



GREATER SEVILLE EXTENSION 3 TOWNSHIP

**FINAL ENVIRONMENTAL IMPACT ASSESSMENT
REPORT THE PROPOSED TOWNSHIP ESTABLISHMENT
ON THE REMAINDER OF PORTIONS 1 AND 2 OF THE
FARM SEVILLE 224 KU MPUMALANGA PROVINCE**

MAY 2023

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Report Title	Environmental impact assessment report for the proposed township establishment on the Remainder of Portions 1 and 2 of the Farm Seville 224 Ku (Greater Seville Extension 3), Bushbuckridge Local Municipality, Mpumalanga Province
Document ID	Final
Client/ Applicant	Bushbuckridge Local Municipality
Date	May 2023
DOCUMENT APPROVAL	
EAP Name	Mankaleme Martina Magoro
Signature	

EAP DECLARATION OF INDEPENDENCE

I, **Mankaleme Martina Magoro** in my capacity as an Environmental Assessment Practitioner, hereby declare that I,

- Act as an independent environmental assessment practitioner.
- 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 (No. 107 of 1998).
- As a registered member of the South African Council for Natural Scientific Professions and the Environmental Assessment Practitioners Association of South Africa, I will undertake our profession in accordance with the Code of Conduct of the Councils.
- Based on information provided to us by the project proponent, and in addition to information obtained during this study, have presented the results and conclusion within the associated document to the best of our professional judgement.

Signature of EAP:

Date Signed:

EXECUTIVE SUMMARY

Leago Environmental Solutions was appointed by Bushbuckridge Local Municipality as independent environmental assessment practitioners to undertake an environmental impact assessment process for the clearance of indigenous vegetation for the purpose of establishing a township. The proposed township is to be situated on the Remainder of Portions 1 and 2 of the Farm Seville 224 KU, Mpumalanga Province. The project area measures 25.50 hectares in extent and it is expected to yield 268 land uses / stands. The proposed township establishment is to be named “Greater Seville Extension 3”.

The application for environmental authorisation was initially submitted on the 21st of September 2022 to the Competent Authority, Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs under Regulation 982 to 985 as amended by Regulation 324 to 327 of the National Environmental Management Act (No. 107 of 1998) and was assigned the reference number: I/3/I/16/IE-409.

The Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs accepted the scoping report on the 29th November 2022 in terms of Regulation 22(a) of the NEMA Regulations and advised the Environmental Assessment Practitioner to proceed with undertaking the environmental impact assessment in accordance with the tasks that are outlined in the plan of study for environmental impact assessment.

Specialist recommendations and comments from the competent authority on the Environmental Impact Assessment reports were also taken into consideration when compiling this report.

TABLE OF CONTENTS

DOCUMENT CONTROL RECORD.....	i
EAP DECLARATION OF INDEPENDENCE	ii
EXECUTIVE SUMMARY	iii
LIST OF TABLES.....	vii
LIST OF FIGURES.....	vii
ACRONYMS AND ABBREVIATIONS	viii
GLOSSARY OF TERMS	ix
LIST OF APPENDICES.....	x
DETAILS OF THE APPLICANT AND THE ENVIRONMENTAL ASSESSMENT PRACTITIONER.....	1
Details of the Environmental Assessment Practitioner	1
1. INTRODUCTION	2
1.1. Purpose of the Report	2
1.1.1. Listing Notice 2, Activity 15	2
1.1.2. Listing Notice 1, Activity 24 (ii).....	2
1.1.3. Listing Notice 1: Activity 28	2
2. DETAILS OF THE PROPOSED DEVELOPMENT	3
2.1. Location of the Proposed Development	3
2.2. Description of the Proposed Development	5
3. CIVIL SERVICES ENVISAGED FOR THE PROPOSED DEVELOPMENT	5
3.1. Roads.....	5
3.2. Water.....	5
3.3. Sewer Reticulation	6
3.4. Electricity.....	6
3.5. Waste.....	6
4. ALTERNATIVES.....	6
4.1. Feasible and Reasonable Alternatives Considered for the Proposed Development	7
4.1.1. Site Alternatives.....	7
4.1.2. Activity Alternatives	7
4.1.3. Design Alternatives	7
4.1.4. Technology Alternatives	7
4.1.5. Operational Aspects.....	7
4.1.6. The Option of not Implementing the Activity.....	7
4.1.6. No-Go Alternatives	7
5. LEGISLATION, POLICIES AND GUIDELINES CONSIDERED.....	8
5.1. The Constitution of the Republic of South Africa (No. 108 of 1996).....	8

5.2. National Environmental Management Act (No. 107 of 1998).....	8
5.3. Environmental Impact Assessment Regulations (2017).....	9
5.4. National Heritage Resources Act (No. 25 of 1999).....	10
5.5. National Water Act (No. 36 of 1998)	10
5.6. Conservation of Agricultural Resources Act (No. 43 of 1983).....	10
5.8. Mpumalanga Biodiversity Conservation Plan (No.10 of 1998).....	11
6. NEEDS AND DESIRABILITY OF PROPOSED DEVELOPMENT	11
7. DESCRIPTION OF THE RECEIVING ENVIRONMENT	12
7.1. Physical Environment.....	12
7.1.1. Topography and Drainage.....	12
7.1.2. Climate.....	12
7.1.3. Geology of the Area.....	12
7.1.4. Hydrology.....	12
7.2. Biological Environment	12
7.2.1. Vegetation	12
7.2.2. Fauna.....	12
8. SUMMARY OF FINDINGS AND RECOMMENDATIONS OF SPECIALIST STUDIES.....	13
8.1. General Biodiversity and Ecological Assessment Report.....	13
8.2. Heritage Impact Assessment	15
8.3. Engineering Services Report.....	17
8.4. Electrical Report.....	18
8.5. Geotechnical Investigations	19
8.6. Floodline Determination	21
8.7. Storm Water Management Plan	21
8.8. Traffic Impact Assessment	23
9. ENVIRONMENTAL IMPACT DETERMINATION AND EVALUATION	25
9.1. Methodology to Assess the Impacts.....	25
10. KEY ENVIRONMENTAL IMPACTS	27
10.1. Identification of Key Environmental Issues and Impacts.....	27
10.1.1. Soil and Geology.....	28
10.1.3. Water: Hydrogeology & Hydrology	35
10.1.4. Noise.....	37
10.1.5. Air and Dust Impacts	40
10.1.6. Biodiversity	41
10.1.6. Solid Waste	44

10.1.7. Landscape & Visual Impact Assessment.....	45
10.1.8. Traffic & Transport.....	48
10.1.10. Services: Water Supply, Sewage & Power Supply	49
10.1.11. Archaeology and Cultural Heritage.....	52
11. PUBLIC PARTICIPATION PROCESS UNDERTAKEN	55
11.1. Introduction and Objectives.....	55
11.2. Methodology	56
11.2.1. Newspaper Advertisement.....	56
11.2.2. On-Site Notices.....	56
11.2.3. Background Information Notices/ Letters	56
11.2.4. Consultations with Stakeholders / Authorities and Interested & Affected Parties.....	56
12. COMPARATIVE ASSESSMENT OF THE IMPLICATIONS OF PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES:.....	56
12.1. Advantages of the Proposed Activity and Alternatives.....	56
12.2. Disadvantages of the Proposed Activity and Alternatives	57
13. CONCLUSIONS.....	57
14. RECOMMENDATIONS.....	57

LIST OF TABLES

Table 1: Details of the Applicant.....	1
Table 2: Details of the EAP	1
Table 3: Significance Ratings.....	26
Table 4: Description of the parameters used in the matrixes	27
Table 5: Impact Assessment on Soil and Geology	30
Table 6: Impact Assessment of Population and Human Health.....	34
Table 7: Impact Assessment of Water: Hydrogeology & Hydrology.....	36
Table 8: : Impact Assessment of Noise	38
Table 9: Impact Assessment of Air Quality and Dust.....	40
Table 10: Impact Assessment on Biodiversity	43
Table 11: Impact Assessment on Solid Waste.....	45
Table 12: Impact Assessment on the Landscape & Visual Impact.....	46
Table 13: Impact Assessment on Traffic	48
Table 14: Impact Assessment of Water Supply, Sewage & Power Supply.....	50
Table 15: Impact Assessment on Archaeology and Cultural Heritage	53

LIST OF FIGURES

Figure 1: Aerial locality map of the proposed development site	4
Figure 2: Topographic locality map of the proposed development site.....	4
Figure 3: Layout plan of the proposed township	5

ACRONYMS AND ABBREVIATIONS

MDARDLEA	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
EDM	Ehlanzeni District Municipality
CA	Competent Authority
EMPr	Environmental Management Plan Report
EMP	Environmental Management Plan
NEMA	National Environmental Management Act
NEMPA	National Environmental Management: Protected Areas
S&EIR	Scoping and Environmental Impact Reporting
EIAr	Environmental Impact Assessment
I&AP	Interested and Affected Parties
EIA	Environmental Impact Assessment
EA	Environmental Authorisation
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Resource Information Systems
CBAs	Critical Biodiversity Areas
ESAs	Ecological Support Areas
PPP	Public Participation Process
RoD	Record of Decision
HIA	Heritage Impact Assessment
Ha	Hectares
No.	Number
ToR	Terms of Reference
TIA	Traffic Impact Assessment
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer

GLOSSARY OF TERMS

Township establishment: a process of converting an agricultural zoned land into residential, commercial or industrial properties.

Environmental assessment practitioner: is a consultant responsible for conducting environmental impact assessment.

Environmental impact assessment: a systematic process of identifying, assessing and reporting environmental impacts associated with an activity.

Proponent / applicant: a person intending to submit an application for environmental authorisation

Significant impact: means an impact that may have a notable effect on one or more aspects of the environment or may result in noncompliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.

Development: means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that are necessary for the undertaking of a listed or specified activity, [including any associated post development monitoring,] but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.

Development footprint: means any evidence of physical alteration as a result of the undertaking of any activity.

Indigenous vegetation: refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

Earth works: this involves construction machinery, dampening and general preparation of the site for construction purposes.

