<i>Eucalyptus</i> dominated Alien Bushclumps		1.89	5.92
Mixed Alien Bushclumps		0.42	1.31
Built-up Areas	Low	0.68	2.15
<i>Seriphium</i> dominated Borrow Pit	Low	0.75	2.34
<i>Melinis-Eragrostis</i> Old Fields	Moderate-Low	6.09	19.09

The *Ridge Habitat* was the most dominant vegetation community representing 42% of the site. It was located to the north and not currently affected by any development on the property. This habitat consists of the *Diospyros-Loudetia* Rocky outcrop areas, largely dominated by rocks with limited area for herbaceous and woody plant growth. In between the rocks, wooded species such as *Lopholaena coriifolia* and *Diospyros lycoides* are present. Under the shade of these shrubs and larger boulders, Protected fern species such as *Pellaea* and *Cheilanthes* are present. The Rocky Habitat and associated drainage is considered to hold a high species richness and diversity as opposed to the surrounding habitat.

A number of old fields dominated by *Melinis* and *Eragrostis* species are found in the south as well as central areas. These fields are considered to have limited species diversity and consist mainly of pioneer species. Cover within these areas is considered to vary between 50-80% (**Figure 7-3**).

The three main grassland habitats (over 19% of the site) identified were the *Schizachyrium-Seriphium* Rocky Grassland; the *Scirpoides-Eragrostis* Grassland and the more disturbed and transformed *Eragrostis-Cynodon-Hyparrhenia* Grassland. The *Scirpoides-Eragrostis* Grassland had recently been mowed and therefore an accurate account of species therein was limited. In addition although this unit shows the presence of a wet indicator species (in the temporary zone), a number of soil samples were taken and no mottles within the first 50cm of the soil profile was detected.

A small patch of *Acacia karroo* is evident just north of the *Melinis* Old fields in the south. This is a relatively small area with limited diversity.

Species recorded within the sampling area were grouped as within **Appendix 1 (Section 12.1)**. Alien species were particularly dominant around the abandoned structures, the main house and around the fields. Over 9% of the site was considered Alien bushclumps (refer to **Section 7.1.4** below),





Melinis-Eragrostis Old Fields



Schizachyrium- Seriphium Rocky Grassland



Scirpoides-Eragrostis Grassland



Indigenous *Acacia* Bushclumps



Diospyros-Loudetia Rocky Ridge



Plateau Grassland

Figure 7-1 Photographs of the different habitats within and surrounding the site



Helichrysum setosum

Merremia tridentata



Scirpoides burkei

Diospyros lycioides



Kalanchoe thyrsiflora

Clematopsis brachiata

Monocymbium cerasiiforme

Figure 7-2 Examples of Species found on site

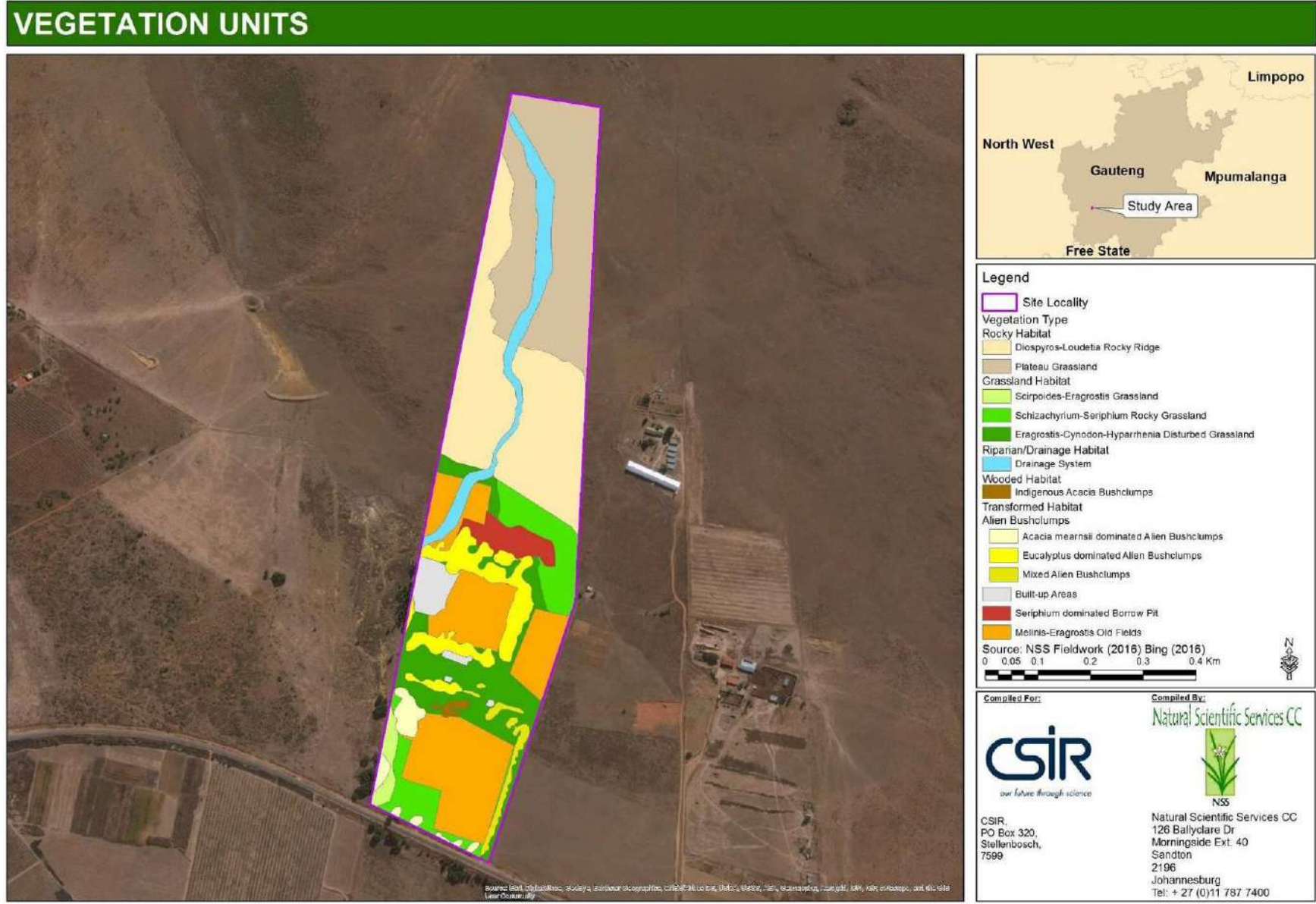


Figure 7-3 Vegetation communities within the study area

7.1.3 Conservation Important Species

It is well documented that heterogeneous landscapes, diverse geology and a range of environmental conditions, provide a diverse number of habitats for plant species (Pickett, *et.al.* 1997; O'Farrell, 2006; KNNCS, 1999). These areas are normally associated with high levels of species endemism and richness. For example, at least 74% of the 23 threatened Highveld plant taxa occur on the crests and slopes of ridges and hills (Pfab & Victor 2002). However, homogenous landscapes, either natural or that have been transformed through historical farming practices and infrastructural development contain minimal diversity and endemism. The current site contains disturbances mainly within the south and central section. The northern section contains ridge habitat that has limited transformation. Although considered a brief Vegetation Scan report, NSS has included a section on Conservation Important (CI) species that were detected or could possibly be detected on site. Within this section the CI species are discussed. These include the National Threatened Plant Species Programme (TSP) lists, any Protected species according to the Nature Conservation Ordinance (12 of 1983) and any specific Endemic or Rare species.

The Threatened Plant Species Programme (TSP) is an ongoing assessment that revises all threatened plant species assessments made by Craig Hilton-Taylor (1996), using IUCN Red Listing Criteria modified from Davis *et al.* (1986). According to the TSP Red Data list of South African plant taxa (accessed March 2016), there are 77 Red Data listed species (**Table 7-3**) out of a possible 2074 species within Gauteng Province (including Data Deficient species) of which 1 species are Critically Endangered (CR), 10 Endangered (EN), 13 are Vulnerable (VU) and 19 are Near Threatened.

Table 7-3 Numbers of conservation important plant species per Red Data category within South Africa and Gauteng (date accessed: April & June 2016)

Threat Status	South Africa	GAUTENG	2627BC 2627BD
EX (Extinct)	28	1	-
EW (Extinct in the wild)	7	0	-
CR PE (Critically Endangered, Possibly Extinct)	57	0	-
CR (Critically Endangered)	332	1	-
EN (Endangered)	716	10	-
VU (Vulnerable)	1217	13	2
NT (Near Threatened)	402	19	2
Critically Rare (known to occur only at a single site)	153	0	-
Rare (Limited population but not exposed to any direct or potential threat)	1212	4	-
Declining (not threatened but processes are causing a continuing decline in the population)	47	9	2
LC (Least Concern)	13 856	1997	133
DDD (Data Deficient - Insufficient Information)	348	1	1
DDT (Data Deficient - Taxonomically Problematic)	904	19	2
Total spp (including those not evaluated)	23 399	2074	148

**Date accessed – April/June 2016

From the POSA website (2627BC & 2627BD QDS) 9 listed CI species have been recorded in the greater region (**Table 7-4**) and habitat potentially exists for approximately 6 species. The NT *Adromischus umbraticola* subsp. *umbraticola* was located within the rocky habitat to the north (**Figure 7-4**). It is a South African Endemic and occurs in south-facing rock crevices on ridges, restricted to Gold Reef Mountain Bushveld in the northern parts of its range, and Andesite Mountain Bushveld in the south. It is known from 14 locations in and around Gauteng. The rocky ridges where this subspecies grows are increasingly under threat from urban expansion within Gauteng (Helme & Raimondo, 2006). In addition to this species, an emerging *Crinum* was detected on site with similar leaf structure to *Crinum macowanii*. This is considered a Declining species.

A number of other species found within the Rocky Habitat are considered Protected species under the Nature Conservation Ordinance, 12 of 1983. These include the *Cheilanthes viridis*, *Cheilanthes* spp, *Pellaea calomelanos* and *Haemanthus cf. humilis* (**Figure 7-4**). Protected Species may not be cut, disturbed, damaged, destroyed without obtaining a permit from North West Province or a delegated authority. The survey was conducted in late summer, when a number of the species were not in their flowering time. However, some species such as *Lithops lesliei* were flowering as NSS had detected a population of them not too far from the site on 25 April 2016.



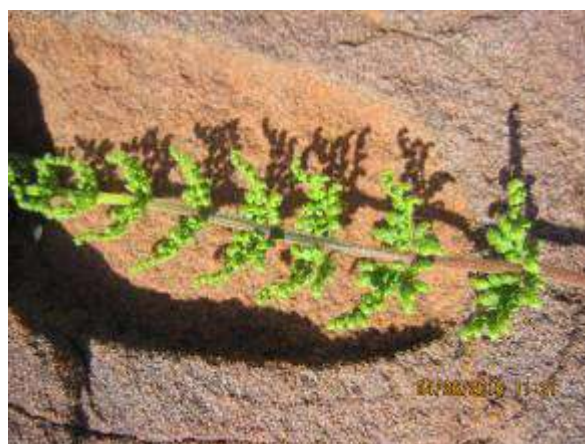
Adromischus umbraticola subsp. *umbraticola*



Haemanthus cf. humilis



Pellaea calomelanos



Cheilanthes cf. viridis

Figure 7-4 Photographs of Conservation Important plant species on Site

Table 7-4 Potential CI species based on information obtained from 2627BC & 2627BD QDG

FAMILY	SPECIES	STATUS	FLOWERING TIME	HABITAT	LoO
AMARYLLIDACEAE	<i>Crinum macowanii</i> Baker	DEC	October-January	Grassland, along rivers, in gravelly soil or on sandy flats.	Possible
AQUIFOLIACEAE	<i>Ilex mitis</i> (L.) Radlk. var. <i>mitis</i>	DEC	October-December	Riverbanks, streambeds, evergreen forests.	Unlikely
ASTERACEAE	<i>Cineraria longipes</i> S.Moore	VU	March-May	Koppies to the south of Johannesburg, amongst rocks and along seep lines in association with <i>Pteridium</i> .	Possible
BRASSICACEAE	<i>Lepidium mossii</i> Thell.	DDD	Unknown	Unknown	-
CRASSULACEAE	<i>Adromischus umbraticola</i> C.A.Sm. subsp. <i>umbraticola</i>	NT	Summer	Rock crevices on rocky ridges -south-facing, or in shallow gravel on top of rocks, but often in shade.	On Site
FABACEAE	<i>Lessertia mossii</i> R.G.N.Young	DDT	Unknown	Unknown	-
GUNNERACEAE	<i>Gunnera perpensa</i> L.	DEC	October - January	It is an obligate wetland plant that grows in shallow water around the edge of pools in marshy areas or along streams.	Unlikely
MESEMBRYANTHEMACEAE	<i>Khadia beswickii</i> (L.Bolus) N.E.Br.	VU	October-March	Open areas on shallow surfaces above rocks in grassland.	Possible
MESEMBRYANTHEMACEAE	<i>Lithops lesliei</i> (N.E.Br.) N.E.Br. subsp. <i>lesliei</i>	NT	April	Grassland with dark pinkish-red ferruginous shaly siltstone	Possible further north in the ridge section
MYROTHAMNACEAE	<i>Myrothamnus flabellifolius</i> Welw.	DDT	Spring-Summer	In shallow soil over sheets of rock	Possible

* Vulnerable – VU; Near Threatened – NT; Declining-DEC; Data Deficient Taxonomically – DDT; Data Deficient –DDD; Species found on site highlighted in green

CONSERVATION IMPORTANT SPECIES

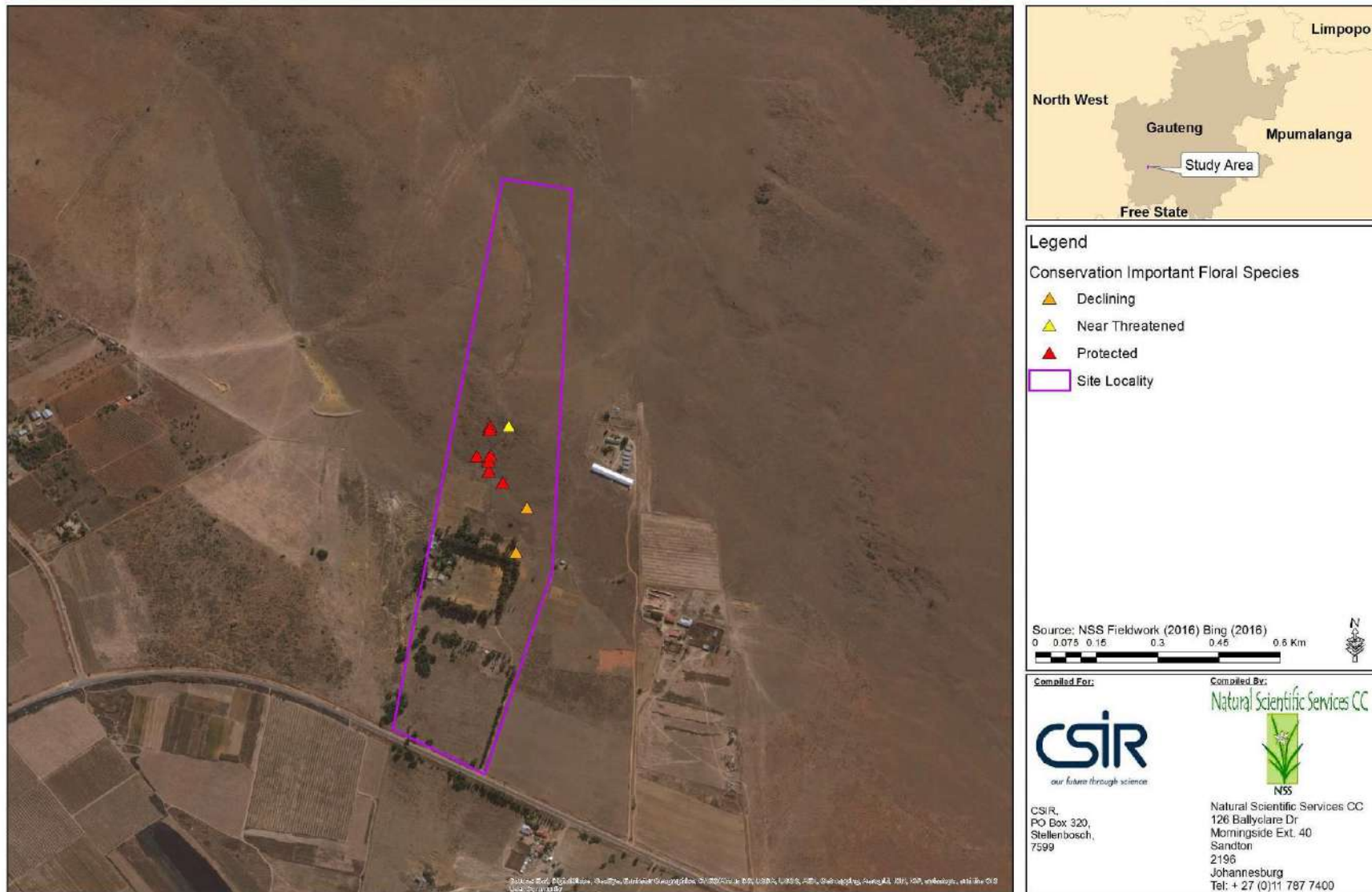


Figure 7-5 Conservation Important species on Site

7.1.4 Alien and Invasives Species

Alien, especially invasive⁵ plant species are a major threat to the ecological functioning of natural systems and to the productive use of land. Due to the current and past disturbances and transformation of the study area, a number of alien species were detected (**Figure 7-6**).

In the brief scan of the site, a minimum of 12 species were recorded. Three of these were Category 1b Invasive species (**Table 7-5**), two as Category 2 and one as Category 3 species. Within the wooded areas (both indigenous *Acacia* patches and Alien bushclumps), species such as *Tagetes minuta* and *Bidens pilosa* were present within the shade of the trees. *Bidens pilosa* was also present at any areas showing signs of disturbance such as dumping areas and around the old infrastructure.

Alien Invasive Categories according to NEM:BA; Act 10 of 2004:

Category 1a

Species requiring compulsory control.

Category 1b

Invasive species controlled by an invasive species management programme

Category 2

Invasive species controlled by area

Category 3

Invasive species controlled by activity

The species recorded within this report were of those seen outside of the residential home and therefore, the home gardens contained a number of alien landscaped species not listed here.

Table 7-5 Alien and Invasive Species detected during the survey

Family	Species	Growth forms	CARA	NEMBA
FABACEAE	<i>Acacia mearnsii</i> De Wild.	Tree	2	2
ASTERACEAE	<i>Bidens pilosa</i> L.	Herb	Weed	
SOLANACEAE	<i>Datura stramonium</i> L.	Shrub	1	1b
FABACEAE	<i>Eucalyptus camaldulensis</i> Dehnh.	Tree	2	1b*
FABACEAE	<i>Eucalyptus sideroxylon</i> A.Cunn.	Tree	2	
AMARANTHACEAE	<i>Gomphrena celosioides</i> Mart.	Herb	Weed	
MELIACEAE	<i>Melia azedarach</i> L.	Tree	3	1b in rural
MORACEAE	<i>Morus alba</i>	Tree	3	3
PINACEAE	<i>Pinus species</i>	Tree	Possibly 2	Possibly 2
RUBIACEAE	<i>Richardia brasiliensis</i> Gomes	Herb	Weed	
ASTERACEAE	<i>Schkuhria pinnata</i> (Lam.) Kuntze ex Thell.	Herb	Weed	
ASTERACEAE	<i>Tagetes minuta</i> L.	Herb	Weed	

* 1b in riparian areas and Grassland Biome

⁵ Two main pieces of national legislation are applicable to alien, invasive plants, namely the:

- Conservation of Agriculture Resources Act (CARA; Act 43 of 1983); and
- National Environmental Management: Biodiversity Act (NEM:BA; Act 10 of 2004):



Melia azedarach (Syringa)



Eucalyptus sideroxylon (Black Ironbark)



Acacia mearnsii (Black Wattle)



Datura stramonium (Common Thorn Apple)



Pinus sp.



Morus alba (White Mulberry)



Cleared *Eucalyptus* stands

Figure 7-6 Photographs of Alien species on Site

7.2. Fauna

Provided in **Section 12.2 to 12.9 (Appendices)** is the name and conservation status of each mammal, bird, reptile, frog, butterfly, odonata (dragonfly and damselfly) and scorpion species that was recorded, or which may potentially occur in the study area. Summarized in **Table 7-6** for each major animal group (taxon) is the estimated number of species with a high or moderate LoO, and the names of those species with a threatened, Near Threatened or Protected status.

Table 7-6 Summary of probable faunal diversity and threatened species

TAXON	APPROXIMATE No. OF SPECIES	POTENTIAL THREATENED SPECIES
Mammals	56	NT Brown Hyaena NT Leopard NT Natal Long-fingered Bat NT Serval NT Southern African Hedgehog PS Cape Fox
Birds	194	VU Secretarybird VU Lanner Falcon NT Blue Korhaan NT Melodious Lark
Reptiles	49	NT Striped Harlequin Snake NT Coppery Grass Lizard
Frogs	15	PS Giant Bullfrog
Butterflies	75	EN Highveld Blue
Odonata	17	None
Scorpions	3	None

7.2.1 Mammals

Approximately 56 mammal species are considered highly likely or likely to occur in the study area, which mostly represent Carnivores, rodents, bats and insectivores (**Appendix 12.3**). Based on our field observations the Common Mole-rat, Scrub Hare and Highveld Gerbil (**Figure 7-7**) among others, are common in the southern half of the site. In the rocky grassland that characterizes the northern half of the site, the Namaqua Rock Mouse, Jameson's Red Rock Rabbit and Rock Elephant-shrew are likely common.

Apart from various Data Deficient (DD) rodent and shrew species, the following conservation important (CI) mammal species are considered highly likely or likely to occur at least occasionally in the study area (**Table 7-6**):

- The globally NT Brown Hyaena has a wide habitat tolerance range and can survive close to urban areas as a result of its scavenging behaviour. Brown Hyaenas are independent of drinking water, but they do require cover in which to hide in during the day (IUCN 2016). This is often in the form of rocky, mountainous areas with bushy

cover, such as in the northern half of the site. As such, this species was rated with a moderate LoO.

- The globally Near Threatened (NT) Leopard also has a wide habitat tolerance range and an extremely catholic diet, which enables this species to persist even in highly transformed environments (NSS *pers. obs.*). Potential evidence of Leopard in the form of spoor has previously been found by NSS in the nearby Driefontein mining right area and, therefore, this species was rated with a moderate LoO.
- The nationally NT Natal Long-fingered Bat is a cave-roosting bat species and although there is no known cave on site, this species was rated with a high LoO. This is because Natal Long-fingered Bats can travel large distances between caves and during nightly foraging excursions, and the species has been found roosting in the nearby West Driefontein Cave (NSS field data in the region from 2010), and foraging within the Kloof mining right area (NSS field data in the region from 2014).
- The nationally NT Serval typically frequents dense, grassy habitat near water (Stuart & Stuart 2007), but appears to be tolerant of considerable habitat transformation (NSS *pers. obs.*). Given this, and the confirmed presence of this species in the nearby Kloof mining right area (NSS field data in the region from 2014), it was rated with a high LoO.
- The nationally NT Southern African Hedgehog tends to avoid wet ground and requires thick, dry cover for nesting, resting by day during summer, and while in torpor during winter (Stuart & Stuart 2007). Habitat, especially in the northern half of the study site, is considered suitable for this species, and since it is known to occur in the nearby Kloof mining right area (NSS field data in the region from 2014), it was rated with a high LoO.
- The Cape Fox is listed as a Protected Species on the 2015 ToPS List. It inhabits mesic to arid grassland (Stuart & Stuart 2007) and is known to occur in the Kloof mining right area (NSS field data in the region from 2014) and was, therefore, rated with a high LoO.

Given the largely nocturnal or subterranean activity of the above-mentioned CI mammal species, they were unlikely to be detected without live-trapping, camera-trapping or night time acoustic survey work.



Common Mole-rat (*Cryptomys hottentotus*) mounds



Scrub Hare (*Lepus saxatilis*) droppings

Possible Scrub Hare (*Lepus saxatilis*) tailGerbil (*Tatera* sp.) burrow**Figure 7-7 Evidence of mammal species on site****7.2.2 Birds**

The latest online list of bird species from the SABAP 2 for pentad 2625_2740, which also contains records of bird species that were observed in QDS 2627BC during the SABAP 1, includes 264 indigenous and three alien bird species (**Appendix 12.4**). However, due to the small size and limited habitat diversity of the study site, only 194 bird species have a high or moderate LoO, of which 34 were detected during our brief site visit.

The SABAP data, which are depicted in **Figure 7-8**, indicate that aerial and arboreal “insect-eating” birds (categories 8, 9 and 10) and water birds (categories 1, 2 and 3), respectively, comprise 42% and 27% (just over two thirds) of the region’s recorded bird species. Small and large “seed-eating” birds (categories 4, 7 and 12), and large predatory birds (categories 5 and 6), respectively, comprise 23% and 6% of the regional recorded bird species richness.

The diversity of birds recorded on site during our visit differed in several ways to the regional pattern in bird diversity. Firstly, because there was no sizeable body of standing water on site during the survey, no wading and very few other water bird species (in categories 1, 2 and 3) were recorded. Secondly, a larger-than-expected proportion of the recorded bird diversity comprised seed-eating birds (in categories 4, 7 and 12). This was possibly because the fallow field in the southern section of the site provided additional grass seed, and/or because grasses were carrying seed when the survey was performed. Thirdly, no nocturnal bird species were recorded, which could be expected from a brief day time survey. Lastly, a smaller-than-expected proportion of the recorded bird diversity comprised cryptic and elusive insect-eaters (in category 9). This was possibly due to their “cryptic and elusive” nature, and lower likelihood of detection.

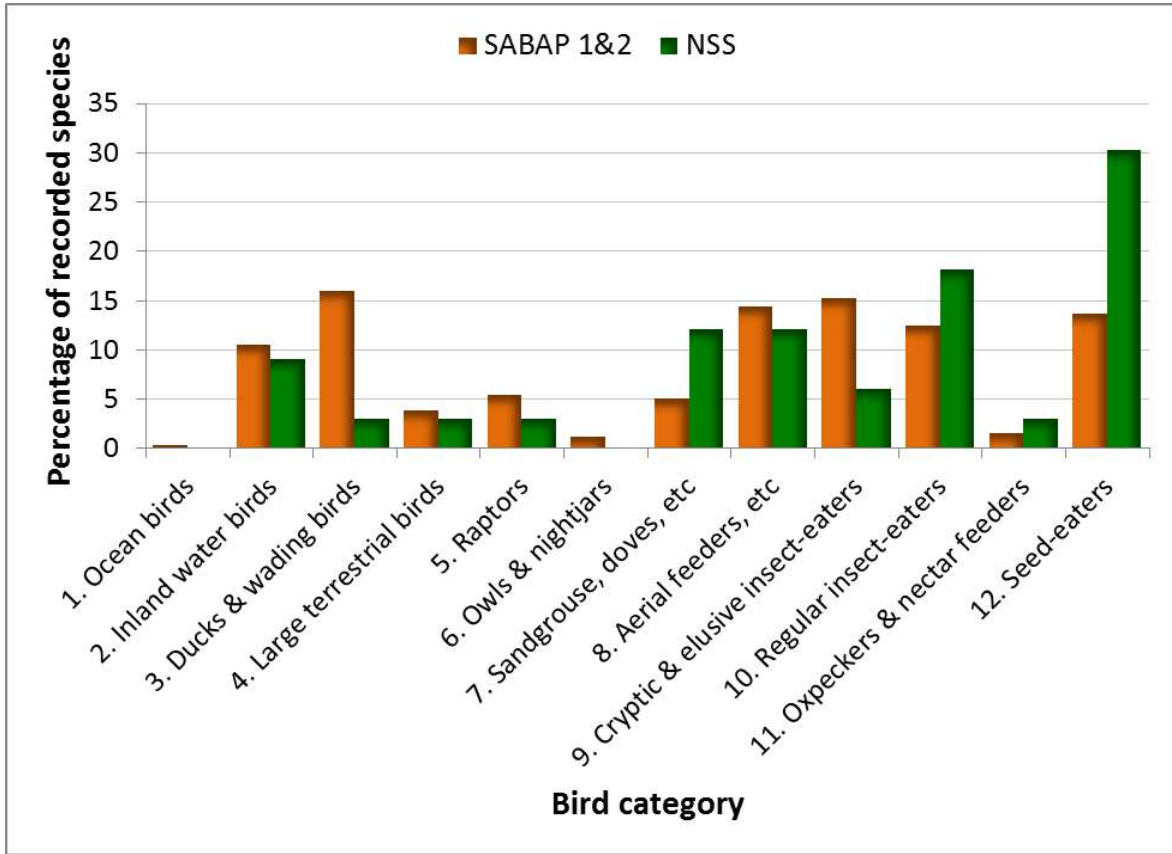


Figure 7-8 Percentage of bird species in each of twelve categories, which has been recorded in the study region by SABAP observers, or on site by NSS



Helmeted Guineafowl (*Numida meleagris*) feather



Red-billed Quelea (*Quelea quelea*)



Lark-like Bunting (*Emberiza impetuanii*)



Chinspot Batis (*Batis molitor*)

Figure 7-9 Evidence of bird species on site

Bird species that were detected most frequently, especially in the southern half of the site, included doves, Common Myna, Cape Sparrow, Dark-capped Bulbul, Common Fiscal, Helmeted Guineafowl and Amethyst Sunbird, among others (**Figure 7-9**). Lark-like Bunting was encountered in the northern half of the site, which has not yet been recorded by SABAP observers in pentad 2625_2740 (SABAP 2016). Although no CI bird species was recorded on site during our survey, several CI bird species have been recorded in the nearby vicinity. Those which were rated with a moderate or high LoO are mentioned below.

- The globally VU Secretarybird, which is also listed on CITES Appendix II, inhabits open grassland to lightly wooded savanna, and is also found in agricultural areas. Although there is no SABAP record for Secretarybird in pentad 2625_2740 (SABAP 2016), GDARD have indicated that this species has been seen in the region (NSS pers. comm.). It was, therefore, rated with a moderate LoO.
- The regionally VU Lanner Falcon inhabits a high diversity of habitats, and was recorded by NSS in the adjacent South Deep mining right area about a week after the present study site was visited. This species was, therefore, rated with a high LoO.
- The globally Near Threatened (NT) Blue Korhaan occurs in grassland usually above 1,500m where populations typically inhabit short, open grassland with termite mounds and few or no trees, but also fallow cropland and pastures (BirdLife 2016). Suitable habitat for this species is present on site, and since this species has been recorded by NSS (2014) in the nearby Kloof mining right area, it was rated with a high LoO.
- The globally NT Melodious Lark inhabits short grassland where there are open spaces between grass tussocks. This species tends to avoid wetter low-lying areas and is sensitive to grazing by livestock (BirdLife 2016). As habitat in the far northern reach of the site could provide suitable habitat for this species, it was rated with a high LoO.

7.2.3 Reptiles

Approximately 49 reptile species are considered highly likely or likely to occur in the study area, which mostly represent snakes and lizards (**Appendix 12.5**). Based on our field observations and ReptileMAP's (2016) records from QDS 2627BC, on site the most frequently encountered reptile species are likely to include Cape Dwarf Gecko, Speckled Rock Skink, and Southern Rock Agama, among others. Regionally-occurring water-associated reptile species, such as the Marsh Terrapin and Nile Monitor, are considered unlikely to occur unless e.g. there is a sizeable accumulation of water on site following heavy rain. The rocky grassland in the northern half of the site is likely to provide important habitat for many of the potentially occurring reptile species, including the CI Coppery Grass Lizard. Some of the potentially occurring gecko, skink and Colubrid snake species could frequent the building rubble and chopped alien tree debris on site. Termitaria on site may provide important habitat for certain Atractaspidid and other snake species, including the CI Striped Harlequin Snake.

- The globally NT Striped Harlequin is an elusive, partially fossorial snake species, which is known to inhabit old termite mounds in grassland, and which feeds exclusively on thread snakes (*Leptotyphlops* spp.). The species is highly threatened by transformation of its Highveld grassland habitat due to agriculture and other forms of land-use (Bates *et al.* 2014). As a few termitaria were seen, and as thread snakes almost certainly occur in the study area, the Striped Harlequin Snake was rated with a moderate LoO.
- The globally NT Coppery Grass Lizard is an extreme grassland specialist. It possesses a long slender body with significantly reduced limbs, enabling it to move swiftly through grass. Populations are restricted to natural grassland areas in proximity to rocks, which provide important shelter for these lizards during veld fires. Individuals probably also shelter in the base of grass tussocks like other grass lizards (Bates *et al.* 2014). Rocky grassland in the northern half of the site could provide suitable habitat for this species, which was rated with a moderate LoO.

7.2.4 Frogs

Fifteen frog species are considered highly likely or likely to occur in or near the study site (**Appendix 12.6**). Due to the apparent lack of a sizeable permanent water body on site, frog species with seasonal or ephemeral aquatic breeding habits and a good capability for moving overland are likely to be more prevalent. The Guttural, Raucous and Red toads, which almost certainly breed in farm dams and other wetland habitats in the vicinity, are capable of moving large distances overland in search of food, burrow sites and alternative breeding habitat. Boettger's Caco, Bubbling Kassina, and the Tremolo and Natal sand frogs might use small, ephemeral pools on site for breeding after heavy rain. The small drainage line, which runs longitudinally down the northern half of the site, might provide habitat for Queckett's River Frog, when inundated. The Giant Bullfrog is the only potentially occurring frog species, which is formally recognized as conservation important (**Table 7-6**).

- Giant Bullfrogs spend most of the year buried in a state of torpor, and exhibit sporadic bouts of (mainly nocturnal) activity after heavy rain in November-January. Bullfrog breeding is limited to a few days in the year and occurs in shallow, standing, seasonal water with preferably emergent grassy vegetation. Bullfrog foraging appears to be concentrated around their burrows, which may be situated up to 1km from their breeding site (Yetman 2012). The Giant Bullfrog has been recorded by NSS (2010) in the nearby Driefontein mining right area, and is known to occur in/around Westonaria (Yetman unpubl. data). The land owner also indicated to NSS (pers. comm.) that he has seen what was possibly a Giant Bullfrog on site. The Giant Bullfrog was therefore rated with a high LoO. At best, if water manages to accumulate in the dam / pit in the central region of the site after heavy rain, this might be used for breeding by Giant Bullfrogs and other frog species. The Giant Bullfrog was assessed as Near Threatened by Minter *et al.* (2004), and is listed as a Protected Species on the 2007 ToPS List under NEM:BA (Act 10 of 2004). As the Giant Bullfrog is not globally threatened,

Measey (2011) did not assess it. Amphibians are not mentioned in the 2015 ToPS List, which preceded the latest conservation assessment of South African amphibians in November 2015. Until the results of this assessment have been published, the status of the Giant Bullfrog, as determined by Minter *et al.* (2004) and as indicated in the 2007 ToPS List, is assumed to remain valid.

7.2.5 Butterflies

At least 75 butterfly species have been recorded in pentad 2625_2740 (LepiMAP 2016; **Appendix 12.7**). Almost half (48%) of the potentially occurring species belong to the family Lycaenidae, which includes the Blues, Coppers, Hairtails, Woolly Legs and their relatives. Most of the other recorded butterfly species belong to the families Nymphalidae (which includes the Acraeas, Pansies, Charaxes and their relatives) and Hesperidae (which includes the Skipper, Sandman, Sylph and related butterfly species). During the site visit, 11 (15%) of the 75 potentially occurring butterfly species were detected (**Figure 7-10**). Although none of the detected species have a threatened or protected status, it is highly probable that the EN Highveld Blue butterfly occurs on site.



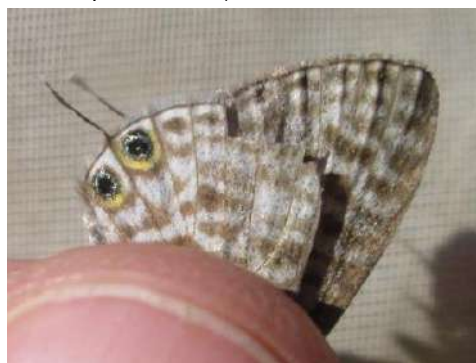
African Monarch (*Danaus chrysippus orientis*)



Black-striped Hairtail (*Anthene amarah amarah*)



African Migrant (*Catopsilia florella*)



Babault's Zebra Blue (*Leptotes babaulti*)

Figure 7-10 Evidence of butterfly species on site

- The globally EN and endemic Highveld Blue is said to inhabit hillsides and koppies in Highveld grassland between Potchefstroom in North West, to Walkerville in Gauteng and Sasolburg in the Free State province. According to Mecenero *et al.* (2013), the Highveld Blue "has shown a fairly rapid decline in both the number of subpopulations as well as the number of emerging adults over the past 20 years. Habitat degradation

caused by lack of fire which diminishes the quantity and quality of the larval host plant [*Ocimum obovatum*] and the associated ant habitat. Air pollution in this heavily industrialized area may also have degraded the habitats." NSS (2012) has previously found the Highveld Blue in the South Deep mining right area, and online photographic evidence indicates that this species has also been found in the nearby Kloof mining right area (<http://www.biodiversityexplorer.org>). Habitat in the northern half of the study site is considered the most suitable for this species, which was rated with a high LoO.

7.2.6 Odonata

Seventeen odonata (dragonfly and damselfly) species were rated with a high or moderate LoO in the study area, most of which have a Biotic score of 3 or less (**Appendix 12.8**). Samways' (2008) Biotic Index is "based on three criteria: geographical distribution, conservation status and sensitivity to change in habitat. It ranges from a minimum of 0 to a maximum of 9. A very common, widespread species which is highly tolerant of human disturbance scores 0. In contrast, a range-restricted, threatened and sensitive endemic species scores 9." Listed species with a Biotic score of 4 include the Mountain Malachite, Mountain Sprite and Sapphire Bluet. The Friendly Hawker has a Biotic score of 5, but none of the listed odonatan species has a known threatened or protected status (Samways 2006).

7.2.7 Scorpions

Three scorpion species are considered highly likely or likely to occur in the study area (**Appendix 12.9**). Of these, *Uroplectes triangulifer* was found to be common under rocks in the northern half of the site (**Figure 7-11**). The common *Opisthophthalmus pugnax* and the rare *Hadogenes gunningi* are also most likely to occur in this habitat. None of the three scorpion species has a threatened or protected status.



Figure 7-11 *Uroplectes triangulifer* on site

8. Areas of Significance

The site significance assessment, which includes a significance map for terrestrial biodiversity on the site, was based on the findings from the ecological scan, as well as relevant international, national and provincial planning and other biodiversity conservation initiatives as described below.

8.1. International Areas of Conservation Significance

On an International level the site does not fall into any:

- *Ramsar Sites*
- *World Heritage Sites*
- *Important Bird Areas (IBAs)*

8.2. National and Regional Areas of Conservation Significance

As inferred in the preceding legislation section of this report, a number of biodiversity features in the region, which are of recognised national or provincial conservation importance, require consideration.

8.2.1 Terrestrial Priority Areas & Threatened Ecosystems

The Terrestrial Component (Rouget *et al.* 2004) of the National Spatial Biodiversity Assessment integrated data on species, habitats and ecological processes to identify areas of greatest terrestrial biodiversity significance. This resulted in the identification of nine spatial terrestrial Priority Areas, which represent high concentrations of biodiversity features and/or areas where there are few options for meeting biodiversity targets. The proposed development is situated in the **Bushveld Bankenveld** Priority Area (**Figure 8-2**).

A list of Threatened Ecosystems within each terrestrial Priority Area was gazetted on 9 December 2011 under the NEM:BA (Act 10 of 2004). The Threatened Ecosystems occupy 9.5% of South Africa, and were selected according to six criteria which included: (1) irreversible habitat loss; (2) ecosystem degradation; (3) rate of habitat loss; (4) limited habitat extent and imminent threat; (5) threatened plant species associations; and (6) threatened animal species associations. **The southern portion of the site falls within the Soweto Highveld Grassland Threatened Ecosystem.** This is the section where the development is proposed.

8.2.2 Freshwater Ecosystem Priority Areas

South African National Biodiversity Institute (SANBI), in collaboration with Department of Water Affairs (DWA), Department of Environmental Affairs (DEA), Water Research Commission (WRC), South African National Parks (SANParks), Worldwide Fund for Nature (WWF), Council for Scientific and Industrial Research (CSIR), South African Institute for Aquatic Biodiversity (SAIAB) and the National Research Foundation (NRF) have prioritised Freshwater systems in the country with an aim to incorporate conservation into Catchment Management Strategies (Nel

et al. 2011). According to Freshwater Ecosystem Priority Areas (FEPAs) for the country, the Leeuspruit and Rietspruit adjacent to the proposed development are not FEPA Rivers (Driver *et al.* 2011). However, the Loopspruit approximately to the west of the study area is an Upstream Management Area and will more than likely not be affected by the current proposed project.

8.2.3 GDARD – Conservation Plan

Currently a total of 26% of Gauteng is considered to be Critical Biodiversity Areas. Of great concern is that only 2.4% is under some kind of formal protection. It is therefore of utmost importance that CBAs containing irreplaceable and important areas be very carefully considered in areas involved in development applications.

The study site has been identified as an **Important Area** and **Ecological Support Area (ESA)** and as indicated in **Figure 8-3**. The ESA falls within the ridge habitat of the site adjacent to one of the Important Areas (IA). NSS is of the opinion that this area rather be considered as an IA rather than an ESA. An ESA is not included as a management objective and only required to be maintained in a functional rather than intact state and hence they may not remain in a condition suitable for meeting biodiversity targets. They are seen as areas used to support Critical Biodiversity Areas and/or Protected Areas.