Mitigation measures: all actions taken to eliminate, offset or reduce potentially adverse environmental impacts to acceptable levels (World Bank, 1999:1).

Interested & affected party: a person, group of people, an organisation (public or private), a business, or other party that has an interest or is affected in terms of their health, property rights, or economy by a proposed activity.

Drainage line: a channel down which surface water naturally concentrates and flows, conveying water only during, or immediately after (that is, only hours or days after) periods of heavy rainfall.

Listed activities: activities that have been recognised as having a detrimental impact on the environment.

LIST OF APPENDICES

Appendix 1	Topographic Locality Map and Topographical Survey
Appendix 2	Township Layout Plan
Appendix 3	Scoping Acceptance from the Competent Authority (MDARDLEA)
Appendix 4	Specialist's Study Reports
Appendix 4.1	Ecological Impact Assessment Report
Appendix 4.2	Heritage Impact Assessment Report
Appendix 4.3	Engineering Services Report
Appendix 4.4	Electrical Services Report
Appendix 4.5	Geotechnical Investigation Report
Appendix 4.6	Floodline Determination Report
Appendix 4.7	Stormwater Management Plan Report
Appendix 4.8	Traffic Impact Assessment Report
Appendix 5	Environmental Management Plan Report
Appendix 6	Public Participation Process
Appendix 6.1	List of Stakeholders and Authorities
Appendix 6.2	Communication with Stakeholders / Authorities and Interested & Affected Parties
Appendix 6.3	Proof of Background Information Notice Delivery
Appendix 6.4	Proof of Newspaper Publication
Appendix 6.5	On - Site Notices
Appendix 6.6	Comments Received
Appendix 6.6.1	Comments from the Competent Authority
Appendix 6.6.2	Comments from Stakeholders and Interested & Affected Parties
Appendix 6.7	Proof of Reports Circulation
Appendix 6.7.1	Proof of Circulation of Scoping Reports
Appendix 6.7.2.	Proof of Circulation of EIA Reports
Appendix 6.8	Comments and Response Report
Appendix 7	Site Photographs
Appendix 8	Additional Information
Appendix 8.1	Confirmation of Bulk Infrastructure Services Letter
Appendix 8.2	Details and Expertise of the EAP
Appendix 8.3	Specialist Declaration Forms
Appendix 8.3.1	Ecology Specialist Declaration Form
Appendix 8.3.2	Heritage Specialist Declaration Form
Appendix 8.3.3	Civil Engineer Specialist Declaration Form

- Appendix 8.3.4 Electrical Engineer Specialist Declaration Form
- Appendix 8.3.5 Geotechnical Specialist Declaration Form
- Appendix 8.3.6 Floodline Specialist Declarations Form
- Appendix 8.3.7 Stormwater Specialist Declaration Form
- Appendix 8.3.8 Traffic Engineer Specialist Declaration Form

DETAILS OF THE APPLICANT AND THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Details of the Applicant	
Project Applicant	Bushbuckridge Local Municipality
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Table 1: Details of the Applicant

Details of the Environmental Assessment Practitioner	
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Contact Person	Mankaleme M. Magoro
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Cell Phone	081 428 6116
Email	info@leagoenviro.co.za
Qualifications	Bachelor of Earth Sciences in Mining and Environmental Geology
Professional Affiliation	Pri. Sci. Nat Reg No.: 120970 (SACNASP) EAP Reg No.: 200/2254 (EAPASA)

Table 2: Details of the EAP

I. INTRODUCTION

Leago Environmental Solutions was appointed by Bushbuckridge Local Municipality as independent environmental assessment practitioners to undertake an environmental impact assessment process in terms of the National Environmental Management Act (No. 107 of 1998) read together with the Environmental Impact Assessment Regulations (GNR 326 of 7 April 2017) for the clearance of indigenous vegetation for the purpose of establishing a township. The proposed township will be situated on the Remainder of Portions 1 and 2 of the Farm Seville 224 KU, in Mpumalanga Province. The proposed development site measures 25.50 hectares in extent and is expected to yield 268 stands / land uses.

I.1. Purpose of the Report

This final environmental impact assessment report has been prepared in accordance with the EIA Regulations published in Government Notice No. R 326 of 07 April 2017. These regulations fall under Section 24(5) read with Section 44 of the National Environmental Management Act (No. 107 of 1998) as amended. NEMA Section 24(5) stipulates that listed activities require environmental authorisation from the competent authority.

Government Notice No. R325, Listing Notice 2 of the Environmental Impact Assessment Regulations of 2017 identifies the following listed activities associated with clearance of vegetation that require environmental authorisation by means of full EIA (Scoping and Environmental Impact Reporting).

1.1.1. Listing Notice 2, Activity 15

The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

Applicability to the project: the clearance of an area of 25.50 hectares of indigenous vegetation.

1.1.2. Listing Notice 1, Activity 24 (ii)

The development of a road - (ii) a road with a reserve wider than 13.5 meters, or where no reserve exists where the road is wider than 8 metres.

Applicability to the project: the development of roads with reserves of 15 meters.

1.1.3. Listing Notice 1: Activity 28

Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding

where such land has already been developed for 261 residential, 2 retail, commercial, industrial or institutional purposes.

Applicability to the project: the development of residential, retail and 1 institutional sites / land uses outside an urban area where the total land to be developed is 25.50 hectares.

1.1.4. Listing Notice 1: Activity 12

The development of—canals exceeding 100 square metres in size; channels exceeding 100 square metres in size bridges exceeding 100 square metres in size; dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; bulk storm water outlet structures exceeding 100 square metres in size; marinas exceeding 100 square metres in size; jetties exceeding 100 square metres in size; slipways exceeding 100 square metres in size; buildings exceeding 100 square metres in size; boardwalks exceeding 100 square metres in size; or infrastructure or structures with a physical footprint of 100 square metres or more.

Applicability to the project: the project includes the development of the storm water culverts but the size of the culverts can only be determined at the detailed design phase, however they might exceed 100m²

2. DETAILS OF THE PROPOSED DEVELOPMENT

2.1. Location of the Proposed Development

The proposed township will be situated on the Remainder of Portions 1 and 2 of the Farm Seville 224 KU in Seville, Mpumalanga Province. The project area is located approximately 18km from Thulamahashe town. The site is located roughly at the following GPS coordinates: 24°39' 33.48" S; 31°24'16.94"E. Figure 1 and 2 below indicate the locality of the proposed development site. The SG digit code is: T0KU000000002240000.



Figure 1: Aerial locality map of the proposed development site

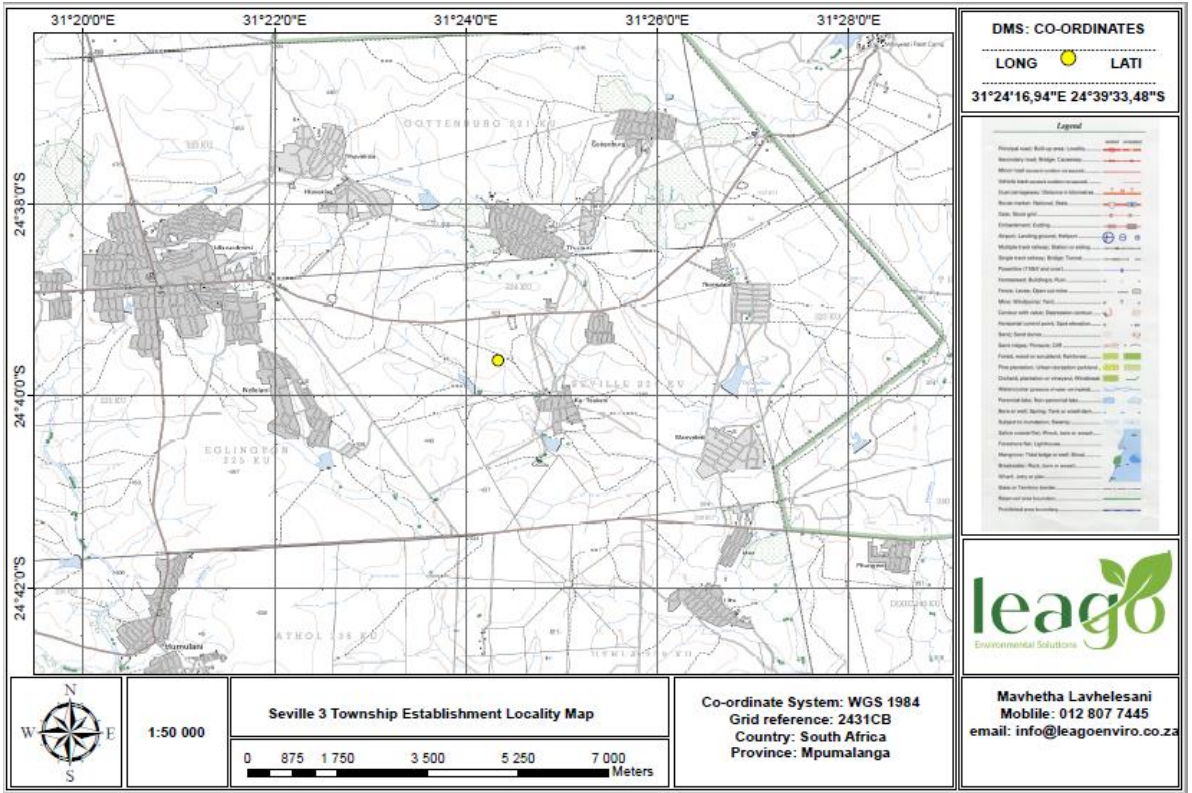


Figure 2: Topographic locality map of the proposed development site

2.2. Description of the Proposed Development

The proposed activity is a township establishment which will entail 268 land uses / stands. The proposed land uses are:

- 261 Residential (dwelling units)
- 2 Business I (shops / retail)
- 1 Institutional (church)
- 2 Educational (secondary school / crèche)
- 2 Public Open Spaces (open space)

Figure 3 below depicts the proposed township layout plan.