It is important to note that Gauteng Province (GDARD, 2014) also specifies that for rivers, the riparian zones and buffer zones must be designated as sensitive with a minimum 100m buffer zone from the edge of the riparian zone for rivers/streams outside urban areas. A drainage system coming from the ridge system was detected entering the Melinis-Eragrostis field in the northern section of the site.

NFEPA RIVERS & WETLANDS

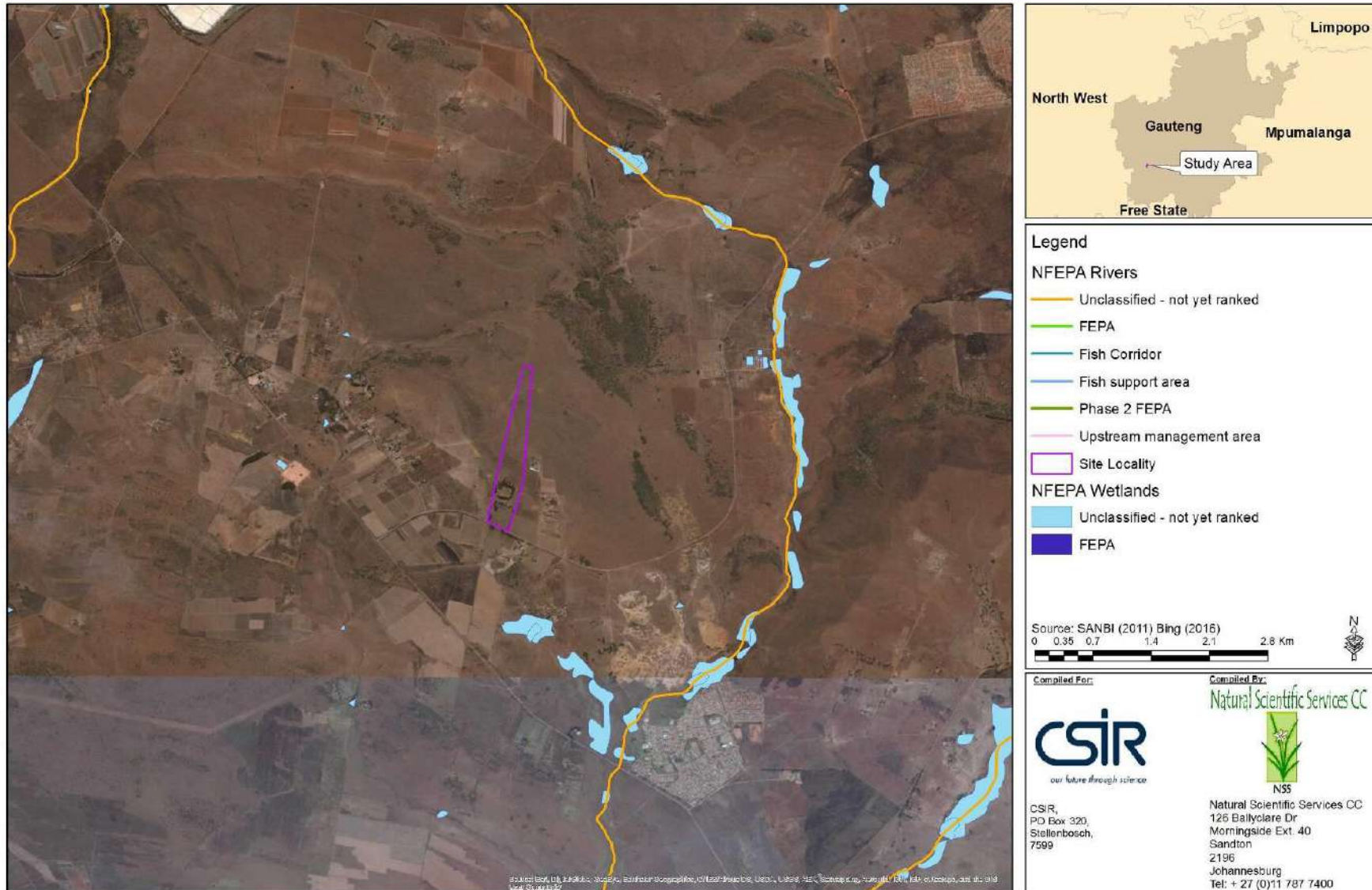


Figure 8-1 National Freshwater Priority Systems

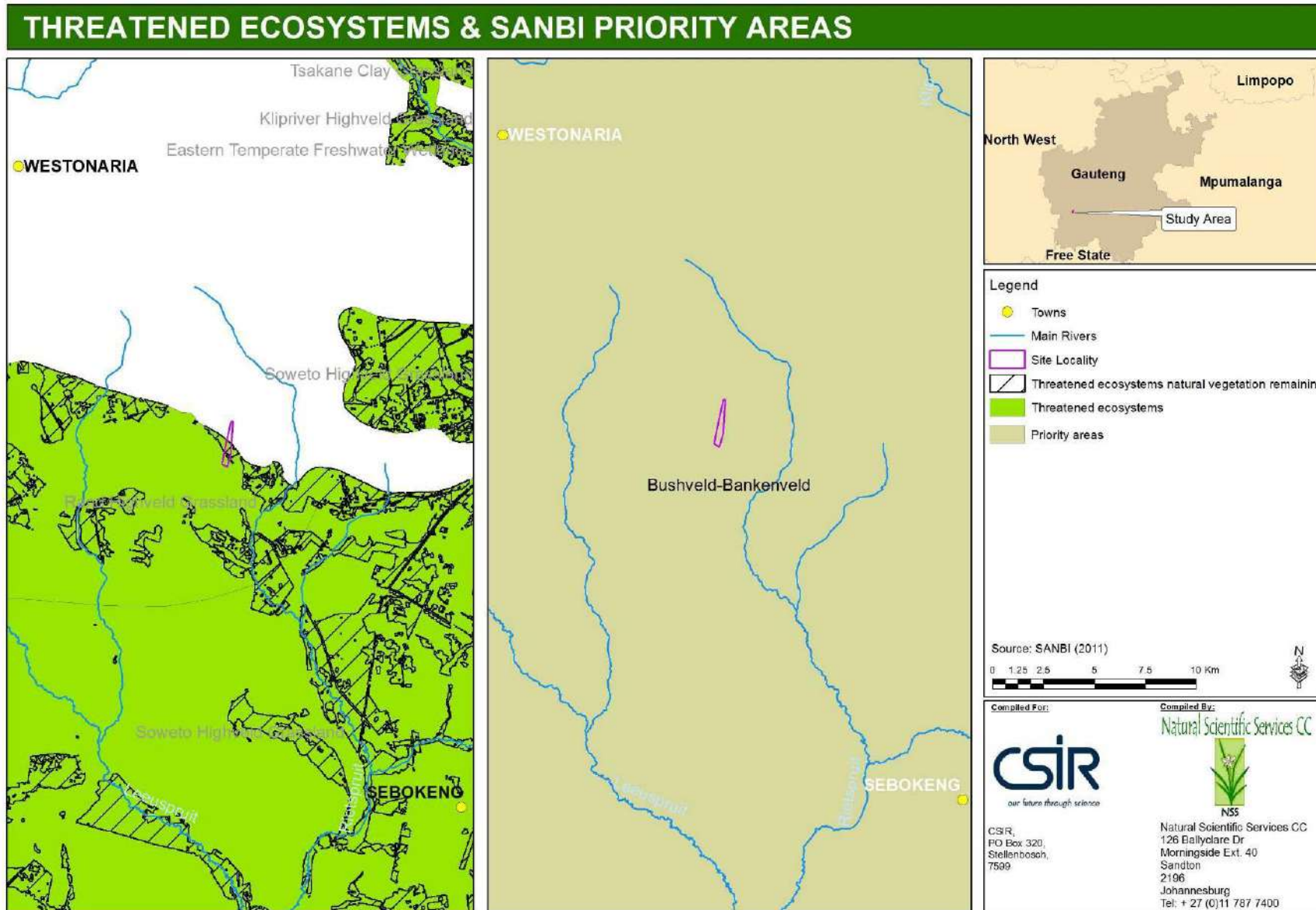


Figure 8-2 Threatened Ecosystems and SANBI Priority Areas

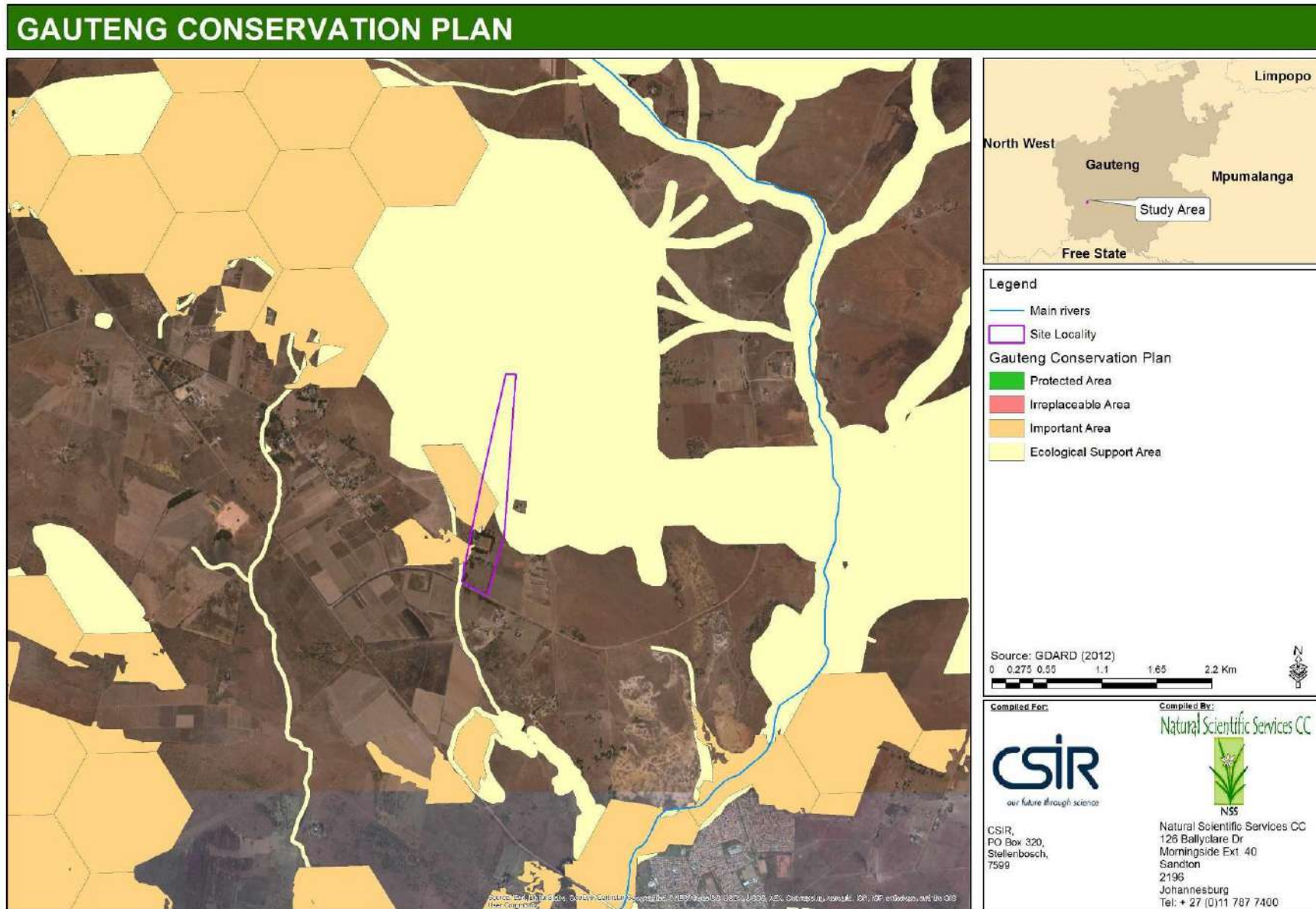


Figure 8-3 Gauteng Conservation Plan Version 3

8.3. Local Areas of Conservation Significance

A map was compiled based on the above and the ecological scan undertaken by NSS to depict local Areas of Significance for the conservation of terrestrial flora and fauna (**Figure 8-4**). Areas of significance include areas that have been highlighted because of their:

- Ecological sensitivity (including renewability/success for rehabilitation);
- Level/Extent of disturbance.
- Presence of CI species (identified at the vegetation unit/habitat level); and
- Conservation value (at a regional, national, provincial and local scale);

Identified habitat units within the study site were ranked into **Very High, Medium-high, Medium, Medium-low** or **Low** classes in terms of significance. This was undertaken according to a sensitivity-value analysis (scoring in **Table 8-1**) and included input based on knowledge of the area, on the ground investigations and experience when dealing with ecological systems and processes. A summary overview of scoring the Areas of Local Conservation Significance is presented in **Table 8-2** and illustrated in **Figure 8-4**.

Table 8-1. Scoring Range for the Areas of Significance

Category		Scoring Range	
		Upper	Lower
HIGH	Very High	15	13.1
	High	13	11.1
Moderate - High		11	7.1
Moderate		7	3.1
Moderate - Low		3	-0.9
Low		-1	-5

Table 8-2 Descriptions and ratings of the various Areas of Significance

Vegetation Type	Ecological Sensitivity (Rating 1-5)	Conservation Value (Rating 1-5)	Presence of CI species* (Rating 1-5)	Level/Extent of Disturbance (Rating -1-5)	Total Score
Rocky Habitats					
<i>Diospyros-Loudetia</i> Rocky Ridge Plateau Grassland	High (5)	<ul style="list-style-type: none"> ■ Situated in a SANBI Priority Zone ■ High Species Richness and contains a number of Protected species ■ A portion falls within an IA and ESA ■ Unit is approximately 42% of the site (4) 	NT Floral species (5)	<ul style="list-style-type: none"> ■ Limited Alien Invasives ■ Some remnants from historical walling etc (0) 	Very-High (14)
Drainage Habitat					
Drainage System	High (5)	<ul style="list-style-type: none"> ■ Situated in a SANBI Priority Zone ■ A portion falls within an IA and ESA ■ Moderate Species Richness and contains a number of Protected species ■ Water resource and protected under DWA ■ Unit is approximately 5.3% of the site (4) 	Protected species and within buffer of the NT species (4)	<ul style="list-style-type: none"> ■ Limited Alien Invasives ■ A portion of the system drains through an old field and is therefore vegetation structure is completely transformed. (-1.5) 	High (11.5)
Grassland Habitat					
<i>Schizachyrium- Seriphium</i> Rocky Grassland	Medium (3)	<ul style="list-style-type: none"> ■ Situated in a SANBI Priority Zone ■ Moderate Species Richness and contains a potential Declining species ■ Within the Threatened Soweto Highveld Grassland ■ A portion falls within an IA (C-Plan) ■ Unit is approximately 7.37% of the site (4) 	Possible Dec species (3)	<ul style="list-style-type: none"> ■ Some Alien and Invasives present ■ Dumping and edge effects from surrounding old fields and alien bushclumps (-2) 	Moderate-High (8)
<i>Scirpoides-Eragrostis</i> Grassland	Medium (3)	<ul style="list-style-type: none"> ■ Situated in a SANBI Priority Zone ■ Moderate-low Species Richness and contains a potential Declining species ■ Within the Threatened Soweto Highveld Grassland 	Possible Dec species (3)	<ul style="list-style-type: none"> ■ Recently mowed ■ Encroachment of species such as Seriphium (bush encroacher) ■ Dumping and edge effects from surrounding old fields and alien bushclumps 	Moderate (7.5)

Vegetation Type	Ecological Sensitivity (Rating 1-5)	Conservation Value (Rating 1-5)	Presence of CI species* (Rating 1-5)	Level/Extent of Disturbance (Rating -1-5)	Total Score
		<ul style="list-style-type: none"> A portion falls within an IA (C-Plan) Water resource and protected under DWA Unit is approximately 1.14% of the site (4) 		(-2.5)	
<i>Eragrostis-Cynodon-Hyparrhenia</i> Disturbed Grassland	Medium-Low (2)	<ul style="list-style-type: none"> Situated in a SANBI Priority Zone Low Species Richness Within the Threatened Soweto Highveld Grassland Unit is approximately 10.43% of the site (3) 	Possible (2)	<ul style="list-style-type: none"> Transformed habitat Alien Invasives present including Category 1b species Anthropogenic influences - edge effects from surrounding activities (-3) 	Moderate (4)
Wooded Habitat					
<i>Acacia</i> Bushclumps	Medium-Low (2)	<ul style="list-style-type: none"> Situated in a SANBI Priority Zone Low Species Richness Within the Threatened Soweto Highveld Grassland Unit is approximately 0.33% of the site (2.5) 	Possible (2)	<ul style="list-style-type: none"> Small patch remaining Alien species present in undergrowth Anthropogenic influences - edge effects from surrounding activities (-2.5) 	Moderate (4)
Transformed					
<i>Melinis-Eragrostis</i> Old Fields	Low (1)	<ul style="list-style-type: none"> Situated in a SANBI Priority Zone Low Species Richness Within the Threatened Soweto Highveld Grassland Unit is approximately 19% of the site (2) 	Unlikely (1)	<ul style="list-style-type: none"> Transformed habitat Alien Invasives present although invasives are limited (-3.5) 	Moderate-Low (0.5)
Alien Bushclumps; Built-up Areas; and <i>Seriphium</i> dominated Borrow Pit	Low (1)	Limited Species diversity and Conservation Value (1)	Unlikely (1)	Highly transformed and extensive alien presence (-4)	Low (-1)

* Dec: Declining species

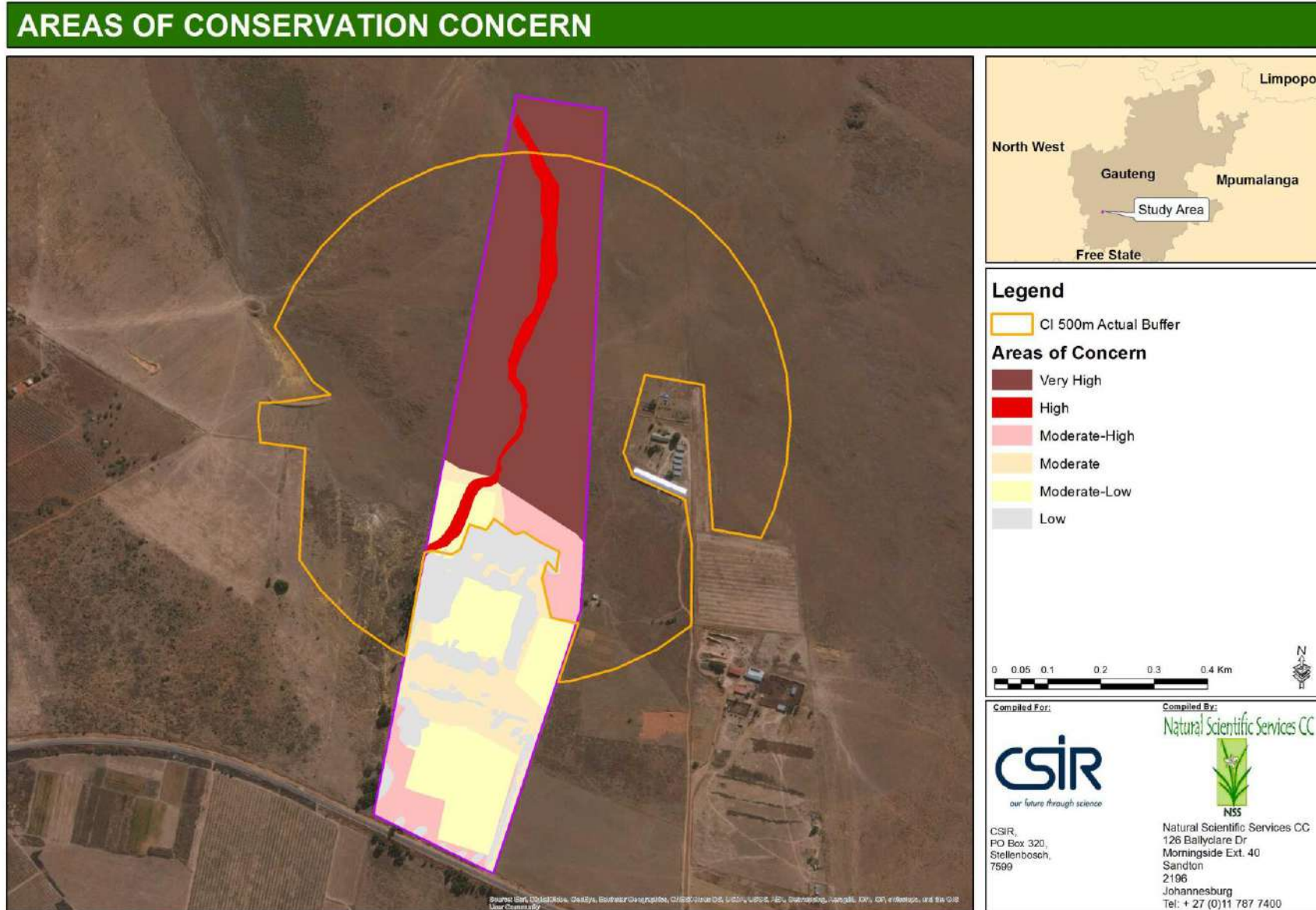


Figure 8-4 Local Areas of Conservation Significance

9. Impact Assessment & Recommendations

Potential impacts of the proposed project on biodiversity are summarized in **Table 10-1**, and briefly discussed below, followed by recommended measures to mitigate these during relevant phases of the development.

9.1. Construction & Operation

9.1.1 *Direct loss of terrestrial vegetation and faunal habitat*

Within the boundary of the site there may be a further loss of Moderate-High and Moderate Significance habitat due to clearing and tilling of the site for the pig facility and crop production. Habitats that may be lost are:

- *Schizachyrium- Seriphium Rocky Grassland*
- *Scirpoides-Eragrostis Grassland*
- *Eragrostis-Cynodon-Hyparrhenia Disturbed Grassland*

Although these habitats may be lost, the overall fragmentation of these habitats as a whole is seen as negligible due to the scale of the development and the current transformations on site. Habitat loss within the development footprint is also considered unlikely to affect potentially occurring CI faunal species due to the current disturbed nature of the site.

The Very High rated Ridge communities are not within the footprint of the development and therefore no direct loss is expected. However, the drainage system exiting the Ridge habitat into the *Melinis-Eragrostis* fields may continue to be impacted upon if farming of this field is planned for the development.

9.1.2 *Loss / Reduction of CI or medicinal flora*

Site clearing may destroy CI and medicinally important species found on site such as the *Crinum* species found in the *Schizachyrium- Seriphium Rocky Grassland* and *Scirpoides-Eragrostis Grassland* habitats. CI species within the Ridge habitats are considered not to be affected by the development during the construction phase.

During Operations, CI species individuals may be reduced due to harvesting by those entering the site. The probability, however, is considered to be low.

9.1.3 *Introduction & proliferation of alien species leading to increased competition and change in habitat structure*

There are two aspects to mention on alien invasive species on site. Currently alien species are being removed and therefore the impact long term is considered positive for the area.



However, in terms of the bee populations on site, this may be seen as a negative impact. Mitigation for this is discussed in **Section 9.4**.

During construction the increase in aliens particularly annuals (herbaceous species) is likely to occur following an increase in vehicles, people and materials, as well as any site disturbance in the absence of any control measures. A number of seedlings from the *Eucalyptus* and *Acacia mearnsii* stands was evident. These may therefore continue to spread.

During Operation an increase could occur from seeds in excess fodder, pig effluent as well as from influx of vehicles etc, and lack of alien species control.

9.1.4 Faunal Mortality and Displacement (including CI species)

Site clearing, construction activities and increased vehicle traffic are likely to cause (albeit limited) destruction or displacement of subterranean and other animal species with poor mobility. Of greatest concern in this regard is possible destruction of potentially occurring CI animal species including Striped Harlequin Snakes in termitaria or elsewhere, buried Giant Bullfrogs, and ground-nesting hedgehogs.

9.1.5 Increase in dust and erosion degrading habitat integrity

Earth-moving activities during the clearing of vegetation for the piggery and the tilling of land for vegetable production is likely to increase bare ground, dust and the land's susceptibility to erosion. As population declines of the potentially occurring Highveld Blue butterfly may be related in part to degradation of habitat from air pollution (Mecenero *et al.* 2013), the potential impact of continued and increased dust during construction was rated with **Medium** significance.

9.1.6 Sensory disturbances

Sensory disturbance of fauna from noise, dust and light pollution during construction will cause many fauna to vacate the site, at least temporarily. During Operation, fauna may experience continued sensory disturbance from vehicle, pig and other noise, and light pollution among other things. Animals that would be most adversely affected include calling species (such as the CI Blue Korhaan), and secretive nocturnal species (such as the South African Hedgehog). Less sensitive common species are likely to tolerate low levels of noise and light pollution, and some species may even benefit - such as bats, which may forage on insects attracted to lights.

9.2. Specific Operational Impacts

9.2.1 Environmental contamination

Various contaminants are present in pig effluents including nutrients, pathogens, veterinary pharmaceuticals (including inter alia antibiotics) and naturally excreted hormones.



Inappropriate slurry management and improper disposal of carcasses as well as excess fodder and chemicals (herbicides and pesticides) or fertilizers used for vegetable production or any other operational waste could cause contamination / eutrophication of soils and eventually, by means of groundwater (most likely) or surface flow (less likely), result in the contamination of lower-lying land.

9.2.2 Poor / Inappropriate control of invertebrate pests

Substandard animal husbandry / hygiene and waste generation in the form of pig effluent, excess fodder and fertiliser has the potential, if improperly managed, to facilitate aggregation and/or breeding of invertebrate pests such as flies, weevils, ants, termites, cockroaches, fleas, lice, mites, ticks, etc.

9.2.3 Poor / Inappropriate control of vertebrate pests

As above, poor waste management and pig hygiene practices has the potential to attract vertebrate pests including rodents (Black Rat, House Mouse), carnivores (Black-backed Jackal, dogs, cats) and birds (Common Myna, Pied Crow, Sacred Ibis, Cattle Egret and Black-headed Heron). Furthermore, proliferation of pest alien animals could adversely affect indigenous fauna through competition, predation and disease transmission.

9.2.4 Transmission of diseases

Diseases could be transmitted either directly from pigs and their effluent, or indirectly from an increased prevalence of pests, which could in turn adversely affect the population dynamics of fauna in the surrounding area.

9.2.5 Altered burning

The incidence of wild fires on site and in the area could increase or decrease to the possible detriment of native flora and fauna. Although fires might result unintentionally with carcass burning, for example, it is more likely that burning will be prohibited as far as possible for human and infrastructural safety. Too frequent fires could adversely affect potentially occurring CI species such as the Coppery Grass Lizard, hedgehog and ground-nesting Blue Korhaan and Melodious Lark. These fires could also impact the ridge vegetation communities to the north but is dependant on the frequency and intensity of the burns. Lack of fire, on the other hand, would adversely affect the potentially occurring Highveld Blue.

9.3. Decommissioning Phase

Two main impacts could occur within the Decommissioning phase. These are highlighted below:

9.3.1 Introduction & proliferation of alien spp. - Competition and change in structure

If no rehabilitation and monitoring efforts are implemented, alien species could continue to increase and spread specifically around fallow fields and building remnants.



9.3.2 Sensory disturbances

Fauna are likely to experience a temporary increase in sensory disturbance during Decommissioning due to increased vehicle and human activity, noise and dust.

9.4. Management and Mitigatory Recommendations

Management and Mitigatory Recommendations are highlighted **Table 10-2** below. With Mitigation measures implemented, the significance of most impacts on site from an ecological perspective are reduced to a **Low Significance** as highlighted in **Table 9-1** below.

Table 9-1 A Summary of Impacts and Significance with Mitigation

POTENTIAL IMPACTS	SIGNIFICANCE	SIGNIFICANCE
	RATING	RATING
CONSTRUCTION	With	Without
<i>Direct loss of terrestrial vegetation and faunal habitat</i>	High	Low
<i>Loss of CI or medicinal flora</i>	Medium	Low
<i>Introduction & proliferation of alien spp.</i>	High	Low
<i>Reduction in Woody Alien Species</i>	Medium	Medium
<i>Faunal Mortality and Displacement (including CI species)</i>	Medium	Low
<i>Increase in dust and erosion degrading habitat integrity</i>	Medium	Low
<i>Sensory disturbances</i>	Medium	Low
OPERATION		
<i>Environmental contamination</i>	Medium	Low
<i>Poor / Inappropriate control of invertebrate pests</i>	High	Low
<i>Poor / Inappropriate control of vertebrate pests</i>	Medium	Low
<i>Transmission of diseases</i>	Medium	Low
<i>Reduction in CI Species - Harvesting of CI or medicinal flora</i>	Medium	Low
<i>Increased burning - degrading habitat integrity/ Destruction of Species</i>	High	Medium
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High	Low
<i>Sensory disturbances</i>	Medium	Low
DECOMMISSIONING		
<i>Introduction & proliferation of alien spp. - Competition and change in structure</i>	High	Low
<i>Sensory disturbances</i>	Low	Low

10. Concluding Remarks

With the implementation of the mitigation measures suggested in this report, the significance of most impacts on site from an ecological perspective are considered to be of **Low Significance**. Based on the information available to date, with the brief field scan of the site, it is NSS's opinion that there are no fatal flaws to the project and that provided the mitigation

set out is adhered to NSS have no objections to the project going forward.. This includes the rehabilitating of the fields to the north and protection of the ridge system. A drainage system flows through these areas and will need to be protected from further development. If the developer would like to develop on this area, a further wetland delineation will be required.

Table 10-1 Impact Assessment

POTENTIAL IMPACTS	MITIGATION	STATUS	EXTENT		DURATION		INTENSITY		REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	PROBABILITY	SIGNIFICANCE		CONFIDENCE	
			RATING	SCORE	RATING	SCORE	RATING	SCORE					RATING	SCORE	RATING	SCORE
CONSTRUCTION																
Direct loss of terrestrial vegetation and faunal habitat																
<p>Within the boundary of the site there may be a further loss of Moderate-High and Moderate Significance habitat due to clearing and tilling of the site for the pig facility and crop production. Habitats that may be further lost are:</p> <ul style="list-style-type: none"> - <i>Schizachyrium-Seriphium</i> Rocky Grassland - <i>Scirpoides-Eragrostis</i> Grassland - <i>Eragrostis-Cynodon-Hyparrhenia</i> Disturbed Grassland <p>Although these habitats may be lost, the overall fragmentation of these habitats as a whole is seen as negligible due to the scale of the development and the current transformations on site.</p> <p>The Very High rated Ridge communities are not within the footprint of the development and therefore no direct loss is expected. However, the drainage system exiting the Ridge habitat into the <i>Melinis-Eragrostis</i> fields may continue to be impacted upon if farming of this field is planned for the development.</p>	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	High	8	Low reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	High	11	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	4	Medium	2
Loss of CI or medicinal flora																
<p>Site clearing may destroy CI and medicinally important species found on site such as the <i>Crinum</i> species found in the <i>Schizachyrium-Seriphium</i> Rocky Grassland and <i>Scirpoides-Eragrostis</i> Grassland habitats. CI species within the Ridge habitats are considered not to be affected by the development during the construction phase.</p>	Without	Negative	Site specific	1	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0.75	Medium	5	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	Moderate reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0.25	Low	1	Medium	2
Introduction & proliferation of alien spp.																
<p>During construction the increase in aliens is likely to occur following an increase in vehicles, people and materials, as well as any site disturbance in the absence of any control measures.</p>	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Low reversibility	Low irreplaceability	Definite (>90% chance)	1	High	10	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	2	Medium	2
Reduction in Woody Alien Species																
<p>Currently alien wooded species are being removed from the site and therefore may have a positive impact in the long term for the surrounding habitat</p>	Without	Positive	Site specific	1	Medium term (5-15 years)	3	Medium	4	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	Medium	6	Medium	2
	With	Positive	Local (<2km from site)	2	Medium term (5-15 years)	3	Medium	4	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	Medium	7	Medium	2
Faunal Mortality and Displacement (including CI species)																
<p>Site clearing, construction activities and increased vehicle traffic are likely to cause (albeit limited) destruction or displacement of subterranean and other animal species with poor mobility. Of greatest concern in this regard is possible destruction of potentially occurring CI animal species including Striped Harlequin Snakes in termitaria or elsewhere, buried Giant Bullfrogs, and ground-nesting hedgehogs.</p>	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Low reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	Medium	6	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Low	1	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	3	Medium	2
Increase in dust and erosion degrading habitat integrity																
<p>Earth-moving activities during the clearing of vegetation for the piggery and the tilling of land for vegetable production is likely to increase bare ground, dust and the land's susceptibility to erosion. As population declines of the potentially occurring Highveld Blue butterfly may be related in part to degradation of habitat from air pollution.</p>	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	Medium	6	Medium	2
	With	Negative	Site specific	1	Long term (>15 years)	4	Low	1	High reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	3	Medium	2
Sensory disturbances																
<p>Sensory disturbance of fauna from noise, dust and light pollution during construction will cause many fauna to vacate the site, at least temporarily. Animals that would be most adversely affected include calling species (such as the CI Blue Korhaan), and secretive nocturnal species (such as the hedgehog).</p>	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Low reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	Medium	6	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	2	High	3
OPERATION																
Environmental contamination																
<p>Various contaminants are present in pig effluents including nutrients, pathogens, veterinary pharmaceuticals (including inter alia antibiotics) and naturally excreted hormones. Inappropriate slurry management and improper disposal of carcasses as well as excess fodder and chemicals (herbicides and pesticides) or fertilizers used for vegetable production or any other operational waste could cause contamination / eutrophication of soils and eventually, by means of groundwater (most likely) or surface flow (less likely), result in the contamination of lower-lying land.</p>	Without	Negative	Regional (within 30km)	3	Long term (>15 years)	4	Medium	4	Low reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0.75	Medium	8	Low	1
	With	Negative	Local (<2km from site)	2	Short term (2-5 years)	2	Low	1	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0.25	Low	1	Medium	2

POTENTIAL IMPACTS	MITIGATION	STATUS	EXTENT		DURATION		INTENSITY		REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	PROBABILITY	SIGNIFICANCE		CONFIDENCE	
			RATING	SCORE	RATING	SCORE	RATING	SCORE					RATING	SCORE	RATING	SCORE
Poor / Inappropriate control of invertebrate pests																
Substandard animal husbandry / hygiene and waste generation in the form of pig effluent, excess fodder and fertiliser has the potential, if improperly managed, to facilitate aggregation and/or breeding of invertebrate pests such as flies, weevils, ants, termites, cockroaches, fleas, lice, mites, ticks, etc.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	High	8	Low reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	High	11	High	3
	With	Negative	Site specific	1	Medium term (5-15 years)	3	Medium-low	2	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	3	Medium	2
Poor / Inappropriate control of vertebrate pests																
As above, poor waste management and pig hygiene practices has the potential to attract vertebrate pests including rodents (Black Rat, House Mouse), carnivores (Black-backed Jackal, dogs, cats) and birds (Common Myna, Pied Crow, Sacred Ibis, Cattle Egret and Black-headed Heron). Furthermore, proliferation of pest alien animals could adversely affect indigenous fauna through competition, predation and disease transmission.	Without	Positive	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Low reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	Medium	8	High	3
	With	Positive	Site specific	1	Medium term (5-15 years)	3	Low	1	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	3	Medium	2
Transmission of diseases																
Diseases could be transmitted either directly from pigs and their effluent, or indirectly from an increased prevalence of pests, which could in turn adversely affect the population dynamics of fauna in the surrounding area.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	High	8	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Medium	7	Medium	2
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0.25	Low	1	Medium	2
Reduction in CI Species - Harvesting of CI or medicinal flora																
During Operations, CI species individuals may be reduced due to harvesting by those entering the site. The probability, however, is considered to be low.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Low reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Medium	5	Medium	2
	With	Negative	Site specific	1	Short term (2-5 years)	2	Low	1	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0.25	Low	1	Medium	2
Altered burning																
The incidence of wild fires on site and in the area could increase or decrease to the possible detriment of native flora and fauna. Although fires might result unintentionally with carcass burning, for example, it is more likely that burning will be prohibited as far as possible for human and infrastructural safety. Too frequent fires could adversely affect potentially occurring CI species such as the Coppery Grass Lizard, hedgehog and ground-nesting Blue Korhaan and Melodious Lark. Lack of fire, on the other hand, would adversely affect the potentially occurring Highveld Blue. These fires could also impact the ridge vegetation communities to the north but is dependant on the frequency and intensity of the burns	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Moderate reversibility	Low irreplaceability	Definite (>90% chance)	1	High	10	High	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Medium-low	2	Moderate reversibility	Low irreplaceability	Definite (>90% chance)	1	Medium	5	Medium	2
Introduction & proliferation of alien spp. - Competition and change in structure																
During Operation an increase in invasive alien species could occur from seeds in excess fodder, pig effluent as well as from influx of vehicles etc, and lack of alien species control.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Low reversibility	Moderate irreplaceability	Definite (>90% chance)	1	High	10	High	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Medium-low	2	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0.25	Low	1	Medium	2
Sensory disturbances																
During Operation, fauna may experience continued sensory disturbance from vehicle, pig and other noise, and light pollution among other things. Animals that would be most adversely affected include calling species (such as the CI Blue Korhaan), and secretive nocturnal species (such as the hedgehog). Less sensitive common species are likely to tolerate low levels of noise and light pollution, and some species may even benefit - such as bats, which may forage on insects attracted to lights.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Low reversibility	Low irreplaceability	Definite (>90% chance)	1	Medium	8	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Medium-low	2	High reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	4	Medium	2
DECOMMISSIONING																
Introduction & proliferation of alien spp. - Competition and change in structure																
If no rehabilitation and monitoring efforts are implemented, alien species could continue to increase and spread specifically around fallow fields and building remnants.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	High	8	Low reversibility	Low irreplaceability	Definite (>90% chance)	1	High	14	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0.5	Low	4	Medium	2
Sensory disturbances																
Fauna are likely to experience a temporary increase in sensory disturbance during decommissioning due to increased vehicle and human activity, noise and dust.	Without	Negative	Local (<2km from site)	2	Temporary (<2 years)	1	Medium-low	2	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0.75	Low	4	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0.25	Low	1	Medium	2

Table 10-2 Mitigation Measures

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	MONITORING	FREQUENCY	RESPONSIBILITY
CONSTRUCTION					
Direct loss of terrestrial vegetation and faunal habitat					
Avoid unnecessary loss of vegetation and faunal habitats	Restrict all habitat loss and disturbances from construction activities to within the proposed and agreed upon site layout. Maintain the viability of the indigenous seed bank in excavated soil so that this can be used for subsequent re-vegetation of any disturbed areas. No landscaping should be performed around the facilities.	<ul style="list-style-type: none"> •Revise the planned layout of the facility and all associated infrastructure to avoid all Very High and High sensitive areas. •Clearly demarcate or fence in the construction site. Relocate specimens that are situated in the construction footprint, according to the advice of an appropriate specialist •Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least. •As the drainage enters the top <i>Melinis-Eragrostis</i> field. It is recommended that no further farming of this area takes place and that it will require some form of rehabilitation to revert back to a similar structure to the surrounding Soweto Highveld Grassland. This will then protect the drainage system and allow for a buffer on the ridge (thereby reducing edge effects). If this is not to occur then a detailed delineation of the system will be required. •Briefly and effectively stockpile topsoil preferably 1-1.5m in height. Natural vegetation must be allowed to recover in areas of disturbance. If recovery is slow, then a seed mix for the area (using indigenous grass species listed within this report) should be sourced and planted. 		During design Pre-construction During construction During construction	CSIR / AlpoMega Management CSIR / AlpoMega Management AlpoMega Management, Construction Crew AlpoMega Management, Construction Crew, with advice from a Botanist /Horticulturist
	Avoid unnecessary loss of indigenous trees (The <i>Acacia</i> Indigenous Bushclumps)	<ul style="list-style-type: none"> •Identify and mark indigenous trees on the ground and digitally to facilitate the retention of as many of these important faunal habitats as possible into the final development footprint. 		Design / pre-construction	AlpoMega Management, Construction Crew, with advice from an Ecologist
Loss of CI or medicinal flora					
Minimize loss of CI or medicinally important flora, in accordance with law and best practice, and encourage rehabilitation.	Adhere to law and best practice guidelines regarding the displacement of CI and medicinally important floral species.	<ul style="list-style-type: none"> •Submit permits for the removal of CI important species within the study site. •Prior to construction all CI and medicinally important floral specimens within the site layout footprint should be collected and replanted in the surrounding areas. •Guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants is advised. 		Pre-construction Pre-construction During construction	CSIR / AlpoMega Management Botanist / horticulturist Botanist / horticulturist
Mortality and displacement of fauna (including CI species)					
Minimize mortality and displacement of fauna.	Adhere to law and best practice guidelines regarding the handling and relocation of CI fauna.	<ul style="list-style-type: none"> •If any of the remaining natural areas are to be affected, then it is recommended that a suitably qualified specialist be assigned to relocate any CI fauna on site to nearby suitable habitat (i.e. Termitaria that need to be destroyed within the project footprint should be carefully searched for Striped Harlequin Snakes and immediately before construction of the units, rocks and grass should be searched for grass lizards, and night time searches for hedgehogs should be performed). 		Pre-construction	Zoologist/Ecologist
	Appropriately deal with fauna on site.	<ul style="list-style-type: none"> •Ensure that procedures are in place for handling and relocating fauna that need to be moved off site. •Ensure that staff are trained and equipped to safely handle fauna (particularly snakes), or that the services of a trained professional are readily available on call. Buried bullfrogs, which are unearthed during construction activities must be handled and relocated with advice from an appropriate specialist. 		All Phases All Phases	AlpoMega Management AlpoMega Management/ External Ecologist
	Time construction activities to minimize faunal mortality.	<ul style="list-style-type: none"> •Construction activities should be timed to start (and preferably end) during winter, when activity levels and the presence of breeding and migratory animal species are lowest. 		Pre-construction	AlpoMega Management, Construction Crew
	Limit unnecessary mortality, and persecution of fauna.	<ul style="list-style-type: none"> •Check open trenches for trapped animals (e.g. bullfrogs, hedgehogs and snakes), which should be carefully caught and relocated according to the specifications of a relevant specialist. •Prohibit the further introduction of domestic animals such as dogs and cats. •Educate the team on prohibited actions involving the utilisation of wildlife (i.e. poaching / harvesting) through training and notices. 		Daily during construction All Phases All Phases	AlpoMega Management, Construction Crew, Zoologist AlpoMega Management AlpoMega Management/ External Ecologist (Advisory Capacity)
	Minimize displacement of fauna that utilize alien trees.	<ul style="list-style-type: none"> •Routinely walk fence lines and within the Ridge habitat to remove snares. •Slowly replace alien trees with indigenous trees, which flower during different times of the years, so as to provide a continued source of arboreal habitat and other resources for fauna (such as pollen for bees). 		All Phases	AlpoMega Management / Farm Management AlpoMega Management/ External Ecologist (Advisory Capacity)
Introduction & proliferation of alien spp. - Competition and change in structure					

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION		MONITORING	
Minimize the introduction and spread of invasive alien species during construction	Regulate / limit access by potential vectors of alien plants.	•Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area.	Prior to and during construction	AlphoMega Management / Farm Management
		•Continue with the removal of alien wooded species. However, this must be supplemented with some indigenous species to provide food resources for species such as the bees present on site.	Pre Construction and continued through the life of the project	AlphoMega Management / Farm Management
	Maintain a tidy construction site.	•Prohibit the introduction of domestic animals such as dogs and cats. •If any landscaping is to be done -Only plant locally indigenous flora.	All Phases All Phases	AlphoMega Management AlphoMega Management / horticulturist
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	•Keep construction activities neat and tidy. When complete remove all sand piles and landscape all uneven ground while re-establishing a good topsoil layer. •Remove Category species using mechanical methods and minimize soil disturbance as far as possible.	During construction During construction	AlphoMega Management, Construction Crew AlphoMega Management, Construction Crew
Increase in dust and erosion				
Minimize dust and erosion	Implement effective measures to control dust and erosion.	•Limit vehicles, people and materials to the construction site.	During construction	AlphoMega Management, Construction Crew
		•Commence (and preferably complete) construction during winter, when the risk of erosion should be least.	During construction	
		•Revegetate denude areas with locally indigenous flora a.s.a.p. •Implement erosion protection measures on site to reduce erosion and sedimentation of downstream areas. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.	During construction During construction	
		•Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting of the entrance road.	During construction	
Sensory disturbances				
Minimize sensory disturbance of fauna	Time construction activities to minimize sensory disturbance of fauna.	•Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	During pre-construction and construction planning	AlphoMega Management, Construction Crew
		•Minimize noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds.	Prior to and throughout construction	AlphoMega Management, Construction Crew
	Limit disturbance from noise.	•Limit construction activities to day time hours.	Throughout construction	AlphoMega Management, Construction Crew
	Limit disturbance from light.	•Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	Throughout construction	Construction Crew
OPERATION				
Environmental contamination				
No environmental contamination.	Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	•Ensure that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic, or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.	During design	CSIR / AlphoMega Management/ Agricultural experts
		•Adhere to best practice pig husbandry and waste disposal norms .	Throughout Operation	CSIR / AlphoMega Management/ Agricultural experts
		•Incorporate effective storm water management design aspects into the infrastructure plan	During design	CSIR / AlphoMega Management
		•Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste.	Throughout Operation	Farm Manager and Team
		•Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.	Prior to operation	AlphoMega Management and Farm Manager.