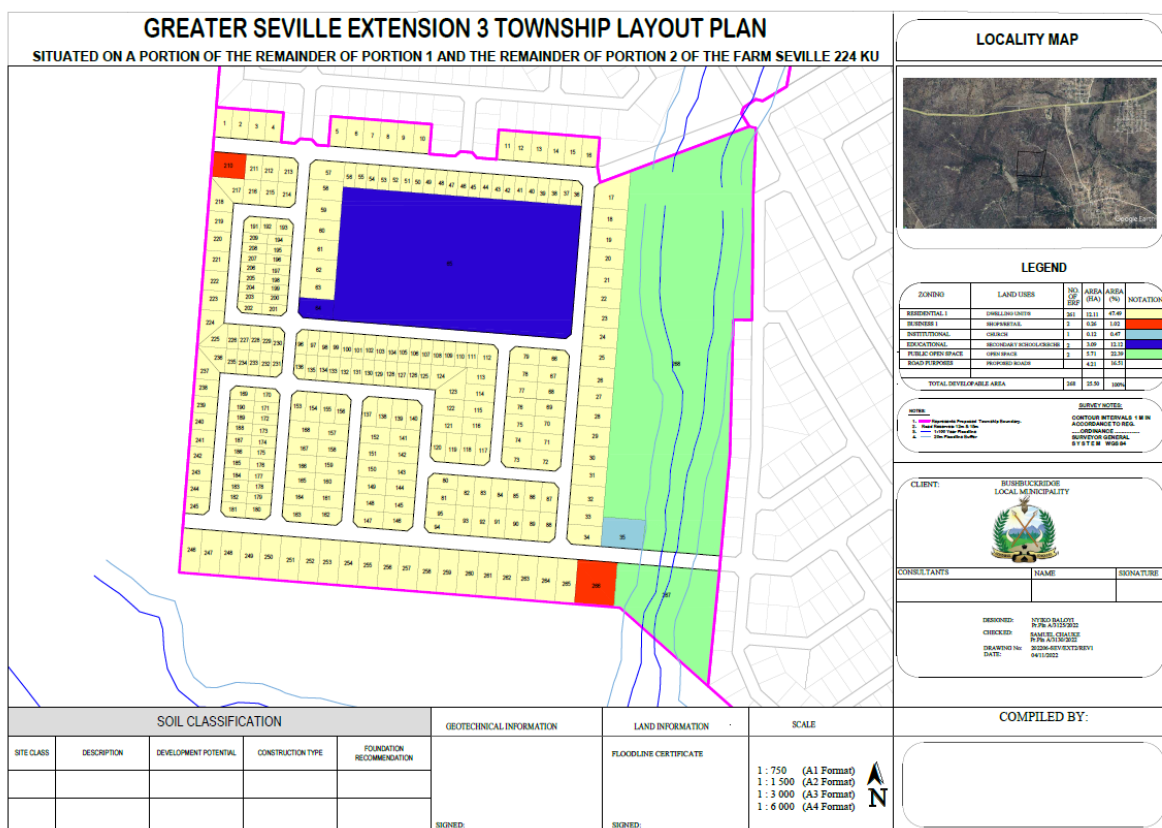


Figure 3: Layout plan of the proposed township

3. CIVIL SERVICES ENVISAGED FOR THE PROPOSED DEVELOPMENT

3.1. Roads

There is an existing functioning road network that can be used to access the proposed development site. The site can be accessed through D4418 from D4419 road.

3.2. Water

The proposed development site has an existing infrastructure for water. The township of Seville gets water from Thorn Dam, which is located 3.5 km east of the proposed development site.

3.3. Sewer Reticulation

The township of Seville has no existing wastewater treatment works. The community depends entirely on pit toilets and septic tanks for sanitation purposes.

3.4. Electricity

There is no electrical infrastructure present on the proposed development site. However, there is an existing electrical infrastructure in the vicinity of the project area which could be utilised to supply the proposed township, subject to approval from the supply authority.

3.5. Waste

A regional landfill situated nearest to the proposed development site should be used to dispose solid waste. The local municipality must be responsible for the collection and disposal of the solid waste.

4. ALTERNATIVES

The EIA Regulations stipulate that a requirement of the Environmental Impact Assessments is to investigate feasible and reasonable alternatives to the project proposal.

The EIA Regulations define “alternatives”, in relation to a proposed activity, as “different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

- The property on which or location where it is proposed to undertake the activity
- The type of activity to be undertaken
- The design or layout of the activity
- The technology to be used in the activity
- The operational aspects of the activity

The concept of alternatives is aimed at ensuring that the best among all possible options in all aspects (environmental, socio economic, etc.) is selected. The option of not carrying out the proposed actions (no-go option) or developments is discussed to demonstrate environmental conditions without the project.

This means that for any project that is proposed, there should be a number of possible proposals or alternatives for accomplishing the same objectives or meeting the same need. Alternatives that would still meet the objective of the original proposal, but which would also have an acceptable impact on the environment (referring to physical, biological, aesthetic/visual) must be considered.

4.1. Feasible and Reasonable Alternatives Considered for the Proposed Development

4.1.1. Site Alternatives

Due to land availability, the proposed development site is the only site that has been identified for establishing the township. Site alternatives are not applicable for this project.

4.1.2. Activity Alternatives

The current preferred activity is deemed to be the only feasible activity alternative as this activity will result in improved housing which can accommodate more people. No other activities were considered in this application due to the assessed need and feasibility of the proposed activity.

4.1.3. Design Alternatives

The unique character and appeal of Seville were taken into consideration with the design philosophy. Various layout alternatives were considered by the applicant and town planners, also taking terrain and environmental constraints into account, hence the current township layout plan being the result, however there is still a possibility of a layout alternative that will still meet the objective of the project scope.

4.1.4. Technology Alternatives

As the preferred use is for predominantly residential development, there are limited technology alternatives that can be considered for these uses, however, individual components of the development could utilise diverse technological alternatives.

4.1.5. Operational Aspects

The operational aspects of the activity relate to the improved housing for the local community. No other alternatives were deemed feasible other than the proposed activity.

4.1.6. The Option of not Implementing the Activity

The direct impacts associated with the entire proposal not being approved include loss of opportunity to provide a new living environment with housing and associated facilities to people that the needs housing and loss of other potential socio-economic activities, in terms of job creation during both the construction and operational phases.

4.1.6. No-Go Alternatives

This option would come into effect if this assessment reveals fatal flaws in the process. To date no fatal flaws have been revealed. The no-go alternative of not developing the proposed site would leave the environment in the current state.

5. LEGISLATION, POLICIES AND GUIDELINES CONSIDERED

The following is a broad overview of the relevant legislation, policy and guidelines applicable to the proposed development.

5.1. The Constitution of the Republic of South Africa (No. 108 of 1996)

The Constitution is the most important part of a legislation that provides a framework for the environmental management in South Africa. Section 24 of the Constitution encourages the prevention of pollution and ecological degradation and also promotes sustainable ecological developments.

According to Chapter 2 of the Bill of Rights, everyone has the right to:

- An environment that is not harmful to their health or wellbeing,
- 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
 - Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Applicability to the project: the applicant will ensure that the conservation principles are promoted and that the proposed township is ecologically sustainable and will not be harmful to human health or well-being.

5.2. National Environmental Management Act (No. 107 of 1998)

The National Environmental Management Act is South Africa's overarching framework for environmental legislation. NEMA sets out the principles of Integrated Environmental Management (IEM). It also aims to promote sustainable development, with wide-ranging implications for national, provincial, and local government. The key principles are that all developments must be environmentally, economically and socially sustainable and that environmental management must place people and their needs at the forefront, and equitably serve their physical, developmental, psychological, cultural and social interest. Section 2 of NEMA, sets out a range of environmental principles that are to be applied by all organs of state when taking decisions that may significantly affect the environment.

Section 24 states that the activities that may significantly affect the environment and require authorisation or permission by law must be investigated and assessed prior to approval. These activities are listed in Government Notice R324, R325 and R327, 07 April 2017. In addition, it provides for the Minister of Environmental Affairs or the relevant MEC to identify:

- New activities that require approval
- Areas within which activities require approval and

- Existing activities that should be assessed and reported on It also provides for the Minister to make regulations with respect to the manner in which investigations should occur.

Section 28(1) states that “every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring.” If such pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the impact on the environment
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks
- Ceasing, modifying or controlling actions which cause pollution/ degradation
- Containing pollutants or preventing movement of pollutants
- Eliminating the source of pollution and
- Remedying the effects of the pollution

The authorities may direct the developer / applicant to rectify or remedy a potential or actual pollution problem. If such a directive is not complied with, the authorities may undertake the work and recover the costs from the responsible developer.

Applicability to the project: the applicant is obliged under Section 28 to take actions to prevent pollution or degradation of the environment.

5.3. Environmental Impact Assessment Regulations (2017)

The Environmental Impact Assessment Regulations, promulgated in terms of Section 24(5) of the National Environmental Management Act (No.107 of 1998) are divided into 3 Listing Notices, GNR 324, GNR 325 and GNR 327. GNR 327 defines activities which will trigger the need for a Basic Assessment and GNR 325 defines activities which trigger an Environmental Impact Assessment process. If activities from both Listing Notices are triggered, then an EIA process will be required. Regulation 324 defines certain additional listed activities per province.

Relevance to the project: this activity is listed under the current 2017 Environmental Impact Assessment Regulations of the National Environmental Management Act (No. 107 of 1998). The application involves a number of listed activities, which were outlined on Section 1.1 of this report. The applicant will ensure that all requirements of NEMA are conformed with.

5.4. National Heritage Resources Act (No. 25 of 1999)

In terms of Section 38 of the Heritage Resources Act, a Heritage Impact Assessment has to be undertaken for the following developments:

- Or other activity which will change the character of a site
- Exceeding 5000 m² in extent
- Involving three or more existing erven or subdivisions
- Involving three or more erven or divisions thereof which have been consolidated within the past five years
- The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- The re-zoning of a site exceeding 10 000m² in extent
- 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.

Section 38 of the NHRA makes provision for developers to apply for a permit before any heritage resource may be damaged or destroyed.

Applicability to the project: the proposed activity is a township establishment, therefore will change the character of the site and it also exceeds 5000 m²

5.5. National Water Act (No. 36 of 1998)

Water use is controlled by the National Water Act and the enforcing authority, Department of Water Affairs. The National Water Act recognises that water is a scarce resource in South Africa and its provisions are aimed at achieving sustainable use of water to the benefit of all users.