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	MONITORING		
	Ensure that there are appropriate control measures in place for any contamination event.	<ul style="list-style-type: none"> •Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists. •Educate workers regarding the handling of hazardous substances and about waste management and emergency procedures with regular training and notices and talks. 	At least annually during operation	AlphoMega Management and Farm Manager / External contamination specialists AlphoMega Management and Farm Manager.
Management of pest invertebrates				
Highly localized pest invertebrate control that does not affect non-target populations or taxa	Detect and control pest infestations before they become a problem through frequent and careful cleaning, monitoring and control.	<ul style="list-style-type: none"> • Clean floors regularly. • Provide sufficient ventilation and airflow to keep floors, bedding, and fodder as dry as possible. • Check that fan louvers work properly, and close fans completely when off. • Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water. • Use appropriately sloped and slatted floors to facilitate drainage. • Clean up excess fodder regularly from under troughs and feed bins • Effectively drain storm water from around pig houses • Keep areas surrounding pig houses free of spilled manure and litter • Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities. • Keep grass and weeds mowed to 5cm or less immediately around the facilities, to prevent insect growth • Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate animals from accessing the effluent. • Regularly empty slurry dam to prevent the accumulation of floating solids for extended periods of time (crust left on top of slurry soon become major breeding ground for flies) • Electrocutation devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps. 	During design, construction and operation	AlphoMega Management and Farm Manager and on-site team.
		<ul style="list-style-type: none"> • Ensure that measures to control pest invertebrates are tightly restricted to areas where these are problematic. Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist. 	When necessary, during operation	
Management of pest vertebrates				
Minimal and humane control of pest vertebrates that does not affect non-target individuals or taxa.	Detect pest infestations before they become a problem through frequent and careful monitoring.	<ul style="list-style-type: none"> • Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent vertebrate animals from accessing the effluent • Manage and prevent access to fodder, especially feed wastage around the houses, feeders. • Control rodents through effective sanitation, rodent proofing and killing. • Glue boards and traps can be used in small areas, but in larger areas (over 12,000 sq ft) baits are more practical. • Rodenticides are not advised. • The most effective control for indigenous birds is screening production house air inlets and open windows with 2x2cm wire mesh. 	When necessary, during operation	AlphoMega Management and Farm Manager
Transmission of diseases				
No transmission of diseases to wildlife.	Ensure that pests and other potential vectors are unable to enter areas where they might encounter production animals, carcasses, excrement or bedding, by thoroughly sealing these areas using effective, humane and environmentally-friendly means.	<ul style="list-style-type: none"> • Maintain the appropriate pest control measures • Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste. • Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate and vertebrate animals from accessing the effluent 	Life of operation particularly at the onset of the rainy season	Farm Manager and Team
			Throughout Operation	Farm Manager and Team
			Throughout Operation	Farm Manager and Team
Harvesting of CI or medicinal flora				
No harvesting of CI flora.	Harvesting of indigenous flora for medicine, fire wood, building materials, and other purposes must be prohibited.	<ul style="list-style-type: none"> • Education of the Farm Management and team required prior to operation and with yearly refresher talks. 	When necessary, during operation	Farm Manager and Team
Altered burning				
No fire on site, without prohibiting wild fires in the surrounding natural	Ensure that flammable materials are stored in an appropriate safe house. Ensure that there are appropriate control measures in place for any accidental	<ul style="list-style-type: none"> • Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures. 	Prior to, and through operation	CSIR /AlphoMega Management and Farm Manager

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	MONITORING		
environment	fires. If artificial burning is considered necessary to reduce risks to human and infrastructure safety from wild fires, a fire management plan should be compiled with input from an appropriate floral specialist, and diligently implemented. Annual wild fires should be strictly prohibited.	<ul style="list-style-type: none"> Maintain an effective fire break between the development area and the surrounding natural environment (especially the ridge to the north, where the fire-dependent Highveld Blue butterfly may occur) Educate workers about the plan and emergency procedures with regular training and notices. 	Prior to, and at least annually during operation	CSIR /AlphoMega Management and Farm Manager
			At least annually during operation	CSIR /AlphoMega Management and Farm Manager
Introduction & proliferation of alien spp.				
Minimize the introduction and spread of invasive alien species during operation.	Regulate / limit access by potential vectors of alien plants.	<ul style="list-style-type: none"> Carefully regulate / limit access by vehicles and materials to the site. 		AlphoMega Management and Farm Manager
	Maintain a neat and tidy production facility.	<ul style="list-style-type: none"> Prohibit the introduction of domestic animals such as dogs and cats. Only plant locally indigenous flora (if landscaping is to be implement). Employ best practices regarding the tilling of soil and weed management. 	Throughout Operation	Farm Management/Agricultural experts
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	<ul style="list-style-type: none"> Minimize the accumulation or dispersal of excess fodder on site. Mechanical removal of these species is recommended. However, the removal must be carefully performed so as to not excessively disturb the soil layer. Alien debris could be donated to a local community. Be especially pro-active around the pig effluent slurry dam, fodder loading bays as well as in and around the croplands. 		Farm Management CSIR /AlphoMega Management and Farm Manager, with advice from a floral specialist
Sensory disturbances				
Minimize sensory disturbance of fauna.	Limit the effects of light pollution on nocturnal fauna (including numerous insects, bats and hedgehogs).	<ul style="list-style-type: none"> Minimize essential lighting. Ensure that all outdoor lights are angled downwards and/or fitted with hoods. Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects. Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV. 	During design, construction and operation	AlphoMega Management and Farm Manager
	Limit the effects of noise from pigs and operational activities on fauna such as carnivores, owls, korhaans and Secretarybirds.	<ul style="list-style-type: none"> Minimize unavoidable noise. Conduct regular maintenance of machinery and pig house ventilation systems / fans (if any). Implement an automated pig feeding system to reduce pig noise upon human entry at feeding times. 	Prior to and during operation	AlphoMega Management and Farm Manager/ External Noise Specialists
DECOMMISSIONING				
Introduction & proliferation of alien spp. - Competition and change in structure				
Minimize introduction and spread of invasive alien species during decommissioning	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	<ul style="list-style-type: none"> Remove Category species using mechanical methods and minimize soil disturbance as far as possible. 	Throughout decommissioning until all Category 1b and Category 2 alien species have been effectively removed from the site	AlphoMega Management / Farm Management
Sensory disturbances				
Minimize sensory disturbance of fauna.	Time demolition / rehabilitation activities to minimize sensory disturbance of fauna.	<ul style="list-style-type: none"> Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. Minimize noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds. 	Throughout decommissioning	Project and Construction managers
	Limit disturbance from noise.		Throughout decommissioning	AlphoMega Management / Farm Management
	Limit disturbance from light.	<ul style="list-style-type: none"> Limit demolition activities to day time hours. 	Throughout decommissioning	AlphoMega Management / Farm Management
		<ul style="list-style-type: none"> Minimize or eliminate security and other lighting, to reduce the disturbance of nocturnal fauna. 	Throughout decommissioning	AlphoMega Management / Farm Management
	Effectively control dust.	<ul style="list-style-type: none"> Implement environmentally-friendly dust control measures (e.g. mulching and wetting) where and when dust is problematic. Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate specialists. Implement the selected control measure(s) where dust is problematic. Revegetate denude areas with locally indigenous flora a.s.a.p. 	When necessary, during decommissioning	AlphoMega Management / Farm Management
			Decommissioning onwards	AlphoMega Management / Farm Management

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12. Appendices

12.1. Appendix 1 Plant species identified within the different habitats

Family	Species	Growth forms	Schiza-Seri Grassland	Scir-Erag Grassland	Melinis- Old Fields	Eragr-Cyno- Disturbed	Rocky Habitats	Alien Bushclumps
ACANTHACEAE	<i>Chaetacanthus sp.</i>	Dwarf shrub					•	
AMARANTHACEAE	• <i>Gomphrena celosioides Mart.</i>	Herb			•	•		•
AMARYLLIDACEAE	<i>Crinum cf graminicola I. Verd.</i>	Geophyte	•					
AMARYLLIDACEAE	<i>Haemanthus cf. humilis Jacq. subsp. humilis</i>	Geophyte					•	
ANACARDIACEAE	<i>Searsia magalismontana (Sond.) Moffett subsp. magalismontana</i>	Dwarf shrub					•	
APOCYNACEAE	<i>Gomphocarpus (burchelli) tomentosus Burch. subsp. tomentosus</i>	Herb					•	
ASPARAGACEAE	<i>Asparagus laricinus Burch.</i>	Shrub		•		•		
ASPHODELACEAE	<i>Bulbine spp</i>	Geophyte	•					
ASTERACEAE	• <i>Bidens pilosa L.</i>	Herb				•		•
ASTERACEAE	• <i>Conyza spp</i>	Herb				•		•
ASTERACEAE	<i>Dicoma anomala Sond. subsp. anomala</i>	Herb					•	
ASTERACEAE	<i>Euryops laxus (Harv.) Burt Davy</i>	Herb	•					
ASTERACEAE	<i>Felicia muricata (Thunb.) Nees subsp. muricata</i>	Shrub	•					
ASTERACEAE	<i>Geigeria burkei Harv.</i>	Herb	•					
ASTERACEAE	<i>Gerbera spp</i>	Herb					•	
ASTERACEAE	<i>Helichrysum (coriaceum) rotundatum Harv.</i>	Dwarf shrub	•					
ASTERACEAE	<i>Helichrysum nudifolium (L.) Less. var. nudifolium</i>	Herb	•					



Family	Species	Growth forms	Schiza-Seri Grassland	Scir-Erag Grassland	Melinis- Old Fields	Eragr-Cyno- Disturbed	Rocky Habitats	Alien Bushclumps
ASTERACEAE	<i>Helichrysum setosum</i> Harv.	Herb					•	
ASTERACEAE	<i>Helichrysum</i> spp	Geophyte					•	
ASTERACEAE	<i>Lopholaena coriifolia</i> (Sond.) E.Phillips & C.A.Sm.	Succulent					•	
ASTERACEAE	<i>Polydora (Vernonia) poskeana</i> (Vatke & Hildebr.) H.Rob.sens.lat.	Herb			•			
ASTERACEAE	• <i>Schkuhria pinnata</i> (Lam.) Kuntze ex Thell.	Herb				•		•
ASTERACEAE	<i>Senecio lydenburgensis</i> Hutch. & Burt Davy	Herb	•					
ASTERACEAE	<i>Seriphium plumosum</i> L.	Shrub	•	•	•	•		
ASTERACEAE	• <i>Tagetes minuta</i> L.	Herb				•		•
CAPPARACEAE	<i>Cleome cf. rubella</i> Burch.	Herb				•		
CAPPARACEAE	<i>Cleome maculata</i> (Sond.) Szyszyl.	Herb	•	•				
COMMELINACEAE	<i>Commelina africana</i> L. var. <i>africana</i>	Herb	•					
CONVOLVULACEAE	<i>Merremia tridentata</i>	Herb					•	
CRASSULACEAE	<i>Adromischus umbraticola</i> C.A.Sm. subsp. <i>umbraticola</i>	Dwarf shrub					•	
CRASSULACEAE	<i>Crassula setulosa</i> Harv.	Succulent					•	
CRASSULACEAE	<i>Kalanchoe thyrsiflora</i> Harv.	Succulent					•	
CUCURBITACEAE	<i>Cucumis zeyheri</i> Sond.	Herb				•		
CYPERACEAE	<i>Bulbostylis burchellii</i> (Fical. & Hiern) C.B.Cl	Cyperoid		•				
CYPERACEAE	<i>Cyperus rupestris</i> Kunth var. <i>rupestris</i>	Cyperoid					•	
CYPERACEAE	<i>Cyperus</i> spp.	Cyperoid					•	
CYPERACEAE	<i>Scirpoides burkei</i> (C.B.Clarke) Goetgh., Muasya & D.A.Simpson	Cyperoid		•			•	
EBENACEAE	<i>Diospyros lycioides</i> Desf. subsp. <i>lycioides</i>	Shrub				•	•	
ERIOSPERMACEAE	<i>Eriospermum</i> spp	Geophyte					•	



Family	Species	Growth forms	Schiza-Seri Grassland	Scir-Erag Grassland	Melinis- Old Fields	Eragr-Cyno- Disturbed	Rocky Habitats	Alien Bushclumps
FABACEAE	<i>Acacia karroo</i> Hayne	Shrub, tree					•	
FABACEAE	• <i>Acacia mearnsii</i> De Wild.	Tree						•
FABACEAE	<i>Elephantorrhiza elephantina</i> (Burch.) Skeels	Dwarf shrub	•	•				
FABACEAE	• <i>Eucalyptus sideroxylon</i> A.Cunn. subsp. <i>Sideroxylon</i>	Tree				•		•
FABACEAE	<i>Indigofera cf melanadenia</i>	Herb					•	
GERANIACEAE	<i>Pelargonium luridum</i> (Andrews) Sweet	Geophyte, succulent					•	
HYACINTHACEAE	<i>Ledebouria cf. revoluta</i> (L.f.) Jessop	Geophyte		•				
HYPOXIDACEAE	<i>Hypoxis iridifolia</i> Baker	Geophyte					•	
HYPOXIDACEAE	<i>Hypoxis rigidula</i> Baker var. <i>rigidula</i>	Geophyte	•					
LAMIACEAE	<i>Leonotis cf. dysophylla</i> Benth.	Shrub				•		
LAMIACEAE	<i>Leonotis microphylla</i> Skan.	Shrub					•	
MELIACEAE	• <i>Melia azedarach</i> L.	Tree	•					•
MORACEAE	• <i>Morus alba</i>	Tree						•
PINACEAE	• <i>Pinus spp</i>	Tree						•
POACEAE	<i>Aristida cf. bipartita</i>	Graminoid		•				
POACEAE	<i>Aristida congesta</i> Roem. & Schult. subsp. <i>congesta</i>	Graminoid	•		•	•		
POACEAE	<i>Aristida diffusa</i> Trin. subsp. <i>diffusa</i>	Graminoid					•	
POACEAE	<i>Aristida junciformis</i> Trin. & Rupr. subsp. <i>junciformis</i>	Graminoid		•				
POACEAE	<i>Brachiaria serrata</i> (Thunb.) Stapf	Graminoid		•				
POACEAE	<i>Cymbopogon plurinodis</i>	Herb					•	
POACEAE	<i>Cynodon dactylon</i> (L.) Pers.	Graminoid		•	•	•		•



Family	Species	Growth forms	Schiza-Seri Grassland	Scir-Erag Grassland	Melinis- Old Fields	Eragr-Cyno- Disturbed	Rocky Habitats	Alien Bushclumps
POACEAE	<i>Digitaria eriantha</i> Steud.	Graminoid				•		
POACEAE	<i>Eragrostis curvula</i> (Schrud.) Nees	Graminoid				•		•
POACEAE	<i>Eragrostis gummiflua</i> Nees	Graminoid	•	•	•	•	•	
POACEAE	<i>Eragrostis lehmanniana</i> Nees var. <i>lehmanniana</i>	Graminoid	•	•	•	•		
POACEAE	<i>Eragrostis nindensis</i> Ficalho & Hiern	Graminoid					•	
POACEAE	<i>Eragrostis racemosa</i> (Thunb.) Steud.	Graminoid	•				•	
POACEAE	<i>Eragrostis rigidior</i> Pilg.	Graminoid	•					
POACEAE	<i>Eragrostis</i> spp	Graminoid					•	
POACEAE	<i>Hyparrhenia</i> cf. <i>filipendula</i> (Hochst.) Stapf	Graminoid				•		
POACEAE	<i>Hyparrhenia hirta</i> (L.) Stapf	Graminoid	•		•	•	•	
POACEAE	<i>Loudetia simplex</i> (Nees) C.E.Hubb.	Graminoid					•	
POACEAE	<i>Melinis nerviglumis</i> (Franch.) Zizka	Graminoid					•	
POACEAE	<i>Melinis repens</i> (Willd.) Zizka subsp. <i>repens</i>	Graminoid	•		•	•	•	
POACEAE	<i>Monocymbium cerasiiforme</i> (Nees) Stapf	Herb					•	
POACEAE	<i>Perotis patens</i> Gand.	Graminoid			•			
POACEAE	<i>Phragmites australis</i> (Cav.) Steud.	Graminoid				•		
POACEAE	<i>Pogonarthria squarrosa</i> (Roem. & Schult.) Pilg.	Graminoid	•		•		•	
POACEAE	<i>Schizachyrium sanguineum</i> (Retz.) Alston	Graminoid	•			•	•	
POACEAE	<i>Setaria sphacelata</i> (Schumach.) Stapf & C.E.Hubb. ex M.B.Moss var. <i>sphacelata</i>	Graminoid		•				
POACEAE	<i>Sporobolus africanus</i> (Poir.) Robyns & Tournay	Graminoid				•		
POACEAE	<i>Sporobolus pectinatus</i> Hack.	Graminoid					•	



Family	Species	Growth forms	Schiza-Seri Grassland	Scir-Erag Grassland	Melinis- Old Fields	Eragr-Cyno- Disturbed	Rocky Habitats	Alien Bushclumps
POACEAE	<i>Themeda triandra</i> Forssk.	Graminoid	•				•	
POACEAE	<i>Trichoneura grandiglumis</i> (Nees) Ekman	Graminoid			•			
POACEAE	<i>Tristachya rehmannii</i> Hack.	Graminoid	•					
POACEAE	<i>Urochloa mosambicensis</i> (Hack.) Dandy	Graminoid				•		
RANUNCULACEAE	<i>Clematopsis brachiata</i>	Climber					•	
RUBIACEAE	<i>Oldenlandia herbacea</i> (L.) Roxb. var. <i>herbacea</i>	Herb					•	
RUBIACEAE	• <i>Richardia brasiliensis</i> Gomes	Herb			•			•
SANTALACEAE	<i>Thesium</i> spp	Parasite	•					
SCROPHULARIACEAE	<i>Selago densiflora</i> Rolfe	Herb		•				
SELAGINELLACEAE	<i>Selaginella dregei</i> (C.Presl) Hieron.	Geophyte					•	
SINOPTERIDACEAE	<i>Cheilanthes viridis</i> (Forssk.) Sw. var. <i>viridis</i>	Geophyte					•	
SINOPTERIDACEAE	<i>Cheilanthes</i> spp	Geophyte					•	
SINOPTERIDACEAE	<i>Pellaea calomelanos</i> (Sw.) Link var. <i>calomelanos</i>	Geophyte					•	
SOLANACEAE	• <i>Datura stramonium</i> L.	Shrub				•		
ZYGOPHYLLACEAE	<i>Tribulus terrestris</i> L.	Herb			•			
KEY:								
Schiza-Seri Rocky Grassland -: <i>Schizachyrium</i> - <i>Seriphium</i> Rocky Grassland								
Scir-Erag Grassland : - <i>Scirpoides</i> - <i>Eragrostis</i> Grassland								
Eragr-Cyno-Disturbed : <i>Eragrostis</i> - <i>Cynodon</i> - <i>Hyparrhenia</i> Disturbed Grassland								
Melinis Old Fields : <i>Melinis</i> - <i>Eragrostis</i> Old Fields								
• <i>Alien species</i> ; DEC-Declining; LC-Least Concern; NE-Not Evaluated								



12.2. Appendix 2 Newman's (2002) modified bird categories

CATEGORY	DESCRIPTION
1. Ocean birds	Albatrosses, gannets/boobies, gulls, penguins, petrels, prions, shearwaters, skimmer, skuas, subAntarctic birds, terns, & tropic/frigatebirds.
2. Inland water birds	Pelicans, cormorants, herons, egrets, storks, hamerkop, flamingos, spoonbill, ibises & finfoot.
3. Ducks & wading birds	Ducks, geese, grebes, coot, gallinules, crakes, flufftails, snipes, plovers, lapwings, waders, jacanas, oystercatchers, curlews, avocet & stilts.
4. Large terrestrial birds	Thicknees, pratincoles, coursers, korhaans, bustards, cranes, quail, francolins, spurfowl, buttonquail, guineafowl, ostrich & secretarybird.
5. Raptors	Vultures, kites, eagles, buzzards, sparrowhawks, hawks, harriers, falcons & kestrels.
6. Owls & nightjars	Owls & nightjars.
7. Sandgrouse, doves, etc	Sandgrouse, doves, pigeons, parrots, lovebirds, trogon, turacos & go-away birds (louries), cuckoos & coucals.
8. Aerial feeders, etc	Swallows, martins, swifts, mousebirds, bee-eaters, kingfishers, rollers, hoopoes, hornbills, barbets, woodpeckers, wryneck & honeyguides.
9. Cryptic & elusive insect-eaters	Larks, finchlarks, pipits, wagtails, drongos, black flycatcher, cuckooshrikes, crows, orioles, bulbuls, tits, babblers, thrushes, chats & robins.
10. Regular insect-eaters	Warblers, apalises, titbabblers, eremomelas, carmoropteras, grassbird, cisticolas, prinias, flycatchers, batises, shrikes, boubous, tchagras, helmetshrikes & starlings.
11. Oxpeckers & nectar feeders	Sunbirds, oxpeckers, white-eyes & queleas.
12. Seedeaters	Sparrows, weavers, widow birds, bishops, finches, firefinches, waxbills, manikins, whydahs, canaries, siskins & buntings.

12.3. Appendix 3 Mammal list for study area

ORDER & SCIENTIFIC NAME	COMMON NAME	SA RED DATA STATUS	GLOBAL RED DATA STATUS	STATUS UNDER NEM:BA	LoO
CARNIVORA	Carnivores				
<i>Atilax paludinosus</i>	Water Mongoose	LC	LC (D)		3
<i>Canis mesomelas</i>	Black-backed Jackal	LC	LC (S)		2
<i>Caracal caracal</i>	Caracal	LC	LC (U)		3
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC (S)		2
<i>Felis nigripes</i>	Black-footed Cat	LC	VU (D)	PS	4
<i>Felis silvestris</i>	African Wild Cat	LC	LC (D)		3
<i>Galerella sanguinea</i>	Slender Mongoose	LC	LC (S)		2
<i>Genetta genetta</i>	Small-spotted Genet	LC	LC (S)		2
<i>Genetta tigrina</i>	Large-spotted Genet	LC	LC (U)		2
<i>Hyaena brunnea</i>	Brown Hyaena	NT	NT (D)	PS	3
<i>Ichneumia albicauda</i>	White-tailed Mongoose	LC	LC (S)		3
<i>Ictonyx striatus</i>	Striped Polecat	LC	LC (S)		2
<i>Leptailurus serval</i>	Serval	NT	LC (S)	PS	2
<i>Panthera pardus</i>	Leopard	LC	NT (D)	PS	3
<i>Poecilogale albinucha</i>	African Weasel	DD	LC (U)		2
<i>Proteles cristatus</i>	Aardwolf	LC	LC (S)		2
<i>Suricata suricatta</i>	Suricate	LC	LC (U)		2
<i>Vulpes chama</i>	Cape Fox	LC	LC (S)	PS	2
CHIROPTERA	Bats				
<i>Miniopterus natalensis</i>	Natal Long-fingered Bat	NT	LC (U)		2
<i>Myotis tricolor</i>	Temminck's Myotis	LC	LC (U)		2
<i>Neoromicia capensis</i>	Cape Serotine	LC	LC (S)		2
<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	LC	LC (U)		2
<i>Rhinolophus blasii</i>	Blasius's Horseshoe Bat	NT	LC (D)		4
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC	LC (U)		2
<i>Scotophilus dinganii</i>	Yellow-bellied House Bat	LC	LC (U)		3
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat	LC	LC (U)		2
EULIPOTYPHLA	Hedgehog & shrews				
<i>Atelerix frontalis</i>	Southern African Hedgehog	NT	LC (S)	PS	2
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	DD	LC (S)		2
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	DD	LC (U)		3
<i>Crocidura silacea</i>	Lesser Grey-brown Musk Shrew	DD	LC (S)		3
<i>Myosorex varius</i>	Forest Shrew	DD	LC (S)		3
<i>Suncus infinitesimus</i>	Least Dwarf Shrew	DD	LC (U)		2
<i>Suncus varilla</i>	Lesser Dwarf Shrew	DD	LC (U)		2



ORDER & SCIENTIFIC NAME	COMMON NAME	SA RED DATA STATUS	GLOBAL RED DATA STATUS	STATUS UNDER NEM:BA	LoO
HYRACOIDEA	Hyraxes				
<i>Procavia capensis</i>	Rock Hyrax	LC	LC (U)		3
LAGOMORPHA	Hares & rabbits				
<i>Lepus capensis</i>	Cape Hare	LC	LC (D)		3
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC (D)		1
<i>Pronolagus randensis</i>	Jameson's Red Rock Rabbit	LC	LC (U)		2
MACROSCELIDEA	Elephant-shrews				
<i>Elephantulus myurus</i>	Rock Elephant-shrew	LC	LC (S)		2
PRIMATES	Primates				
<i>Cercopithecus pygerythrus</i>	Vervet Monkey	LC	LC (S)		2
<i>Galago moholi</i>	Southern Lesser Galago	LC	LC (S)		3
<i>Papio ursinus</i>	Chacma Baboon	LC	LC (S)		4
RODENTIA	Rodents				
<i>Aethomys ineptus</i>	Tete Veld Rat	LC	LC (U)		2
<i>Aethomys namaquensis</i>	Namaqua Rock Mouse	LC	LC (S)		2
<i>Cryptomys hottentotus</i>	Common Mole-rat	LC	LC (S)		1
<i>Dendromus melanotis</i>	Grey Climbing Mouse	LC	LC (S)		3
<i>Hystrix africaeaustralis</i>	Porcupine	LC	LC (S)		2
<i>Mastomys coucha</i>	Multimammate Mouse	LC	LC (S)		2
<i>Mystromys albicaudatus</i>	White-tailed Rat	EN	EN (D)		4
<i>Otomys irroratus</i>	Vlei Rat	LC	LC (S)		3
<i>Pedetes capensis</i>	Springhare	LC	LC (U)		2
<i>Rhabdomys pumilio</i>	Striped Mouse	LC	LC (S)		2
<i>Saccostomus campestris</i>	Pouched Mouse	LC	LC (S)		2
<i>Steatomys krebsii</i>	Krebs's Fat Mouse	LC	LC (S)		2
<i>Steatomys pratensis</i>	Fat Mouse	LC	LC (S)		3
<i>Tatera brantsii</i>	Highveld Gerbil	LC	LC (U)		1
<i>Tatera leucogaster</i>	Bushveld Gerbil	DD	LC (S)		3
<i>Thryonomys swinderianus</i>	Greater Cane Rat	LC	LC (U)		3
<i>Xerus inauris</i>	Cape Ground Squirrel	LC	LC (S)		2
RUMINANTIA	Even-toed ungulates				
<i>Raphicerus campestris</i>	Steenbok	LC	LC (S)		2
<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC (S)		2
<i>Tragelaphus strepsiceros</i>	Kudu	LC	LC (S)		4
TUBULIDENTATA	Aardvark				
<i>Orycteropus afer</i>	Aardvark	LC	LC (U)		4

Status: D = Declining; DD = Data Deficient; EN = Endangered; I = Increasing; LC = Least Concern; NT = Near Threatened; PS = Protected Species; S = Stable; U

ORDER & SCIENTIFIC NAME	COMMON NAME	SA RED DATA STATUS	GLOBAL RED DATA STATUS	STATUS UNDER NEM:BA	LoO
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= Unknown population trend; VU = Vulnerable

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Friedmann & Daly (2004); Stuart & Stuart (2007); Monadjem *et al.* (2010); IUCN (2013.1); ToPS List (2015); MammalMAP (2016)

12.4. Appendix 4 Bird list for study area

CATEGORY & SCIENTIFIC NAME	COMMON NAME	SA RED DATA STATUS	GLOBAL RED DATA STATUS	STATUS UNDER NEM:BA	SABAP	LoO
1. Ocean birds						
<i>Pelecanus rufescens</i>	Pink-backed Pelican	VU	LC (S)		1	4
2. Inland water birds						
<i>Anhinga rufa</i>	African Darter	LC	LC (D)		1	4
<i>Ardea cinerea</i>	Grey Heron	LC	LC (U)		1	2
<i>Ardea goliath</i>	Goliath Heron	LC	LC (S)		1	4
<i>Ardea melanocephala</i>	Black-headed Heron	LC	LC (I)		1	1
<i>Ardea purpurea</i>	Purple Heron	LC	LC (D)		1	4
<i>Ardeola ralloides</i>	Squacco Heron	LC	LC (D)		1	4
<i>Bostrychia hagedash</i>	Hadedda Ibis	LC	LC (I)		1	1
<i>Bubulcus ibis</i>	Cattle Egret	LC	LC (I)		1	1
<i>Egretta alba</i>	Great Egret	LC	LC (U)		1	4
<i>Chlidonias hybrida</i>	Whiskered Tern	LC	LC (S)		1	4
<i>Chlidonias leucopterus</i>	White-winged Tern	LC (NB)	LC (S)		1	4
<i>Ciconia abdimii</i>	Abdim's Stork	LC (NB)	LC (D)		1	4
<i>Ciconia ciconia</i>	White Stork	LC (NB)	LC (I)		1	4
<i>Egretta ardesiaca</i>	Black Heron	LC	LC (S)		1	4
<i>Egretta garzetta</i>	Little Egret	LC	LC (I)		1	4
<i>Glareola nordmanni</i>	Black-winged Pratincole	NT (NB)	NT (D)		1	4
<i>Ixobrychus minutus</i>	Little Bittern	LC	LC (D)			4
<i>Larus cirrocephalus</i>	Grey-headed Gull	LC	LC (S)		1	4
<i>Egretta intermedia</i>	Yellow-billed Egret	LC	LC (D)		1	4
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	LC	LC (D)		1	4
<i>Phalacrocorax africanus</i>	Reed Cormorant	LC	LC (D)		1	4
<i>Phalacrocorax carbo</i>	White-breasted Cormorant	LC	LC (I)		1	4
<i>Phoenicopus minor</i>	Lesser Flamingo	NT	NT (D)		1	4
<i>Phoenicopus ruber</i>	Greater Flamingo	NT	LC (I)		1	4
<i>Platalea alba</i>	African Spoonbill	LC	LC (S)		1	4
<i>Plegadis falcinellus</i>	Glossy Ibis	LC	LC (D)		1	4
<i>Scopus umbretta</i>	Hamerkop	LC	LC (S)		1	4
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	LC	LC (D)		1	2
3. Ducks & wading birds						
<i>Actitis hypoleucos</i>	Common Sandpiper	LC (NB)	LC (D)		1	4
<i>Alopochen aegyptiacus</i>	Egyptian Goose	LC	LC (D)		1	2
<i>Amaurornis flavirostris</i>	Black Crake	LC	LC (U)		1	4
<i>Anas capensis</i>	Cape Teal	LC	LC (I)		1	4



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<i>Anas erythrorhyncha</i>	Red-billed Teal	LC	LC (D)		1	4
<i>Anas hottentota</i>	Hottentot Teal	LC	LC (D)		1	4
<i>Anas smithii</i>	Cape Shoveler	LC	LC (I)		1	4
<i>Anas sparsa</i>	African Black Duck	LC	LC (D)		1	4
<i>Anas undulata</i>	Yellow-billed Duck	LC	LC (S)		1	4
<i>Calidris ferruginea</i>	Curlew Sandpiper	LC (NB)	LC (I)		1	4
<i>Calidris minuta</i>	Little Stint	LC (NB)	LC (D)		1	4
<i>Charadrius hiaticula</i>	Common Ringed Plover	LC (NB)	LC (D)		1	4
<i>Charadrius pecuarius</i>	Kittlitz's Plover	LC	LC (U)		1	4
<i>Charadrius tricollaris</i>	Three-banded Plover	LC	LC (U)		1	4
<i>Dendrocygna bicolor</i>	Fulvous Duck	LC	LC (D)		1	4
<i>Dendrocygna viduata</i>	White-faced Duck	LC	LC (I)		1	4
<i>Fulica cristata</i>	Red-knobbed Coot	LC	LC (D)		1	4
<i>Gallinago nigripennis</i>	African Snipe	LC	LC (U)		1	4
<i>Gallinula chloropus</i>	Common Moorhen	LC	LC (U)		1	4
<i>Himantopus himantopus</i>	Black-winged Stilt	LC	LC (I)		1	4
<i>Limosa limosa</i>	Black-tailed Godwit	Not assessed	NT (D)		1	4
<i>Netta erythrophthalma</i>	Southern Pochard	LC	LC (D)		1	4
<i>Oxyura maccoa</i>	Maccoa Duck	NT	NT (D)		1	4
<i>Philomachus pugnax</i>	Ruff	LC (NB)	LC (D)		1	4
<i>Plectropterus gambensis</i>	Spur-winged Goose	LC	LC (I)		1	3
<i>Podiceps cristatus</i>	Great Crested Grebe	LC	LC (U)		1	4
<i>Podiceps nigricollis</i>	Black-necked Grebe	LC	LC (U)		1	4
<i>Porphyrio madagascariensis</i>	African Purple Swamphen	LC	LC (U)		1	4
<i>Rallus caerulescens</i>	African Rail	LC	LC (U)		1	4
<i>Recurvirostra avosetta</i>	Pied Avocet	LC	LC (U)		1	4
<i>Sarkidiornis melanotos</i>	Comb Duck	LC	LC (D)		1	4
<i>Sarothrura rufa</i>	Red-chested Flufftail	LC	LC (D)		1	4
<i>Tachybaptus ruficollis</i>	Little Grebe	LC	LC (D)		1	4
<i>Tadorna cana</i>	South African Shelduck	LC	LC (I)		1	4
<i>Thalassornis leuconotus</i>	White-backed Duck	LC	LC (D)		1	4
<i>Tringa glareola</i>	Wood Sandpiper	LC (NB)	LC (S)		1	4
<i>Tringa nebularia</i>	Common Greenshank	LC (NB)	LC (S)		1	4
<i>Tringa stagnatilis</i>	Marsh Sandpiper	LC (NB)	LC (D)		1	4
<i>Vanellus armatus</i>	Blacksmith Lapwing	LC	LC (I)		1	2
<i>Vanellus coronatus</i>	Crowned Lapwing	LC	LC (I)		1	1
<i>Vanellus senegallus</i>	African Wattled Lapwing	LC	LC (S)		1	2

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4. Large terrestrial birds						
<i>Afrotis afraoides</i>	Northern Black Korhaan	LC			1	2
<i>Anthropoides paradiseus</i>	Blue Crane	NT	VU (S)	PS	1	4
<i>Burhinus capensis</i>	Spotted Thick-knee	LC	LC (S)		1	2
<i>Coturnix coturnix</i>	Common Quail	LC	LC (D)		1	2
<i>Cursorius temminckii</i>	Temminck's Courser	LC	LC (S)		1	3
<i>Eupodotis caerulescens</i>	Blue Korhaan	LC	NT (S)			2
<i>Francolinus coqui</i>	Coqui Francolin	LC	LC (S)			2
<i>Scleroptila levaillantoides</i>	Orange River Francolin	LC	LC (S)		1	2
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	LC	LC (S)		1	2
<i>Numida meleagris</i>	Helmeted Guineafowl	LC	LC (S)		1	1
<i>Pavo cristatus</i>	Common Peacock	AL	LC (S)			5
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU (D)		1	3
<i>Struthio camelus</i>	Common Ostrich	LC	LC (D)			5
<i>Turnix sylvaticus</i>	Kurrichane Buttonquail	LC	LC (D)		1	2
5. Raptors						
<i>Milvus aegyptius</i>	Yellow-billed Kite	LC			1	2
<i>Accipiter ovampensis</i>	Ovambo Sparrowhawk	LC	LC (I)		1	2
<i>Buteo vulpinus</i>	Steppe Buzzard	LC (NB)	LC (I)		1	2
<i>Circaetus pectoralis</i>	Black-chested Snake-eagle	LC	LC (U)		1	3
<i>Circus pygargus</i>	Montagu's Harrier	LC (NB)	LC (D)		1	2
<i>Circus ranivorus</i>	African Marsh-harrier	VU	LC (D)		1	4
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC	LC (S)		1	1
<i>Falco amurensis</i>	Amur Falcon	LC (NB)	LC (S)		1	2
<i>Falco biarmicus</i>	Lanner Falcon	VU	LC (I)		1	2
<i>Falco naumanni</i>	Lesser Kestrel	VU (NB)	LC (S)		1	2
<i>Falco rupicoloides</i>	Greater Kestrel	LC	LC (S)		1	2
<i>Falco rupicolus</i>	Rock Kestrel	LC			1	2
<i>Gyps coprotheres</i>	Cape Vulture	EN	VU (D)	EN	1	4
<i>Haliaeetus vocifer</i>	African Fish-eagle	LC	LC (S)			4
<i>Lophaetus occipitalis</i>	Long-crested Eagle	LC	LC (I)		1	3
6. Owls & nightjars						
<i>Asio capensis</i>	Marsh Owl	LC	LC (S)		1	3
<i>Bubo africanus</i>	Spotted Eagle-owl	LC	LC (S)		1	2
<i>Tyto alba</i>	Barn Owl	LC	LC (S)		1	2
<i>Tyto capensis</i>	African Grass-owl	VU	LC (D)			4
7. Sandgrouse, doves etc						