Additionally, Part 3 of the National Water Act requires certain information relating to floods, droughts and potential risks to be made available to the public. Township layout plans must indicate a specific floodline.

Applicability to the project: based on the findings of the floodline determination report, the project area is affected by flood water within the 1:100 period. The township layout plan indicating the floodline is attached as Appendix 2.

5.6. Conservation of Agricultural Resources Act (No. 43 of 1983)

To provide for the conservation of the natural agricultural resources of the Republic of South Africa by the preservation of the production potential of land, by the combating and prevention of erosion

and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.

Applicability to the project: the developer / applicant will be responsible for weed and invader control, storm water control must also be implemented

5.8. Mpumalanga Biodiversity Conservation Plan (No.10 of 1998)

To consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith.

Applicability to the project: According to the Mpumalanga Conservation Plan, the project area is situated outside an Ecological Support Area but within an area regarded as Other natural area.

6. NEEDS AND DESIRABILITY OF PROPOSED DEVELOPMENT

- The proposed development will contribute towards improving the housing stock of the area and general livelihood of the residents.
- The existing road leading to the existing township will provide access to the proposed township establishment.
- There will be sites for business opportunities for the residents
- Furthermore, the development will eventually be integrated with the environment, have proper service provision and it will be well planned.
- The proposed township will create job opportunities and ensure social upliftment of the area, create investment opportunities and create a sustainable development environment.
- The proposed development will increase the availability of housing
- The development will promote the economic growth within the Bushbuckridge Local Municipality.
- The establishment of the proposed township will prevent illegal settlement / land invasions
- The township will attract people through creation of a conducive environment for business, educational and institutional developments.

The development is desirable due to its location in terms of:

- The proposed development site is strategically located next to the boundaries of the existing township of Ka-Tsakani.
- There is an existing functioning road network that can be used to access the proposed development site. The site can be accessed through D4418 from D4419 road.
- The proposed development will not have a significant detrimental impact on the surrounding areas and is not in conflict with the adjacent land uses.

7. DESCRIPTION OF THE RECEIVING ENVIRONMENT

7.1. Physical Environment

7.1.1. Topography and Drainage

The topography of the proposed development site is generally flat.

7.1.2. Climate

The climate in Seville is a local steppe climate. There is little rainfall throughout the year and it is classified as hot semi-arid (BSh) by the Köppen-Geiger system. The average annual temperature in Seville is 21.7 °C.

7.1.3. Geology of the Area

The proposed development site is located within the lithologies of the Metamorphic Makhutswi Gneiss rocks. The Makhutswi Gneiss is complex folded, and in some areas intruded by younger, unmigmatised biotite gneiss of tonality composition. The findings of the geotechnical investigation indicate the phaneritic texture granatoid rocks which are predominately composed of felsic minerals such as quartz, plagioclase feldspars and mafic (amphiboles and pyroxene) accessory minerals.

7.1.4. Hydrology

No ground water seepage was encountered in any of the test pits during the geotechnical investigations and there were also no indications of temporary perched water tables in the soil profiles.

7.2. Biological Environment

7.2.1. Vegetation

The proposed development site falls within the vegetation of the Granite Lowveld. This type of vegetation in South Africa is mainly found in Limpopo and Mpumalanga province. The Granite Lowveld comprises of tall shrubland with few trees to moderately dense low woodland dominated by *Terminalia sericea*, *Combretum zeyheri* and *C. apiculatum* and a ground layer consisting of *Pogonarthria squarrosa*, *Tricholaena monache* and *Eragrostis rigidior* (grasses).

7.2.2. Fauna

The proposed development site is impacted by the existing nearby townships and is therefore subject to a level of anthropogenic disturbance, which is not conducive to its use by large mammals, other than domestic species.

7.2.3. Archaeological and Cultural Heritage

There are undiagnostic pot sherds (possibly dating to Iron Age), an isolated MSA flake and an area marking the remains of a possible homestead identified within the proposed development site.

8. SUMMARY OF FINDINGS AND RECOMMENDATIONS OF SPECIALIST STUDIES

Specialist studies / assessments have been undertaken whereby the impacts were identified and mitigation measures were also provided. The specialist studies undertaken are included as Appendix 4 of this EIA report. A summary of the more relevant findings of each study are outlined below:

8.1. General Biodiversity and Ecological Assessment Report

Details of the Specialist:

Naledzani Environmental Services
Suite 211, Elephant House
107 Albertina Sisulu Street
Johannesburg, 2107

Contact Person: Mpho Ramalivhana

Area of Expertise: Environmental Scientist and Biodiversity Consultant

Contact Number: 078 901 4833 / 076 388 7203

Email: ramalivhanam@gmail.com / ramalivhanam@naledzanies.co.za

FINDINGS

General

A desktop survey utilising aerial images and photography was undertaken to assemble background information regarding the different features and vegetation communities present within the proposed project footprint. The site was fully surveyed on the 24th August 2022 to ensure that the true floristic reflection of the site is recorded.

Vegetation

The PRECIS list of plants recorded in the 2431CB quarter degree grid square was obtained from SANBI. This list was consulted to verify the record of occurrence of the plant species seen on the site. A desktop study of the habitats of the red-listed and orange-listed species known to occur in the area was done before the site visits. The rapid visual assessment was used to assess the abundance of floral species. The vegetation units of Mucina & Rutherford (2006) were also used as reference but where necessary communities are named according to the recommendations for a standardized South African syntaxonomic nomenclature system. By combining the available literature with the survey results, stratification of vegetation communities was possible.

Vegetation Survey

The grass layer on site was found to be dry making it difficult to identify some of the grasses to species level. The graminoids recorded and known to occur within the project site include *Eragrostis curvula*, *Brachiaria serrata*, *Digitaria eriantha*, *Eragrostis rigidior*, *Melinis repens*, *Hypperhania hirta*, *Panicum maximum*, *Pogonarthria squarrosa*, *Brachiaria nigropedata*, *Perotis patens* and *Tricholaena monachne*.

The shrub and tree layer consists mainly of *Senegalia nigrescens*, *Peltophorum africanum*, *Terminalia sericea*, *Dichrostachys cinerea*, *Ziziphus mucronata*, *Combretum imberbe*, *Combretum apiculatum*, *Combretum zeyheri*, *Terminalia sericea*, *Ficus Stuhlmannii*, *Pterocarpus rotundifolius*, *Schotia brachypetala*, *Diospyros lycioides*, *Gymnosporia buxifolia*, *Englerophytum magalimontanum*, *Acacia sieberiana*, *Ximenia caffra*, *Strychnos madagascariensis*, *Vachellia nilotica*, *Sclerocarya birrea*.

Fauna

The faunal assessment is based on desktop analysis and observations that were made during the site visit. During the time on site, no mammals were noticed and it was deemed necessary that a desktop analysis be done to explore all different kinds of animals to habit the area. The occurrence of some key bird species were verified according to the distribution record obtained during the Southern African Bird Atlas period from 1981 to 1993 (Harrison et al., 1997) as well as records from 1974 to 1987 according to Tarboton et al (1987).

Nationally Protected Trees

The National Forest Act, 1998 (Act No. 84 of 1998) enforces the protection of several indigenous trees. This national list of protected trees was developed through the application of objective scientific criteria which was supported by a computerised scoring system. Criteria for listing the trees as protected included:

- The rarity of the species
- Importance of the species in the maintenance of an ecosystem, also known as keystone species
- The utilization pressure on a species
- Cultural or spiritual value (including landscaping) of the species
- The degree to which a species is already protected under provincial legislation

The recorded nationally protected trees area *Combretum imberbe* and *Sclerocarya birrea*.

Alien Invasive Plants

Declared weeds and invaders have the tendency to dominate or replace the herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of natural ecosystems. Therefore, it is important that all these transformers be eradicated and controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

According to the published Alien and Invasive Species regulations in terms of section 97(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) four categories of problem plants are identified as:

- **Category 1a** plants are high-priority emerging species requiring compulsory control. All breeding, growing, moving and selling are banned.
- **Category 1b** plants are widespread invasive species controlled by a management programme.
- **Category 2** plants are invasive species controlled by area. Can be grown under permit conditions in demarcated areas. All breeding, growing, moving, and selling are banned without a permit.
- **Category 3** plants are ornamental and other species that are permitted on a property but may no longer be planted or sold.

Fauna

According to MammalMap (Animal Demographic Unit) a total of 13 species have been recorded within the 2431CB quarter degree square (QDS). However, it must be noted that approximately 85% of these species are largely restricted to nature reserves/privately owned conservation areas. The remaining species diversity is low and is likely attributed to a lack of sampling effort coupled with anthropogenic habitat modification and associated pressures within the QDS.

Terrestrial and arboreal habitats were the dominant niches from a spatial perspective associated with the project area. The project area represents a relatively large tract of remaining habitat within the Ladysmith urban landscape. Therefore, although not pristine, the area provides refuge as well as some degree of connectivity to surrounding micro-habitats characterised by unique ecological features including unique floral assemblages and specific micro-climate conditions. As such these habitats provide elevated niche heterogeneity and subsequently higher species richness than adjacent anthropogenically modified areas. During the August 2022 site investigation, *Rattus rattus*, *Bos Taurus*, *Pronolagus crassicaudatus* and *Capra aegagrus hircus* were identified within the project area based on direct and indirect signs.

RECOMMENDATIONS

- Ensure that the disturbed footprint is kept to a minimum
- Ensure compliance to the recommended mitigation measures by any contractors (project proponent) used on the project.
- Management measures stipulated in this report be included into the proposed projects official EMP and that these are assessed for efficacy during all phases of the project and adapted accordingly to ensure minimal disturbance of the study areas' ecology.

8.2. Heritage Impact Assessment

Details of the Specialist:

Beyond Heritage
Private Bag X 1049
Modimolle, 0510

Contact Number: 082 373 8491
Email: jaco@heritageconsultants.co.za

Contact Person: Jaco van der Walt
Area of Expertise: Heritage Specialist and Archaeologist

FINDINGS

Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located, these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

Heritage Resources

The area is characterised by dense vegetation and the local community is utilizing the small trees for firewood. Overgrazing of the area further causes an influx of pioneer species. Erosion causes small dongas to form in some areas that reveals a subsurface gravel layer on top of bedrock that could have been utilised during Stone Age times. A community member accompanied the survey team and indicated a site (SX002) consisting of the ephemeral remains of a possible homestead just outside of the impact area. Findspots consisting of scatters of undiagnostic ceramics and background scatter of MSA lithics. These findspots are isolated and out of context and of no significance.

Paleontological Heritage

According to the SAHRA Paleontological map, the project area is of insignificant palaeontological significance and no further action is necessary.

RECOMMENDATIONS

- Implementation of Chance Find Procedure (CFP) for the project
- The study area should be monitored during construction by the ECO;
- The significance of feature SX002 to the local community should be confirmed prior to development through social consultation.

8.3. Engineering Services Report

Details of the Specialist:

Dalimede Projects (Pty) Ltd

No. 11 Pierre street, Office 6, IT Park RentCo Building

Polokwane, 0699

Contact Number: 015 291 0775 / 079 368 8414

Email: admin@dalimede.com

Contact Person: Litmos Mthunzi

Area of Expertise: Civil Engineer

FINDINGS

Water Source

In Seville township, water is sourced from Thorn Dam, GPS coordinates 24°39'56.57"S 31°26'43.80"E. The Thorn Dam is 3.5 km east of the proposed site. Raw water is then conveyed to the following water treatment works (WTW):

- Thorn Dam WTW, GPS 24°39'52.67"S 31°26'35.95"E

Bulk Water Pipeline

At the Thorndale Dam WTW, water is pumped through a 160mm diameter uPVC pipeline. The pumping main conveys potable water to the reservoir in Seville village and directly into the existing water reticulation supplying the neighbouring villages.

Water Reticulation

The area adjacent to site has an existing water reticulation to yard connection standard.

Sewer

There are no existing bulk sewer pipelines servicing Seville in general. Seville village currently has no existing wastewater treatment works. Sewer is currently handled onsite through septic tanks and pit toilets. Honey-sucker trucks are then engaged by individuals to empty filled up septic tanks.

Sewer Reticulation

There is no sewer reticulation currently at the township site. The community rely on pit toilets and septic tanks for sanitation needs.

Electricity

There is existing electricity supply infrastructure in the vicinity of the proposed development. This could be utilised to supply the development, subject to approval from the power authority.

Solid Waste

A regional landfill situated nearest the site is to be used to dispose solid waste. The local municipality is responsible for connecting and disposing the solid waste. If the municipality is not able to provide this service, then a private company will need to be appointed by the development owners for the service. A refuse area with bins will be done onsite and solid waste will be disposed of at the municipal dump site as per the municipal health bylaws.

RECOMMENDATIONS

- A water connection to the proposed reticulation for the development.

8.4. Electrical Report

Details of the Specialist:

Buro Tech Consulting Engineers CC
141 Main Street, Heatherdale
Karenpark, 0118

Contact Number: 082 600 8328 / 012 542 1010

Email: nicovw@burotech.co.za

Contact Person: Nico van Wyk

Area of Expertise: Electrical Engineer

FINDINGS

Brief on Existing Networks

Eskom is the supply authority in the area and have electrical infrastructure servicing adjacent townships in the area. No electrical infrastructure is currently present on the project site. The area is supplied from the Acornhoek 275/132/22kV MTS Substation via the Acornhoek / Tintswalo 22kV overhead line.

Available Capacity

Eskom indicated that the Acornhoek MTS Substation have an installed capacity of 2× 40MVA and is currently loaded to 93.9% of firm capacity (thus 37.56MVA).

Eskom indicated that the Acornhoek / Tintswalo 22kV overhead feeder have no spare capacity available and the new Tsakani substation is currently being constructed to:

- De-load the existing Acornhoek / Tintswalo 22kV feeder
- Unlock additional capacity to the area

RECOMMENDATIONS

Eskom will require a formal application process to be followed for official feedback and to reserve capacity.

8.5. Geotechnical Investigations

Details of the Specialist:

Mutali Geoscience Solutions

Unit 01A Stanford Park, 817 16th Road

Randjespark, Midrand, 1685

Cell: 079 081 2369/ 067 706 9904

Email: info@mutali.co.za

Contact Person: Mavhetha Lavhelesani

Area of Expertise: Geologist

FINDINGS

Ground Subsidence

No signs of previous subsidence were evident during the site investigation. The site cannot be classified as a mining active area and there are no underground mining directly below the site. Should the new information relating to mining activity or seismic activity later be uncovered, the Department of Mineral Resources (DMR) will be consulted.

Sinkhole Formation

The available geological maps and geological mapping from site investigations indicate that the site is not underlain by dolomite or soluble rocks / minerals.

Landslides and Mudslides

The probability of landslides and mudslides occurring within this area are remote. This is primarily due to the low relief and relatively flat gradient that have angle less than that of critical angle of repose.

Falls and Rockslides

The probability of the occurrence of rock falls and rockslides is low.

PH and Conductivity

pH measurements conducted indicated that the pH of the area is 5.89 for TP02 at a depth of 0.9-1.6m and 7.4 for TP10 at depth of 1.08-1.9m. Conductivity measurements indicated that the conductivity of the area is 0.0043 S/m for TP02 at a depth of 0.9-1.6m, 0.0143 S/m for TP10 at depth of 1.08-1.9m. The area can be classified as Slightly-corrosive (SC). Therefore, corrosive materials (pipelines) installation must include

measures against corrosion.

Residual Soils

Residual soil was encountered in all test pit with an average thickness of 1.35m in the range 0.3m to 1.66m below ground level. These soils originate from the in-situ weathering of the metamorphic rock (Makhutswi Gneiss) which is underlined the site. This stratum is typically described as “slightly moist, light brown, intact, _medium dense, coarse grained ~gravelly-sand”.

RECOMMENDATIONS

The gravelly sand residual soils were classified as “S/C”. The recommended foundation type for this soil class is a **normal strip foundation**. The following construction procedures apply:

- All topsoil to be stripped to spoil
- Foundation excavation to the moderately weathered, highly fractured, medium hard rock at an average depth of 1.6 m below existing ground level;
- The excavation onto the weathered Gneiss to be hand cleaned and all loose material to be removed
- A concrete blinding to be cast to onto cleaned rock surface prior to casting foundations
- The allowable bearing capacity should be limited to 250kPa on the weathered Gneiss bedrock

Foundations on Soil Class “S/C1”

Residual soils on this portion are highly weathered due to the moisture content onsite and the portion of the site is classified as “S/C1”. The following construction procedures apply:

- All topsoil to be stripped to spoil
- Foundation trenches for 500mm wide strip footing to be over-excavated to 1.0m wide by 1.6m deep below existing ground level
- Excavation to be backfilled with G6 quality material to a depth of 0.6m existing ground level
- G6 material to be compacted in 150mm thick layers to 93% Mod AASHTO density at –1% to +2% OMC
- Strip footings 500mm wide and adequately reinforced should be constructed at a depth of 0.6m
- The allowable bearing capacity should be limited to 150kPa on the engineered soil mattress
- Articulation joints at some internal doors and all external doors
- Light reinforcement in masonry
- Good site drainage requirements

8.6. Floodline Determination

Details of the Specialist:

Dalimede Projects (Pty) Ltd
No. 11 Pierre street, IT Park RentCo Building Office 6
Bendor, 0699

Contact Number: 015 291 0775
Email: admin@dalimede.com

Contact Person: Litmos Mthunzi
Area of Expertise: Civil Engineer

FINDINGS

In terms of section 114 of the National Water Act 36 of 1998, the above-mentioned property is affected by flood water within the 1:100 period from the stream / river as indicated in the floodline report.

RECOMMENDATIONS

It is recommended that a buffer zone of 20m should be provided between the 1:100 flood line and any proposed development.

8.7. Storm Water Management Plan

Details of the Specialist

Dalimede Projects (Pty) Ltd
No. 11 Pierre street, IT Park RentCo Building Office 6
Bendor, 0699

Contact Number: 015 291 0775
Email: admin@dalimede.com

Contact Person: Litmos Mthunzi
Area of Expertise: Civil Engineer

FINDINGS

The proposed storm water management system has been designed to be self-regulating with no external control. It will aim to collect run-off into rainwater harvesting tank, swales, underground pipes with an attenuation pond to attenuate and manage the increase in flow between the pre and post development stages from the transformed areas.

The run-off from the roofs, gutters and downpipes shall be collected in rainwater harvesting tanks considering any overflows being dispersed overland into swales and ultimately collected into

underground stormwater systems and contained in two stormwater attenuation ponds. Hardened areas, like roads and parking areas will be routed overland, collected in kerbs and channels and into grid inlets or catchpits where it is collected in concrete stormwater pipes and diverted into the two stormwater attenuation ponds along the lower boundary of the site where increased flow will be attenuated, whilst silt is deposited. The stormwater attenuation ponds should be located along the lower end of the site, but outside the mainstream area to encourage the infiltration of stormwater, whilst silt is collected. The outlet or discharge from the attenuation pond will be protected with gabion mattresses and other energy dissipaters from where it will be released into the natural drainage areas and stream in a controlled manner.

RECOMMENDATIONS

The following recommendations are made for the proposed housing development:

- That the storm water design parameters used in the design of the storm water management system are accepted and approved.
- The detail design of the storm water system includes recommendations of this plan.
- Rainwater harvesting should be encouraged at all residential dwellings.
- Rainwater harvesting tanks should be included in building plans submitted to the municipality for building plan approval.
- The stormwater attenuation ponds should be constructed off-channel before draining into the stream.
- The storm water system must be kept separate from the sewerage system.
- All chemicals, cement, fuel and other hazardous material used during construction should be stored in controlled areas and not lower than the internal road.
- Concentration of storm water should be prevented where possible, but energy dissipaters should be provided in areas of concentration.
- On completion of every construction phase within the development, comprising the construction of buildings, roads and parking areas, all remaining exposed embankments and open areas must be vegetated as soon as possible, including the use of “Soil saver”, where necessary.
- During the construction phase, the following aspects shall be closely monitored by the ECO to ensure the contractor complies:
 - Temporary berms and cut-off drains must be provided on site to collect runoff, especially until the stormwater attenuation pond is complete and functional.
 - Silt screens must be provided at the catchpits during road/stormwater construction.
 - Topsoil must be conserved on site and prevented from entering the stormwater system.