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<i>Centropus burchellii</i>	Burchell's Coucal	LC	LC (S)		1	2
<i>Centropus superciliosus</i>	White-browed Coucal	LC	LC (S)		1	4
<i>Chrysococcyx caprius</i>	Dideric Cuckoo	LC (B)	LC (S)		1	2
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	LC	LC (S)		1	2
<i>Clamator jacobinus</i>	Jacobin Cuckoo	LC (B)	LC (S)		1	3
<i>Columba guinea</i>	Speckled Pigeon	LC	LC (S)		1	2
<i>Columba livia</i>	Rock Dove	AL	LC (D)		1	1
<i>Corythaixoides concolor</i>	Grey Go-away-bird	LC	LC (S)		1	2
<i>Cuculus solitarius</i>	Red-chested Cuckoo	LC (B)	LC (S)		1	2
<i>Oena capensis</i>	Namaqua Dove	LC	LC (I)		1	2
<i>Streptopelia capicola</i>	Cape Turtle Dove	LC	LC (I)		1	1
<i>Streptopelia semitorquata</i>	Red-eyed Dove	LC	LC (I)		1	1
<i>Streptopelia senegalensis</i>	Laughing Dove	LC	LC (S)		1	1
8. Aerial feeders, etc						
<i>Alcedo cristata</i>	Malachite Kingfisher	LC	LC (S)		1	4
<i>Apus affinis</i>	Little Swift	LC	LC (I)		1	2
<i>Apus apus</i>	Common Swift	LC (NB)	LC (D)		1	3
<i>Apus barbatus</i>	African Black Swift	LC	LC (S)		1	3
<i>Apus caffer</i>	White-rumped Swift	LC (B)	LC (I)		1	2
<i>Apus horus</i>	Horus Swift	LC	LC (I)		1	3
<i>Ceryle rudis</i>	Pied Kingfisher	LC	LC (U)		1	4
<i>Colius colius</i>	White-backed Mousebird	LC	LC (I)		1	2
<i>Colius striatus</i>	Speckled Mousebird	LC	LC (I)		1	2
<i>Coracias caudatus</i>	Lilac-breasted Roller	LC	LC (S)		1	3
<i>Cypsiurus parvus</i>	African Palm-swift	LC	LC (I)		1	3
<i>Delichon urbicum</i>	Common House-martin	LC	LC (D)		1	2
<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	LC	LC (S)		1	2
<i>Hirundo abyssinica</i>	Lesser Striped-swallow	LC	LC (I)		1	3
<i>Hirundo albigularis</i>	White-throated Swallow	LC	LC (I)		1	2
<i>Hirundo cucullata</i>	Greater Striped-swallow	LC	LC (I)		1	2
<i>Hirundo fuligula</i>	Rock Martin	LC	LC (S)		1	2
<i>Hirundo rustica</i>	Barn Swallow	LC (NB)	LC (D)		1	2
<i>Hirundo semirufa</i>	Red-breasted Swallow	LC	LC (I)		1	3
<i>Hirundo spilodera</i>	South African Cliff-swallow	LC (B, N-End)	LC (I)		1	2
<i>Indicator indicator</i>	Greater Honeyguide	LC	LC (I)		1	2
<i>Indicator minor</i>	Lesser Honeyguide	LC	LC (S)		1	2
<i>Jynx ruficollis</i>	Red-throated Wryneck	LC	LC (I)		1	1



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<i>Lybius torquatus</i>	Black-collared Barbet	LC	LC (D)		1	1
<i>Megaceryle maximus</i>	Giant Kingfisher	LC	LC (D)		1	4
<i>Merops apiaster</i>	European Bee-eater	LC (B/NB)	LC (D)		1	2
<i>Merops bullockoides</i>	White-fronted Bee-eater	LC	LC (I)			2
<i>Merops pusillus</i>	Little Bee-eater	LC	LC (D)			2
<i>Phoeniculus purpureus</i>	Green Wood-hoopoe	LC	LC (D)		1	1
<i>Prodotiscus regulus</i>	Brown-backed Honeybird	LC	LC (I)		1	2
<i>Rhinopomastus cyanomelas</i>	Common Scimitarbill	LC	LC (D)		1	3
<i>Riparia cincta</i>	Banded Martin	LC	LC (I)		1	2
<i>Riparia paludicola</i>	Brown-throated Martin	LC	LC (D)		1	3
<i>Riparia riparia</i>	Sand Martin	LC (NB)	LC (D)		1	4
<i>Tachymarpis melba</i>	Alpine Swift	LC (B)	LC (S)		1	4
<i>Trachyphonus vaillantii</i>	Crested Barbet	LC	LC (D)		1	1
<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	LC	LC (I)		1	2
<i>Upupa africana</i>	African Hoopoe	LC			1	2
<i>Urocolius indicus</i>	Red-faced Mousebird	LC	LC (U)		1	2
9. Cryptic & elusive insect-eaters						
<i>Acrocephalus arundinaceus</i>	Great Reed-warbler	LC (NB)	LC (D)		1	4
<i>Acrocephalus baeticatus</i>	African Reed-warbler	LC (B)			1	4
<i>Acrocephalus gracilirostris</i>	Lesser Swamp-warbler	LC	LC (S)		1	4
<i>Acrocephalus palustris</i>	Marsh Warbler	LC (NB)	LC (I)		1	4
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	LC (NB)	LC (D)		1	4
<i>Anthus cinnamomeus</i>	African Pipit	LC	LC (S)		1	2
<i>Anthus leucophrys</i>	Plain-backed Pipit	LC	LC (S)		1	3
<i>Anthus lineiventris</i>	Striped Pipit	LC	LC (S)			2
<i>Anthus similis</i>	Long-billed Pipit	LC	LC (S)		1	2
<i>Anthus vaalensis</i>	Buffy Pipit	LC	LC (I)		1	3
<i>Apalis thoracica</i>	Bar-throated Apalis	LC	LC (S)		1	2
<i>Bradypterus baboecala</i>	Little Rush-warbler	LC	LC (S)		1	4
<i>Calandrella cinerea</i>	Red-capped Lark	LC	LC (I)		1	2
<i>Certhilauda semitorquata</i>	Eastern Long-billed Lark	LC (N-End)	LC (D)		1	2
<i>Chersomanes albofasciata</i>	Spike-heeled Lark	LC	LC (D)		1	2
<i>Cisticola aridulus</i>	Desert Cisticola	LC	LC (I)		1	3
<i>Cisticola ayresii</i>	Wing-snapping Cisticola	LC	LC (D)		1	2
<i>Cisticola chiniana</i>	Rattling Cisticola	LC	LC (S)		1	3
<i>Cisticola fulvicapilla</i>	Neddicky	LC	LC (S)		1	2

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<i>Cisticola juncidis</i>	Zitting Cisticola	LC	LC (I)		1	2
<i>Cisticola lais</i>	Wailing Cisticola	LC	LC (S)		1	3
<i>Cisticola textrix</i>	Cloud Cisticola	LC (N-End)	LC (D)		1	2
<i>Cisticola tinniens</i>	Le Vaillant's Cisticola	LC	LC (S)		1	4
<i>Eremopterix leucotis</i>	Chestnut-backed Sparrowlark	LC	LC (S)		1	2
<i>Macronyx capensis</i>	Cape Longclaw	LC	LC (S)		1	1
<i>Mirafra africana</i>	Rufous-naped Lark	LC	LC (D)		1	2
<i>Mirafra cheniana</i>	Melodious Lark	LC	NT (D)		1	2
<i>Mirafra fasciolata</i>	Eastern Clapper Lark	LC			1	2
<i>Calendulauda sabota</i>	Sabota Lark	LC	LC (I)		1	2
<i>Motacilla aguimp</i>	African Pied Wagtail	LC	LC (S)		1	4
<i>Motacilla capensis</i>	Cape Wagtail	LC	LC (S)		1	2
<i>Phylloscopus trochilus</i>	Willow Warbler	LC (NB)	LC (D)		1	2
<i>Prinia flavicans</i>	Black-chested Prinia	LC	LC (S)		1	1
<i>Prinia subflava</i>	Tawny-flanked Prinia	LC	LC (S)		1	2
<i>Pycnonotus nigricans</i>	African Red-eyed Bulbul	LC	LC (I)		1	3
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	LC			1	1
<i>Sphenoeacus afer</i>	Cape Grassbird	LC (N-End)	LC (D)		1	2
<i>Spizocorys conirostris</i>	Pink-billed Lark	LC	LC (D)		1	2
<i>Sylvia borin</i>	Garden Warbler	LC	LC (D)		1	2
<i>Sylvietta rufescens</i>	Long-billed Crombec	LC	LC (S)		1	2
10. Regular insect-eaters						
<i>Acridotheres tristis</i>	Common Myna	AL	LC (I)		1	1
<i>Batis molitor</i>	Chinspot Batis	LC	LC (S)		1	1
<i>Cercomela familiaris</i>	Familiar Chat	LC	LC (S)		1	2
<i>Corvinella melanoleuca</i>	Magpie Shrike	LC	LC (D)			2
<i>Corvus albus</i>	Pied Crow	LC	LC (S)		1	2
<i>Corvus capensis</i>	Cape Crow	LC	LC (I)		1	3
<i>Cossypha caffra</i>	Cape Robin-chat	LC	LC (S)		1	2
<i>Creatophora cinerea</i>	Wattled Starling	LC	LC (S)		1	2
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	LC	LC (S)		1	2
<i>Dryoscopus cubla</i>	Black-backed Puffback	LC	LC (D)			2
<i>Erythropygia leucophrys</i>	White-browed Scrub-robin	LC	LC (S)			2
<i>Cercotrichas paena</i>	Kalahari Scrub-robin	LC	LC (S)		1	2
<i>Lamprotornis nitens</i>	Cape Glossy Starling	LC	LC (S)		1	1
<i>Laniarius atrococcineus</i>	Crimson-breasted Shrike	LC	LC (I)		1	2
<i>Laniarius ferrugineus</i>	Southern Boubou	LC	LC (S)			2

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<i>Lanius collaris</i>	Common Fiscal	LC	LC (I)		1	1
<i>Lanius collurio</i>	Red-backed Shrike	LC (NB)	LC (D)		1	2
<i>Lanius minor</i>	Lesser Grey Shrike	LC (NB)	LC (D)		1	2
<i>Muscicapa striata</i>	Spotted Flycatcher	LC (NB)	LC (D)		1	2
<i>Myrmecocichla formicivora</i>	Anteater Chat	LC	LC (S)		1	2
<i>Nilaus afer</i>	Brubru	LC	LC (S)		1	2
<i>Oenanthe monticola</i>	Mountain Wheatear	LC	LC (S)		1	2
<i>Oenanthe pileata</i>	Capped Wheatear	LC (B)	LC (S)		1	2
<i>Onychognathus morio</i>	Red-winged Starling	LC	LC (I)		1	2
<i>Oriolus larvatus</i>	Black-headed Oriole	LC	LC (I)			2
<i>Parisoma subcaeruleum</i>	Chestnut-vented Tit-babbler	LC			1	2
<i>Parus cinerascens</i>	Ashy Tit	LC	LC (S)		1	3
<i>Psophocichla litsipsirupa</i>	Groundscraper Thrush	LC	LC (U)		1	2
<i>Saxicola torquatus</i>	African Stonechat	LC	LC (S)		1	2
<i>Sigelus silens</i>	Fiscal Flycatcher	LC (N-End)	LC (S)		1	1
<i>Spreo bicolor</i>	Pied Starling	LC (N-End)	LC (S)		1	2
<i>Stenostira scita</i>	Fairy Flycatcher	LC (N-End)	LC (S)		1	3
<i>Sylvia communis</i>	Common Whitethroat	LC (NB)	LC (D)		1	3
<i>Tchagra australis</i>	Brown-crowned Tchagra	LC	LC (S)		1	2
<i>Telophorus zeylonus</i>	Bokmakierie	LC	LC (S)		1	1
<i>Terpsiphone viridis</i>	African Paradise-flycatcher	LC	LC (S)		1	2
<i>Thamnota cinnamomeiventris</i>	Mocking Cliff-chat	LC	LC (S)			2
<i>Turdus libyanus</i>	Kurrichane Thrush	LC	LC (U)			2
<i>Turdus smithi</i>	Karoo Thrush	LC (N-End)			1	2
11. Oxpeckers & nectar feeders						
<i>Chalcomitra amethystina</i>	Amethyst Sunbird	LC	LC (S)		1	1
<i>Nectarinia famosa</i>	Malachite Sunbird	LC	LC (S)		1	2
<i>Cinnyris talatala</i>	White-bellied Sunbird	LC	LC (S)		1	2
<i>Zosterops virens</i>	Cape White-eye	LC (N-End)			1	2
12. Seed-eaters						
<i>Amadina erythrocephala</i>	Red-headed Finch	LC	LC (S)		1	2
<i>Amandava subflava</i>	Orange-breasted Waxbill	LC	LC (S)		1	2
<i>Amblyospiza albifrons</i>	Thick-billed Weaver	LC	LC (S)		1	2
<i>Crithagra atrogularis</i>	Black-throated Canary	LC	LC (S)		1	1
<i>Crithagra flaviventris</i>	Yellow Canary	LC	LC (S)		1	1
<i>Crithagra gularis</i>	Streaky-headed Seedeater	LC	LC (S)		1	2
<i>Crithagra mozambicus</i>	Yellow-fronted Canary	LC	LC (D)		1	2

CATEGORY & SCIENTIFIC NAME	COMMON NAME	SA RED DATA STATUS	GLOBAL RED DATA STATUS	STATUS UNDER NEM:BA	SABAP	LoO
<i>Emberiza capensis</i>	Cape Bunting	LC	LC (S)		1	2
<i>Emberiza impetuani</i>	Lark-like Bunting	LC	LC (S)			1
<i>Emberiza tahapisi</i>	Cinnamon-breasted Bunting	LC	LC (S)		1	2
<i>Estrilda astrild</i>	Common Waxbill	LC	LC (S)		1	2
<i>Coccygia melanotis</i>	Swee Waxbill	LC (N-End)	LC (S)		1	3
<i>Euplectes afer</i>	Yellow-crowned Bishop	LC	LC (S)		1	3
<i>Euplectes albonotatus</i>	White-winged Widowbird	LC	LC (S)		1	2
<i>Euplectes ardens</i>	Red-collared Widowbird	LC	LC (S)		1	2
<i>Euplectes orix</i>	Southern Red Bishop	LC	LC (S)		1	2
<i>Euplectes progne</i>	Long-tailed Widowbird	LC	LC (S)		1	2
<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch	LC	LC (S)		1	1
<i>Lagonosticta rubricata</i>	African Firefinch	LC	LC (S)		1	2
<i>Lagonosticta senegala</i>	Red-billed Firefinch	LC	LC (S)		1	2
<i>Ortygospiza atricollis</i>	African Quailfinch	LC	LC (S)		1	1
<i>Passer diffusus</i>	Southern Grey-headed Sparrow	LC	LC (S)		1	2
<i>Passer domesticus</i>	House Sparrow	AL	LC (D)		1	2
<i>Passer melanurus</i>	Cape Sparrow	LC	LC (S)		1	1
<i>Plocepasser mahali</i>	White-browed Sparrow-weaver	LC	LC (S)		1	1
<i>Ploceus capensis</i>	Cape Weaver	LC (N-End)	LC (S)		1	2
<i>Ploceus velatus</i>	Southern Masked-weaver	LC	LC (S)		1	1
<i>Pytilia melba</i>	Green-winged Pytilia	LC	LC (S)		1	3
<i>Quelea quelea</i>	Red-billed Quelea	LC	LC (S)		1	1
<i>Spermestes cucullatus</i>	Bronze Mannikin	LC	LC (S)		1	2
<i>Sporopipes squamifrons</i>	Scaly-feathered Finch	LC	LC (S)		1	3
<i>Uraeginthus angolensis</i>	Blue Waxbill	LC	LC (S)		1	1
<i>Vidua chalybeata</i>	Village Indigobird	LC	LC (S)		1	2
<i>Vidua macroura</i>	Pin-tailed Whydah	LC	LC (S)		1	2
<i>Vidua paradisaea</i>	Long-tailed Paradise-whydah	LC	LC (S)		1	2
<i>Vidua purpurascens</i>	Purple Indigobird	LC	LC (S)		1	3
<i>Vidua regia</i>	Shaft-tailed Whydah	LC	LC (S)			2

Status: AL = Alien; B = Breeding; D = Declining; DD = Data Deficient; End = Endemic; I = Increasing; LC = Least Concern; NB = Non-breeding; N-End = Near-Endemic; NT = Near Threatened; S = Stable; U = Unknown population trend; Vag = Vagrant; VU = Vulnerable

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Newman (2002); IUCN (2013.1); Taylor *et al.* (2015); ToPS List (2015); SABAP 2 (2016)

12.5. Appendix 5 Reptile list for study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	RED DATA STATUS	LoO
ATRACTASPIDIDAE			
<i>Aparallactus capensis</i>	African burrowing snakes	1LC	2
<i>Atractaspis bibronii</i>	Black-headed Centipede-eater	1LC	3
<i>Homoroselaps dorsalis</i>	Bibron's Burrowing Asp	2NT (End)	3
<i>Homoroselaps lacteus</i>	Striped Harlequin Snake	2LC (End)	3
COLUBRIDAE			
Typical snakes			
<i>Boaedon capensis</i>	Brown House Snake	1LC	2
<i>Crotaphopeltis hotamboeia</i>	Red-Lipped Snake	1LC	2
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	1LC	2
<i>Dispholidus typus</i>	Boomslang	1LC	3
<i>Duberria lutrix</i>	Common Slug-eater	1LC (End)	3
<i>Lamprophis aurora</i>	Aurora Snake	1LC (End)	2
<i>Lycodonomorphus inornatus</i>	Olive Ground Snake	2LC (End)	2
<i>Lycodonomorphus laevisissimus</i>	Dusky-bellied Water Snake	2LC (End)	3
<i>Lycodonomorphus rufulus</i>	Brown Water Snake	2LC	3
<i>Lycophidion capense</i>	Common Wolf Snake	1LC	2
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	2LC (N-End)	2
<i>Psammophis brevirostris</i>	Short-snouted Grass Snake	2LC	2
<i>Psammophis crucifer</i>	Cross-Marked Grass Snake	2LC (N-End)	2
<i>Psammophis trinasalis</i>	Fork-marked Sand Snake	1LC	2
<i>Psammophylax rhombeatus rhombeatus</i>	Spotted Grass Snake	1LC	2
<i>Psammophylax tritaeniatus</i>	Striped Grass Snake	1LC	3
<i>Pseudaspis cana</i>	Mole Snake	1LC	2
<i>Telescopus semiannulatus semiannulatus</i>	Eastern Tiger Snake	1LC	4
ELAPIDAE			
Cobras, mambas & relatives			
<i>Aspidelaps scutatus scutatus</i>	Common Shield Cobra	2LC	3
<i>Elapsoidea sundevallii media</i>	Sundevall's Garter Snake	2LC	2
<i>Hemachatus haemachatus</i>	Rinkhals	2LC (N-End)	2
LEPTOTYPHLOPIDAE			
Worm & thread snakes			
<i>Leptotyphlops distanti</i>	Distant's Worm Snake	2LC (N-End)	3
<i>Leptotyphlops scutifrons</i>	Peter's Thread Snake	1LC	2
TYPHLOPIDAE			
Blind snakes			
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	2LC (N-End)	2
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	1LC	2
VIPERIDAE			
Adders & vipers			
<i>Bitis arietans arietans</i>	Puff Adder	1LC	2



FAMILY & SCIENTIFIC NAME	COMMON NAME	RED DATA STATUS	LoO
<i>Causus rhombeatus</i>	Common Night Adder	1LC	2
AGAMIDAE	Agamas		
<i>Agama aculeata distanti</i>	Distant's Ground Agama	2LC (End)	2
<i>Agama atra</i>	Southern Rock Agama	2LC (N-End)	2
CHAMAELEONIDAE	Chamaeleons		
<i>Chamaeleo dilepis</i>	Flap-necked Chamaeleon	1LC	2
CORDYLIDAE	Girdled lizards		
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	2NT (End)	3
<i>Cordylus vittifer</i>	Common Girdled Lizard	2LC (N-End)	3
GEKKONIDAE	Geckos		
<i>Lygodactylus capensis</i>	Cape Dwarf Gecko	1LC	2
<i>Lygodactylus ocellatus ocellatus</i>	Spotted Dwarf Gecko	2LC (End)	3
<i>Pachydactylus affinis</i>	Transvaal Gecko	1LC	3
<i>Pachydactylus capensis</i>	Cape Gecko	1LC	2
GERRHOSAURIDAE	Plated lizards		
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	1LC	2
LACERTIDAE	Lacertid lizards		
<i>Nucras holubi</i>	Holub's Sandveld Lizard	1LC	3
<i>Nucras lalandii</i>	Delalande's Sandveld Lizard	2LC (End)	3
<i>Pedioplanis lineoocellata lineoocellata</i>	Spotted Sand Lizard	1LC	3
SCINCIDAE	Skinks		
<i>Acontias gracilicauda</i>	Thin-tailed Legless Skink	2LC (End)	2
<i>Afroablepharus walbergii</i>	Wahlberg's Snake-eyed Skink	1LC	2
<i>Trachylepis capensis</i>	Cape Skink	1LC	2
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	1LC	1
<i>Trachylepis varia</i>	Variable Skink	1LC	2
VARANIDAE	Monitor lizards		
<i>Varanus albigularis</i>	Southern Rock Monitor	1LC	4
<i>Varanus niloticus</i>	Nile Monitor	1LC	4
PELOMEDUSIDAE	Terrapins		
<i>Pelomedusa subrufa</i>	Marsh Terrapin	1LC	4

Status: 1 = Regional; 2 = Global; End = Endemic; LC = Least Concern; N-End = Near-Endemic; NT = Near Threatened

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Bates *et al.* (2014); ToPS List (2015); ReptileMAP (2016)

12.6. Appendix 6 Frog list for study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	SA RED DATA STATUS	GLOBAL RED DATA STATUS	STATUS UNDER NEM:BA	LoO
BUFONIDAE	True toads				
<i>Sclerophrys capensis</i>	Raucous Toad	LC	LC (D)		2
<i>Sclerophrys garmani</i>	Eastern Olive Toad	LC	LC (U)		2
<i>Sclerophrys gutturalis</i>	Guttural Toad	LC	LC (I)		2
<i>Schismaderma carens</i>	Red Toad	LC	LC (U)		2
HYPEROLIIDAE	Leaf-folding & reed frogs				
<i>Kassina senegalensis</i>	Bubbling Kassina	LC	LC (U)		2
<i>Semnodactylus wealii</i>	Rattling Frog	LC	LC (U)		3
PHRYNOBATRACHIDAE	Puddle frogs				
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	LC	LC (S)		3
PIPIDAE	Platannas (African clawed frogs)				
<i>Xenopus laevis</i>	Common Platanna	LC	LC (I)		2
PYXICEPHALIDAE	River, stream, moss & sand frogs				
<i>Cacosternum boettgeri</i>	Boettger's Caco	LC	LC (U)		2
<i>Amietia queketti</i>	Quekett's River Frog	LC	LC (S)		3
<i>Amietia fuscigula</i>	Cape River Frog	LC	LC (S)		3
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	NT	LC (D)	PS	2
<i>Strongylopus fasciatus</i>	Striped Stream Frog	LC	LC (U)		3
<i>Tomopterna cryptotis</i>	Tremolo Sand Frog	LC	LC (S)		2
<i>Tomopterna natalensis</i>	Natal Sand Frog	LC	LC (U)		2

Status: D = Declining; I = Increasing; LC = Least Concern; NT = Near Threatened; S = Stable; U = Unknown population trend

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Minter *et al.* (2004); ToPS List (2007); Du Preez & Carruthers (2009); IUCN (2013.1); FrogMAP (2016)

12.7. Appendix 7 Butterfly list for study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	RED DATA STATUS	LoO
HESPERIIDAE			
<i>Coeliades pistratus</i>	Two-pip Policeman	LC	2
<i>Eretis umbra umbra</i>	Small Marbled Elf	LC (End)	2
<i>Gegenes niso niso</i>	Common Hottentot	LC	2
<i>Gegenes pumilio gambica</i>	Dark Hottentot	LC	2
<i>Kedestes mohozutza</i>	Fulvous Ranger	LC	2
<i>Platylesches ayresii</i>	Peppered Hopper	LC	2
<i>Platylesches dolomitica</i>	Hilltop Hopper	LC (End)	2
<i>Platylesches neba</i>	Flower-girl Hopper	LC	2
<i>Spialia asterodia</i>	Star Sandman	LC	2
<i>Spialia diomus ferax</i>	Common Sandman	LC	2
<i>Spialia mafa mafa</i>	Mafa Sandman	LC	2
<i>Tsitana tsita</i>	Dismal Sylph	LC	2
LYCAENIDAE			
<i>Actizera lucida</i>	Rayed Blue	LC	2
<i>Aloeides aranda</i>	Aranda Copper	LC	2
<i>Aloeides henningi</i>	Henning's Copper	LC (End)	2
<i>Aloeides molomo molomo</i>	Molomo Copper	LC (End)	2
<i>Aloeides taikosama</i>	Dusky Copper	LC	2
<i>Anthene amarah amarah</i>	Black-striped Hairtail	LC	1
<i>Aloeides trimeni trimeni</i>	Trimen's Copper	LC	2
<i>Anthene livida livida</i>	Pale Hairtail	LC	2
<i>Axiocerses tjoane tjoane</i>	Eastern Scarlet	LC	2
<i>Azanus jesous jesous</i>	Topaz-spotted Blue	LC	2
<i>Azanus moriqua</i>	Black-bordered Babul Blue	LC	2
<i>Azanus ubaldus</i>	Velvet-spotted Babul Blue	LC	2
<i>Cacyreus lingeus</i>	Bush Bronze	LC	3
<i>Cacyreus virilis</i>	Mocker Bronze	LC	2
<i>Capys disjunctus</i>	Russet Protea	LC	2
<i>Chilades trochylus</i>	Grass Jewel Blue	LC	2
<i>Cigaritis ella</i>	Ella's Bar	LC	2
<i>Cigaritis mozambica</i>	Mozambique Bar	LC	2
<i>Cigaritis natalensis</i>	Natal Bar	LC	2
<i>Cupidopsis cissus cissus</i>	Common Meadow Blue	LC	2
<i>Cupidopsis jobates jobates</i>	Tailed Meadow Blue	LC	2
<i>Eicochrysops messapus mahallakoaena</i>	Cupreous Blue	LC	2
<i>Euchrysops dolorosa</i>	Sabie Smoky Blue	LC	2
<i>Lampides boeticus</i>	Pea Blue	LC	2
<i>Lepidochrysops glauca</i>	Silvery Blue	LC	2
<i>Lepidochrysops patricia</i>	Patricia Blue	LC	2
<i>Lepidochrysops praeterita</i>	Highveld Blue	EN (End)	2



FAMILY & SCIENTIFIC NAME	COMMON NAME	RED DATA STATUS	LoO
<i>Lepidochrysops procera</i>	Potchefstroom Blue	LC (End)	2
<i>Leptomyrina henningi henningi</i>	Henning's Black-eye	LC	2
<i>Leptotes babaulti</i>	Babault's Zebra Blue	LC	1
<i>Leptotes pirithous pirithous</i>	Common Zebra Blue	LC	2
<i>Tarucus sybaris sybaris</i>	Dotted Blue	LC	2
<i>Tuxentius melaena melaena</i>	Black Pie	LC	2
<i>Uranothauma nubifer nubifer</i>	Black Heart	LC	2
<i>Zizeeria knysna</i>	Sooty Blue	LC	2
<i>Zizula hylax</i>	Tiny Grass Blue	LC	2
NYMPHALIDAE			
<i>Acraea barberi</i>	Barber's Acraea	LC	2
<i>Acraea neobule neobule</i>	Wandering Donkey Acraea	LC	1
<i>Byblia ilithyia</i>	Spotted Joker	LC	2
<i>Catacroptera cloanthe cloanthe</i>	Pirate	LC	2
<i>Danaus chrysippus orientis</i>	African Monarch	LC	1
<i>Hamanumida daedalus</i>	Guinea-fowl Butterfly	LC	2
<i>Hypolimnas misippus</i>	Common Diadem	LC	2
<i>Junonia hierta cebrene</i>	Yellow Pansy	LC	1
<i>Junonia oenone oenone</i>	Blue Pansy	LC	2
<i>Junonia orithya madagascariensis</i>	Eyed Pansy	LC	1
<i>Paternympha narycia</i>	Spotted-eye Brown	LC (End)	2
<i>Precis archesia archesia</i>	Garden Commodore	LC	2
<i>Stygionympha wichgrafi wichgrafi</i>	Wichgraf's Hillside Brown	LC (End)	2
<i>Telchinia rahira rahira</i>	Marsh Acraea	LC	2
<i>Telchinia serena</i>	Dancing Acraea	LC	2
<i>Vanessa cardui</i>	Painted Lady	LC	2
PAPILIONIDAE			
<i>Papilio demodocus demodocus</i>	Citrus Swallowtail	LC	1
PIERIDAE			
<i>Belenois aurota</i>	Brown-veined White	LC	1
<i>Belenois creona severina</i>	African Common White	LC	2
<i>Catopsilia florella</i>	African Migrant	LC	1
<i>Colias electo electo</i>	African Clouded Yellow	LC	2
<i>Colotis annae annae</i>	Scarlet Tip	LC	2
<i>Colotis evenina evenina</i>	Orange Tip	LC	2
<i>Eurema brigitta brigitta</i>	Broad-bordered Grass Yellow	LC	1
<i>Pinacopteryx eriphia eriphia</i>	Zebra White	LC	2
<i>Pontia helice helice</i>	Common Meadow White	LC	1
<i>Teracolus subfasciatus</i>	Lemon Traveller	LC	2

Status: EN = Endangered; End = Endemic; LC = Least Concern

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate

Sources: ToPS List (2007); Mecenero *et al.* (2013); LepiMAP (2016)



12.8. Appendix 8 Odonata list for study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	BIOTIC INDEX	SA RED DATA STATUS	GLOBAL RED DATA STATUS	LoO
SYNLESTIDAE	Malachites				
<i>Chlorolestes fasciatus</i>	Mountain Malachite	4	-	LC (S)	3
PROTONEURIDAE	Threadtails				
<i>Elattonaura glauca</i>	Common Threadtail	1	-	LC (U)	3
COENAGRIONIDAE	Citrils, Sprites & relatives				
<i>Pseudagrion draconus</i>	Mountain Sprite	4	-		4
<i>Pseudagrion salisburyense</i>	Slate Sprite	1	-	LC (U)	2
<i>Ischnura senegalensis</i>	Marsh Bluetail	0	-	LC (S)	2
<i>Africallagma glaucum</i>	Swamp Bluet	1	-	LC (U)	2
<i>Africallagma sapphirinum</i>	Sapphire Bluet	4	-	LC (I)	3
AESHNIDAE	Hawkers, Emperors & relatives				
<i>Aeshna minuscula</i>	Friendly Hawker	5	-	LC (U)	3
GOMPHIDAE	Tails				
<i>Ceratogomphus pictus</i>	Common Thorntail	2	-	LC (S)	4
CORDULIIDAE	Presbas & Cruisers				
<i>Orthetrum abbottii</i>	Little Skimmer	2	-		3
<i>Orthetrum caffrum</i>	Two-striped Skimmer	3	-	LC (U)	2
<i>Orthetrum chrysostigma</i>	Epaulet Skimmer	2	-	LC (S)	3
<i>Orthetrum trinacria</i>	Long Skimmer	1	-	LC (U)	3
<i>Crocothemis erythraea</i>	Broad Scarlet	0	-	LC (I)	2
<i>Crocothemis sanguinolenta</i>	Little Scarlet	3	-	LC (U)	3
<i>Sympetrum fonscolombii</i>	Nomad	0	-	LC (S)	2
<i>Trithemis arteriosa</i>	Red-veined Dropwing	0	-	LC (S)	3
<i>Trithemis kirbyi</i>	Kirby's Dropwing	0	-	LC (I)	3
<i>Pantala flavescens</i>	Pantala	0	-	LC (S)	2

Status: I = Increasing; LC = Least Concern; S = Stable; U = Unknown population trend

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Samways (2006); Samways (2008); IUCN (2014.3); OdonataMAP (2016)

12.9. Appendix 9 Scorpion list for study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	LoO
BUTHIDAE <i>Uroplectes triangulifer</i>	Thick-tailed scorpions & relatives	1
ISCHNURIDAE <i>Hadogenes gunningi</i>	Rock scorpions & relatives	3
SCORPIONIDAE <i>Opisthophthalmus pugnax</i>	Burrowing scorpions & relatives	2

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate
Sources: Leeming (2003); ToPS List (2015); ScorpionMAP (2016)

12.10. Appendix 10 CVs of Specialists**CURRICULUM VITAE**

Name: SUSAN ABELL (neé BRADLEY)
Position: Senior Ecologist and Co-Owner of Natural Scientific Services
Date of Birth: 29 March 1976
Nationality: South African
Languages: English (mother tongue), Afrikaans

EDUCATIONAL QUALIFICATIONS

- ☒ MSc Resource Conservation Biology (Ecology) (2000 – 2001)
- ☒ B Sc Hons University of the Witwatersrand, Johannesburg (1999)
- ☒ B Sc University of the Witwatersrand, Johannesburg (1998)

KEY QUALIFICATIONS☒ **Environmental Impact Assessment:**

Compiled numerous Environmental Impact Assessments, Scoping Reports and Environmental Management Programmes as required by the Environment Conservation Act (Act No. 73 of 1989) and the National Environmental Management Act (Act 107 of 1998).

☒ **Specialist Assessments:**

Over 14 years performing ecological and vegetation surveys within Southern Africa. Expertises are strong in the Savanna and Grasslands within Gauteng, North West, Limpopo, Mpumalanga, KwaZulu Natal, Lesotho and Botswana. Further experience within the Karoid Shrub, Kalahari and Fynbos Areas.

GIS Mapping, Database management, GIS Modelling undertaken within specialist projects

❏ **Strategic / Spatial Planning:**

Co-ordinated and managed strategic spatial planning projects in Gauteng, North West Province and Mpumalanga including the:

- State of Environment Reporting
- Gauteng Agricultural Potential Atlas (GAPA)
- North West Biodiversity Site Inventory and Database Development Atlas
- Tshwane Macro Open Space Policy
- Biodiversity Database for Optimum Collieries (BHP Billiton)

❏ **Conference Presentations:**

Undertaken numerous presentations at conferences (SAAB; IAIA)

❏ **Educational Training:**

Education training for organisations such as Wits University and Induction Training in Biodiversity Conservation for Mining Operations

EMPLOYMENT EXPERIENCE

❏ **Member & Senior Ecologist: Natural Scientific Services. Johannesburg (November 2004-Present)**

- Project management and administration
- Project management and compilation of biodiversity assessments within savanna, karoid, fynbos and grassland systems including:
 - Ecological assessments
 - Vegetation/Habitat assessments;
 - Red Data Scans;
 - Ecological Screening, Opinions & Statements;
 - Wetland Assessments.
- Ecological Sensitivity Mapping;
- Project management and compilation of Biodiversity Management & Action Plans (BMAPS);
- Reserve Management Plans (examples below):
 - Blyde River Reserve Strategic Management Plan
 - Monate Reserve Management Plan
- Alien Invasive Management Plans;
- Project Management for Rehabilitation and Land-Use Plans;
- Management and specialist input into Green Star Rating Projects (Ecological Component);
- Environmental Impact Assessments and Scoping Reports;
- Project management and compilation of a number of Environmental Impact Control Reports (EICR) for waste management projects;
- Compilation of Conceptual Closure Plans for a number of mining operations;
- Tender and proposal compilation;
- Marketing;
- Liaison with clients and government officials; and
- Involvement in Specific GIS-related projects (examples below):
 - Blyde Strategic Management Plan
 - Visual Assessment for Natalspruit Hospital

- Biodiversity Database – Optimum Collieries
- ❏ **Project Manager: Strategic Environmental Focus (SEF) (November 2003-October 2004)**
 - Project management, Marketing and administration
 - Project Management of and input into Ecological Assessments
 - Tender and proposal compilation
 - Liaison with clients and government officials
 - Involvement in GIS-related projects.
 - Tshwane Open Space Project
 - Numerous State of the Environment Reports
- ❏ **Environmental Manager: SEF, Pretoria (April 2001- November 2003)**
 - Project management and administration
 - Compilation of environmental assessments and scoping reports including:
 - Tourism & Recreational developments
 - Residential developments
 - Commercial and industrial developments
 - Liaison with government officials
 - Management and input into GIS-related projects:
 - Gauteng Agricultural Potential Atlas (GAPA)
 - Gauteng Open Space Plan (GOSP)
 - North West Biodiversity Database Development
 - Ecological Assessments / vegetation surveys / opinions/ Red Data Scans for various industries – mining, industrial, business, residential and sampling
 - Sensitivity mapping
- ❏ **University of the Witwatersrand (Wits) 1999 – 2001**
 - Teaching Assistant:
 - Mammalian surveys within Wits Rural Facility, Mpumalanga
 - Vegetation sampling SAFARI 2000- Kruger National Park (Paper: Koedoe Journal 44/1 2001
 - Vegetation sampling Nylsvley Nature Reserve (2000)
 - Monitoring and growth experiments (1998-1999) Electron and Transmission microscopy

MEMBERSHIPS IN PROFESSIONAL SOCIETY

- ❏ South African Council for Natural Scientific Professions (*Pr.Sci.Nat*)
- ❏ Botanical Society of South Africa
- ❏ International Association for Impact Assessment (IAIA)

PAPERS PUBLISHED

- ❏ Koedoe Journal 44/1 2001
- ❏ Proceedings: Microscopy Society of South Africa, 1999

PAPERS PRESENTED

- ❏ Proceedings of the Microscopy Society of Southern Africa, 1999
- ❏ Population dynamics and regeneration ecology of *Acacia nilotica* and *Acacia tortilis* in Nylsvley Nature Reserve, SAAB Conference 2000



- ☒ Tools for Cooperative Governance: North West Biodiversity Site Inventory And Database Development, IAIA Conference 2003

CURRICULUM VITAE

Name: CAROLINE ANGELA LÖTTER (YETMAN)
Firm: Natural Scientific Services CC, Randburg
Position: Terrestrial Ecologist – Level 2
Date of Birth: 6 November 1979
Nationality: South African, British
Language: English, Afrikaans

KEY EDUCATIONAL QUALIFICATIONS

- ☒ PhD Zoology (2012). Conservation biology of the Giant Bullfrog, *Pyxicephalus adspersus*. (University of Pretoria).
- ☒ MSc African Mammalogy (2002). Effects of body size on the activity budgets of African browsing ruminants. (University of Pretoria).
- ☒ BSc Honours Zoology (2001). Terrain ruggedness and forage patch use by African browsing ungulates. (University of Pretoria).
- ☒ BSc Ecology (2000). (University of Pretoria).

KEY EXPERIENCE

☒ Specialist Assessments

- International Experience
 - Terrestrial faunal assessments in Sierra Leone (2011 & 2012).
 - Terrestrial faunal assessment in Lesotho (2012).
- Local Experience
 - Biodiversity Management Plans in Gauteng Province (2014-present).
 - Terrestrial faunal assessments in the Free State, Gauteng, Kwa-Zulu Natal, Limpopo, Mpumalanga, Northern Cape and North-West provinces (2011-present).
 - Long-term bat monitoring for wind farm developments in the Western, Eastern, Northern Cape and Kwa-Zulu Natal provinces (2012-2013).
 - Giant Bullfrog assessments in Gauteng, Limpopo, Mpumalanga and North-West provinces (2004-2011).

☒ Research

- Analysis of acoustic bat data using AnalookW (2013).
- Species distribution modelling in MaxEnt (2008-2013).
- Geographic Information Systems (in ArcView and ArcGIS) (2001-2013).
- DNA sequencing and analysis (2003-2011).
- Histology (2003-2011).
- Amphibian and mammal radio- and spool-tracking (2003-2010).
- Amphibian and mammal mark-recapture (2001-2010).
- Extensive data analysis in Statistica (2001-2013).
- Vegetation sampling (1999-2001).
- Cricket behavioural studies (1999-2001).



☒ **Applied Conservation**

- Biodiversity Management Plans for large gold mines in Gauteng Province (2014-present).
- Monitoring and mitigating impacts on bats at wind farms in South Africa, NSS (2012-2013).
- Giant Bullfrog conservation in South Africa, Endangered Wildlife Trust (2004-2007).
- Captive animal care at the National Zoological Gardens (1993-1998).

☒ **Lecturing**

- Third year Animal Physiology (2007).
- First year Amphibian Practicals (2007-2012).
- Giant Bullfrogs (2003-2012).

KEY EMPLOYMENT EXPERIENCE

☒ **Natural Scientific Services, Johannesburg (November 2011 – present)**

- Project Management
 - Biodiversity Management Plans in Gauteng Province (2014-present).
 - Biodiversity Assessments in Gauteng and Mpumalanga provinces (2012-present).
 - Long-term bat monitoring studies in the Western and Northern Cape provinces (2012-2013).
- Field work, data analysis and report writing
 - Terrestrial faunal assessments in Sierra Leone, Lesotho, and South Africa (2011-present).
 - Long-term bat monitoring for wind farm developments in the Western, Eastern, Northern Cape and Kwa-Zulu Natal provinces (2012-2013).

☒ **Exclusive Books, Woodlands Boulevard, Pretoria (2008-2011)**

- Night-staff management and book sales.

☒ **University of Pretoria, Pretoria (1999-2011)**

- Government Environmental Inspectorate exam invigilation and marking (2009-2011).
- Lecturing (2007-2011).
- Academic Programme Organizer for Dartmouth College, U.S.A. (2003-2007).
- Editorial Assistant for The Kruger Experience (2005) by Du Toit.
- Research Assistant for behavioural and evolution studies on crickets (1999-2001).

☒ **Endangered Wildlife Trust, Johannesburg (2004-2008)**

- Project Executant of the Giant Bullfrog Project.

☒ **Biodiversity Foundation of Africa, Zimbabwe (December 2001)**

- Insect and amphibian collecting expedition on the Barotse Floodplain, Zambia.

☒ **National Zoological Gardens, Pretoria (1993-1998)**

- Public Educator.

- Assistant Nature Conservator.
- Junior Nature Conservator.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- ☒ International Association for Impact Assessment: 2014-present.
- ☒ Gauteng and Northern Regions Bat Interest Group: 2014-present.
- ☒ South African Council for Natural Scientific Professions: 2008-present.
- ☒ Herpetological Association of Africa: 2004-present.
- ☒ Zoological Society of Southern Africa: 2003-present.