- Exposed embankments, cut / fill slopes and open areas must be vegetated as soon as possible to reduce runoff.
- Dust control during construction must be always applied.
- Excess spoil material from topsoil or bulk earthworks must be placed in areas or even removed entirely off site to minimise silt deposition, scouring and soil erosion.
- Post construction, all exposed areas must be covered in vegetation, grass or landscaped.

8.8. Traffic Impact Assessment

Details of the Specialist

Lumka Civil Developments
534 Block K
Soshanguve, 0152

Contact Number: 073 717 9550

Email: lumkalcd@gmail.com

Contact Person: Lumka Makgaba
Area of Expertise: Traffic Engineer

FINDINGS

Annual Average Daily Traffic (AADT) From Mpumalanga Public Works, Roads and Transport

Lumka Civil Developments requested traffic count information from Mpumalanga Public works, Roads and Transport. The information obtained was to be used a guideline and also verification purposes. No Information was found to date

Average Weekday Traffic Demand (AWDT)

A conversion factor of 1.25 is appropriate to convert 12-hour Friday traffic counts to AWDT traffic counts - based on typical traffic patterns in urban areas along major roads.

Average Annual Daily Traffic Demand (AADT)

Since the expected monthly or annual fuel sales is based on factored daily trips, it is common practice to use a number of average trading days per month which is less than the calendar average of 30.5 days. In this instance – based on the prevailing traffic characteristics - it is recommended to use 25 average trip days per month.

The affected Road is D4419, the township establishment is expected to generate 3025 vehicles per day in both directions combined and characterized by the following:

- The week peak AM and PM generated would be 6048 combined in and out. A directional split assumed is 85:15 and 15:85 in the determination of the worst-case scenario to evaluate intersections capacity and propose mitigation measures
- From the site investigations, the morning peak hour at the intersections are 7:00 to 8:00 except for D4419/D4418 which occurs between 6:00 to 7:00 am. The afternoon peak hour observed was between 5:00 to 6:00pm.

Proposed Alternative Access Road

The affected internal access roads are D4419:

The township establishment is expected to generate 1903 vehicles per day in both directions combined and characterised by the following:

- The week peak AM and PM generated would be 2019 combined in and out. A directional split assumed is 85:15 and 15:85 in the determination of the worst-case scenario to evaluate intersections capacity and propose mitigation measures
- From the site investigations, the morning peak hour at the intersections are 7:00 to 8:00 except for D4419 and D4418 which occurs between 6:00 to 7:00 am. The afternoon peak hour observed was between 5:00 to 6:00pm

Proposed Access Design: Pavement Design

The pavement design was done according to Draft TRH4:1996 “Structural Design of Flexible Pavements for Interurban and Rural Roads”. The following inputs were considered in the design:

- A Structural Design period of 20 years
- ES 10 (3 to 10 million cumulative 80 kN axles per lane)
- Road Category B
- Moderate climatic region.

Junction

The road has two additional 7.4m lane surfaced wide, with two lanes each being 3.7m; this will serve as turning lane. 15m Radius Bell mouth will be sufficient with associated slip way into the village.

Road Safety and Road Signs

The area lacks information, directional and warning signs in mainly areas. A special budget is required to upgrade and install signage in most of the area. From a traffic safety point of view, it would be advisable to provide the following:

- It is extremely important to provide the necessary signboards to ensure that the proposed new facilities would function optimally.

RECOMMENDATIONS

- Intersection will require an upgrade from an existing give way yield control to a signalised control in order to provide enough capacity for the proposed trips generated by the township.
- It is recommended that the application be approved as per recommendation of this report and the geometrical specification of the Mpumalanga Department of Public works, Roads and Transport and the Ehlanzeni District Municipality, subjected to the provision of the required road reserve.

9. ENVIRONMENTAL IMPACT DETERMINATION AND EVALUATION

9.1. Methodology to Assess the Impacts

To assess the impacts on the environment, the process has been divided into two main phases namely the construction phase and the operational phase. The activities, products and services present in these two phases have been studied to identify and predict all possible impacts.

In any process of identifying and recognising impacts, one must recognise that the determination of impact significance is inherently an anthropocentric concept. Duinker and Beanlands, (1986) in DEAT 2002, Thompson (1988), in DEAT 2002 stated that the significance of an impact is an expression of the cost or value of an impact to society.

However, the tendency is always towards a system of quantifying the significance of the impacts so that it is a true representation of the existing situation on site. This has been done by using wherever possible, legal and scientific standards which are applicable.

The significance of the aspects/impacts of the process have been rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The consequence matrix use parameters like severity, duration and extent of impact as well as compliance to standards. Values of 1-5 are assigned to the parameters that are added and averaged to determine the overall consequence. The same process is followed with the likelihood that consists of two parameters namely frequency and probability. The overall consequence and the overall likelihood are then multiplied to give values ranging from 1 to 25. These values as shown in the following table and are used to rank the significance.

Significance	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X	1-4.9	5-9.9	10-14.9	15-19.9	20-25

Overall Likelihood					
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Table 3: Significance Ratings

SEVERITY	
Low	Low cost/high potential to mitigate. Impacts easily reversible, non-harmful insignificant change/deterioration or disturbance to natural environments.
Low-medium	Low cost to mitigate small / potentially harmful moderate change / deterioration or disturbance to natural environment.
Medium	Substantial cost to mitigate. Potential to mitigate and potential to reverse impact. Harmful Significant change / deterioration or disturbance to natural environment.
Medium-high	High cost to mitigate. Possible to mitigate great/very harmful, very significant change / deterioration or disturbance to natural environment.
High	Prohibitive cost to mitigate. Little or no mechanism to mitigate. Irreversible. Extremely harmful Disastrous change / deterioration or disturbance to natural environment.
DURATION	
Low	Up to one month
Low-medium	One month to three months
Medium	Three months to one year
Medium-high	One to ten years
High	Beyond ten years
EXTENT	
Low	Project area
Low-medium	Surrounding area
Medium	Within Bushbuckridge Local Municipality
Medium-high	Within Ehlanzeni District Municipality
High	Regional, National and International
FREQUENCY	
Low	Once a year or once during operation
Low-medium	Once in 6 months
Medium	Once a month
Medium-high	Once a week

High	Daily
PROBABILITY	
Low	Almost never / almost impossible
Low-medium	Very seldom / highly unlikely
Medium	Infrequent / unlikely / seldom
Medium-high	Often / Regularly / Likely / possible
High	Daily / Highly likely / definitely
COMPLIANCE	
The following criteria are used during the rating of possible impacts	
Low	Best practise
Low-medium	Compliance
Medium	Non-compliance / conformance to Policies etc. – Internal
Medium-high	Non-compliance / conformance to Legislation etc. – External
High	Directive, prosecution of closure or potential for non-renewal of licences or rights

Table 4: Description of the parameters used in the matrixes

10. KEY ENVIRONMENTAL IMPACTS

This chapter provides an assessment of the impacts associated with each issue and further includes mitigation measures to be implemented to reduce the significance of negative impacts. This chapter provides a description of the specific, direct and indirect, impacts that could potentially result from the proposed development, both during the construction and operational phases of the proposed project.

These potential impacts are described with reference to both the characteristics of the receiving baseline environment and characteristics of the proposed development. The potential impacts are described in terms of their intensity, integrity, duration and probability of impacts. Impact assessment addresses direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions. These listed issues have been determined through the scoping and EIA process. For this purpose, the project is considered in two phases – construction and operational phases.

10.1. Identification of Key Environmental Issues and Impacts

An environmental issue is defined as “a generally expressed concern or impact” raised in an EIA process. The EIA process also includes the assessment of issues or impacts with regards to the activity / development being proposed.

Key issues were identified according to the following criteria:

- Whether or not the issue raised falls within the scope and the responsibility of the project
- Whether or not there is sufficient information available to respond to the issues or concerns raised without further specialist investigation
- Whether any aspect of the project is inconsistent with the legal, policy or planning framework

These key issues have been identified in the scoping process through the following means:

- Site visits
- Legislation and policies
- Gleaning over existing information pertaining to similar developments and issues
- Discussions, and meetings
- Opinions and concerns raised by interested and affected parties
- Specialist studies and qualified opinions
- Professional judgement

Key issues are potential environmental impacts. Impacts, both positive and negative, are associated with these key issues. These impacts are addressed in accordance with the methodology outlined in Section 9 of this environmental impact assessment report.

10.1.1. Soil and Geology

(a) Characteristics of the Proposed Development

Site development works will include stripping of thick topsoil layer. It is expected that all stripped topsoil will be reused on site (incorporated into landscaping of back gardens and public open spaces). Excavation of subsoil layers will be required in order to allow foundation excavation.

(b) Potential Impact of the Proposed Development

Construction Phase:

Stripping of Topsoil

- Removal of the existing topsoil layer will be required across the site. As noted previously, it is expected that all stripped topsoil will be reused on site (incorporated into landscaping of back gardens and public open spaces).
- Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion.

Excavation of Subsoil Layers

- Excavation of existing subsoil layers will be required in order to allow foundation excavation and infrastructure services installation.

- Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material beneath houses and roads) however, unsuitable excavated subsoil is expected and will have to be removed to an approved landfill site.

Construction Traffic

- Earthworks plant (e.g. dump trucks) and vehicles delivering construction materials to site have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion. This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network).
- Dust generation can also occur during extended dry weather periods as a result of construction traffic.

Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in contamination of the soils underlying the site.