PUBLICATIONS

- Yetman, C.A., Verburgt, L. & S.D. Laurence (2015). Geographical distributions Pyxicephalidae *Pyxicephalus adspersus* Tschudi, 1838 Giant Bullfrog. *African Herp News* 62: 50-53.
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- Yetman, C.A., P. Mokonoto & J.W.H. Ferguson (2012). Conservation implications of the age/size distribution of Giant Bullfrogs (*Pyxicephalus adspersus*) at three peri-urban breeding sites. *Herpetological Journal* 22: 23-32.
- Yetman, C.A. & J.W.H. Ferguson (2011). Conservation implications of spatial habitat use by adult Giant Bullfrogs (*Pyxicephalus adspersus*). *Journal of Herpetology* 45: 56-62.
- Yetman, C.A. & J.W.H. Ferguson (2011). Spawning and non-breeding activity of adult Giant Bullfrogs (*Pyxicephalus adspersus*). *African Journal of Herpetology* 60: 13-29.
- Bateman, P.W., J.W.H. Ferguson & C.A. Yetman (2006). Courtship and copulation, but not ejaculates, reduce the longevity of female field crickets (*Gryllus bimaculatus*). *Journal of Zoology, London* 268: 341-346.
- Du Toit, J.T. & C.A. Yetman (2005). Effects of body size on the diurnal activity budgets of African browsing ruminants. *Oecologia* 143: 317-325.

AWARDS



- 2010-2013: Podium positions for various 10km, 21km, 42km and +50km road and trail-running races in Gauteng, Mpumalanga, Limpopo and North-West provinces.
- 2012: PhD, Academic Honorary Colours, University of Pretoria.
- 2009: Best PhD Student Presentation, AGM, Dept. of Zoology & Entomology, University of Pretoria.
- 2005: Nominated: Science & Technology Category, Shoprite Checkers SABC 2 Woman of the Year.
- 2003: Best Student Presentation, Conference, Zoological Society of Southern Africa.
- 2003: MSc, Academic Honorary Colours, University of Pretoria.

OTHER TRAINING

- Permaculture (2016).
- First Aid (2013).
- Comrades Marathon (2012 & 2013)
- Climbing and Fall Arrest at height (2012).
- Basic 4x4ing (2010).
- Snake handling (2008).

CONFERENCES

- 2014 & 2015: Annual Oppenheimer De Beers Group Diamond Route Research Conference, Johannesburg, Gauteng.
- 2013: Annual Symposium of the Zoological Society of Southern Africa, Tshipise, Limpopo.

FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

HERITAGE IMPACT ASSESSMENT: BASIC ASSESSMENT FOR A PROPOSED PIGGERY ON PORTION 18 OF PORTION 13 OF POORTJE 340-IQ, GAUTENG



CSIR

our future through science

SPECIALIST REPORT

**HERITAGE IMPACT ASSESSMENT:
BASIC ASSESSMENT FOR A PROPOSED PIGGERY ON
PORTION 18 OF PORTION 13 OF POORTJE 340-IQ,
GAUTENG**

Required under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999).

Report for:

CSIR – Environmental Management Services
P.O. Box 320, Stellenbosch, 7599
Tel: 021 888 2432
Email: rmogotshi@csir.co.za

On behalf of:

Alphomega Farming Co-Operative



Dr Jayson Orton
ASHA Consulting (Pty) Ltd
6A Scarborough Road, Muizenberg, 7945
Tel: (021) 788 8425 | 083 272 3225
Email: jayson@asha-consulting.co.za

Jaco van der Walt
Heritage Contracts Archaeological Consulting
37 Olienhout Street, Modimolle, 0510
Tel: 082 373 8491
Email: jaco.heritage@gmail.com

23 May 2016

Specialist declaration

I, JAYSON ORTON as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

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

Name of Specialist:

Dr Jayson Orton.

Signature of the specialist:



Date:

23 MAY 2016.

EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a piggery on Portion 18 of Portion 13 of Poortje 340-IQ in Gauteng. The site measures 35.0667 ha in extent and lies 3 km northwest of the small town of Poortje.

The southern part of the site where the development is planned is flat and has been used for agriculture in the past. Several buildings and ruins are present along with a number of windrows, some of which were being chopped down at the time of assessment. To the north the land rises gently with a rocky area in the central part. The vegetation cover was light and comprised primarily of grass.

A number of finds were made across the property including several structures, a cemetery and some Late Iron Age stone-walled enclosures. Historical imagery and maps revealed that none of the standing structures is greater than 60 years of age and none of the runs is greater than 100 years of age. None is thus protected under the NHRA. The date at which the first graves were laid is unknown but, for the sake of prudence, they are treated as though they are greater than 60 years of age and covered by the NHRA. They are accorded high local heritage significance. The Iron Age finds are protected under the NHRA and are accorded low local heritage significance.

The only possible impact would be accidental damage to the graves during the construction phase. This could be an impact of high significance but, with mitigation, the potential impact would be reduced to very low significance. Mitigation would entail protection of the graves and establishment of a buffer around them. Once the farming operation is established no further impacts are expected. No cumulative impacts will occur.

Since significant impacts are highly unlikely to occur, it is recommended that the proposed agricultural development should be authorised but subject to the following conditions which should be incorporated into the Environmental Authorisation:

- A fence should be erected around the graves allowing at least 5 m of space between the graves and the fence and a buffer of 10 m should be respected around the fence line; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Glossary

Background scatter: Artefacts whose spatial position is conditioned more by natural forces than by human agency

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

In situ: in their original (primary) location.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BAR: Basic Assessment Report

CRM: Cultural Resources Management

ECO: Environmental Control Officer

EIA: Environmental Impact Assessment

ESA: Early Stone Age

GPS: global positioning system

HIA: Heritage Impact Assessment

HWC: Heritage Western Cape

LIA: Late Iron Age

LSA: Later Stone Age

MSA: Middle Stone Age

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

NID: Notification of Intent to Develop

PPP: Public Participation Process

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Compliance with Appendix 6 of the 2014 EIA Regulations

Requirements of Appendix 6 – GN R982	Addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	Section 1.2 & Appendix 1
a) details of-	
i. the specialist who prepared the report; and	
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.3
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3.2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	Section 3
f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	Section 1.1
g) an identification of any areas to be avoided, including buffers;	Section 8.1.1, 10 & 12
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 6 (Figure 9)
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 3.4
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;	Sections 6 & 7
k) any mitigation measures for inclusion in the EMPr;	Sections 8, 10 & 12
l) any conditions for inclusion in the environmental authorisation;	Section 12
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 10
n) a reasoned opinion-	Section 12
i. as to whether the proposed activity or portions thereof should be authorised; and	
ii. if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	n/a (Section 3.5)
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	n/a
q) any other information requested by the competent authority.	n/a

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1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a piggery on Portion 18 of Portion 13 of Poortje 340-IQ in Gauteng (Figure 1). The site measures 35.0667 ha in extent and lies 3 km northwest of the small town of Poortje. Because the project site lies in Gauteng, the assessment is being undertaken jointly by Jayson Orton of ASHA and Jaco van der Walt of Heritage Contracts and Archaeological Consulting.

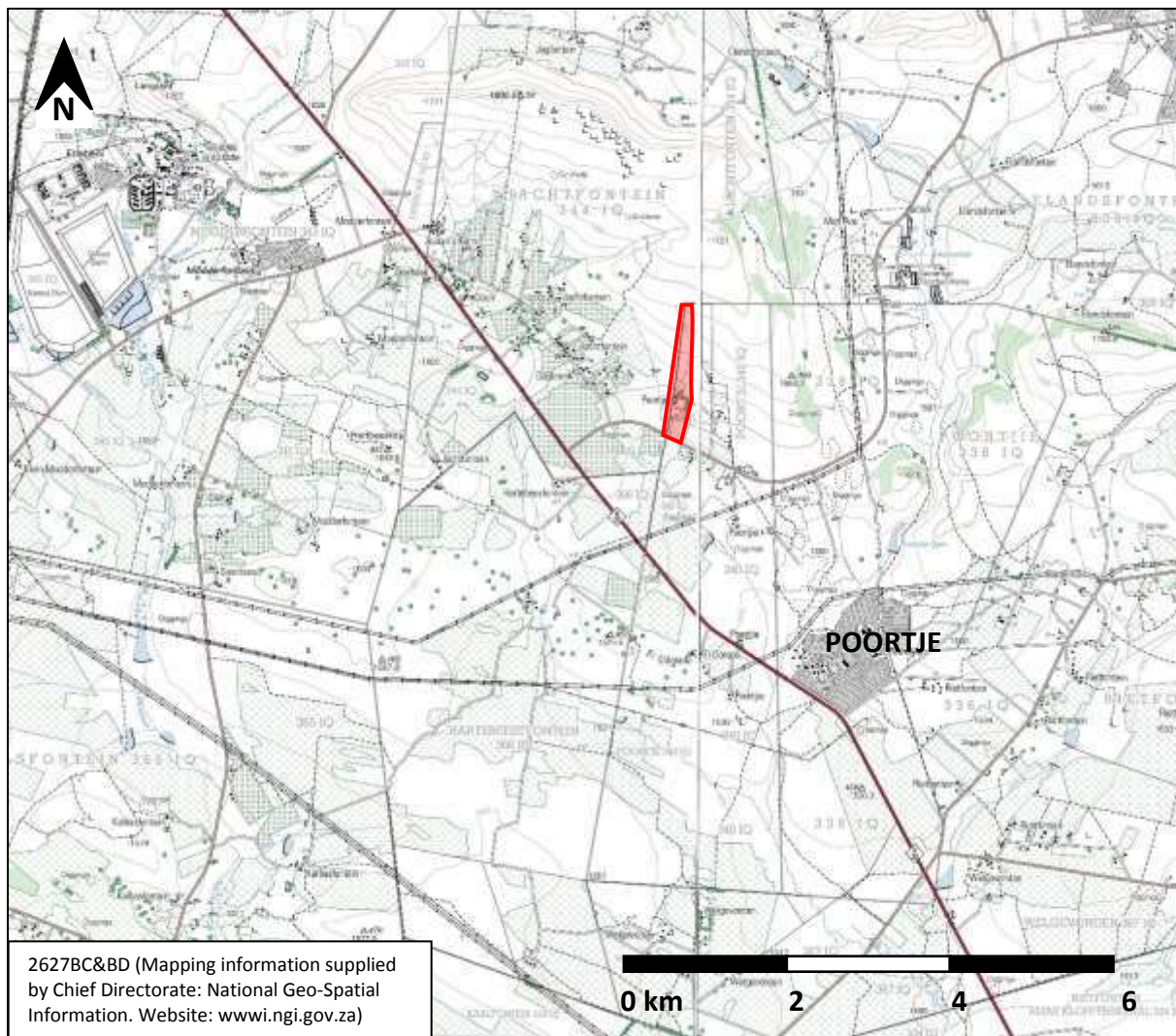


Figure 1: Map showing the location of the site (red polygon).

1.1. Project description

It is proposed to cultivate 8 ha of land in two sections for growing maize and to construct pig houses on the site. Residential structures on the property will be retained, but two other structures will be demolished to allow for construction of the pig houses. All aspects of this

proposal could result in impacts to heritage resources because structures and ruins could be protected and archaeological and/or palaeontological resources could occur on or beneath the surface.

1.2. Terms of reference

ASHA Consulting was requested to compile a heritage impact assessment that would meet the requirements of the heritage authorities. The South African Heritage Resources Agency (SAHRA) was notified of the proposed development and they requested that an impact assessment be compiled for the site.

It should be noted that, following S.38(3) of the National Heritage Resources Act (No. 25 of 1999), all heritage resources should be identified and assessed.

1.3. Scope and purpose of the report

A heritage impact assessment (HIA) is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued for consideration by the Gauteng Department of Agriculture and Rural Development (GDARD) who will review the Basic Impact Assessment (BAR) and grant or withhold authorisation. The HIA report will outline any mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The authors

Dr Jayson Orton took responsibility for the reporting. He has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in the western part of South Africa since 2004 (Please see curriculum vitae included in Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

Jaco van der Walt conducted the fieldwork and necessary background research. He has an MA in Archaeology (Wits, 2012) and has worked in the heritage field since 2001 across much of southern Africa (Please see curriculum vitae included in Appendix 1). He has carried out and published research on Iron Age sites and is an accredited heritage practitioner with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #159) as follows:

- Field Director: Iron Age, Shell Middens & Grave Relocation; and
- Field Supervisor: Colonial Period, Stone Age & Grave Relocation.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription,

government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BAR. Provincial Heritage Resources Authority Gauteng (PHRAG; for built environment and cultural landscapes) and the South African Heritage Resources Agency (SAHRA; for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making by the GDARD.

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). The 1:50 000 map and historical aerial images were sourced from the Chief Directorate: National Geo-Spatial Information. During the course of researching the property material was also sourced from the National Archives, Pretoria.

3.2. Field survey

The site was subjected to a detailed foot survey on 4th May 2016. This was in early winter, a time when the grass was dying back and ground visibility was good. During the survey the positions of finds were recorded on a hand-held GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

3.3. Impact assessment

For consistency, the impact assessment was conducted through application of a scale supplied by the CSIR.

3.4. Assumptions and limitations

The study is carried out at the surface only and hence any completely buried archaeological sites will not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. Although a detailed site development plan was not available, we do not believe that this will have impacted on the outcome of the assessment.



Figure 2: Map showing the walk-paths on site.

3.5. Consultation processes undertaken

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of a BAR application which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site lies on the eastern edge of an agricultural area that is largely under orchards and is just north of the intersection of the R28 (Randfontein Road) and Walter Road (Figure 3). While towns occur to the northeast (Lawley 7 km away) and southeast (Poortje 3 km away), there are gold mines located 6 km to the northwest and 7 km to the west.

4.2. Site description

The property slopes gently downhill from north to south (Figure 4). While the northern part of the site is open grassland (Figure 5), the southern part is less rocky and is characterised by old agricultural fields (Figure 6). The farmstead also occurs in the south. An access road runs northwards from Walter Road along the eastern edge of the property (Figure 7). A number of trees, many in lines, occur on the property, although it is evident that some have chopped down in recent times (Figure 8).



Figure 3: Aerial view of the broader area showing the local context of the site (blue polygon).



Figure 4: View towards the south from the centre of the property. The proposed development will be amongst the cluster of trees in mid-picture.



Figure 5: View towards the northwest from the centre of the property showing open grassland.



Figure 6: View towards the south across the southern section of agricultural lands. The tree-lined access road lies at the far left hand side of the photograph and Walter Road is among the trees in the background to the right.



Figure 7: View towards the south along the tree-lined access road.

Figure 8: View towards the east of the once treed area between the two old agricultural fields.

5. CULTURAL HERITAGE CONTEXT

This section of the report contains the desktop study and establishes what is already known about heritage resources in the vicinity of the study area. What was found during the field survey as presented below may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

5.1. Archaeological aspects

5.1.1. Stone Age

The Stone Age is not well researched in this area, but a number of finds have been made during the course of commercial surveys. On the farm Rietfontein, to the east of the present study area, Huffman *et al.* (1999) noted a number of Early (ESA), Middle (MSA) and Late Stone Age (LSA) sites and artefacts, while Schoeman and Barry (2004) found similar occurrences dating to all three Stone Ages some 3.4 km to the west. These materials were generally found close to water courses (streams or vleis) or close to rock outcrops that were suitable for the manufacture of artefacts.

5.1.2. Iron Age

The Iron Age tended to have a very strong footprint and, as a result, it is this period, and especially the Late Iron Age (LIA) that has been most intensively studied in the Gauteng area.

Extensive Stone walled sites are on record 22 km to the north east at Klipriviers Berg Nature Reserve associated with the LIA. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites dates to the 18th and 19th centuries and were built by people in the Fokeng cluster.

In this area the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978) during the Difaqane. This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's (Bergh 1999: 10). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other

tribes (Bergh 1999: 14, 116-119). It seems that, in 1827, Mzilikazi's Ndebele started moving through the area where Johannesburg is located today. This group went on raids to various other areas in order to expand their area of influence (Bergh 1999: 11).

Closer to the current area of investigation a Late Iron Age settlement complex is situated 3 kilometres to the North West of the study area on the Gatsrand Mountain Range and can be associated with the Bakwena-ba Mare-a-Phogole. The Bakwena-ba Mare-a-Phogole's origins can be traced back to an area close to the current Zeerust (Rathateng) where Phogole I, a son of Kwena-a-Malope, lived. Between 1470-1500 a large famine drove Phogole I, away from the Kwena-a-Malope settlement. Through various movements between the Rustenburg and Free State the last known main settlement of the Bakwena-ba Mare-a-Phogole was at Kokosi (Losberg) in the Fochville area (Vorster 1933 and Breutz 1954).

Commercial surveys have yielded a number of LIA sites in the area. Huffman *et al.* (1999) noted eight LIA cattle posts on the farm to the east of Poortjie, while three similar LIA stone-walled enclosures were recorded by Fourie and Van der Walt (2005) some 6.7 km to the northwest of the present study area.

5.2. Graves

Cemeteries are reasonably commonly encountered in the broader area but of the studies conducted in close proximity to the study area just one recorded cemeteries, in that instance there were three on the farm Waterpan 292 IQ (Fourie & Van der Walt 2005).

5.3. Historical aspects and the built environment

A review of historical aerial imagery shows that agriculture has been ongoing in the area for more than 75 years but the vast majority of built structures are less than 60 years of age. Nevertheless, Huffman *et al.* (1999) noted several historic structures on the adjacent farm, Rietfontein, while further afield to the west and northwest a number of other historic buildings have been recorded (Fourie & van der Walt 2005; Schoeman & Barry 2004). The Wits University database also includes historical sites in the area to the east, one of which is a British Blockhouse from the Second Anglo-Boer War (or South African War).

A farm does not exist in isolation, and it is important to understand the social history of the surrounding area. Poortje 340 IQ is located about 40 km to the southwest of Johannesburg and about 30 km to the northwest of both Vereeniging and Vanderbijlpark. Historically, the property first fell under the jurisdiction of the Pretoria district, then the Heidelberg, Potchefstroom, Vereeniging and Vanderbijlpark districts in turn. Therefore, historically it has always been "between" urban centres. Some information regarding the history of human settlement and black and white interaction in the study area will be provided here (Bergh 1999: 17, 20-27).

By the late 1820's, many Dutch speaking people started leaving the Cape Colony to settle in the northern areas of modern South Africa. This was due to feelings of mounting dissatisfaction caused by economic and other circumstances in the Cape. This movement later became known as the Great Trek. The migration resulted in a massive increase in the

extent of land dominated by people of European descent. Between 1839 and 1840, the white settlers in the Transvaal had occupied and started measuring farms in a large area that included land in the current study area. The movement of whites into the Northern Provinces would have a significant impact on the black people who populated the land at that time. By 1860, the population of white people in the central Transvaal was already very dense and the administrative machinery of their leaders was firmly in place. Many of the policies that would be entrenched as legislation during the apartheid era had already been developed (Ross 2002: 39; Bergh 1999: 15, 170).

During the time of the Second Anglo-Boer War (1899-1902), an important event occurred at Vereeniging, which is today located some 30 kilometres to the southeast of the property under investigation. Peace talks between the Boers and the British had started around April 1902 and agreement was finally reached at the end of May in Vereeniging. The Peace of Vereeniging treaty was subsequently signed in Pretoria on 31 May 1902. This event signalled the end of the Anglo-Boer War, as well as the end of the Boer Republics' independence from Britain (Bergh 1999: 251; Grobler 2004).

In 1904 about a half of the black population in the Transvaal was living on private land, owned by whites or companies. According to the Squatters' Law of 1895, no more than five families of "natives" could live on any farm or divided portion of a farm, without special permission of the government in the Transvaal (Massie 1905: 97).

Black and white relations were however at times also interdependent in nature. After the Great Trek, when white farmers had settled at various areas in the northern provinces, wealthier farmers were often willing to lodge needy white families on their properties in exchange for odd jobs and commando service. This bywoner often arrived with a family and a few cows. He would till the soil and pay a minimal rent to the farmer from the crops he grew. The farmer did not consider him a laborer, but mostly kept black workers for hard labour on the farm. After the Anglo-Boer War, many families were left destitute. Post war years of severe droughts and locust plagues did not ameliorate this state of affairs. All of these factors resulted in what became known as the 'poor white problem'. On the advent of commercial farming in South Africa, white landowners soon found bywoners to be a financial burden, and many were evicted from farms. In many cases, wealthier landlords found it far more profitable to rent their land to blacks than to bywoners. This enabled them to create reservoirs of black labour (for which mine recruiting agencies were prepared to pay handsome commissions), while it was also possible to draw more rent from their black tenants. This practice was outlawed by the 1913 Natives Land Act, which forbade more than five black families from living on white farms as peasant squatters. The 1913 and 1936 Native Land Acts designated specific portions of land as black settlement areas. One small settlement area to the northwest of Vereeniging was the only area that was designated for black settlement by 1936 (Readers Digest 1992: 329-332; Bergh 1999: 42).

6. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project. Table 1 summarises the observations made on site, while mapping is presented in Figure 9.

Table 1: List of heritage resources located on the site.

GPS No.	Co-ordinates	Description	Significance
449	See map locations	Complex of at least 3 houses and associated outbuildings (garage and sheds). None of these structures is older than 60 years since none appear on either the 1961 aerial photograph or the 1968 subdivisional plan (the latter shows a house at waypoint 455 though).	n/a
450	26° 25' 34.21" S 27° 44' 52.86" E	Two interlinked LIA stone-walled enclosures of approximately 9 m diameter. Walling consists of a single alignment of rocks and no entrance or orientation could be determined. No artefacts were noted in the vicinity.	Low
451	26° 25' 35.01" S 27° 44' 53.12" E	LIA stone-walled enclosure of approximately 8 m diameter. Walling consists of a single alignment of rocks and no entrance or orientation could be determined. No artefacts were noted in the vicinity.	Low
452	26° 25' 47.44" S 27° 44' 54.75" E	A cemetery of at least eleven stone-packed graves. Some have standing headstones made from natural stone slabs. There are no inscriptions and their age is unknown. They are only protected by the NHRA if older than 60 years (i.e. pre-1956). Given the uncertainty, it is prudent to regard them as protected.	High
453	26° 25' 51.7585" S 27° 44' 51.5436" E	A complex of what are likely to have been farm labourers' dwellings. There are nine rooms in the main structure and it is made from cement bricks. All fittings and joinery missing.	n/a
453b	26° 25' 53.04" S 27° 44' 50.72" E	A single-roomed cement brick ruin. All fittings and joinery missing. From the aerial photographic evidence, this structure appears to have existed already in 1938.	n/a
453c	26° 25' 54.26" S 27° 44' 50.78" E	A set of stone and cement enclosures that are likely to be old pig sties. All joinery missing.	n/a
454	26° 25' 57.51" S 27° 44' 48.03" E	Stone cairn of about 1.0 m by 0.8 m. Its position coincides exactly with the edge of an agricultural field and certainly represents a pile of rocks removed from the land.	n/a
455	26° 25' 55.53" S 27° 44' 53.90" E	Two ruins consisting of cement floor slabs and piles of cement breeze blocks. The standing structures are visible in 1952 aerial photographs but not later ones. The 1938 photograph shows a single small structure at this position.	n/a
456	26° 25' 54.53" S 27° 44' 53.30" E	Round cement dam. Age unclear from aerial photography but likely greater than 60 years.	Very low.

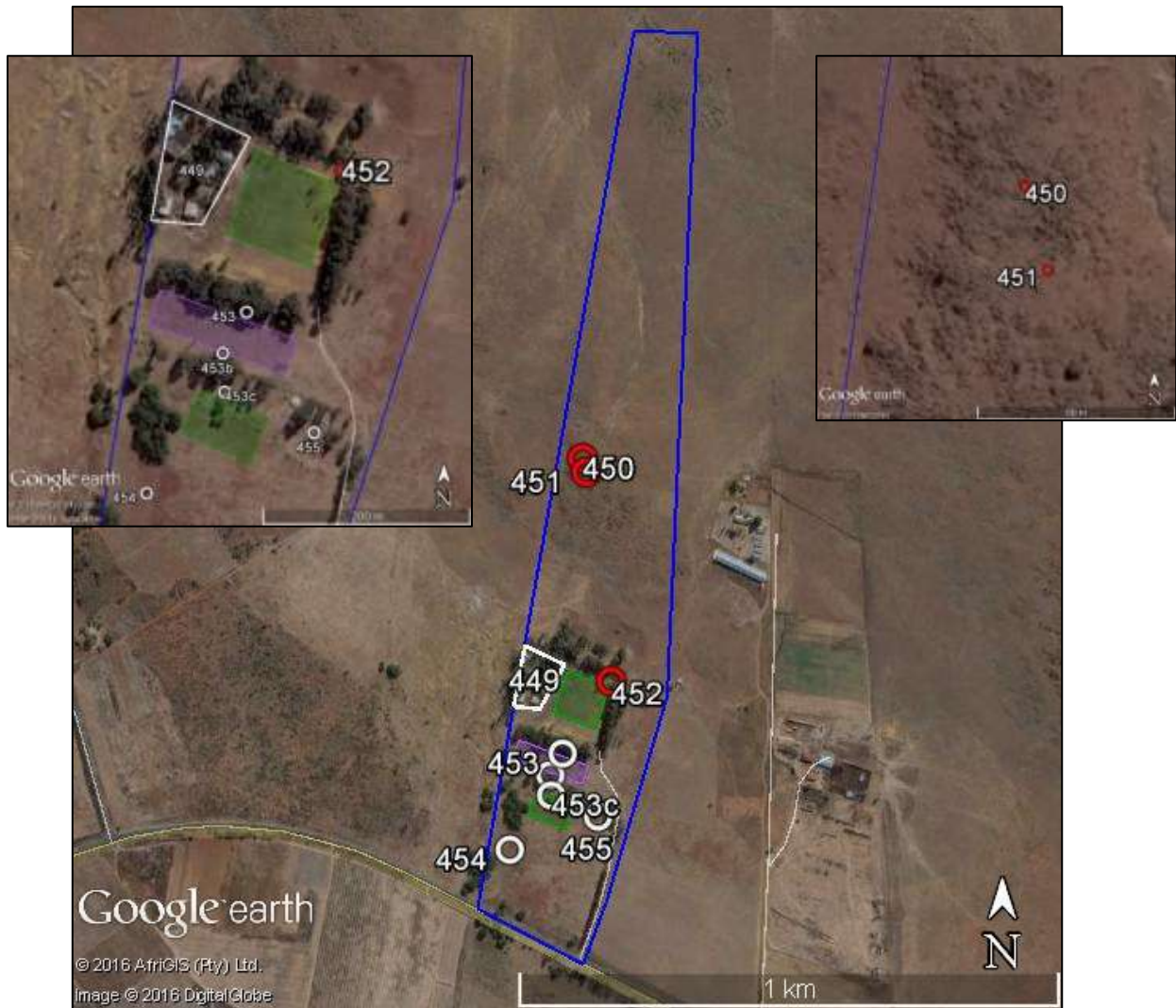


Figure 9: Aerial view of the property showing the locations of the identified finds in relation to the proposed development areas. Red symbols are heritage resources, white symbols are other finds, green shaded polygons are proposed maize fields and the purple polygon is the proposed piggery.

6.1. Palaeontology

Dr John Almond was commissioned to conduct a palaeontological study for the project. Due to the nature of the surface geology no field study was deemed to be necessary. The study was thus carried out from the desktop. Although brief findings are described here, the entire specialist study is included in Appendix 2 to this report.

The bedrock in the study area is part of the Klapperkop Quartzite Member of the Timeball Hill Formation. The potentially fossiliferous lower shales/mudrocks of the Timeball Hill Formation lying stratigraphically beneath the Klapperkop quartzites and are unlikely to be impacted by the proposed farming development.

The only palaeontological resources recorded within the Timeball Hill Formation are stromatolites. However, they occur only within the lower mudstone horizons and it is thus

not anticipated that any palaeontological impacts will occur during implementation of the proposed development.

No fossil material was noted during the archaeological ground survey.

6.2. Archaeology

A gentle rocky slope extends from the central part of the study area in a north-westerly direction over about 2 km. A number of Iron Age settlements are visible on aerial photography along this rocky area but these have not been studied. However, on the south-eastern end of this alignment three stone-walled enclosures were located, two of them in one location (waypoint 450) and a third some 25 m to the south (waypoint 451). Both sites consisted of stone alignments only one rock high and were thus somewhat ephemeral (Figures 10 & 11). Neither had any associated artefacts and nothing further can be said of them besides that they are Late Iron Age residues.



Figure 10: View of the stone-walled enclosure at waypoint 450.



Figure 11: View of the stone-walled enclosure at waypoint 451.

No rock outcrops suitable for stone tool manufacture or any permanent water sources occur in the area. As such, no Stone Age sites were expected. The survey revealed five isolated artefacts (one core and several flakes) scattered across the landscape. These are attributable to background scatter.

6.3. Graves

A single unfenced cemetery was found close to the farm complex (Figures 12 to 14). It is most likely that the graves are no older than the earliest buildings on the farm. Their location in the corner of the tree lines (planted between 1952 and 1961) suggests they go back to the 1950s or 1960s. Because they are all located together they are treated as a single resource. This means that if the oldest pre-dated 1956 then they would be protected in terms of the NHRA. Although their age remains unknown, for the sake of prudence, the cemetery is regarded as a heritage resource. They may represent the graves of farm labourers. Although the cemetery is not a significant heritage resource, it should be treated as important because it contains human remains.



Figure 12: View of the graveyard.
graves,

Figures 13 & 14: Examples of two
one with a headstone and one without.

6.4. Built environment

A number of structures are present on the property and are in variable states of preservation. There are three residential dwellings (Figure 15 to 18) and some outbuildings (e.g. Figure 19), all located in a cluster at waypoint 449. None are older than 60 years and, from their style, may have been built in about the 1970s.



Figures 15 & 16: Two views of the main residential dwelling.



Figures 17 & 18: Two other residential buildings.

Figure 19: A set of garages.

There are also several ruins on the property, but being less than 100 years of age they are not protected under the provisions of the NHRA.

6.5. Cultural landscape

The windrows present on this site are the primary elements of the cultural landscape and are responsible for the provision of a rural character to the local environment. At present the site is in a somewhat degraded condition because of the poor state of preservation of some of the structures and because many of the windrow trees have been cut down recently. The broader landscape is an agricultural one with a rural feel, but windrows are generally rare. The development of this landscape is best explored through maps and aerial photographs.

The earliest known map indicating the site is from 1902. It shows Walter Road to be present at the southern edge of the site (Figure 20). No other features are indicated. The earliest aerial photograph of the area dates to 1938 and at that time the site appears to have been almost entirely undeveloped (Figures 21 & 22) but two small structures are evident. No wind rows had yet been planted.

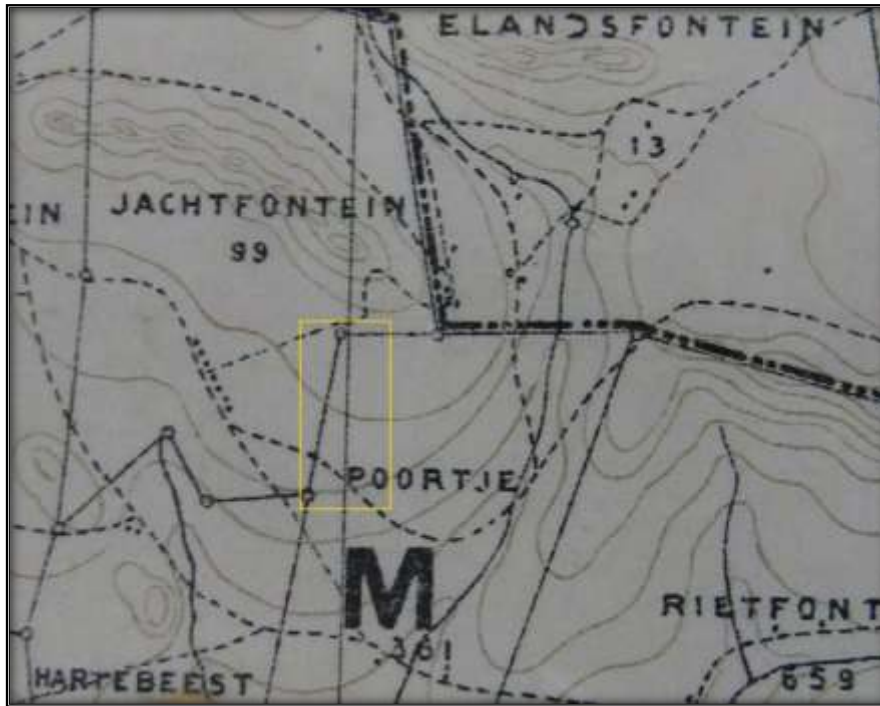


Figure 20: Extract from a 1902 map of the Potchefstroom District showing the location of the farm Poortje No. 361. The portion currently under investigation is located within the yellow polygon (NASA TAB, Maps: 2/180).

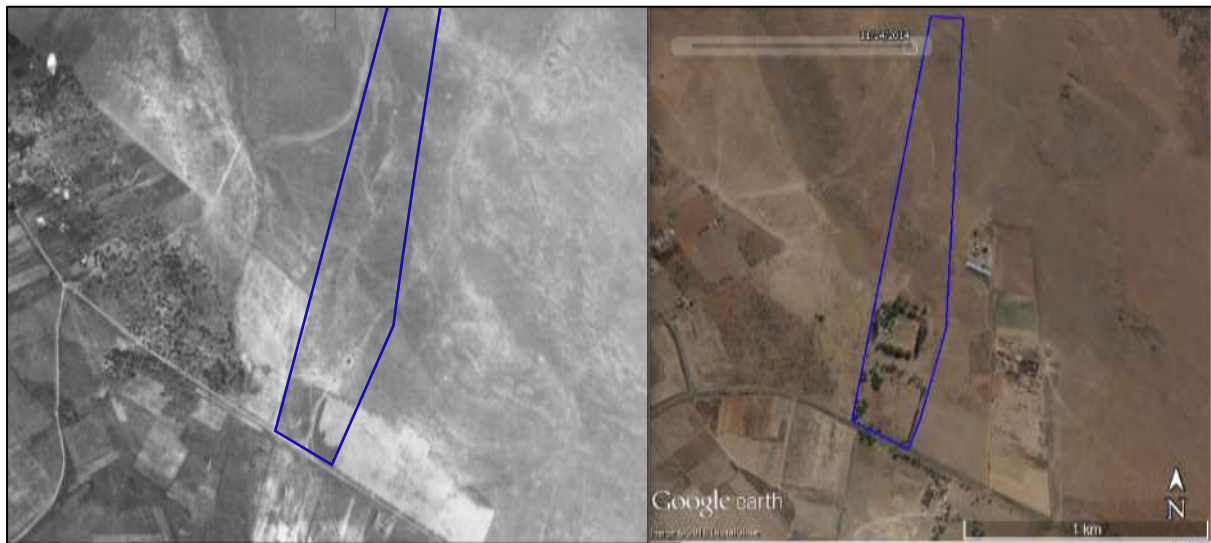


Figure 21: Aerial views of the study area from 1938 (left; job 129, strip 35, photo 74731) and 2016 (right; Google Earth).



Figure 22: *Enlargement from Figure 20 showing the two small structures present in 1938. It is unclear exactly which structures or ruins these represent.*

A 1943-4 topographic map of the area shows the site to be undeveloped in terms of formal infrastructure but some agricultural lands occur in the far south and a 'native hut' is marked (Figure 23). While the positional accuracy of features and their number should not be assumed correct, it does show that some sort of accommodation was present and that it might have been fairly informal.

By 1952 agricultural development had progressed somewhat with the northern field also laid out (Figures 24). The two structures are still present. Trees still appear generally absent, although it looks as though a line of small trees was present in the south-western corner of the site. The 1956-7 topographic map shows much the same situation with two structures and a wind pump indicated. Part of the agricultural land laid out as an orchard and a small access road is present along the south-eastern boundary of the site (Figure 25). This is the first map to show the boundaries of Farm Poortje 340 IQ.

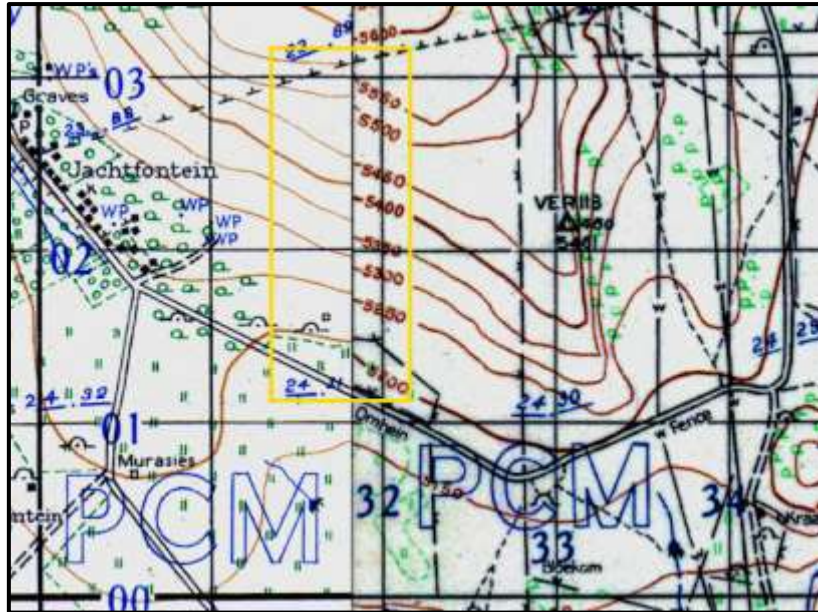


Figure 23: 1943-1944 topographic map with the portion under investigation located within the yellow polygon. Walter Road is again shown and limited agricultural development has occurred in the south.



Figure 24: Aerial views of the study area from 1952 (left & inset; job 314, strip 11, photo 43422) and 2016 (right; Google Earth). The structures seem now to be those at waypoints 453b and 455.

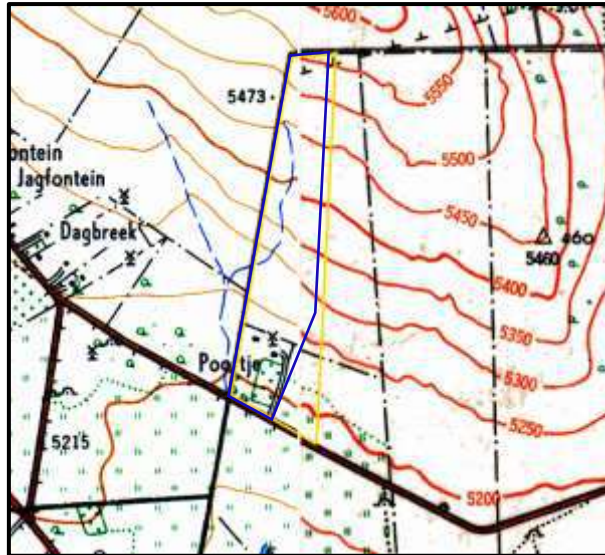


Figure 25: 1956-1957 Topographic map with the portion under investigation outlined in blue. The property still seems to be mostly undeveloped.

By 1961 the windrows had been planted but there was still no sign of the complex of buildings currently present in the western part of the site (Figure 26). This indicates that all are less than 60 years old. Another small structure appears to have been present in the south-western corner of the site but is absent today. The trees visible in this area in 1952 have grown substantially and all the other windrows have been planted.



Figure 26: Aerial views of the study area from 1961 (left & inset; job 438, strip 18, photo 04528) and 2016 (right; Google Earth).

The final image in our sequence is a subdivisional plan dating to 1968 when this farm portion (Portion 18 of Portion 13) was first created (Figure 27). The windrows are indicated along with a single house in the position of waypoint 455. Other structures may have been present with the house the only one deemed important enough to be marked.

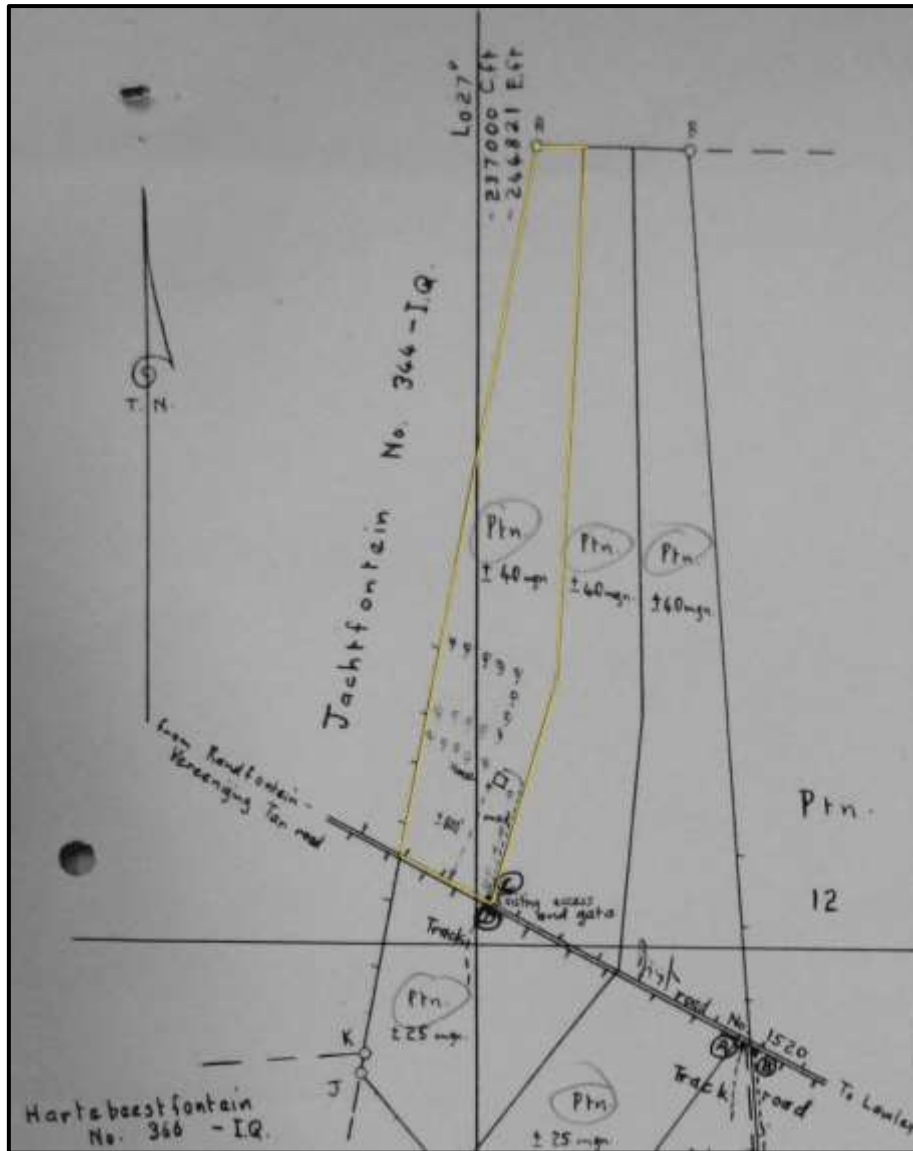


Figure 27: 1968 Subdivisional plan showing the subdivision of Portion 13 of Poortje 340 IQ, which was located in the Vereeniging district at the time. Portion 18 of Portion 13 is indicated by the yellow border (NASA SAB, CDB: 3/932 TAD9/51/16).

6.6. Historical ownership

The farm Poortje goes back originally to 1853 when Het Poortje No. 6 was granted in Freehold to Lukas Rudolph. The farm remained whole until 1905 when the first subdivisions occurred (NASA TAB, RAK: 3050). Over the years subdivision continued and at some point the reconfigured farm became Poortje 340-IQ. The current Portion 18 of Portion 13 was created in 1968 and ownership was transferred to the Alphomega Farming Primary Co-operative Limited in 2008.

6.7. Statement of significance

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

The archaeological resources are deemed to have low cultural significance for their scientific value, while the cemetery is deemed to have high cultural significance for their social value. None of the other finds on the property are considered to be heritage in terms of the NHRA.

7. ISSUES, RISKS AND IMPACTS

7.1. Identification of potential impacts/risks

The only identified heritage resources on the site include two LIA sites and a historic/recent cemetery. It has already been stated that the cemetery will be preserved in situ and the layout of the proposed development shows that the LIA sites are well away from the area where the activities will occur. The cultural landscape is a relatively recent one and has not specific heritage value. The risks to heritage resources are thus minimal with accidental damage to the graves being the only possible impact. The impacts would be most likely to occur during the construction phase of the project, since the operational phase would not result in any new breaking of ground. No decommissioning phase is envisaged.

8. IMPACT ASSESSMENT

8.1. Direct Impacts

8.1.1. Construction Phase

Impacts to graves

There is a very small chance that direct impacts could occur to the graves present on site during the construction phase of the project if construction or agricultural vehicles were to drive over the graves. Stones could also be removed from the graves for use elsewhere on the farm. Destruction of graves would be regarded as an impact of high significance with a negative status.

It is proposed that the developer should erect a low fence around the cemetery in order to properly demarcate it. This fence should be approximately 5 m away from all graves and include an access gate. No agricultural or building development should be allowed to occur within 10 m of the fence. This buffer is to allow for the possibility of further unmarked graves being present around the visible graves (although the likelihood of such graves being present is considered very low).

Should this mitigation measure be carried out and the graves protected then the impacts would be of low significance but positive in nature because the graves would have been recognised and protected from future accidental damage. The potential impacts are assessed in Table 1.

The environmental control officer (ECO) should ensure that such a fence is erected and that no disturbance occurs within 10 m of the fence.

8.1.2. Cumulative Impacts

No cumulative impacts to heritage resources are expected.

Table 1: Impact assessment summary table – Construction Phase direct impacts.

Aspect/ Impact pathway	Nature of potential impact/risk	Status	Spatial Extent	Duration	Consequence	Probability	Reversibility of impact	Irreplaceability of receiving environment/resource	Potential mitigation measures	Significance of impact/risk = consequence x probability		Ranking of impact/risk	Confidence level
										Without mitigation /management	With mitigation /management (residual risk/impact)		
CONSTRUCTION PHASE													
Ploughing of land and construction of pig sties	Destruction of graves	Negative	Site	Permanent	Extreme	Unlikely	No (destruction is permanent)	High (destruction is permanent)	Erect fence 5 m from graves and respect 10 m buffer from fence.	Moderate	Very Low	5	High

9. LEGISLATIVE AND PERMIT REQUIREMENTS

There are no further legal requirements for this project in terms of the NHRA because no impacts are expected to occur. Should the need to remove the graves arise then a formal public consultation process would need to be carried out and the exhumations conducted under a permit issued from SAHRA. However, it is envisaged that the graves will not be moved.

10. ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

The following monitoring requirements pertain to this project. It is recommended that the ECO should:

- (1) establish the exact locations of the graves;
- (2) supervise the erection of a fence 5 m away from all graves in the cemetery; and
- (3) ensure that all agricultural and/or construction work occurs at least 10 m away from the fence.

11. CONCLUSIONS

The only significant heritage resource located on the property is the cemetery. Provided that it is protected as recommended in this report there is no reason why the proposed development should not proceed.

12. RECOMMENDATIONS

Since significant impacts are highly unlikely to occur, it is recommended that the proposed agricultural development should be authorised but subject to the following conditions which should be incorporated into the Environmental Authorisation:

- A fence should be erected around the graves allowing at least 5 m of space between the graves and the fence and a buffer of 10 m should be respected around the fence line; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

13. REFERENCES

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APPENDIX 1 – Curriculum Vitae



Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 6A Scarborough Road, Muizenberg, 7945
Telephone: (021) 788 8425
Cell Phone: 083 272 3225
Email: jayson@asha-consulting.co.za

Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Memberships and affiliations:

South African Archaeological Society Council member	2004 –
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
ASAPA Cultural Resources Management Section member	2007 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –

Professional Accreditation:

ASAPA membership number: 233, CRM Section member
Principal Investigator: Coastal shell middens (awarded 2007)
Stone Age archaeology (awarded 2007)
Grave relocation (awarded 2014)
Field Director: Rock art (awarded 2007)
Colonial period archaeology (awarded 2007)

Fieldwork and project experience:

Extensive fieldwork as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Phase 1 surveys and impact assessments:

- Project types
 - Notification of Intent to Develop applications (for Heritage Western Cape)
 - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
 - Archaeological specialist studies
 - Phase 1 test excavations in historical and prehistoric sites
 - Archaeological research projects
- Development types
 - Mining and borrow pits
 - Roads (new and upgrades)
 - Residential, commercial and industrial development
 - Dams and pipe lines
 - Power lines and substations
 - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

Phase 2 mitigation and research excavations:

- ESA open sites
 - Duinefontein, Gouda
- MSA rock shelters
 - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
 - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
 - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
 - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
 - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
 - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
 - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
 - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

CV Jaco van der Walt

PERSONAL PARTICULARS:

NAME: Jaco van der Walt
MARITAL STATUS: Married with two dependants
DATE OF BIRTH: 1977-11-04
Work Address 37 Olienhout Street, Modimolle, 0510
E-MAIL: jaco.heritage@gmail.com
MOBILE: +27 82 373 8491
FAX: +27 86 691 6461

SYNOPSIS

Jaco has been actively involved as a professional archaeologist within the heritage management field in southern Africa for the past 15 years. Jaco acted as council member for the Association of Southern African Professional Archaeologist (ASAPA Member #159) in the Cultural Resource Management (CRM) portfolio for two years (2011 – 2012). Jaco was also a Research Associate with the University of Johannesburg from 2011 – 2013. He is well respected in his field and published in peer reviewed journals and presented his findings on various national and international conferences.

ACADEMIC QUALIFICATIONS:

Date of matriculation: 1995
Particulars of degrees/diplomas and/or other qualifications:
Name of University or Institution: University of Pretoria
Degree obtained : BA
Major subjects : Archaeology
Cultural Heritage Tourism
Year of graduation : 2001
Name of University or Institution: University of the Witwatersrand
Degree obtained : BA [Honours]
Major subjects : Archaeology
Year of graduation : 2002
Name of University or Institution : University of the Witwatersrand
Degree Obtained :BA [Masters]
Major subject :Archaeology
Year of Graduation :2012

EMPLOYMENT HISTORY:

2011 – Present: **Owner - Heritage Contracts and Archaeological Consulting CC.**
2007 – 2010 : **CRM Archaeologist**, Managed the Heritage Contracts Unit at the
University of the Witwatersrand.
2005 - 2007: **CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004: **Technical Assistant**, Department of Anatomy University of Pretoria
2003: **Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002: **CRM Archaeologists**, For R & R Cultural Resource Consultants,
Polokwane
2000: **Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- o Association of Southern African Professional Archaeologists. Member number 159
- o Association of Southern African Professional Archaeologists Cultural Resource Management Section
Accreditation: Field Director Iron Age Archaeology
Field Supervisor – Colonial Period
Archaeology, Stone Age Archaeology and Grave
Relocation
- o Accredited CRM Archaeologist with SAHRA
- o Accredited CRM Archaeologist with AMAFA
- o Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

REFERENCES:

1. Prof Marlize Lombard Senior Lecturer, University of Johannesburg, South Africa
E-mail: mlombard@uj.ac.za
2. Prof TN Huffman Department of Archaeology Tel: (011) 717 6040
University of the Witwatersrand
3. Alex Schoeman University of the Witwatersrand E-mail: Alex.Schoeman@wits.ac.za

APPENDIX 2 – Palaeontological study

PROPOSED ALPHOMEGA PIGGERY NEAR POORTJE, GAUTENG: PALAEOLOGICAL HERITAGE

John E. Almond, *Natura Viva* cc (May 2016)

1. Project outline

It is proposed to cultivate 8 ha of land in two sections for growing maize and to construct pig houses on the study site on farm Poortjie 340 near Poortje, Gauteng. Residential structures on the property will be retained, but two other structures will be demolished to allow for construction of the pig houses.

2. Geological context

The development footprint lies in a fairly flat-lying, grassy to highly-disturbed area at c. 1580-1600 m amsl. with no bedrock exposure. On satellite images gently hilly terrain to the north features low rocky outcrops and grassy vegetation cover. The geology of the study area is shown on 1: 250 000 geology sheet 2626 West Rand (Council for Geoscience, Pretoria) (Fig. 1) for which a sheet explanation has not yet been published. The study area is underlain by ancient Precambrian (Palaeoproterozoic) bedrocks of the Pretoria Group (Transvaal Supergroup). The bedrocks here are assigned to the **Klapperkop Quartzite Member** (Vt, pale red with stipple in Fig. 1) of the **Timeball Hill Formation**. The potentially fossiliferous lower shales / mudrocks of the Timeball Hill Formation (Vt, pale red with hatched lines in Fig. 1), lying stratigraphically beneath the Klapperkop quartzites and outcropping to the south of the study area, are unlikely to be directly impacted by proposed development.

The sedimentology and sequence stratigraphy of the lithologically varied Timeball Hill Formation has recently been reviewed by Catuneanu & Eriksson (2002). These authors consider that this unit was deposited within a deep to shallow basin as a result of suspension sedimentation, turbidity currents and fluvio-deltaic processes under the influence of widespread fumarolic activity. There was in addition extrusion of basic lavas towards the base and evidence for short-lived glacial influence towards the top. The Klapperkop Quartzite Member quartzites are probably of fluvio-deltaic origin with some tidal influence (Catuneanu & Eriksson 2002, Eriksson *et al.* 2006 and refs, therein).

3. Palaeontological heritage

Stromatolites (*i.e.* fossil microbial mounds) have been recorded from the Timeball Hill Formation. They occur in association with thin carbonate interbeds within turbidite successions forming the lower part of the formation (“lower mudstones”), implying deposition within the photic zone (Catuneanu & Eriksson 2002). Stromatolites are not recorded from the overlying fluvio-deltaic Klapperkop Quartzite Member, however. Since this last unit underlies the great majority or all of the present study area, impacts on stromatolitic bedrocks are not anticipated here.

4. Conclusions & recommendations

The non-marine quartzites of the Timeball Hill Formation underlying the study area are of low palaeontological sensitivity. Impacts on underlying, potentially stromatolitic sediments are unlikely, especially since deep excavations are not anticipated here. No further specialist palaeontological studies or mitigation are recommended for this development.

5. References

CATUNEANU, O. & ERIKSSON, P.G. 2002. Sequence stratigraphy of the Precambrian Rooihoogte-Timeball Hill rift succession, Transvaal Basin, South Africa. *Sedimentary Geology* 147, 71-88.

ERIKSSON, P.G., ALTERMANN, W. & HARTZER, F.J. 2006. The Transvaal Supergroup and its precursors. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) *The geology of South Africa*, pp. 237-260. Geological Society of South Africa, Marshalltown.

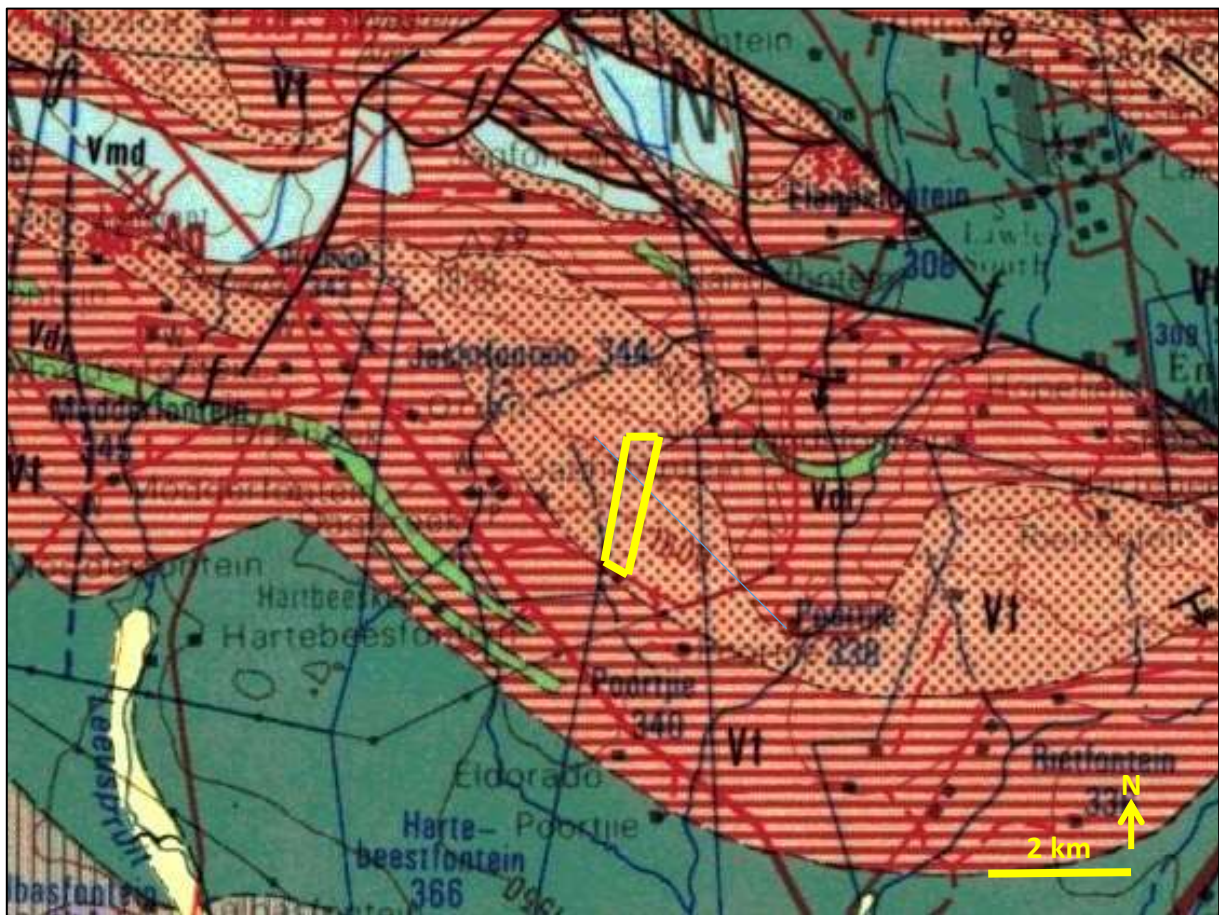


Figure 1. Extract from 1: 250 000 sheet 2626 West Rand (Council for Geoscience, Pretoria) showing the location of the Alphomega piggery study area on Poortjie 340 near Poortje, Gauteng (yellow polygon). The study area is underlain by ferruginous quartzites of the Klapperkop Quartzite Member, Timeball Hill Formation (Vt, pale red with stipple).

FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng.

APPENDIX H: Environmental Management Programme



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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of
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1 INTRODUCTION

1.1 Purpose of the Environmental Management Programme

The Alhomega Farming Co-Operative is a small scale commercial farming enterprise that was established in 2005. This Co-Operative comprises of 11 members and is proposing to establish a start-up enterprise comprising of a commercial pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng. The farm currently has dilapidated buildings and a slurry dam. Furthermore there are 11 unidentified graves on site. This Draft Environmental Management Programme (EMPr) is prepared as part of the requirements of the Environmental Impact Assessment (EIA) Regulations (December 2014, as amended) promulgated under the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended). The purpose of this Environmental Management Programme (EMPr) is to ensure “good environmental practice” by taking a holistic approach to the management and mitigation of environmental impacts during the construction, operation and decommissioning phase of Alhomega proposed piggery. This EMPr therefore sets out the methods by which proper environmental controls are to be implemented by the piggery’s management. The Draft EMPr is to be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) as part of the Application for Environmental Authorisation.

This EMPr is considered as a document that can be updated as new information becomes available during the construction, operational and operational phases, if applicable, of the proposed development. Mitigations measure need to be implemented as addressed in this EMPr, except where they are not applicable, and additional measures should be considered when necessary. The EMPr identifies the following:

- Construction and Operation activities that will impact on the environment;
- Specifications with which the piggery’s management shall comply in order to protect the environment from the identified impacts; and
- Actions that shall be taken in the event of non-compliance.

This EMPr incorporates management plans for the design, construction, operation and decommissioning phases of the project, which consist of the following components:

- **Impact:** The potential positive or negative impact of the development that needs to be enhanced, mitigated or eliminated.
- **Objectives:** The objectives necessary in order to meet the goal; these take into account the findings of the specialist studies.
- **Mitigation/Management Actions:** The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
- **Monitoring:** The key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting.

1.2 Contents of the EMPr

This EMPr specifies the management actions necessary to ensure minimal environmental impacts, as well as procedures for monitoring these impacts associated with the proposed activity. In terms of legal compliance, this EMPr aims to satisfy appendix 4 of Government Notice Regulation 982 of 4 December 2014, presented in Table 1-1 below.

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Table 1-1: Compliance with Appendix 4 of Government Notice Regulation 982 of 4 December 2014 and Section 24N of the National Environmental Management Act 107 of 1998.

Requirements according to Appendix 4 of GNR 982 of 4 December 2014	Section
(1) An EMPr must comply with section 24N of the Act and include-	
a) details of -	Section 1.3
(i) the EAP who prepared the EMPr; and	Appendix I
(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 2
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 2, Figure 2-1, 2-2, 2-3
d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 4
(i) planning and design;	Section 4
(ii) pre-construction activities;	Section 4
(iii) construction activities;	Section 4
(iv) rehabilitation of the environment after construction and where applicable post closure; and	Section 4
(v) where relevant, operation activities;	Section 4
e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 4
f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to –	Section 4
i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
ii. comply with any prescribed environmental management standards or practices;	Section 4
iii. comply with any applicable provisions of the Act regarding closure, where applicable; and	N/A
iv. comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	N/A
g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 4
h) frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 4
i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 4
j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 4
k) the mechanism for monitoring compliance with the impact management actions	Section 4

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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of
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Requirements according to Appendix 4 of GNR 982 of 4 December 2014	Section
contemplated in paragraph (f);	
l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 4
m) an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 4
n) any specific information that may be required by the competent authority.	N/A

1.3 Environmental Assessment Practitioner

The Environmental Management Services (EMS) falls under the Specialist Services (SS) group within the Implementation Unit (IU) of the Council for Scientific and Industrial Research (CSIR). The CSIR is amongst the largest multi-disciplinary research and development organizations in Africa, which undertakes applied research and development for implementation across the continent, as well as providing consulting services to industry, government and international agencies. It has been one of the leading organisations in South Africa contributing to the development and implementation of environmental assessment and management methodologies and sustainability science.

The EMS vision is to assist in ensuring the sustainability of projects or plans in terms of environmental and social criteria, by providing a range of environmental services that extend across the project and planning life cycles. This group has over 20 years of experience in environmental management practices and research methodologies, as well as in conducting environmental assessment and management studies in over 15 countries in Africa, in particular in southern and West Africa, and elsewhere in the world. The EMS group links closely with wider CSIR expertise in areas such as resource mapping, biodiversity assessment, socio-economic assessments, strategic infrastructure development studies, environmental screening studies, natural resource management, etc. The group has also prepared guidelines such as the Integrated Management Series and Guidelines for Environmental Impact Assessment for the Western Cape provincial government.

Reinett Mogotshi- Reinett holds a BSc degree in Environmental Sciences as well as BSc (Hons) in Environmental Management and Analysis from the University of Pretoria. She has two years' experience in the environmental management field. Prior to joining EMS Group of the CSIR, she worked as an Environmental Science Intern in the Environmental management section of the city of Tshwane, where she reviewed Basic Assessment and Scoping and Environmental Reports. Reinett is currently one of the project managers of the Special Needs and Skills Development Programme of the CSIR. Reinett is a member of the IAIAAsa.

Minnelise Levendal – Minnelise is a Senior EAP in the EMS group of the CSIR and holds a Master's degree in Biological Science (Botany) from the Stellenbosch University. She has 16 years of experience in Environmental Management (which includes ten years working as an EAP). Before she joined the CSIR she was employed at the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) for five years

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where she assessed EIAs, BAs and EMPs. Minnelise is currently managing various EIAs for wind and solar renewable energy projects in South Africa. She was the CSIR project manager for the 100 MW Ubuntu Wind Energy Facility near Jeffreys Bay (Environmental Authorisation granted in June 2012), as well as the 50 MW Banna Ba Pifhu Wind Energy Facility proposed by WKN Windcurrent near Humansdorp in the Eastern Cape (Environmental Authorisation granted in July 2014). She was the project manager of ten BAs for wind monitoring masts in South Africa as part of the National Wind Atlas Project of the Department of Energy. Environmental Authorisation from the DEA for all the ten masts was obtained in 2010.

This Environmental Management Programme that has been compiled in fulfilment of the requirements of the Environmental Impact Assessment Regulations (2014). This EMPr describe the activities that are proposed, and prescribe the management, mitigation and monitoring measures that must be implemented to ensure that potential negative environmental or socio-economic impacts that may be associated with the development are avoided or mitigated correctly, and to ensure that positive impacts of the proposed development are promoted where possible.

This document also intended to ensure that the principles of Environmental Management specified in the National Environmental Management Act are promoted during the different phases of the proposed development of a piggery.

1.4 Description of applicable legislation and policies

1.4.1 National Environmental Management Act

The National Environmental Management Act (NEMA) (Act 107 of 1998 as amended) is the primary piece of environmental legislation in South Africa, and establishes principles for decision-making on matters affecting the environment, and establishes a framework for integrating good environmental management into all development activities.

Section 2 of NEMA states the principles of environmental management that must be applied through the Republic of South Africa. The key principles that are relevant to the proposed project include:

- Environmental management must place people and their needs at the forefront, and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated & take into account the effects of decisions on all aspects of the environment & all people in the environment by pursuing the best practical environmental option.
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued.
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding. Skills and capacity necessary for achieving equitable and effective participation and participation by vulnerable and disadvantaged persons must be ensured.
- The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated. Decisions must be appropriate in the light of such consideration and assessment.
- The polluter must pay for the cost of remedying pollution, environmental degradation and adverse health effects.

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- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

In terms of Section 28 of NEMA “Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment.”

The principles of environmental management and the Duty of Care as stated in NEMA must be observed on site, during all phases of the proposed development of a piggery.

1.4.2 Environmental Impact Assessment Regulations

The Environmental Impact Assessment Regulations of 2014 (GN No. R982, 984 and-985 of December 2014), published under NEMA, list those activities that may have a potentially detrimental impact on the environment, and which require environmental authorisation before those listed activities can be undertaken.

1.4.3 National Water Act (Act 36 of 1998)

In terms of the National Water Act (Act 36 of 1998), there are eleven types of “water use” that require authorisation from the Department of Water & Sanitation (DWS) before the water use activities commences. Given the nature of the project, the type of water use in terms of Section 21 of the National Water Act that is relevant to the proposed project is: Section 21(i) – altering the beds, banks, course or characteristics of a watercourse.

Authorisation for a Water Use Licence Application is required from the DWS in order to undertake the above activity. An application for Water Use Authorisation will be lodged with the DWS.

1.4.4 National Environmental Management Waste Act (NEM:WA) GNR 921, 29 November 2013

In terms of the National Environmental Management Waste Act (Act 59 of 2008) the storage of piggery waste in a lagoon is a listed activity that requires a waste management license. An application for a Waste Management Licence will be submitted in terms of NEM:WA as the proposed activity pertains to the storage of general waste in lagoons.

1.4.5 National Heritage Resources Act 25 of 1999

In terms of the National Heritage Resources Act (Act 25 of 1999) an application for Heritage Resources review was submitted to SAHRA (Case ID: 97840) in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) as amended.

1.4.6 National Environmental Management Biodiversity Act 10 of 2004

The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the pertinent legislation published in terms of this act was considered in compiling this EMPr. This included the determination and assessment of the fauna and flora prevailing in the proposed project and the handling thereof in terms of NEMBA.

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1.4.7 The Gauteng Department of Agriculture and Rural Development: Guideline Manual for Management of Abattoirs and other waste of animal origin.

The proposed development of a piggery and an abattoir shall ensure compliance with the manual for management of abattoirs.

1.4.8 The Gauteng Department of Agriculture and Rural Development: Developmental guidelines for Ridges

In terms of the GDARD's developmental guidelines for Ridges, a class 1 ridge is present within the vicinity of the site. According to this policy only low impact activities are allowed within the 200m buffer of this Ridge.

2 THE APPROACH TO THE EMPR

A typical EMPr takes the planning and design, construction and operational phases of a project into account. The EMPr is based largely on the findings and recommendations of the BA process. However, the EMPr is considered a "live" document and must be updated with additional information or actions during the lifetime of the project if and when needed.

The EMPr follows an approach of identifying an over-arching goal and objectives, accompanied by management actions that are aimed at achieving these objectives. The management actions are presented in a table format in order to show the links between the goal and associated objectives, actions, responsibilities, monitoring requirements and targets. The management plans for the Design and Layout, Construction and Operational phases consist of the following components:

- Description of the activity taking place;
- The potential impacts associated with that activity;
- The appropriate mitigation measures;
- The responsible party; and
- Monitoring Frequency.

3 ROLES AND RESPONSIBILITIES

For the purposes of the EMPr, the generic roles that need to be defined are those of the:

- Farm Manager and Team;
- The Contractor; and
- Environmental Control Officer.

Note: The specific titles for these functions will vary from project to project. The intent of this section is to give a generic outline of what these roles typically require.

3.1 Farm Manager and Team

The manager of the Alphomega farm and the team. The farm manager is responsible to oversee construction, operational and decommissioning aspects of the piggery to make sure that the EMPr is implemented and the conditions of Environmental Authorisation are adhere to throughout the project lifecycle. He will also be responsible for rehabilitation of disturbed areas during construction.

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3.2 The Contractor

The person or company appointed to undertake construction or decommissioning of the piggery. For the purposes of this EMPr, “Contractor” may also refer to the person undertaking any of the proposed activities whether awarded a contract or not. The contractor will be responsible for the overall construction and decommissioning activities on site and compliance with all conditions of authorization as well as drafting the method statement that is aimed to protect environmental resources, minimise pollution and to rehabilitate disturbed areas and its implementation thereof.

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3.3 Environmental Control Officer

It can either be an internal staff member of the Engineer / Contractor assigned to the project. The Environmental Control Officer will be part of the project staff and will advise the Engineer on all environmental matters relating to the works, in terms of this EMPr. The environmental officer will also be responsible for monitoring construction activities on site to also ensure that all the recommendations of the EMPr are adhere to during construction phase. He/she will also be responsible for the implementation of the EMPr on site.

4 THE PROJECT DESCRIPTION

The Alphomega Farming Co-Operative is a small scale commercial farming enterprise that was established in 2005. This Co-Operative comprises of 11 members and is proposing to establish a start-up enterprise comprising of a commercial pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng. The farm currently has dilapidated buildings and a slurry dam. Furthermore there are 11 unidentified graves on site. The proposed development footprint is 4 hectare of land and consists of pig production, cultivation of yellow maize as well as the establishment of an agro-processing facility for slaughtering of pigs. Furthermore 7 units of pigs will be slaughtered per day when necessary, as well as cultivation of yellow maize on 3.5 ha land that was previously used for agriculture. The proposed development is for a 200 sow unit with a throughput of 2122 pigs per to supply Stubbs Meat Supply and Distributors with pigs weekly.

There is a guaranteed market for pork meat in South Africa. The demand for pork meat has increased by 24% since 2007, while the domestic use of pork products has increased by almost 12% between 2010 and 2012. However the number of pigs producers has decreased by 14.41% from 2011 to 2012. The demand for pork meat continues to escalate, which allows Alphomega Farming Co-operative to realistically gain substantial milestones in the domestic market.

The proposed infrastructure of the piggery will entail the following:

2x Soar and Boar house (12 x30m)

2x Farrowing house, weaner and Grower house (12 x30m)

Abattoir (12 x30m)

170 m³ Slurry Dam

Listed Activities

The development of the piggery triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations, Government Regulations (GNR) 983 and 985 of December 2014 promulgate under the National Environmental Management Act (NEMA) (Act no 107 of 1998). The development also triggers listed activities in terms of the National Environmental Management: Waste Act (NEMWA) (Act no 59 of 2008). In terms of these Regulations, a Basic Assessment (BA) and an application for a Waste Management Licence should be undertaken for the proposed project.

In terms of the NEMA EIA Regulations published in GNR 983, 984 and 985 on the 4 December 2014 Government Gazette Number 38282, a BA process is required as the project triggers the following listed activities (detailed in Table 1 below).

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Relevant notice:	Description of each listed activity as per the Government Notice:	Description of
GN. R 983, 4 December 2014	3. The development and related operation of facilities or infrastructure for the slaughter of animals with a production throughput of- (ii) reptiles, game and red meat exceeding 6 units per day	The development of an abattoir with the capacity to slaughter 7 units of pigs per day
GN. R 983, 4 December 2014	4. The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceeds- (ii) 8 square meters per small stock unit and; (a) More than 1 000 units per facility excluding pigs were (b) applies	The development of facilities for concentration of 2122 pigs per annum
GN. R 983, 4 December 2014	27 The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- the undertaking of a linear activity; or ii) maintenance purposes undertaken in accordance with a maintenance management plan	The clearance of vegetation for the establishment of a piggery
GNR 921, 29 November 2013	Category (A) 1: The storage of general waste in lagoons	The storage of piggery waste in a lagoon that is present on site

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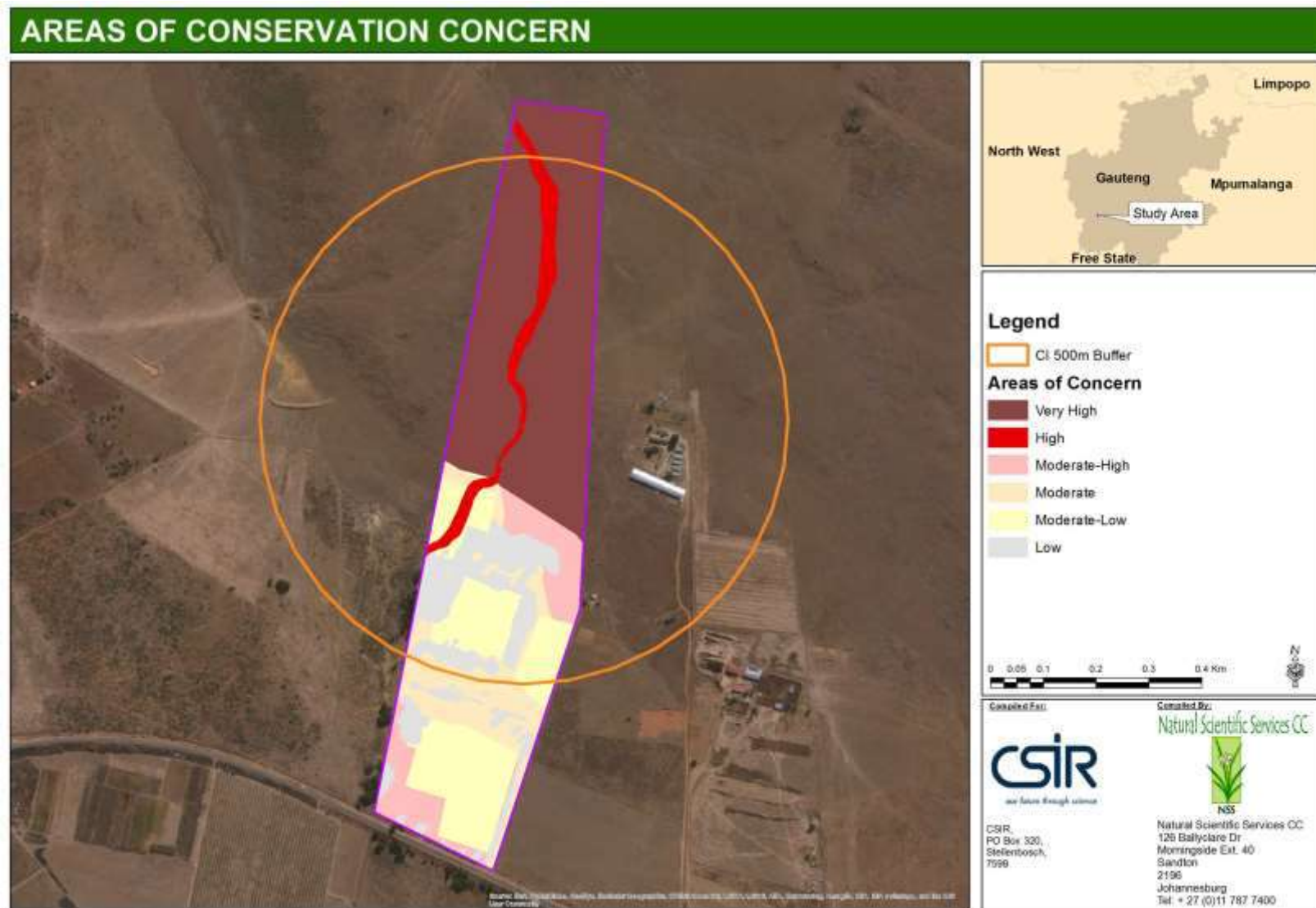


Figure 1: Map showing areas of conservation concerns as identified by (NSS, 2016)

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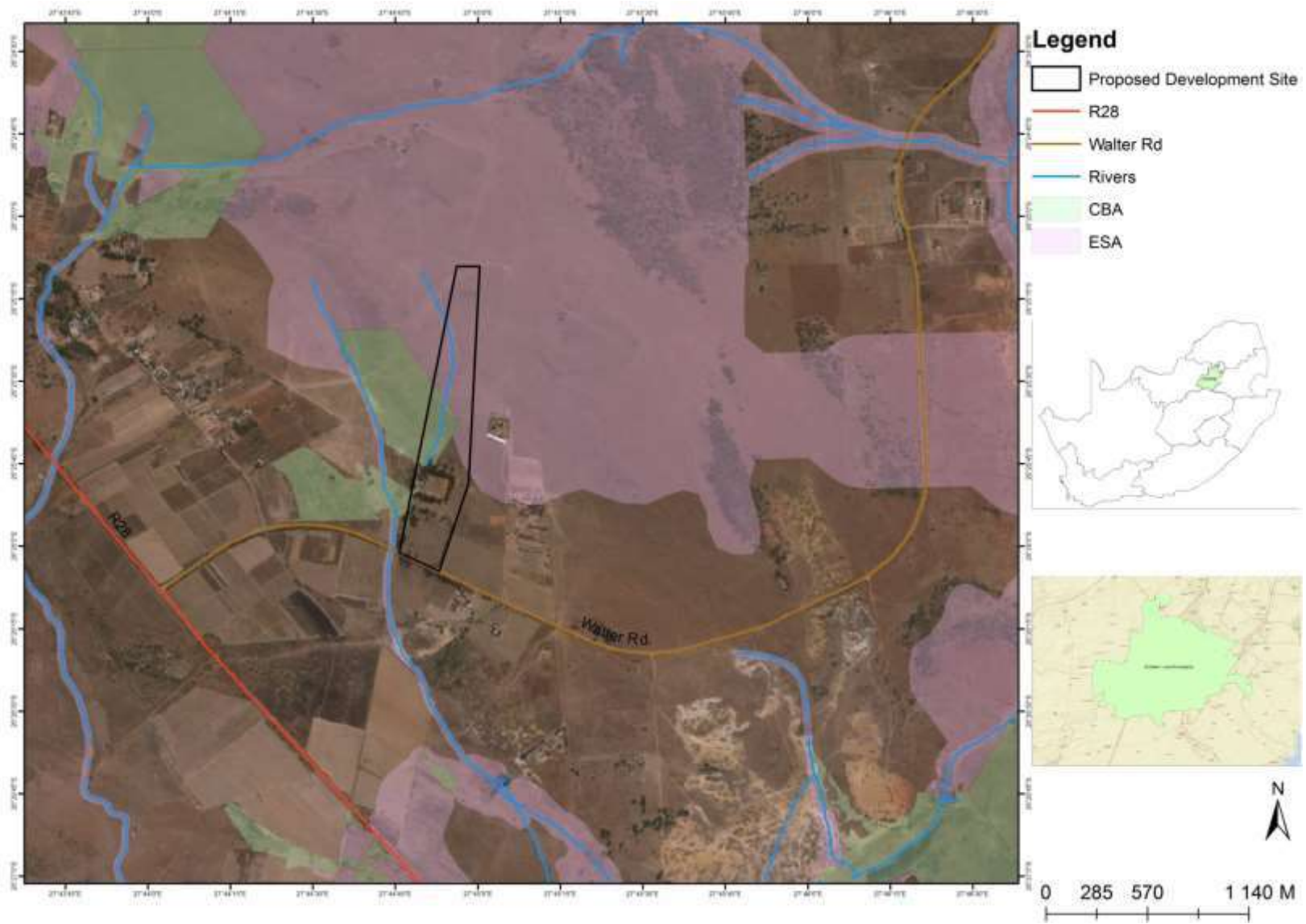


Figure 2: The biodiversity map of the proposed development site

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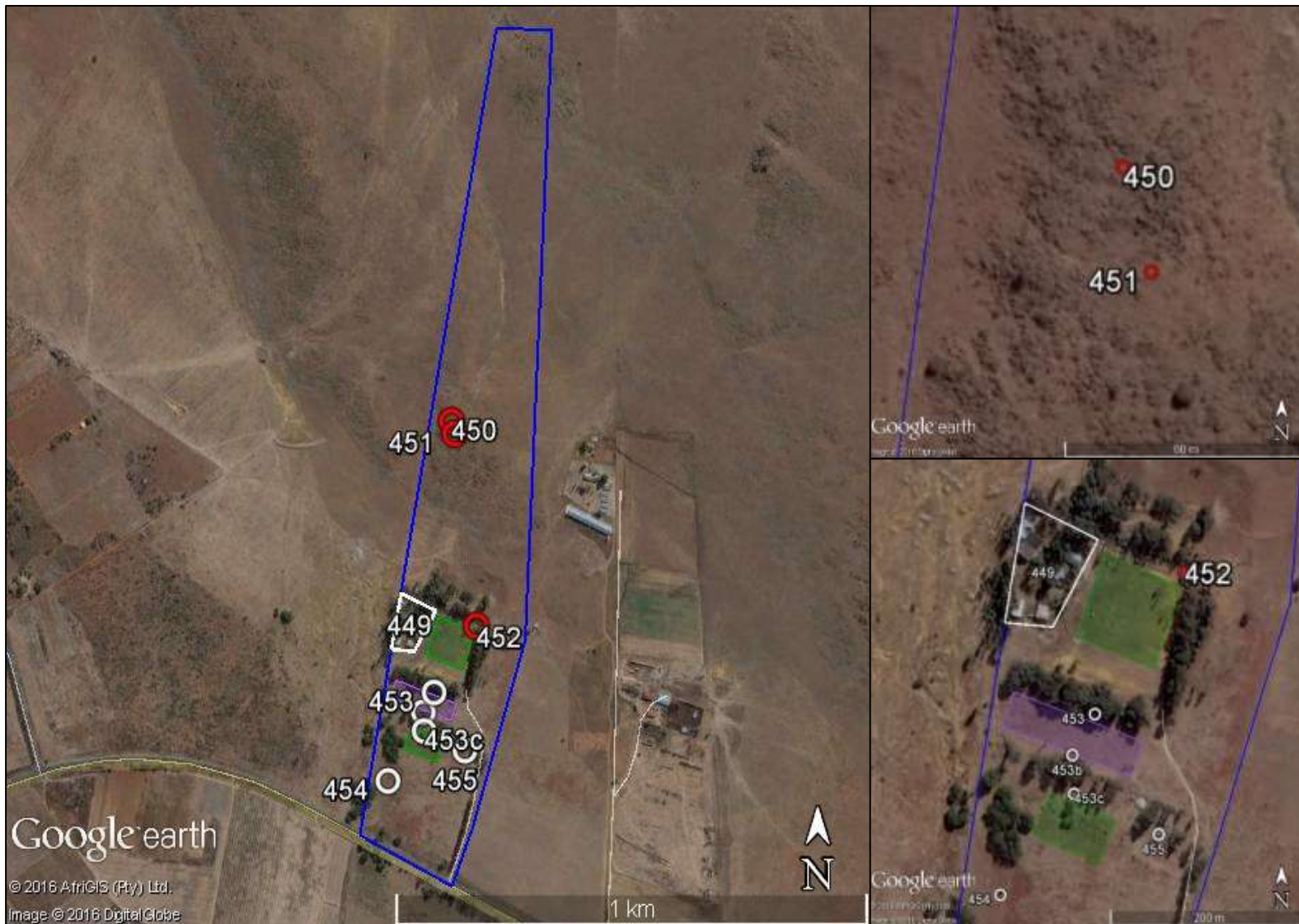


Figure 3: Aerial view of the property showing the locations of the identified finds in relation to the proposed development areas. Red symbols are heritage resources, white symbols are other finds, green shaded polygons are proposed maize fields and the purple polygon is the proposed piggery.