- Oils and fuels leaking from construction machinery / vehicles
- Spillage during refuelling of construction vehicles
- Use of cement and concrete during construction works

Operation Phase

During the operational phase of the township, negative impacts might be due to the incorrect use of fertilisers, exposure of soil surfaces and poor storm water management. If ablution facilities are not secured properly it could fall over and result in spillage which will pollute both the soil and the ground water. Table 5 below indicates the impact assessment of the proposed township on the soil and geology.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Stripping of Topsoil	Negative	Project site	Short term	Medium	Definite	Medium	Low
Excavation of Subsoil Layers	Negative	Project Site	Short term	Medium	Definite	Medium	Low
Construction Traffic	Negative	Local	Short term	Low	Likely	Low	Low
Accidental Spills and Leaks	Negative	Local	Medium term	Medium	Likely	Medium	low

Operational Phase	Negative	Local	Medium term	Medium	Definite	Medium	Low
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Table 5: Impact Assessment on Soil and Geology

(c) Mitigation Measures

Construction Phase

Stripping of Topsoil

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.

- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter surface water drains / culverts.
- Topsoil stockpiles will also be located so as not to necessitate double handling.

Excavation of Subsoil Layers

- The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping).
- Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.

Construction Traffic

- Earthworks plant and vehicles delivering construction materials to site will be confined to pre-determined haul routes around the site.
- Road sweeping will be implemented as necessary in order to maintain the road network in the immediate vicinity of the site.
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

Accidental Spills and Leaks

- In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded area.

- Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- Any excess or waste material or chemicals should be removed from the site and discarded in an environmental friendly manner.
- All construction vehicles should be inspected for oil and fuel leaks regularly, and any vehicle showing signs of leaking should be serviced immediately.

Operational Phase

- No paint tins or rollers are allowed to be washed out on bare soil – washing may occur in a drum of water, which must be emptied into a disposable drum as part of building rubble (hazardous material) and not tipped onto the soil.
- Any contact of fuels with the bare soils must at all cost be avoided. Should there be any spillages on the ground, immediate rehabilitation must be done.
- Ablution facilities must be properly secured and located far away from the environmental sensitive areas.
- A proper storm water management plan must be provided.

(d) Predicted Impact of the Proposed Development

Construction Phase

- Implementation of the measures outlined in above will ensure that the potential impacts of the proposed development on soils and the geological environment do not occur during the construction phase and that any residual impacts will be short term.
- The primary residual impact is the removal of material unsuitable for reuse as fill material. This impact is unavoidable given the nature of the proposed development.

Operational Phase

- There are no predicted impacts arising from the operational phase.

(e) Monitoring

The proposed monitoring measures during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to the recommendations of the geotechnical report
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.

- Monitoring cleanliness of adjacent road network and implementation of dust suppression.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination)
- Monitoring sediment control measures

(f) Potential Cumulative Impacts

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented.

10.1.2. Population & Human Health

This section examines the potential socio-economic impact of the construction and operation of the proposed township development.

Issues associated with human beings are varied and covers a broad spectrum of topics associated with the existence, activities and wellbeing of people as groups or 'populations'. Whilst most developments will affect people in some form or way, this section of the EIAR focuses on those topics which are manifested in the environment, such as impacts on community facilities, and on the economy. Actual and perceived impact of the proposed development on human beings and human health may also arise from a number of elements of the project proposal.

(b) Potential Impacts of the Proposed Development

Construction Phase

Population

Due to the construction works, there will be an increase in the number of persons working in the immediate area on a daily basis. There will be no adverse impact on population arising from the construction phase of the development as it is likely to be short term and of low negative impact.

Community

- The construction phase has the potential to impact on communities' convenience. Currently local residents / community are utilizing the small trees for firewood. A short term low negative impact is likely due to the restricted access to the fields once construction commences.

Economic Activity and Employment

The provisions of direct employment (full and part-time employment) within the construction and related sectors over the course of the construction phase. This is likely to bring benefits to the local economy in the form of increases in consumption in the locality and through the additional supply of goods and services required over the duration of the construction phase. This may also result in the

creation of secondary employment opportunities. This will be a direct short term medium positive impact.

Human Health and Safety

- Like most substantial development projects, the construction phase of the proposed development is likely to have some short-term impacts on local residents. These impacts are likely to result from construction traffic movements to and from the site together with other possible health and safety impacts, such as nuisances associated with construction access requirements, pollution spillages, migration of surface contaminants, dust, noise and littering.
- Indirect impacts may result from increased construction traffic, hauling building materials to and from the proposed development site which are likely to affect humans in a variety of potential locations distant from the proposed development site, such as residents near landfill sites.
- The construction methods employed, and the hours of construction proposed on site will be undertaken in such a manner to mitigate any adverse resulting effects.

Operation Phase

Population

- The township will contribute positively to the population / community of Seville by increasing housing stands supply. The proposed development will have a significant positive long-term impact.

Community Facilities

- The township will contribute positively to the population / community of Seville by increasing housing stands supply. This will contribute to the consolidation of the rural area and will assist in creating a more active, vibrant area with the critical mass to support a wide range of facilities and services.
- The proposed development will have a significant positive long-term impact on the community.

Economic Activity and Employment

- Local retail and businesses are likely to see a positive impact in the long term. The construction of housing will likely lead to increased expenditure by new residents in the local community. This will have a Long Term Medium Positive Impact.
- The proposed development will provide a range of businesses, creating long term employment. This will have a long term high positive impact on the economic functioning of the wider area.

Human Health and Safety

- During the operational phase there is a possibility that there could be smoke caused by fires, this is however not anticipated as electricity will be provided. Other health impacts could be due to the pollution that might be due to littering or inadequate waste removal and if public space is used as toilets. Table 6 below indicates the impact assessment of the proposed township on the population and human health.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Population	Negative	Local	Short term	Low	Likely	Low	Low
Community Facilities	Negative	Project site	Short term	Medium	Definite	Low	Low
Economic Activity and Employment	Positive Direct	Local	Short term	High	Definite	Medium	Medium
Human Health and Safety	Negative	Local	Short term	Low	Likely	Low	Low
Operation Phase							
Population	Positive	Regional	Long term	High	Definite	Medium	Medium
Community Facilities	Positive	Local	Long term	Medium	Highly Likely	Medium	Medium
Economic Activity and Employment	Positive Direct	Regional	Long term	High	Definite	Medium	High
Human Health and Safety	Negative	Local	Long term	Medium	Likely	Medium	Low

Table 6: Impact Assessment of Population and Human Health

(c) Proposed Remedial and Mitigation Measures

The mitigation measures outlined in this section will minimise and / or eliminate the potential adverse impacts on the local community.

Construction Phase

A range of construction related remedial and mitigation measures are proposed in this EIAR with reference to the various environmental topics discussed under each. These measures seek to ensure that any likely significant adverse environmental impact on humans during the construction phases being either ameliorated to have an acceptable level of impact or be avoided altogether.

In order to minimise impacts during the construction phase, the following mitigation measures are recommended:

- Demarcation of the construction site to prevent public access.
- Erection of signage informing public of onsite activities and their potential danger.
- Ensure that the equipment is in good working order.
- Provide adequate safety warning signage on roads.
- Site managers must ensure that the drivers of these machines do so responsibly i.e. site safety induction meetings.
- The mitigation measures in relation to construction, traffic, noise, air quality and landscaping as set out in this EIA report will be carried out in full to minimise impacts on adjacent residents / communities.
- The recruitment process and the use of contractors should be clearly communicated to the local communities, e.g. through community meetings arranged by the local councillors.
- Councillors in the adjacent areas / villages should be consulted regarding the sourcing of labour.

Operation Phase

- No fires allowed on site.
- Land owners must be informed of the health risk associated with dust and must be motivated to plant vegetation so as to avoid dust creation.
- Community facilities must have proper public notices to inform the public on different diseases and how it is spread.
- Proper Municipal services must be provided to ensure that waste is collected on a regular basis.
- All operational phase remedial and mitigation measures included in this EIAR document with reference to all environmental topics will be implemented.

10.1.3. Water: Hydrogeology & Hydrology

This chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on the surrounding surface water and hydrogeological environments, as well as identifying proposed mitigation measure to minimise any impacts.

(a) Potential Impacts of the Proposed Development

Construction Phase

Water: Hydrogeology & Hydrology.

- Careful stormwater controls are mandatory to the safe and secure development of this site. It is generally good practice to avoid any accumulation of surface water near buildings by appropriate

surface drainage design. Care must be taken to ensure that stormwater is settled and handled on site so that it does not impact on the surroundings.

- Accidental spills and leaks associated with storage of oils and fuels, leaks from construction machinery and spillage during refueling and maintenance contaminating the hydrogeological environments.
- Concrete runoff, particularly discharge of wash water from concrete trucks.

Operation Phase

- Increased impermeable surface area will reduce local groundwater recharge and potentially increase surface water runoff.
- Accidental leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas).
- Littering

Table 7 below indicates the impact assessment of the proposed township on water: hydrogeology & hydrology.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Water: Hydrogeology & Hydrology	Negative	Local	Short term	Medium	Highly likely	Medium	Low
Operation Phase							
Water: Hydrogeology & Hydrology	Negative	Local	Long term	Medium	Likely	Low	Low

Table 7: Impact Assessment of Water: Hydrogeology & Hydrology

(b) Mitigation Measures

Construction Phase

- Manage, across the property, stormwater discharges with consideration for both water quality and flow rates.
- Reduce both the volumes and rate of runoff from the developments proposed on the site itself.
- Place excavation material on stream-up side of all trenches that will be excavated.
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- In order to mitigate against spillages contaminating the hydrogeological environments, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area. Refueling and servicing of construction machinery will take place in a designated bunded area.

Operational Phase

- Planting of trees, aesthetic gardens and lawns by residents is recommended, as it will serve to minimise the amount of runoff.
- No accumulation of surface water must be allowed around the perimeter of the proposed structures and the entire development must be properly drained.

(c) Predicted Impact of the Proposed Development

Construction Phase

- Implementation of the measures outlined in above will ensure that the potential impacts of the proposed development the hydrogeological environment does not occur during the construction phase and that any residual impacts will be short term.

Operational Phase

- There are no predicted impacts on the hydrogeological environment arising from the operational phase.

(d) Monitoring

The proposed monitoring measures during the construction phase in relation to the hydrogeological environment are as follows:

- Adherence to outline EMPr
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness and implementation of dust suppression measures.