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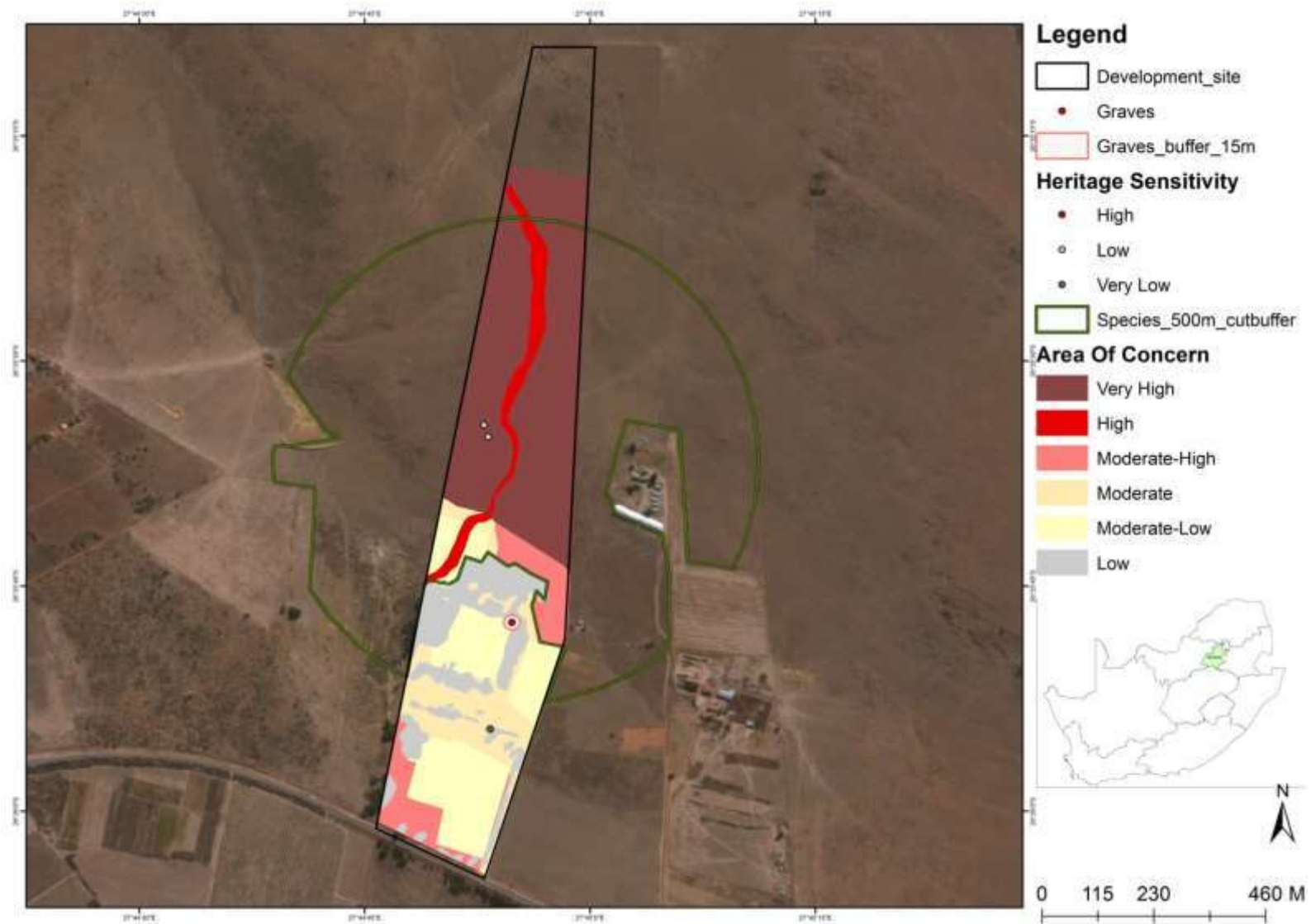


Figure 4: Site sensitivities of the proposed development site

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Figure 5: Amended site layout of the proposed development site

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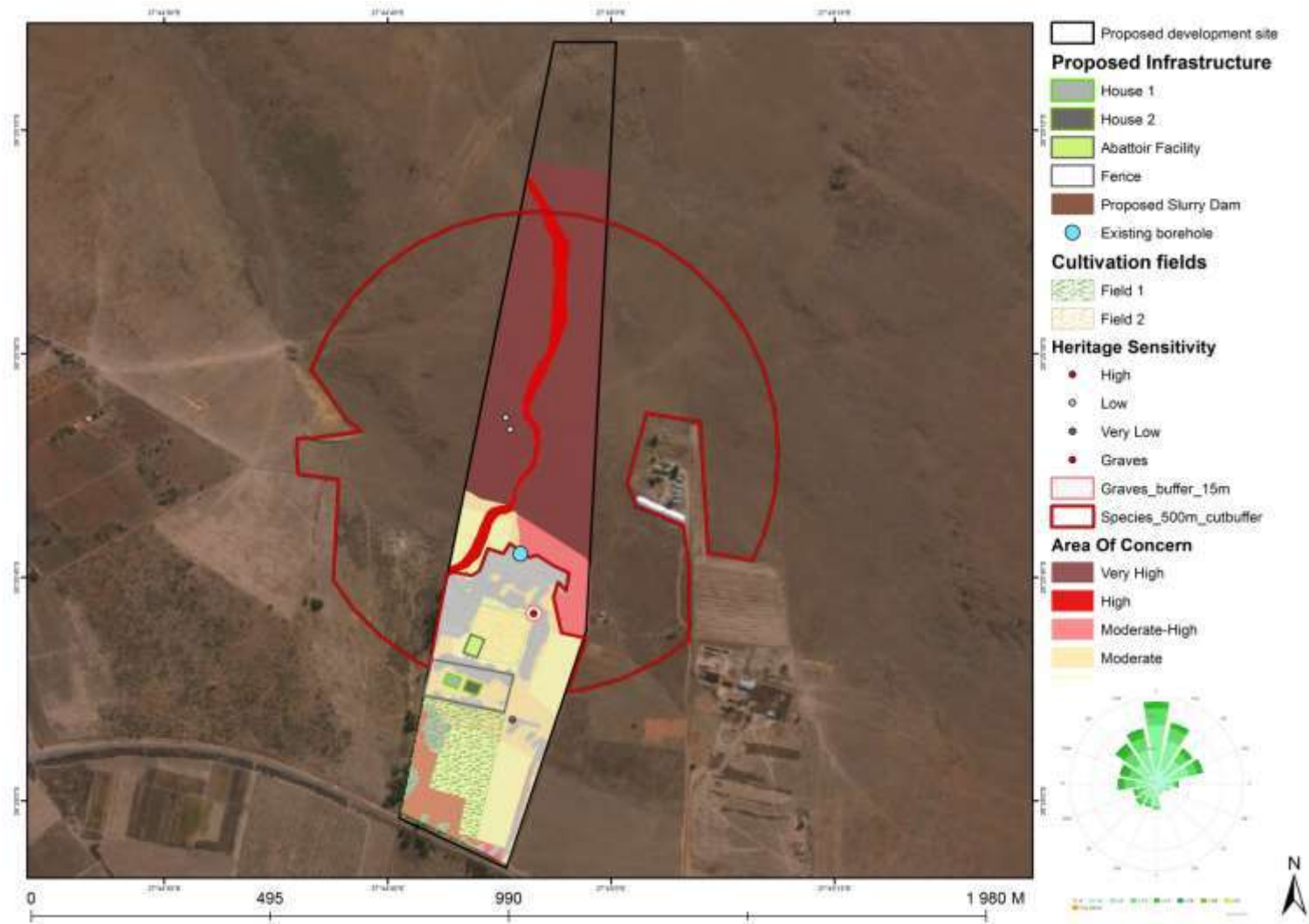


Figure 6: Amended layout of the proposed development with sensitivities

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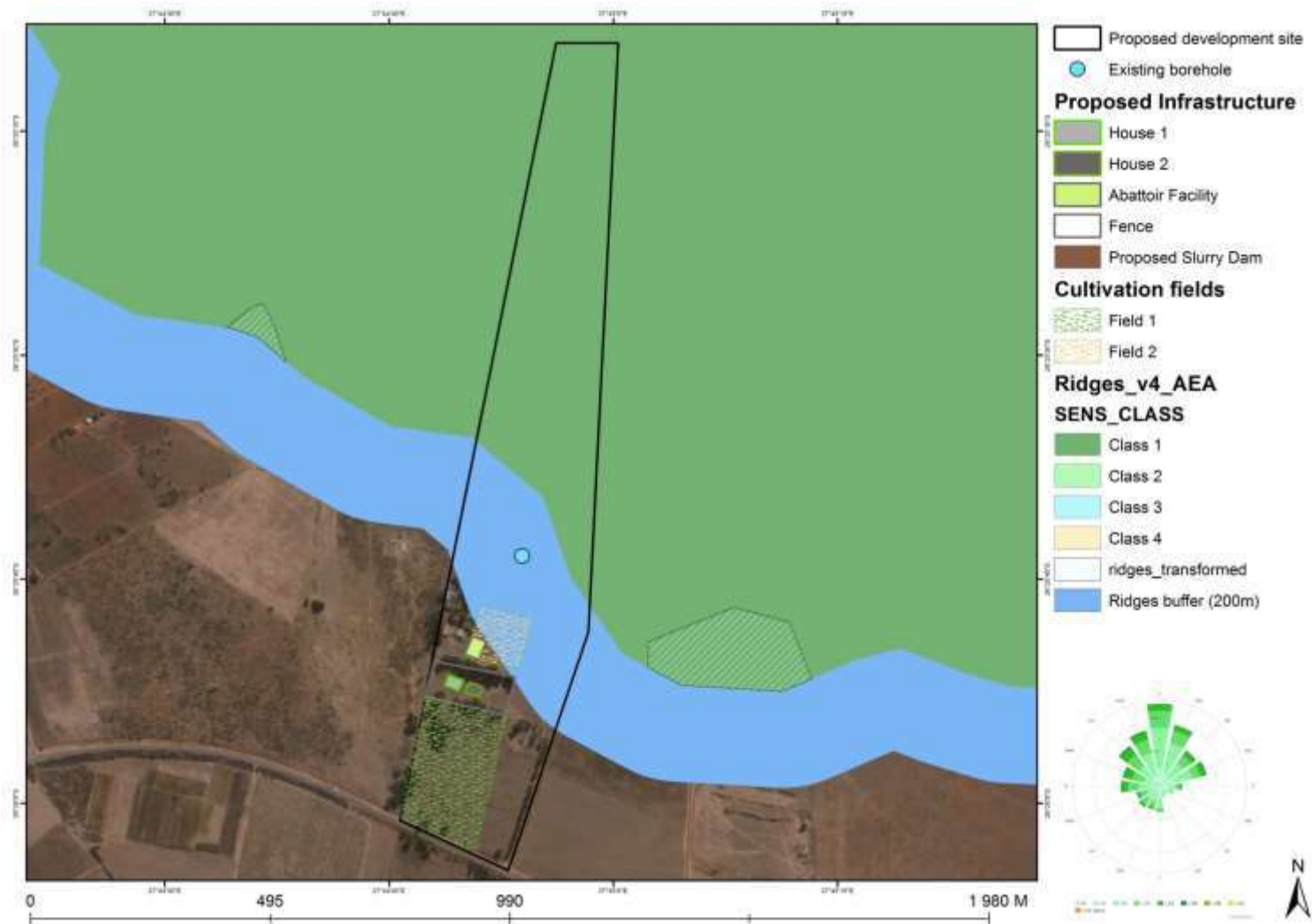


Figure 7: Ridges map of the proposed development superimposed with amended layout

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5 ENVIRONMENTAL MANAGEMENT PLAN

As part of environmental management and enhancement, an identification and description of impact management objectives must be developed, inclusive of the proposed methods and effective management and mitigation measures required during the design, construction and operational phases of the proposed piggery. The table below lists potential impacts and mitigation measures recommended for the proposed Alhomega piggery and agricultural development at the different phases.

Table 5-1: Impact management plan for the proposed Design and Planning Phase

Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Biodiversity Management				
Direct loss of terrestrial vegetation and faunal habitat	Restrict all habitat loss and disturbances from construction activities to within the proposed and agreed upon site layout.	Revise the planned layout of the facility and all associated infrastructure to avoid all Very High and High sensitive areas	During design	Farm Manager and Team
		Clearly demarcate or fence in the construction site. Relocate specimens that are situated in the construction footprint, according to the advice of an appropriate specialist	Pre-construction	Farm Manager and Team
	Maintain the viability of the indigenous seed bank in excavated soil so that this can be used for subsequent re-vegetation of any disturbed areas. No landscaping should be performed around the facilities.	Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least	During construction	Farm Manager and Team
		No further farming should take place at the top field near the drainage area. The area should be rehabilitated to revert back to a similar structure to the surrounding Soweto Highveld Grassland.	During design	Farm Manager and Team
		Avoid unnecessary loss of indigenous trees (The <i>Acacia</i> Indigenous Bushclumps)	Identify and mark indigenous trees on the ground and digitally to facilitate the retention of as many of these important faunal habitats as possible into the final development footprint	Design / pre-construction
Loss of CI or medicinal flora	Adhere to legal requirements and best practice guidelines regarding the	Submit permits for the removal of CI important species within the study site.	Pre-Construction	Farm Manager and Team

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	displacement of CI and medicinally important floral species.	Prior to construction all CI and medicinally important floral specimens within the site layout footprint should be collected and replanted in the surrounding areas.	Pre-Construction	Botanist / horticulturist
		Guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants is advised	During Construction	Botanist / horticulturist
Mortality and displacement of fauna (including CI species)	Adhere to legal requirements and best practice guidelines regarding the handling and relocation of CI fauna.	If any of the remaining natural areas are to be affected, then it is recommended that a suitably qualified specialist be assigned to relocate any CI fauna on site to nearby suitable habitat (i.e. <i>Termitaria</i> that need to be destroyed within the project footprint should be carefully searched for Striped Harlequin Snakes and immediately before construction of the units, rocks and grass should be searched for grass lizards, and night time searches for hedgehogs should be performed).	Pre-Construction	Zoologist/Ecologist
		Appropriately deal with fauna on site	Ensure that procedures are in place for handling and relocating fauna that need to be moved off site.	All Phases
		Ensure that staff are trained and equipped to safely handle fauna (particularly snakes), or that the services of a trained professional are readily available on call. Buried bullfrogs, which are unearthed during construction activities must be handled and relocated with advice from an appropriate specialist.	All Phases	Farm Manager and Team / External Ecologist
	Time construction activities to minimize faunal mortality	Construction activities should be timed to preferably start (and preferably end) during winter, when activity levels and the presence of breeding and migratory animal species are lowest	Pre-construction	Farm Manager and Team, Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	Limit unnecessary mortality, and persecution of fauna	Check open trenches for trapped animals (e.g. bullfrogs, hedgehogs and snakes), which should be carefully caught and relocated according to the specifications of a relevant specialist	Daily during construction	Farm Manager and Team, Construction Crew, Zoologist
		Prohibit the further introduction of domestic animals such as dogs and cats.	All Phases	Farm Manager and Team
		Educate the team on prohibited actions involving the utilisation of wildlife (i.e. poaching / harvesting) through training and notices	All Phases	Farm Manager and Team / External Ecologist (Advisory Capacity)
		Routinely walk fence lines and within the Ridge habitat to remove snares.	All Phases	Farm Manager and Team / Farm Management
	Minimize displacement of fauna that utilize alien trees.	Slowly replace alien trees with indigenous trees, which flower during different times of the years, so as to provide a continued source of arboreal habitat and other resources for fauna (such as pollen for bees).	All Phases	Farm Manager and Team / External Ecologist (Advisory Capacity)
Introduction & proliferation of alien spp. - Competition and change in structure	Regulate / limit access by potential vectors of alien plants.	Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area	Prior to and during construction	Farm Manager and Team ECO Construction manager
		Continue with the removal of alien wooded species. However, this must be supplemented with some indigenous species to provide food resources for species such as the bees present on site	Pre-Construction and continued through the life of the project	Farm Manager and Team
		Prohibit the introduction of domestic animals such as dogs and cats	All Phases	Farm Manager and Team
		If any landscaping is to be done -Only plant locally indigenous flora	All Phases	Farm Manager and Team
	Maintain a tidy construction site.	Keep construction activities neat and tidy. When complete remove all sand piles and	During construction	Farm Manager and Team

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		landscape all uneven ground while re-establishing a good topsoil layer.		
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Remove Category species using mechanical methods and minimize soil disturbance as far as possible.	During construction	Farm Manager and Team / construction crew
Increase in dust and erosion	Implement effective measures to control dust and erosion.	Limit vehicles, people and materials to the construction site.	During construction	Farm Manager and Team, Construction Crew
		Commence (and preferably complete) construction during winter, when the risk of erosion should be least		
		Revegetate denude areas with locally indigenous flora a.s.a.p.		
		Implement erosion protection measures on site to reduce erosion and sedimentation of downstream areas. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.		
		Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting of the entrance road.		
Minimize sensory disturbance of fauna	Time construction activities to minimize sensory disturbance of fauna.	Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least	During pre-construction and construction planning	Farm Manager and Team, Construction Crew
	Limit disturbance from noise	Minimize noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds.	Prior to and throughout construction	Farm Manager and Team, Construction Crew
	Limit disturbance from light	Limit construction activities to day time hours.	Throughout construction	Farm Manager and Team, Construction Crew
		Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	Throughout construction	Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Water Quality Impacts				
Pollution of the surrounding environment as a result of contamination of stormwater. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Reduce the contamination of stormwater.	The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.	All phases	Construction Crew and Farm Manager and Team
		Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff.		
		Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.		
		Ensure that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic, or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.		

Table 5-2: Impact management plan for the proposed Construction Phase

Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Biodiversity Impacts				
Direct loss of terrestrial vegetation and faunal habitat	Restrict all habitat loss and disturbances from construction activities to within the proposed and agreed upon site layout.	Revise the planned layout of the facility and all associated infrastructure to avoid all Very High and High sensitive areas	During design	Farm Manager and Team
		Clearly demarcate or fence in the construction site. Relocate specimens that are situated in	Pre-construction	Farm Manager and Team

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		the construction footprint, according to the advice of an appropriate specialist		
	Maintain the viability of the indigenous seed bank in excavated soil so that this can be used for subsequent re-vegetation of any disturbed areas. No landscaping should be performed around the facilities.	Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least	During construction	Farm Manager and Team
		No further farming should take place at the top field near the drainage area. The area should be rehabilitated to revert back to a similar structure to the surrounding Soweto Highveld Grassland. d.	During design	Farm Manager and Team
		Briefly and effectively stockpile topsoil preferably 1-1.5m high. Natural vegetation must be allowed to recover in areas of disturbance. If recovery is slow, then a seed mix for the area (using indigenous grass species listed within this report) should be sourced and planted	During construction	Construction Crew
	Avoid unnecessary loss of indigenous trees (The <i>Acacia</i> Indigenous Bushclumps)	Identify and mark indigenous trees on the ground and digitally to facilitate the retention of as many of these important faunal habitats as possible into the final development footprint	Design / pre-construction	Farm Manager and Team, Construction Crew, with advice from an Ecologist
Loss of CI or medicinal flora	Adhere to legal requirements and best practice guidelines regarding the displacement of CI and medicinally important floral species.	Submit permits for the removal of CI important species within the study site.	Pre-Construction	Farm Manager and Team
		Prior to construction all CI and medicinally important floral specimens within the site layout footprint should be collected and replanted in the surrounding areas.	Pre-Construction	Botanist / horticulturist
		Guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants is advised	During Construction	Botanist / horticulturist
Mortality and displacement of fauna (including CI species)	Adhere to legal requirements and best practice guidelines regarding the handling and relocation of CI fauna.	If any of the remaining natural areas are to be affected, then it is recommended that a suitably qualified specialist be assigned to relocate any CI fauna on site to nearby suitable	Pre-Construction	Zoologist/Ecologist

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		habitat (i.e. <i>Termitaria</i> that need to be destroyed within the project footprint should be carefully searched for Striped Harlequin Snakes and immediately before construction of the units, rocks and grass should be searched for grass lizards, and night time searches for hedgehogs should be performed).		
	Appropriately deal with fauna on site	Ensure that procedures are in place for handling and relocating fauna that need to be moved off site.	All Phases	Farm Manager and Team
		Ensure that staff are trained and equipped to safely handle fauna (particularly snakes), or that the services of a trained professional are readily available on call. Buried bullfrogs, which are unearthed during construction activities must be handled and relocated with advice from an appropriate specialist.	All Phases	Farm Manager and Team / External Ecologist
	Time construction activities to minimize faunal mortality	Construction activities should be timed to start (and preferably end) during winter, when activity levels and the presence of breeding and migratory animal species are lowest	Pre-construction	Farm Manager and Team, Construction Crew
	Limit unnecessary mortality, and persecution of fauna	Check open trenches for trapped animals (e.g. bullfrogs, hedgehogs and snakes), which should be carefully caught and relocated according to the specifications of a relevant specialist	Daily during construction	Farm Manager and Team, Construction Crew, Zoologist
		Prohibit the further introduction of domestic animals such as dogs and cats.	All Phases	Farm Manager and Team
		Educate the team on prohibited actions involving the utilisation of wildlife (i.e. poaching / harvesting) through training and notices	All Phases	Farm Manager and Team / External Ecologist (Advisory Capacity)
		Routinely walk fence lines and within the Ridge habitat to remove snares.	All Phases	Farm Manager and Team / Farm Management

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	Minimize displacement of fauna that utilize alien trees.	Slowly replace alien trees with indigenous trees, which flower during different times of the years, so as to provide a continued source of arboreal habitat and other resources for fauna (such as pollen for bees).	All Phases	Farm Manager and Team / External Ecologist (Advisory Capacity)
Introduction & proliferation of alien spp. - Competition and change in structure	Regulate / limit access by potential vectors of alien plants.	Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area	Prior to and during construction	Farm Manager and Team ECO Construction manager
		Continue with the removal of alien wooded species. However, this must be supplemented with some indigenous species to provide food resources for species such as the bees present on site	Pre-Construction and continued through the life of the project	Farm Manager and Team
		Prohibit the introduction of domestic animals such as dogs and cats	All Phases	Farm Manager and Team
		If any landscaping is to be done -Only plant locally indigenous flora	All Phases	Farm Manager and Team
	Maintain a tidy construction site.	Keep construction activities neat and tidy. When complete remove all sand piles and landscape all uneven ground while re-establishing a good topsoil layer.	During construction	Farm Manager and Team
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Remove Category 1b species using mechanical methods and minimize soil disturbance as far as possible.	During construction	Farm Manager and Team / construction crew
Minimize sensory disturbance of fauna	Time construction activities to minimize sensory disturbance of fauna.	Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least	During pre-construction and construction planning	Farm Manager and Team, Construction Crew
	Limit disturbance from noise	Minimize noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds.	Prior to and throughout construction	Farm Manager and Team, Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	Limit disturbance from light	Limit construction activities to day time hours.	Throughout construction	Farm Manager and Team, Construction Crew
		Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	Throughout construction	Construction Crew
Heritage				
Destruction of graves	Manage the disturbance of graves	Erect fences 5 m from graves and respect 10 m buffer from fence	Prior to and throughout construction	Farm Manager and Team
Disturbance to and damage to Heritage Artefacts	Prevent damage and destruction to fossils, artefacts and materials of heritage significance.	The construction workers must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted	Prior to and throughout construction	Farm Manager and Team
Waste				
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of general and hazardous waste.	General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate		
		Should the on-site storage of general waste and hazardous waste exceed 100 m ³ and 80 m ³ respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.		
		Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.		

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>Ensure that sufficient general waste disposal bins are provided for all construction personnel throughout the site. These bins must be emptied on a regular basis.</p> <p>No solid waste may be burned on site.</p> <p>Segregation of hazardous waste from general waste to be in place.</p> <p>The Contractor should provide adequate waste skips (or similar) on site and the Construction Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.</p> <p>All construction waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site</p> <p>Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</p> <p>Records of removal of infectious waste must be kept</p>		
Air Quality				
Increase in dust and erosion	Implement effective measures to control dust and erosion.	Limit vehicles, people and materials to the construction site.	During construction	Farm Manager and Team, Construction Crew
		Commence (and preferably complete) construction during winter, when the risk of erosion should be least		
		Revegetate denude areas with locally		

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		indigenous flora a.s.a.p.		
		Implement erosion protection measures on site to reduce erosion and sedimentation of downstream areas. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.		
		Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting of the entrance road.		
Emissions from construction vehicles and generation of dust as a result of earthworks, demolition, as well as the delivery and mixing of construction materials.	Reduce dust emissions during construction activities.	Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.	During pre-construction and construction planning	Construction Crew
		Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary		
		Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.		
		Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.		
		Noise should also be minimised throughout construction to limit the impact on sensitive fauna such as owls and large terrestrial birds.		
Emissions from construction vehicles and generation of dust as a result of earthworks, demolition, as	Reduce dust emissions during construction activities.	Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.	During pre-construction and construction planning	Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
well as the delivery and mixing of construction materials.		Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary		
		Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.		
		Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.		
		Noise should also be minimised throughout construction to limit the impact on sensitive fauna such as owls and large terrestrial birds.		
Socio-Economic Impacts				
Socio-economic Impact: Employment creation and skills development opportunities during the construction phase, which is expected to give rise to approximately 6-12 new jobs. This impact is rated as positive.	Maximise local employment and local business opportunities to promote and improve the local economy.	Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained	During the construction phase	Farm Manager and Team
		Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract.		
		Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.		
Visual Impacts				

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Potential visual intrusion of construction/demolition activities on the views of sensitive visual receptors	Prevent unnecessary visual clutter from focusing attention of surrounding visual receptors on the proposed development.	No specific mitigation measures are required other than standard construction site housekeeping and dust suppression such as demarcating construction boundaries and minimise areas of surface disturbance.	All Phases	Construction Crew
		Night lighting of the construction site should be minimised within requirements of safety and efficiency		
Safety, Health and Environment				
Potential noise impact from the use of construction equipment (for the construction of the proposed infrastructure and demolition of existing infrastructure).	Prevent unnecessary impacts on the surrounding environment by ensuring that the piling noise is mitigated	Limit construction activities to day time hours	During construction	Construction Crew
Noise generation from demolition and construction work (e.g. grinding and use of angle grinders), as well as from the removal of waste material (e.g. crane and truck engines). This impact is rated as neutral.	Reduce the potential noise impacts on the construction workers.	Construction personnel must wear proper hearing protection, which should be specified as part of the Construction Phase Risk Assessment carried out by the Contractor.	During construction	Construction Crew
		The Contractor must ensure that all construction personnel are provided with adequate Personal Protective Equipment (PPE), where appropriate		
Potential health injuries to construction personnel as a result of construction work (i.e. welding fumes. This impact is rated as neutral.	Prevent respiratory illnesses caused to the construction personnel.	The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.	During construction	Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
<p>Construction safety injuries: potential impact on the safety of construction workers due to construction activities (such as welding, cutting, working at heights, lifting of heavy items etc.). This impact is rated as neutral.</p>	<p>Prevention of injuries to and fatalities of construction personnel during the construction phase.</p>	<p>Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards.</p>	<p>During construction</p>	<p>Construction Crew</p>
		<p>The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.</p>		
		<p>A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to co-ordinate the construction traffic.</p>		
		<p>The Contractor must undertake a Construction Phase Risk Assessment</p>		
		<p>Ensure that roads are not closed during construction, which may restrict access for emergency services.</p>		
Traffic Impacts				
<p>Traffic, congestion and potential for collisions during the construction phase. This impact is rated as neutral.</p>	<p>Prevent unnecessary impacts on the surrounding road network by supplying parking for construction vehicles on site.</p>	<p>During the construction phase, suitable parking areas should be created and designated for construction trucks and vehicles.</p>	<p>During construction</p>	<p>Construction Crew</p>
		<p>A construction supervisor should be appointed to co-ordinate construction traffic during the construction phase (by drawing up a traffic plan prior to construction).</p>		
Water Quality Impacts				

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Pollution caused by spillage or discharge of construction waste water into the surrounding environment.	Reduce the spillage of domestic effluent and the impact thereof on the environment.	Ensure that adequate containment structures are provided for the storage of construction materials on site.	During construction	Construction Crew
Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material.	Prevent unnecessary pollution impacts on the surrounding environment.	The amount of hazardous materials and liquids (such as cleaning materials) handled will be minimal. Fumes generated during welding will be minimal, within a well-ventilated area.	All phases	Construction Crew and Farm Manager and Team
		The construction site should be cleaned regularly		
		The Contractor should provide adequate waste skips (or similar) on site and the Construction Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.		
		All construction waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site.		
Pollution of the surrounding environment as a result of contamination of stormwater. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Reduce the contamination of stormwater.	The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.	All phases	Construction Crew and Farm Manager and Team
		Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff.		

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.		
		Ensure that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.		

Table 5-2: Impact management plan for the proposed Operational Phase

Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Biosecurity Impacts				
Odours from operations and Environmental contamination of the surrounding environment from organic waste and blood	Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	Ensure that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic, or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.	During design	Farm Manager and Team
		Adhere to best practice pig husbandry and waste disposal norms	Throughout Operation	
		Blood, waste water should drain into septic tank and any remaining waste will be disposed of by licensed contractor.	Throughout Operation	
		Ensure that excrement, carcasses, feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.	Throughout Operation	
		Adhere to GDARD guidelines for Management of Abattoirs.	All phases	

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Incorporate effective storm water management design aspects into the infrastructure plan	During design	
		Design of abattoir shall comply with health and safety guidelines for pig husbandry and abattoirs. Furthermore the applicant shall comply with the South African Pork Quality Assurance and Traceability Standards.	During design	
		Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste.	Throughout Operation	
		Applicant must comply with Best Practice Guidelines and Animal Disease Act 35 of 1984. The design of the abattoir shall comply with health and safety guidelines for piggeries and abattoirs.	All phases	
		Pig houses should be cleaned regularly and should be stored within the slurry dam	Daily during the operational phase	
		Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.	Prior to operation	

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Management of pest invertebrates	Detect and control pest infestations before they become a problem through frequent and careful cleaning, monitoring and control.	Clean floors regularly.	Daily during the construction phase.	Farm Manager and Team
		Provide sufficient ventilation and airflow to keep floors, bedding, and fodder as dry as possible		
		Check that fan louvers work properly, and close fans completely when off		
		Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water		
		Use appropriately sloped and slatted floors to facilitate drainage.		
		Clean up excess fodder regularly from under troughs and feed bins		
		Effectively drain storm water from around pig houses		
		Keep areas surrounding pig houses free of spilled manure and litter		
		Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities.		
		Keep grass and weeds mowed to 5cm or less immediately around the facilities, to prevent insect growth		
		Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate animals from accessing the effluent.		
Regularly empty slurry dam to prevent the accumulation of floating solids for extended periods of time (crust left on top of slurry soon				

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		become major breeding ground for flies)		
		Electrocution devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps.		
		Ensure that measures to control pest invertebrates are tightly restricted to areas where these are problematic. Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist.		
Management of pest vertebrates	Detect pest infestations before they become a problem through frequent and careful monitoring.	Maintain the appropriate pest control measures	Daily during the construction phase.	Farm Manager and Team
		Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste.		
		Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate and vertebrate animals from accessing the effluent		
Transmission of diseases	Ensure that pests and other potential vectors are unable to enter areas where they might encounter production animals, carcasses, excrement or bedding, by thoroughly sealing these areas using effective, humane and environmentally-friendly means.	Maintain the appropriate pest control measures	Life of operation particularly at the onset of the rainy season	Farm Manager and Team
		Ensure compliance with the South African Pork Quality Assurance and Traceability Standards.	Life of operation particularly at the onset of the rainy season	Farm Manager and Team
		Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can	Throughout Operation	Farm Manager and Team

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste.		
		Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate and vertebrate animals from accessing the effluent.	Throughout Operation	
Biodiversity Impacts				
Harvesting of CI or medicinal flora	Harvesting of indigenous flora for medicine, fire wood, building materials, and other purposes must be prohibited.	Education of the Farm Management and team required prior to operation and with yearly refresher talks.	When necessary, during operation	Farm Manager and Team
Heritage Impacts				
Destruction of graves	Limit disturbance of graves on site	Erect fences of 5 m from graves and respect 10 m buffer from fence	Prior to construction	Construction crew
Disturbance to and damage to Heritage Artefacts	Limit disturbance of any Heritage Artefacts	The construction workers must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted.	Throughout Operation	Farm Manager and Team
Air Quality				
Atmospheric pollution due to fumes, smoke from fires (involving plant and vegetable oils or MEG).	Prevent unnecessary air pollution impacts as a result of the operational procedures.	Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the terminal as required. Mobile fire-fighting equipment should be provided at the berths as a safety precaution during the vessel offloading process. It should be noted that the products planned to be stored at the terminal have high flash points and low volatility. As a result, fires are unlikely,		Farm Manager and Team and ECO

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		unsustainable, and can be extinguished with basic fire water and portable fire extinguishers.		
Emissions from staff vehicles.	Reduce emissions during operation	Efficient movement of traffic through the entrance and exit in order to reduce congestion and vehicle emissions. Ensure that the facility is operated in such a manner whereby potential odours are minimised.		Farm Manager and Team
Altered burning	Ensure that flammable materials are stored in an appropriate safe house. Ensure that there are appropriate control measures in place for any accidental fires. If artificial burning is considered necessary to reduce risks to human and infrastructure safety from wild fires, a fire management plan should be compiled with input from an appropriate floral specialist, and diligently implemented. Annual wild fires should be strictly prohibited.	Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures Maintain an effective fire break between the development area and the surrounding natural environment (especially the ridge to the north, where the fire-dependent Highveld Blue butterfly may occur) Educate workers about the plan and emergency procedures with regular training and notices	Throughout Operation	Farm Manager and Team and ECO
Biodiversity Impacts				
Introduction & proliferation of alien spp.	Regulate / limit access by potential vectors of alien plants.	Carefully regulate / limit access by vehicles and materials to the site	Throughout Operation	Farm Manager and Team and ECO
		Prohibit the introduction of domestic animals such as dogs and cats.		
		Only plant locally indigenous flora (if landscaping is to be implement)		
	Maintain a neat and tidy production facility	Employ best practices regarding the tilling of soil and weed management		
		Minimize the accumulation or dispersal of excess fodder on site		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Mechanical removal of these species is recommended. However, the removal must be carefully performed so as to not excessively disturb the soil layer. Alien debris could be donated to a local community. Be especially pro-active around the pig effluent slurry dam, fodder loading bays as well as in and around the croplands		
Sensory disturbances	Limit the effects of light pollution on nocturnal fauna (including numerous insects, bats and hedgehogs).	Minimize essential lighting. <ul style="list-style-type: none"> • Ensure that all outdoor lights are angled downwards and/or fitted with hoods. • Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects. • Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV. 		Farm Manager and Team
	Limit the effects of noise from pigs and operational activities on fauna such as carnivores, owls, korhaans and Secretarybirds.	Minimize unavoidable noise. <ul style="list-style-type: none"> • Conduct regular maintenance of machinery and pig house ventilation systems / fans (if any). • Implement an automated pig feeding system to reduce pig noise upon human entry at feeding times. 		Farm Manager and Team
Socio-Economic Impacts				
Improved service delivery with regards to produce and pork products.	Maximise service delivery through maintenance of infrastructure	Ensure that the proposed infrastructure is maintained appropriately to ensure that all facilities and infrastructure operate within its design capacity to deliver as the market requires.		Farm Manager and Team
Visual Impacts				

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Potential impact of night lighting of the development on the nightscape of the surrounding landscape.	Prevent night lights from impacting on surrounding visual receptors by minimizing glare and light spill.	No specific mitigation measures are recommended as it is assumed that night lighting of the proposed storage facility will be planned in such a manner so as to minimize light pollution such as glare and light spill (light trespass) by: Using light fixtures that shield the light and focus illumination on the ground (or only where light is required).		Farm Manager and Team
		Avoiding elevated lights within safety/security requirements.		
		Using minimum lamp wattage within safety/security requirements.		
		Where possible, using timer switches or motion detectors to control lighting in areas that are not occupied continuously (if permissible and in line with minimum security requirements). Switching off lights when not in use in line with safety and security.		
Health, Safety and Environment				
Potential noise impact from operations and road transport of products during the operational phase (i.e. increased road traffic).	Prevent unnecessary impacts on the surrounding environment by ensuring that the drivers of road tankers minimise the use of air brakes.	It is recommended that the drivers of the vehicles be discouraged from using air brakes at night.		Farm Manager and Team
		Limit the effects of noise associated disturbances from pigs and operational activities on sensitive fauna such as owls and medium-large mammals (especially carnivores), potentially occurring hedgehogs and large terrestrial birds such as Korhaans and Secretarybirds.		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Groundwater contamination as a result of the storage of pig waste in the proposed cement lagoon.	Reduce soil and groundwater contamination as a result of incorrect storage and disposal of waste.	Ensure that that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic, or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.		ECO
		Personnel should ensure careful transportation of waste from the pig facilities to the lagoon as to avoid spillage.		
		Adequate infrastructure should ensure waste will not exit the lagoon in an extreme weather event.		
		Ensure adequate treatment of the waste to avoid extreme odours and contaminations.		
Potential impact on the health of operating personnel resulting in potential health injuries.	To ensure that there are no adverse effects on the health of operating personnel.	Operational personnel must wear basic PPE (e.g. gloves, goggles etc.) as necessary during the operational phase.		Farm Manager and Team
Minor accidents to the public and moderate accidents to operational staff (e.g. fires).	Ensure operating personnel or the public are not affected or injured by heat from possible fires.	An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site.	Annually	Farm Manager and Team
		Scheduled inspections should be implemented by operating personnel in order to assure and verify the integrity of hoses, piping and storage lagoon.		
		Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required.		
Impact of extra operational vehicles on the road network.	Prevent unnecessary or excessive heavy vehicles	Undertake re-calibration of existing traffic signals if required.		Farm Manager and Team

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility

Table 5-3: Impact management plan for the proposed Decommissioning Phase

Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Biodiversity Impacts				
Introduction & proliferation of alien spp. - Competition and change in structure	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Remove Category species using mechanical methods and minimize soil disturbance as far as possible.	Throughout the decommissioning phase.	Farm Manager and Team and ECO
Sensory disturbances	Time demolition / rehabilitation activities to minimize sensory disturbance of fauna.	Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	Throughout the decommissioning phase.	Farm Manager and Team and ECO
	Limit disturbance from noise	Minimize noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds		
	Limit disturbance from light	Limit demolition activities to day time hours		
		Minimize or eliminate security and other lighting, to reduce the disturbance of nocturnal fauna		
Effectively control dust.	Implement environmentally-friendly dust control measures (e.g. mulching and wetting) where and when dust is problematic	Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate specialists. Implement the selected control measure(s) where dust is problematic. Revegetate denude areas with locally indigenous flora a.s.a.p.		
Heritage Impacts				
Destruction of graves	Limit disturbance of graves on site	Erect fence of 5 m from graves and respect 10 m buffer from fence	Carry out monitoring for the	Contractor

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
			decommissioning phase.	
Water Quality Impacts				
Potential spillage of effluent to the surrounding environment (from portable sanitation facilities for decommissioning personnel).	Reduce the spillage of domestic effluent and the impact thereof on the environment.	Normal sewage management practises should be implemented. These include ensuring that portable sanitation facilities are regularly emptied and the resulting sewage is transported safely (by an appointed service provider) for correct disposal at an appropriate, licenced facility. Proof of disposal (in the form of waste disposal slips or waybills) should be retained on file for auditing purposes.	Monthly	ECO
Discharge of contaminated stormwater into the surrounding environment. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Reduce the contamination of stormwater.	The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase.	Once off (and thereafter updated as required).	Contractor
		Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff.		
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste.	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of general and hazardous waste.	General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.	Carry out monitoring for the decommissioning phase.	ECO

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>Should the on-site storage of general waste and hazardous waste exceed 100 m³ and 80 m³ respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.</p> <p>Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal.</p> <p>Ensure that sufficient general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis.</p> <p>Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna.</p>		
Noise Impacts				
Emissions from decommissioning vehicles and generation of dust as a result of earthworks and demolition.	Reduce dust emissions during decommissioning activities.	Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.	Carry out monitoring for the decommissioning phase.	Contractor and ECO

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Approved soil stabilisers may be utilised to limit dust generation.		
		Ensure that decommissioning vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.		
Visual Impacts				
Potential visual intrusion of decommissioning activities on the existing views of sensitive visual receptors.	Prevent unnecessary visual clutter from focusing attention of surrounding visual receptors on the proposed development.	No specific mitigation measures are required other than standard site housekeeping and dust suppression. These are included below: The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste.	Weekly	Construction Crew and ECO
		The project developer should demarcate decommissioning boundaries and minimise areas of surface disturbance.		
		Appropriate plans should be in place to minimise fire hazards and dust generation.		
		Litter and rubble should be timeously removed from the work site and disposed at a licenced waste disposal facility.		
		Night lighting of the decommissioning site should be minimised within requirements of safety and efficiency.		
		Limit the effects of light pollution on nocturnal fauna (e.g. The potentially occurring Hedgehog and Rusty Pipistrelle but also various invertebrate species)		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Limit the effects of light pollution on nocturnal fauna (e.g. The potentially occurring Hedgehog and Rusty Pipistrelle but also various invertebrate species)		
Safety, Health and Environment				
Noise generation from demolition activities (e.g. grinding, steel falling, use of angle grinders) during the decommissioning phase. This impact is rated as neutral.	Reduce the potential noise impacts on the decommissioning personnel	A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks.	Throughout the decommissioning phase.	ECO and Contractor
		Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor.		
		The Contractor must ensure that all decommissioning personnel are provided with adequate PPE, where appropriate.		
Potential health injuries to demolition staff during the decommissioning phase. This impact is rated as neutral.	Prevent respiratory illnesses caused to the decommissioning personnel	The Contractor must ensure that all decommissioning personnel are provided with adequate PPE for use where appropriate.	Throughout the decommissioning phase.	ECO and Contractor
Traffic Impacts				
Heavy traffic, congestion and potential for collisions. This impact is rated as neutral.	Prevention of injuries, fatalities, and damage to equipment and vehicles during the decommissioning phase.	Suitable parking areas should be created and designated for trucks and vehicles.	Throughout the decommissioning phase.	Contractor and ECO
		A supervisor should be appointed to co-ordinate traffic during the decommissioning phase.		
		Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the site.		

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6 STORM WATER MANAGEMENT PLAN

Table 6-1: Storm Water management plan for the proposed development

Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Design Phase				
Impact of the project if a detailed storm water management plan is not correctly prepared and implemented.	A detailed stormwater management plan outlining appropriate treatment measures to address runoff from disturbed portions of the site must be compiled.	Check compliance with specified conditions.	Once-off during design followed by regular control	Contractor
		Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	During the design phase	ECO
Construction Phase				
Diversion and impedance surface water flows as well as increased run-off as the result of construction activities	Prevent interference with natural run-off patterns, diverting flows and increasing the velocity of surface water flows.	Compile a Method Statement for Stormwater Management and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction phase.		
		Stormwater and any run-off generated by the hard surfaces should be discharged into retention swales or areas with rock rip-rap (or similar). These could be used to enhance the sense of place, if they are planted with indigenous vegetation.		
		Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks.		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Unnecessary run-off such as over wetting during dust control and irrigation must be avoided.		
		Perform periodic inspections and maintenance of soil erosion measures and stormwater control structures		
Pollution of the surrounding environment as a result of contamination of stormwater. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Reduce the contamination of stormwater.	The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.	All phases	Construction Crew and Farm Manager and Team
		Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff during construction phase.		
		Ensure that the temporary site camp and ablution facilities are established at least 32 m away from areas of high sensitivity.		
		Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.		
Operation				
Discharge of contaminated stormwater into the surrounding environment. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Reduce the contamination of stormwater during operation.	The appointed Contractor should compile a Method Statement for Stormwater Management during the operation.	Once off and updated as required.	Contractor
		Undertake regular inspections of the stormwater infrastructure (i.e. by implementing walk through inspections).	Throughout Operation	Farm manager and team

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7 BIOSECURITY PLAN

Table 7-1: Biosecurity plan for the proposed development of a piggery

Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Odours from operations and Environmental contamination of the surrounding environment from organic waste and blood	Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	Ensure that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.	During design	Farm Manager and Team
		Adhere to best practice pig husbandry and waste disposal norms	Throughout Operation	
		Blood, waste water should drain into septic tank and any remaining waste will be disposed of by licensed contractor.	Throughout Operation	
		Ensure that excrement, carcasses, feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.	Throughout Operation	
		Adhere to GDARD guidelines for Management of Abattoirs.	All phases	
		Incorporate effective storm water management design aspects into the infrastructure plan	During design	
		Design of abattoir must comply with health and safety guidelines for pig husbandry and abattoirs.		
		Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed	Throughout Operation	

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>facility for hazardous waste.</p> <p>Applicant must comply with Best Practice Guidelines and Animal Disease Act 35 of 1984. The design of the abattoir shall comply with health and safety guidelines for piggeries and abattoirs.</p> <p>Pig houses should be cleaned regularly and should be stored within the slurry dam</p> <p>Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</p>	<p>All phases</p> <p>Daily during the operational phase</p> <p>Prior to operation</p>	
Management of pest invertebrates	Detect and control pest infestations before they become a problem through frequent and careful cleaning, monitoring and control.	<p>Clean floors regularly.</p> <p>Provide sufficient ventilation and airflow to keep floors, bedding, and fodder as dry as possible</p> <p>Check that fan louvers work properly, and close fans completely when off</p> <p>Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water</p> <p>Use appropriately sloped and slatted floors to</p>	Daily during the construction phase.	Farm Manager and Team

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>facilitate drainage.</p> <p>Clean up excess fodder regularly from under troughs and feed bins</p> <p>Effectively drain storm water from around pig houses</p> <p>Keep areas surrounding pig houses free of spilled manure and litter</p> <p>Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities.</p> <p>Keep grass and weeds mowed to 5cm or less immediately around the facilities, to prevent insect growth</p> <p>Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate animals from accessing the effluent.</p> <p>Regularly empty slurry dam to prevent the accumulation of floating solids for extended periods of time (crust left on top of slurry soon become major breeding ground for flies)</p> <p>Electrocution devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps.</p> <p>Ensure that loading bays, water lines and drinkers are cleaned and disinfected regularly.</p> <p>Ensure that measures to control pest invertebrates are tightly restricted to areas where these are problematic. Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist.</p>		
Management of pest vertebrates	Detect pest infestations before they become a problem through	Maintain the appropriate pest control measures	Daily during the construction phase.	Farm Manager and Team

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	frequent and careful monitoring.	<p>Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste.</p> <p>Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate and vertebrate animals from accessing the effluent</p>		
Transmission of diseases	Ensure that pests and other potential vectors are unable to enter areas where they might encounter production animals, carcasses, excrement or bedding, by thoroughly sealing these areas using effective, humane and environmentally-friendly means.	Maintain the appropriate pest control measures	Life of operation particularly at the onset of the rainy season	Farm Manager and Team
		Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste.	Throughout Operation	Farm Manager and Team
		Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate and vertebrate animals from accessing the effluent.	Throughout Operation	
		Visitors must be limited to the reception and wear protective clothing if they are in contact with the pigs.		
		Ensure that the farm access road is disinfected regularly and is clear of dung.		
		Ensure that feed spillages are removed as quickly as possible and feed for the pigs are		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		stored in rodent safe containers.		

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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of
Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
FINAL BASIC ASSESSMENT REPORT

8 ENVIRONMENTAL EDUCATION/ ENVIRONMENTAL AWARENESS PLAN

The farm manager will be responsible for implementing a programme that will raise environmental awareness for all construction workers. The environmental awareness training will be presented to all workers in order to promote a successful implementation of the EMPr. An Environmental Control Officer shall be appointed to assist the manager with effective implementation of the programme and to also ensure compliance with all conditions of authorisations received.

The Awareness training shall emphasise the importance of an EMPr in order to promote compliance. All the environmental impacts that are associated with the proposed development should be outlined together with the proposed mitigation measures. The programme should also focus on sensitive areas in order to ensure that sensitive natural resources are protected.

The environmental awareness training should be undertaken when necessary and it is the responsibility of the farm manager to ensure that every person who will be coming to site is educated about the general conduct. Furthermore a register must be signed as part of the monitoring process; this will serve as proof that workers were made aware of the sensitivities on site. A method statement will be compiled by the contractor prior to commencement of construction activities. The method statement will comply with all the recommendations that have been outlined in the EMPr of the project with aims to protect environmental resources, minimise pollution and to rehabilitate disturbed areas.

9 ENVIRONMENTAL MONITORING & REPORTING/ AUDITING

The Environmental Control Officer will be responsible for monitoring of construction activities on site to also ensure that all the recommendations of the EMPr, Storm Water management plan and biosecurity plan are adhered to during the construction phase of the programme. Monitoring of compliance with all the recommendations should be done regularly in order to protect the natural resources on site.

The construction area must be inspected and the Environmental Control Officer must compile a report after each inspection. Should non-compliance be recorded, the construction activities must be ceased until remedial actions are taken to ensure compliance. The report must be submitted to the Farm manager who can then address any issues raised with the engineer and contractor. The reports will be kept as part of record keeping and will be sent to GDARD should they be requested.

Written records should entail the method statement, the approved EMPr that consists of monitoring reports, a site incident register, relevant authorisations that have been obtained and records of any meeting and training held with the construction workers. The farm manager will also be responsible for post construction phase monitoring programme i.e. clearance of Invasive Alien Species on site, the removal of debris during flooding etc.

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Basic Assessment for the proposed development of a Pig production facility on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Poortje, Gauteng:
FINAL BASIC ASSESSMENT REPORT

BASIC ASSESSMENT REPORT

APPENDIX I: OTHER INFORMATION

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Annexure I.1: Minnelise Levendal (Project Leader)



CSIR
Jan Cilliers Street
PO Box 320 Stellenbosch 7600
South Africa

Phone: +27 21 888 2400
Fax: +27 21 888 2693
Email: mlevendal@csir.co.za



CURRICULUM VITAE OF MINNELISE LEVENDAL – PROJECT LEADER

Name of firm	CSIR
Name of staff	Minnelise Levendal
Profession	Environmental Assessment and Management
Position in firm	Project Manager
Years' experience	8 years
Nationality	South African
Languages	Afrikaans and English

CONTACT DETAILS:

Postal Address: P O Box 320, Stellenbosch, 7599
Telephone Number: 021-888 2495/2661
Cell: 0833098159
Fax: 0865051341
e-mail: mlevendal@csir.co.za

BIOSKETCH:

Minnelise joined the CSIR Environmental Management Services group (EMS) in 2008. She is focussing primarily on managing Environmental Impact Assessments (EIAs), Basic Assessments (BAs) and Environmental Screening studies for renewable energy projects including wind and solar projects. These include an EIA for a wind energy facility near Swellendam, Western Cape South Africa for BioTherm (Authorisation granted in September 2011) and a similar EIA for BioTherm in Laingsburg, Western Cape (in progress). She is also managing two wind farm EIAs and a solar Photovoltaic BA for WKN-Windcurrent SA in the Eastern Cape. Minnelise was the project manager for the Basic Assessment for the erection of ten wind monitoring masts at different sites in South Africa as part of the national wind atlas project of the Department of Energy in 2009 and 2010..She was also a member of the Project Implementation Team who managed the drafting of South Africa's Second National Communication under the United Nations Framework Convention on Climate Change. The national Department of Environmental Affairs appointed the South African Botanical Institute (SANBI) to undertake this project. SANBI subsequently appointed the CSIR to manage this project.

EDUCATION:

▪ M.Sc. (Botany)	Stellenbosch University	1998
▪ B.Sc. (Hons.) (Botany)	University of the Western Cape	1994
▪ B.Sc. (Education)	University of the Western Cape	1993

MEMBERSHIPS:

- International Association for Impact Assessment (IAIA), Western Cape (member of their steering committee from 2001-2003)
 - IUCN Commission on Education and Communication (CEC); World Conservation Learning Network (WCLN)
 - American Association for the Advancement of Science (AAAS)
 - Society of Conservation Biology (SCB)
-

EMPLOYMENT RECORD:

- **1995:** Peninsula Technicon. Lecturer in the Horticulture Department.
 - **1996:** University of the Western Cape. Lecturer in the Botany Department.
 - **1999:** University of Stellenbosch. Research assistant in the Botany Department (3 months)
 - **1999:** Bengurion University (Israel). Research assistant (Working in the Arava valley, Negev – Israel; 2 months). Research undertaken was published (see first publication in publication list)
 - **1999-2004:** Assistant Director at the Department of Environmental Affairs and Development Planning (DEA&DP). Work involved assessing Environmental Impact Assessments and Environmental Management Plans; promoting environmental management and sustainable development.
 - **2004 to present:** Employed by the CSIR in Stellenbosch:
 - September 2004 – May 2008: Biodiversity and Ecosystems Services Group (NRE)
 - May 2008 to present: Environmental Management Services Group (EMS)
-

PROJECT EXPERIENCE RECORD:

The following table presents a list of projects undertaken at the CSIR as well as the role played in each project:

Completion Date	Project description	Role	Client
2011 <i>(in progress)</i>	EIA for the proposed Electrawinds Swartberg wind energy project near Moorreesburg in the Western Cape	Project Manager	Electrawinds
2010-2011 <i>(in progress)</i>	EIA for the proposed Ubuntu wind energy project, Eastern Cape	Project Manager	WKN Windkraft SA
2010-2011 <i>(in progress)</i>	EIA for the proposed Banna ba pifhu wind energy project, Eastern Cape	Project Manager	WKN Windkraft SA
2010-2011	BA for a powerline near Swellendam in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd)
2010-2011 <i>(Environmental Authorisation granted in September 2011)</i>	EIA for a proposed wind farm near Swellendam in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd)
2010 <i>(complete)</i>	Basic Assessment for the erection of two wind monitoring masts near Swellendam and Bredasdorp in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd)
2010 <i>(complete)</i>	Basic Assessment for the erection of two wind monitoring masts near Jeffrey's Bay in the Eastern Cape	Project Manager	Windcurrent (Pty Ltd)
2009-2010 <i>((Environmental Authorisations granted during 2010)</i>	Basic Assessment Process for the proposed erection of 10 wind monitoring masts in SA as part of the national wind atlas project	Project Manager	Department of Energy through SANERI; GEF
2010	South Africa's Second National Communication under the United Nations	Project Manager	SANBI

Completion Date	Project description	Role	Client
	Framework Convention on Climate Change		
2009 (<i>Environmental Authorisation granted in 2009</i>)	Basic Assessment Report for a proposed boundary wall at the Port of Port Elizabeth, Eastern Cape	Project Manager	Transnet Ltd
2008	Developing an Invasive Alien Plant Strategy for the Wild Coast, Eastern Cape	Co-author	Eastern Cape Parks Board
2006-2008	Monitoring and Evaluation of aspects of Biodiversity	Project Leader	Internal project awarded through the Young Researchers Fund
2006	Integrated veldfire management in South Africa. An assessment of current conditions and future approaches.	Co- author	Working on Fire
2004-2005	Biodiversity Strategy and Action Plan Wild Coast, Eastern Cape, SA	Co-author	Wilderness Foundation
2005	Western Cape State of the Environment Report: Biodiversity section. (Year One).	Co- author and Project Manager	Department of Environmental Affairs and Development Planning

PUBLICATIONS:

Bowie, M. (née Levendal) and Ward, D. (2004). Water status of the mistletoe *Plicosepalus acaciae* parasitic on isolated Negev Desert populations of *Acacia raddiana* differing in level of mortality. *Journal of Arid Environments* 56: 487-508.

Wand, S.J.E., Esler, K.J. and **Bowie, M.R** (2001). Seasonal photosynthetic temperature responses and changes in ¹³C under varying temperature regimes in leaf-succulent and drought-deciduous shrubs from the Succulent Karoo, South Africa. *South African Journal of Botany* 67:235-243.

Bowie, M.R., Wand, S.J.E. and Esler, K.J. (2000). Seasonal gas exchange responses under three different temperature treatments in a leaf-succulent and a drought-deciduous shrub from the Succulent Karoo. *South African Journal of Botany* 66:118-123.

LANGUAGES

<i>Language</i>	<i>Speaking</i>	<i>Reading</i>	<i>Writing</i>
<i>English</i>	<i>Excellent</i>	<i>Excellent</i>	<i>Excellent</i>
<i>Afrikaans</i>	<i>Excellent</i>	<i>Excellent</i>	<i>Excellent</i>

Minnelise Levendal



March 2017

Annexure I.2: Reinett Mogotshi (Project Manager)



CURRICULUM VITAE: REINETT MOGOTSHI

PO Box 320
Stellenbosch
7599
South Africa

Office : +27 21 888 2432
Cell : +27 72 926 8494
Fax : +27 21 888 2473
Email rmogotshi@csir.co.za

Position in Firm: Junior Environmental Assessment Practitioner (306695)
Full Name: Mogotshi, Mashedi Reinett
Specialisation: GIS and Environmental Science
Date of Birth: 09 February 1993
Nationality: South African

BIOSKETCH

Reinett holds a Bachelor of Science degree in Environmental Sciences and Honours in Environmental Analysis and Management from University of Pretoria. She is currently studying towards her Master of Philosophy in Environmental Management at the University of Stellenbosch. Reinett was appointed as a teaching assistant for Academic Information Management and Assistant lecturer, where she taught first year students Ms Office (Excel, Word, PowerPoint, Access and Project), internet and database searching from 2013-2014. She then worked for Environmental Management Services department of City of Tshwane Metropolitan Municipality as an Environmental Science Intern in November 2014, where she got exposure in three sub-sections within the department, namely Landscape and Urban Design, Environmental Planning and Open Space Management. Experience acquired included reviewing of BA and S&EI reports, creating thematic maps using ArcGIS, mapping of City of Tshwane Parks; reviewing Landuse applications such as applications for township establishment, rezoning, consolidation, division, subdivision and consent use as well working with project managers and Landscape Architects to do technical quality control for parks development within the City.

Reinett joined the Council for Scientific and Industrial Research (CSIR) as an Environmental Assessment Practitioner (EAP) Intern within the Environmental Management Services (EMS) group in 2015. She is currently a Junior Environmental Practitioner for the same group. Her duties include Assistance to other EAPs within EMS in their projects; Report writing and project management; Participating in various forms of environmental assessments (BAs, EIAs); consultation with stakeholders and public meetings; GIS mapping for Special Needs projects and other EIAs within the group and Project administration (e.g. contracting and invoicing). She is involved with the Special Needs and Skills Development (SNSD) Programme, which assists Community Trusts, Small, Micro to Medium Enterprises, with environmental services to comply with NEMA EIA Regulations.

EXPERIENCE

Completion Date	Project description	Role	Client
2016 (In Progress)	Basic Assessment for Scouts South Africa for the proposed expansion of a bridge over the Spruit River on the remainder of the farm Olyvenbosch 326, Wellington, Western Cape.	Project Manager and Mapping	Scouts South Africa
2016 (In Progress)	Basic Assessment and Waste Management Licence for Alphomega Farming Co-operative for the proposed development of a pig production enterprise on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Vereeniging, Gauteng	Project Manager and Mapping	Alphomega Farming

Completion Date	Project description	Role	Client
2017 (In Progress)	Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.	Project Manager and Mapping	JamRock (Pty) Ltd
2016 (In Progress)	Basic Assessment for Khanyani Agricultural Co-operative's proposed maize and bean cultivation and harvesting enterprise on two portions of the Emthembeni Farm, near Estcourt in KwaZulu-Natal.	Project Reviewer	Khanyani Agricultural Co-operative's
2015 (in progress)	Special Needs and Skills Development Programme: Programme management and conducting of Basic Assessments for disadvantaged communities/businesses/enterprises	GIS Technician	National Department of Environmental Affairs (DEA), South Africa
February 2015	Draft Environmental Impact Assessment Report for the proposed Class 3 road between the K34 and the Hazeldean Node in the Pretoria East- To be known as Hazeldean Boulevard submitted to City of Tshwane metropolitan Municipality	Departmental Reviewer	Confidential
April 2015	Final Environmental Impact Assessment Report for the proposed Class 3 road between the K34 and the Hazeldean Node in the Pretoria East- To be known as Hazeldean Boulevard submitted to City of Tshwane metropolitan Municipality	Departmental Reviewer City of Tshwane	Confidential
April 2015	Draft basic Assessment Report for the proposed residential township development as part of Portion 5 of the Farm Tygervalley 334-JR- To be known as Tijger Valley Extension 14 and 34	Departmental Reviewer City of Tshwane	Confidential
January 2015	Final Basic Assessment Report for the proposed township establishment on part of the Remainder of Portion 9 and a part of Portion 145 of the Farm Brakfontein 399-JR- To be known as Rooihuiskraal North extension 29	Departmental Reviewer City of Tshwane	Confidential
2015	GIS screening for sites recommended for parks development in the 2015/2016 financial year.	Project assistant	Confidential
2015	APPLICATION FOR TOWNSHIP ESTABLISHMENT: <ul style="list-style-type: none"> • Bronberg Close Extension 9 • Bronberg Close Extension 10 • Bronberg Extension 28 • Die Hoewes Extension 305 • Derdepoort Extension 14 • Lotus Gardens Extension 22 • Lotus Gardens Extension 18-28 • Proposed Monavoni Extensions 74 And 75 • Monavoni Extension 65 • Monavoni Extension 70 • Andeon Extension 28 • Heatherview Extension 42 • Rosslyn Extension 61 • Equestria X206 • Zwartkoppies X41 • Zwartkoppies X42 	Environmental and GIS Screening and Departmental Reviewer City of Tshwane	Confidential

EMPLOYMENT RECORD

- **2017** CSIR Environmental Management Services (EMS) Junior Environmental Assessment Practitioner (EAP)

- **2015** CSIR Environmental Management Services (EMS) Environmental Assessment Practitioner (EAP) Intern
- **2015** City Of Tshwane Junior Environmental Science Intern
- **2013-2014** UP School of Information Management Assistant Lecturer & Teaching Assistant

QUALIFICATIONS

- **2014** University of Pretoria BSc Honours (Environmental Analysis and Management)
- **2013** University of Pretoria BSc (Environmental Sciences)

SHORT-COURSES, CONFERENCES AND WORKSHOPS

- 2016 Technical Workshop on the Roles and Responsibilities of Environmental Control Officers, Brackenfell, November 2016.
- 2016 International Association for Impact Assessors South Africa (IAIAsa) National Annual Conference, August 2016, Port Elizabeth.
- 2015 Practical Adaptation for vulnerable communities by Adaptation Network, Kirstenbosch Botanical Gardens, Cape Town, August 2015.
- 2016 Environmental Law on October 2015 at Newlands, Cape Town.
- 2015 CILLA Project Management I Course on November 2015 at CSIR Pretoria

LANGUAGES

	Speaking	Reading	Writing
Setswana	Excellent	Excellent	Excellent
Sepedi	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent

PROFESSIONAL REGISTRATIONS

- IAIA: Member of International Association of Impact Assessment South Africa (IAIAsa) since 12 January 2016.

Reinett Mogotshi



March 2017

Annexure I3: Confirmation letter from Emfuleni



**OFFICE OF THE ASSISTANT MANAGER:
ENVIRONMENTAL MANAGEMENT**

Tel: +27 16 930 5590
Fax: +27 16 988 1531
E-mail: zamanim@emfuleni.gov.za

P. O. Box 3
C/o KlasieHavenga Street and
Frikkie Meyer Boulevard
VANDERBIJLPARK
1911

Web: www.emfuleni.gov.za

Date: 13 March 2017

File: Confirmation of site

**THE PROPOSED DEVELOPMENT OF A PIG PRODUCTION FACILITY ON PORTION 18 OF
PORTION 13 OF THE FARM POORTJE 340 IQ, EMFULENI LOCAL MUNICIPALITY**

The above mentioned matter including your request on the 9th March 2017 refers.

The Emfuleni Local Municipality's Section of Environmental Management has reviewed the draft Basic Assessment Report for the proposed pig production facility and subsequently provided comments on the 21 February 2017.

The Section of Environmental Management hereby confirms that the proposed site of development falls within the jurisdiction of the Emfuleni Local Municipality.

Should you have any further queries regarding this matter, please contact the relevant official at the number stated above.


Mt. J.Z. Mabena
Assistant Manager
Environmental Management

13/03/2017
Date

Annexure I4: Zoning Certificate



Vaal River City, the Cradle of Human Rights

DEPARTMENT: LAND USE MANAGEMENT

Tel: +27 16 950 5619
Fax: 016950-5533
E-mail: daisym@emfuleni.gov.za

C/o Pres Kruger & Eric Louw Streets
P.O. Box 3
Vanderbijlpark 1900

Web: www.emfuleni.gov.za

Your ref:

File: 7/3 Poortjie
Ref: D Louw
Date: 19 May 2016

BY HAND
Jacob Mataboge

Sir

ZONING CERTIFICATE: PORTION 18 OF THE FARM POORTJIE 340 I.Q.

In terms of the Peri Urban Town Planning Scheme 1975, the zoning of the abovementioned portion is "Undetermined".

Coverage	10%
Height	2 storeys
Density	1 dwelling house with the necessary outbuildings
Building line	30m from the street
Purposes allowed:	Dwelling houses, agricultural buildings

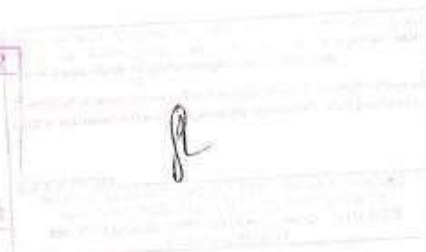
Purposes allowed with consent: Any other use

CLAUSE 16.2 TRANSGRESSION OF THE SCHEME AND TITLE CONDITIONS

No consent of the local authority given under the provisions of this Scheme shall be construed as conferring upon any person the right to use any land or to erect or use any buildings thereon in any manner or for any purpose which is prohibited by any other law which are applicable to the property.

Yours faithfully


L. M. MOTAPANE
MANAGER:
LAND USE MANAGEMENT
Receipt: 1080



Tel: +27 16 950 5000 • Fax: +27 16 950 5050 • Web: www.emfuleni.gov.za
P.O. Box 3, Vanderbijlpark, 1900 • Corner Klasie Havenga Street and Frikkie Meyer Boulevard, Vanderbijlpark

APPENDICES

Annexure I4: Impact Assessment Table

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
Construction Phase													
Direct loss of terrestrial vegetation and faunal habitat	Negative	Local	Long term	High	Highly probable	High	Low	Low	3	No	Yes	<ul style="list-style-type: none"> Restrict all habitat loss and disturbances from construction activities to within the proposed and agreed upon site layout. Maintain the viability of the indigenous seed bank in excavated soil so that this can be used for subsequent re-vegetation of any disturbed areas. No landscaping should be performed around the facilities. Avoid unnecessary loss of indigenous trees (The <i>Acacia</i> Indigenous Bushclumps) 	Low
Loss of CI or medicinal flora	Negative	Site Specific	Long term	Medium-low	Probable	Medium	Moderate	Low	3		Yes	<ul style="list-style-type: none"> Submit permits for the removal of CI important species within the study site Prior to construction all CI and medicinally important floral specimens within the site layout footprint should be collected and replanted in the surrounding areas. Guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants is advised. 	Low
Introduction & proliferation of alien spp.	Negative	Local	Long term	Medium	Definite	High	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> Regulate / limit access by potential vectors of alien plants. Maintain a tidy construction site By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit. 	Low
Reduction in Woody Alien Species	Positive	Site Specific	Medium term	Medium	Highly probable	Medium	Moderate	Low	3	No	No	<ul style="list-style-type: none"> N/A 	Medium
Faunal Mortality and Displacement (including CI species)	Negative	Local	Long term	Medium-low	Highly probable	Medium	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> Adhere to law and best practice guidelines regarding the handling and relocation of CI fauna Appropriately deal with fauna on site Time construction activities to minimize faunal mortality. Limit unnecessary mortality, and persecution of fauna. Minimize displacement of fauna that utilize alien trees 	Low
Increase in dust and erosion degrading habitat integrity	Negative	Local	Long term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> Limit vehicles, people and materials to the construction site Commence (and preferably complete) construction during winter, when the risk of erosion should be least. Revegetate denude areas with locally indigenous flora a.s.a.p. 	Low

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												<ul style="list-style-type: none"> Implement erosion protection measures on site to reduce erosion and sedimentation of downstream areas. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed. Implement effective and environmentally-friendly dust control measures, such as mulching or periodic 	
Sensory disturbances	Negative	Local	Long term	Medium-low	Highly probable	Medium	Low	Low	3	No	Yes	<ul style="list-style-type: none"> Time construction activities to minimize sensory disturbance of fauna. Limit disturbance from noise. Limit disturbance from light. 	Low
Destruction of graves	Negative	Site-specific	Permanent	Extreme	Unlikely	Medium	Low	High	5	Yes	Yes	<ul style="list-style-type: none"> Erect fence 5 m from graves and respect 10 m buffer from fence. 	Very low
Disturbance to and damage to Heritage Artefacts	Negative	Site-Specific	Short term	Medium	Unlikely	Medium	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> The construction workers must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted 	Low
Emissions from construction vehicles and generation of dust	Negative	Local	Short term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. Approved soil stabilisers may be utilised to limit dust generation. Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour. Limit vehicles, people and materials to the construction site Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. Noise should also be minimised throughout construction to limit the impact on sensitive fauna such as owls and large terrestrial birds. Limit construction activities to day time hours 	Low
Pollution caused by spillage or discharge of	Negative	Local	Short term	Medium	Probable	Low	High	High	3	Yes	Yes	<ul style="list-style-type: none"> Ensure that adequate containment structures are provided for the storage of 	Very Low

APPENDICES

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
construction waste water												<ul style="list-style-type: none"> construction materials on site. Ensure the adequate removal and disposal of construction waste and material 	
Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material	negative	Local	Short term	Medium	Probable	High	High	High	3	Yes	Yes	<ul style="list-style-type: none"> Ensure that adequate containment structures are provided for the storage of construction materials on site. Ensure the adequate removal and disposal of construction waste and material 	Low
Employment creation and skills development opportunities	Positive	Local	Long term	Medium	Probable	Medium	High	High	3	No	Ye	<ul style="list-style-type: none"> Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained. Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract. Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible. 	High
Visual intrusion of construction activities	Negative	Local	Short term	Medium-low	Probable	Low	High	High	3	Yes	Yes	<ul style="list-style-type: none"> No specific mitigation measures are required other than standard construction site housekeeping and dust suppression. These are included below: <ul style="list-style-type: none"> The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste. Litter and rubble should be timeously removed from the construction site and disposed at a licenced waste disposal facility. The project developer should demarcate construction boundaries and minimise areas of surface disturbance. Appropriate plans should be in place to minimise fire hazards and dust generation. Night lighting of the construction site should be minimised within requirements of safety and efficiency. 	Low
Noise impact from the use of	Negative	Local	Short term	Medium-low	Probable	Medium	Moderate	High	3	No	Yes	<ul style="list-style-type: none"> Limit construction activities to day time hours 	Low

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
construction equipment													
Noise generation from demolition and construction work	Negative	Site specific	Short term	Medium-low	Probable	Medium	Moderate	High	3	No	Yes	<ul style="list-style-type: none"> Construction personnel must wear proper hearing protection, which should be specified as part of the Construction Phase Risk Assessment carried out by the Contractor. The Contractor must ensure that all construction personnel are provided with adequate Personal Protective Equipment (PPE), where appropriate. The Contractor must prescribe, to construction personnel, what is required by Alphomega management permit to work system 	Low
Construction safety injuries: potential impact on the safety of construction workers and Health injuries to construction personnel as a result of construction work	Negative	Site-specific	Short term	Low	Improbable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards. The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate. The Contractor must undertake a Construction Phase Risk Assessment. A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to co-ordinate the construction traffic. Ensure that roads are not closed during construction, which may restrict access for emergency services. The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate. 	Medium
Traffic, congestion and potential for collisions	Negative	Local	Short term	Medium-Low	Probable	LOW	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> During the construction phase, suitable parking areas should be created and designated for construction trucks and vehicles. A construction supervisor should be appointed to co-ordinate construction traffic during the construction phase (by drawing up a traffic plan prior to construction). Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic 	Low

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												points	
Operation Phase													
Odours from operations and Environmental contamination of the surrounding environment from organic waste and blood	Negative	Regional	Long term	Medium	Highly probable	Medium	Low	Moderate	1	No	Yes	<ul style="list-style-type: none"> Ensure that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms. Adhere to best practice pig husbandry and waste disposal norms Blood, waste water should drain into septic tank and any remaining waste will be disposed of by licensed contractor. Ensure that excrement, carcasses, feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment. Adhere to GDARD guidelines for Management of Abattoirs. Incorporate effective storm water management design aspects into the infrastructure plan Design of abattoir must comply with health and safety guidelines for broilers and abattoirs. Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste. Applicant must comply with Best Practice Guidelines and Animal Disease Act Feral animals should not come onto the site Design of abattoir must comply with health and safety guidelines for broilers and abattoirs. Pig houses should be cleaned regularly and should be stored within the slurry dam Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted 	Low

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.	
Poor / Inappropriate control of invertebrate pests	negative	Local	Long term	High	Highly probable	High	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> ▪ Clean floors regularly. ▪ Provide sufficient ventilation and airflow to keep floors, bedding, and fodder as dry as possible ▪ Check that fan louvers work properly, and close fans completely when off ▪ Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water ▪ Use appropriately sloped and slatted floors to facilitate drainage. ▪ Clean up excess fodder regularly from under troughs and feed bins ▪ Effectively drain storm water from around pig houses ▪ Keep areas surrounding pig houses free of spilled manure and litter ▪ Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities. ▪ Keep grass and weeds mowed to 5cm or less immediately around the facilities, to prevent insect growth ▪ Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate animals from accessing the effluent. ▪ Regularly empty slurry dam to prevent the accumulation of floating solids for extended periods of time (crust left on top of slurry soon become major breeding ground for flies) ▪ Electrocuting devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps. ▪ Ensure that measures to control pest invertebrates are tightly restricted to areas where these are problematic. Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist. 	Low
Poor / Inappropriate control of vertebrate pests	Negative	Local	Long term	Medium	Highly probable	Medium	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> ▪ Maintain the appropriate pest control measures ▪ Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess 	Low

APPENDICES

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												<p>disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste.</p> <ul style="list-style-type: none"> Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate and vertebrate animals from accessing the effluent 	
Transmission of diseases	Negative	Local	Long term	High	Probable	Medium	Moderate	Low	2	Yes	Yes	<ul style="list-style-type: none"> Maintain the appropriate pest control measures Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants. The run-off substances should be effectively captured and stored, and later disposed of at an appropriate licensed facility for hazardous waste. Effectively maintain and seal the concrete reservoir, where the storage of pig slurry is planned, to prevent invertebrate and vertebrate animals from accessing the effluent. 	Low
Reduction in CI Species - Harvesting of CI or medicinal flora	Negative	Local	Long term	Medium	Probable	Medium	Low	High	2	Yes	Yes	<ul style="list-style-type: none"> Education of the Farm Management and team required prior to operation and with yearly refresher talks. 	Low
Altered burning	Negative	Local	Long term	Medium	Definite	High	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures Maintain an effective fire break between the development area and the surrounding natural environment (especially the ridge to the north, where the fire-dependent Highveld Blue butterfly may occur) Educate workers about the plan and emergency procedures with regular training and notices 	Medium
Introduction & proliferation of alien spp. - Competition and change in structure	Negative	Local	Long term	Medium	Definite	High	Low	Moderate	3	Yes	Yes	<ul style="list-style-type: none"> Carefully regulate / limit access by vehicles and materials to the site Prohibit the introduction of domestic animals such as dogs and cats. Only plant locally indigenous flora (if landscaping is to be implement) Employ best practices regarding 	Low

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												the tilling of soil and weed management <ul style="list-style-type: none"> Minimize the accumulation or dispersal of excess fodder on site Mechanical removal of these species is recommended. However, the removal must be carefully performed so as to not excessively disturb the soil layer. Alien debris could be donated to a local community. Be especially pro-active around the pig effluent slurry dam, fodder loading bays as well as in and around the croplands 	
Sensory disturbances	Negative	Local	Long term	Medium-low	Definite	Medium	Low	Low	3	Yes	Yes	Minimize essential lighting. <ul style="list-style-type: none"> Ensure that all outdoor lights are angled downwards and/or fitted with hoods. Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects. Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV. 	Low
Destruction of graves	Negative	Site-specific	Permanent	Extreme	Unlikely	Medium	Low	High	5	Yes	Yes	<ul style="list-style-type: none"> Erect fence 5 m from graves and respect 10 m buffer from fence. 	Very low
Disturbance to and damage to Heritage Artefacts										Yes	Yes	<ul style="list-style-type: none"> The construction workers must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted. 	
Emissions from staff vehicles	Negative	Local	Short term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> Efficient movement of traffic through the entrance and exit in order to reduce congestion and vehicle emissions. Ensure that the facility is operated in such a manner whereby potential odours are minimised. 	Low
Improved service delivery with regards pork products	Positive	Local	Long term	Medium	Probable	Medium	High	High	3	No	Yes	<ul style="list-style-type: none"> Ensure that the proposed infrastructure is maintained appropriately to ensure that all facilities and infrastructure operate within its design capacity to deliver as the market requires. 	High
Employment creation and skills development	Positive	Local	Long term	Medium	Probable	Medium	High	High	3	No	Yes	<ul style="list-style-type: none"> Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained Ensure that an equitable 	High

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												percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract.	
Night lighting of the development on the nightscape of the surrounding landscape	Negative	Local	Long term	Medium	Highly probable	Low	Moderate	Low	3	Yes	No	<ul style="list-style-type: none"> ▪ No specific mitigation measures are recommended as it is assumed that night lighting of the proposed storage facility will be planned in such a manner so as to minimize light pollution such as glare and light spill (light trespass) by: ▪ Using light fixtures that shield the light and focus illumination on the ground (or only where light is required). ▪ Avoiding elevated lights within safety/security requirements. ▪ Using minimum lamp wattage within safety/security requirements. ▪ Where possible, using timer switches or motion detectors to control lighting in areas that are not occupied continuously (if permissible and in line with minimum security requirements). ▪ Switching off lights when not in use in line with safety and security. 	Low
Noise impact from operations and road transport of products	Negative	Site specific	Short term	Medium-low	Probable	Medium	Moderate	High	3	No	Yes	<ul style="list-style-type: none"> ▪ It is recommended that the drivers of the vehicles be discouraged from using air brakes at night. ▪ Limit the effects of noise associated disturbances from pigs and operational activities on sensitive fauna such as owls and medium-large mammals (especially carnivores), potentially occurring hedgehogs and large terrestrial birds such as Korhaans and Secretarybirds. 	Low
Atmospheric pollution due to fumes, smoke from fires	Negative	Local	Short term	Medium-low	improbable	Medium	Moderate	High	3	Yes	Yes	<ul style="list-style-type: none"> ▪ Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the terminal as required. Mobile fire-fighting equipment should be provided at the berths as a safety precaution during the vessel offloading process. It should be noted that the products planned to be stored at the terminal have high flash points and low volatility. As a result, fires are unlikely, unsustainable, and can be extinguished with basic fire water and portable fire extinguishers. 	Low

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Groundwater contamination as a result of the storage of pig waste	Negative	Local	Long term	Medium	Probable	Medium	Moderate	Moderate	3	Yes	Yes	<ul style="list-style-type: none"> Ensure that that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic, or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms. Personnel should ensure careful transportation of waste from the pig facilities to the lagoon as to avoid spillage. Adequate infrastructure should ensure waste will not exit the lagoon in an extreme weather event. Ensure adequate treatment of the waste to avoid extreme odours and contaminations. 	Low
Minor accidents to the public and moderate accidents to operational staff	Negative	Local	Long term	Medium-low	Improbable	Medium	Moderate	High	3	Yes	Yes	<ul style="list-style-type: none"> An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site. Scheduled inspections should be implemented by operating personnel in order to assure and verify the integrity of hoses, piping and storage lagoon. Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required. 	Low
Impact of extra operational vehicles on the road network	Negative	Local	Long term	Medium-low	Improbable	Low	Moderate	high	3	Yes	Yes	<ul style="list-style-type: none"> Undertake re-calibration of existing traffic signals if required. 	Low
Decommissioning Phase													
Introduction & proliferation of alien spp. - Competition and change in structure	Negative	Local	Long term	High	Definite	High	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> Remove Category species using mechanical methods and minimize soil disturbance as far as possible. 	Low
Sensory disturbances	Negative	Local	Long term	Medium-low	Highly probable	Low	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. Minimize noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds Limit demolition activities to day time hours Minimize or eliminate security and other lighting, to reduce the 	Low

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												<ul style="list-style-type: none"> disturbance of nocturnal fauna Implement environmentally-friendly dust control measures (e.g. mulching and wetting) where and when dust is problematic Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate specialists. Implement the selected control measure(s) where dust is problematic. Revegetate denude areas with locally indigenous flora a.s.a.p. 	
Destruction of graves	Negative	Site-specific	Permanent	Extreme	Unlikely	Medium	Low	High	5	Yes	Yes	<ul style="list-style-type: none"> Erect fence 5 m from graves and respect 10 m buffer from fence. 	Very low
Discharge of contaminated stormwater into the surrounding environment	Negative	Local	Long term	High	Highly probable	Medium	Moderate	High	3	Yes	Yes	<ul style="list-style-type: none"> The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase. Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff. 	Low
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate. Should the on-site storage of general waste and hazardous waste exceed 100 m3 and 80 m3 respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to. Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal. Ensure that sufficient general waste disposal bins are provided 	Low

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												for all personnel throughout the site. These bins must be emptied on a regular basis. <ul style="list-style-type: none"> • Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna. 	
Emissions from decommissioning vehicles and generation of dust	Negative	Local	Short term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> • Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. • Approved soil stabilisers may be utilised to limit dust generation. • Ensure that decommissioning vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour. 	Low
Noise generation from demolition activities	Negative	Site specific	Short term	Medium-low	Probable	Medium	Moderate	High	3	No	Yes	<ul style="list-style-type: none"> • A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks. • Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor. • The Contractor must ensure that all decommissioning personnel are provided with adequate PPE, where appropriate. 	Low
Potential health injuries to demolition staff during the decommissioning phase	Negative	Site-specific	Short term	Low	Improbable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> • The Contractor must ensure that all decommissioning personnel are provided with adequate PPE for use where appropriate. 	Low
Heavy traffic, congestion and potential for collisions	Negative	Local	Short term	Medium-Low	Probable	Low	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> • Suitable parking areas should be created and designated for trucks and vehicles. • A supervisor should be appointed to co-ordinate traffic during the decommissioning phase. • Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the site. 	Low

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Pollution of the surrounding water and ground as a result of spillages, generation of building rubble and waste scrap material	Negative	Local	Short term	Medium-low	Highly probable	High	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> ▪ General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate. ▪ Should the on-site storage of general waste and hazardous waste exceed 100 m3 and 80 m3 respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to. ▪ Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal. ▪ Ensure that sufficient general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis. ▪ Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna. 	Low