(e) Potential Cumulative Impacts

- The proposed surface water drainage infrastructure will be designed in accordance with the relevant guidelines. Any other future development in the vicinity of the site would have to be similarly designed in relation to permitted surface water discharge, surface water attenuation, therefore, no potential cumulative impacts are anticipated in relation to surface water.

10.1.4. Noise

(a) Potential Impacts of the Proposed Development

Construction Phase

- Construction activities will be generating noise. Such noise will mainly emanate from the construction machinery and equipment which include trucks and other vehicles accessing the site not forgetting noise that would emanate from the workers on site and from other activities.
- Construction of access roads (excavator / grader / bulldozer and dump trucks).

- Vehicular movement or large delivery trucks on access and internal roads.

Operation Phase

Noise

- Once the development is completed, the potential noise impacts to the surrounding environment will be minimal. The residential aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (vehicle movements, children playing, music etc.) and hence no significant impact are expected from this area of the development site.
- The main potential noise impact associated with the proposed development is considered therefore to relate to the generation of additional traffic to and from the site as a result of the new residential element, given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development as low. The potentially of noise from activities associated with an outdoor crèche play area and primary school will be medium to low.
- The proposed development is not considered to contribute to any significant likely indirect noise impacts on its surrounding environment due to the nature of the development type which does not include any significant noise sources. In addition, the proposed development is in line with the existing surrounding environment and hence day to day activities including local access movements, children playing, and pedestrian movements are fully in line with the existing baseline noise environment. Table 8 below indicates the impact assessment of noise

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Noise	Negative	Study area	Short term	Medium	Highly likely	Medium	Low
Operation Phase							
Noise	Negative	Project site	Long term	Medium	Highly likely	Medium	Low

Table 8: : Impact Assessment of Noise

(c) Mitigation Measures

Construction Phase

Various mitigation measures will be considered and applied during the construction of the proposed development to ensure noise limit values are complied with, such as:

- Machineries should be maintained regularly to reduce noise resulting from friction.
- There should not be unnecessary honking of the involved machinery.

- Construction works should be carried out only during the specified time.
- Establishing channels of communication between the contractor/developer, local authority and residents
- Appointing a site representative responsible for matters relating to noise
- All site access roads will be kept even so as to mitigate the potential for vibration from trucks.

Operational Phase

- During the operational phase of the development, noise mitigation measures with respect to the outward impact of the development are not deemed necessary.

Cumulative Impacts

The key potential noise source associated with the proposed development relates to additional traffic on the surrounding road network. The cumulative noise impacts associated with existing and development related traffic has been considered within this assessment and the impacts determined to be not significant.

In summary, the predicted increase in noise levels in the vicinity of the proposed development is neutral, long term and not significant.

(d) Predicted Impacts of the Proposed Development

Construction Phase

During the construction phase of the project there is the potential for some minor impact on nearby properties due to noise emissions from site activities. Construction activities must be between normal working hours 8:00 to 17:00 week days with no construction activities taking place during weekends, along with implementation of appropriate noise and vibration control measures, will ensure that noise impact is kept to a minimum. The overall impact is determined to be short-term and slight affecting a small number of local adjacent properties.

Operational Phase

The predicted noise level associated with additional traffic is predicted to be of insignificant impact along the existing road network. In the context of the existing noise environment, the overall contribution of traffic is not considered to pose any significant impact to nearby residential locations. It can be concluded that, once operational, noise levels associated with the proposed development will not contribute any significant noise impact to its surrounding environment. The resulting impact is determined to be neutral, long-term and not-significant.

(f) Monitoring

During the construction phase, spot check noise monitoring will be undertaken by the contractor to ensure construction noise limits are not exceeded. It is recommended that monitoring is undertaken in the event that any significant intrusive works are taking place during the construction phase which has the potential to give rise to elevated vibration levels. During normal site preparation and house building activities, however, vibration monitoring is not deemed necessary.

10.1.5. Air and Dust Impacts

(a) Potential Impacts of the Proposed Development

Construction Phase

Air Quality and Dust

- The greatest potential impact on air quality during the construction phase is from construction dust emissions and the potential for nuisance dust.
- Construction dust has the potential to cause local impacts through dust nuisance at the nearest houses. Construction activities such as excavation and earth moving may generate quantities of dust, particularly in dry and windy weather conditions.
- The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.
- Vehicles transporting material to and from the site also have the potential to cause dust generation along the selected haul routes from the construction areas.

Operation Phase

- During the operational phase of the project, dust will be minimal, since the disturbed areas will be rehabilitated. Table 9 below indicates the impact assessment of air quality and dust.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Air Quality and Dust	Negative	Project site	Short term	Medium	Definite	Medium	Low
Operation Phase							
Air Quality and Dust	Negative	Project site	Long term	Medium	Likely	Low	Low

Table 9: Impact Assessment of Air Quality and Dust

(b) Mitigation Measures

Construction Phase

The measures which will be implemented will include:

- Disturb as little as possible of the natural vegetation on site and keep construction activities within demarcated areas only.
- Only approved soil stabilizers may be utilised to limit dust generation.
- All vehicles and equipment/ machinery must regularly be checked to ensure that they are in good working order to minimise pollution.
- The location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors
- Material loads shall be suitably covered and secured during transportation.
- Rehabilitate disturbed areas as soon as construction activities are finished in that area.
- Construction workers to follow prescribed precautions when working in dusty conditions.
- Ensure that cleared areas and unpaved surfaces are sprayed with water to minimise dust generation.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. Ensure that construction vehicles do not exceed a speed limit of 40 km/hour.

(c) Predicted Impacts of the Proposal

Construction Phase

Air Quality

A range of dust minimisation measures have been outlined and are required to prevent dust nuisance during construction. If the dust minimisation measures specified are implemented, fugitive emissions of dust from the site will be temporary and not significant, posing no nuisance at nearby sites.

Human Health

An adverse impact to air quality during the construction phase has the potential to impact human health. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all ambient air quality which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be temporary and not significant with respect to air quality and human health.

10.1.6. Biodiversity

(a) Potential Impact of the Proposed Development

Construction Phase

Vegetation and habitant disturbance

- During the construction phase, the vegetation cover will be cleared to enable the development of the township. These activities will have a significant impact on the natural vegetation of the area which will result in the loss of both flora and fauna species on site.
- Construction activities will cause disturbance (noise) and displacement of fauna and avifauna on site, but not on a permanent basis, since the fauna and avifauna would most probably move away from the area to the natural areas in the surroundings.
- The storage of materials or the movement of machinery can result in soil compaction, which can in turn damage the roots zones of trees, leading to poor growth or disease.
- Disturbance of the area could lead to an increase in the growth of alien vegetation.
- Installation of services by heavy vehicles could cause fauna mortalities

Operation Phase

Vegetation and Habitant Disturbance

There will be no further loss of vegetation during the operational phase. Instead, it will be recommended that indigenous plants be planted to enhance the aesthetic beauty of the landscape. It is anticipated that typical indigenous plants will increase the bird and animal biodiversity of the area.

Human Disturbance

- Disturbance to species from increased human activity (lighting, pets etc.). The species/ habitats present on this site are not considered sensitive to disturbance from noise or general human activity. However, given the already built up nature of the surrounds, it is likely that species present are tolerant of some degree of disturbance.
- Lighting is to be controlled on the site spatially and temporally. Nevertheless, there will be an increase in ambient lighting levels from windows, cars etc.

Landscaping

Creation of landscaped area to include additional planting. This will include the planting of trees and shrubs that are likely to provide habitat for nesting birds and pollinating insects. Table 10 below indicates the impact assessment on biodiversity.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Vegetation and habitant disturbance	Negative	Project site	short term	Medium	Definite	Medium	Low
Operation Phase							

Vegetation and habitant disturbance	Negative & Positive	Project site	Long term	Medium	Definite	Medium	Low
Surface water pollution	Negative	Study area	Permanent	High	Highly likely	Medium	Low
Human Disturbance	Negative	Project site	Long term	High	likely	Low	Low
Landscaping	Positive	Project site	Long term	High	Definite	High	High

Table 10: Impact Assessment on Biodiversity

(b) Mitigation Measures

Construction Phase

- Only indigenous plant species, preferably species that are indigenous to the natural vegetation of the area, should be used for landscaping.
- The contractor must ensure that no fauna on site and in the surroundings is disturbed, trapped, hunted or killed during the construction phase.
- Trees are must be retained where feasible. Landscaping or the reinstatement of new indigenous planting can offset this habitat loss. It will not be possible to offset exactly what is being lost but, over time, these new features can be expected to provide an equivalent area of biodiversity interest.
- Dumping of builders' rubble and other waste in the areas earmarked for exclusion must be prevented, through fencing or other management measures. These areas must be properly managed throughout the lifespan of the project in terms of fire, eradication of exotics etc. to ensure continuous biodiversity. No dumping within the sensitive environments – including waste and construction material.
- Damage to large indigenous trees should be kept to a minimum.
- Minimise cutting down of big indigenous trees where possible and also ensure that protected plants are conserved
- Obtain a permit to cut or disturb protected plants
- Advice should be sought when using any sort of poisons or pesticides.
- Construction activities must not exceed the footprint of buildings as outlined in the township layout plan.

Operation Phase

- With the implementation of mitigation measures residual significant impacts to biodiversity are not expected to arise. There will be minor negative effects to birds and other small animals during the removal of vegetation. The loss of vegetation will be minor negative in the short

term when offset with new planting. In time however, as these new features mature, the ultimate impact will be neutral.

- During operational phase residents should be encouraged to plant their own aesthetic gardens and trees on their individual stands. Only indigenous vegetation must be used.
- Lighting in green spaces will be minimised while the use of LED bulbs must be employed throughout. These are proven to have lower deterrent impacts.
- Public awareness is essential in order to protect the environment.

(c) Cumulative Impacts

- A number of the identified impacts can also act cumulatively with other impacts from similar developments in the area. These include: loss of habitats, spread of alien invasive species, pollution from surface water run-off and pollution from wastewater generation.
- A cumulative loss of flora and fauna value however will be experienced as land use changes in this area from open agricultural to residential. It is considered that the species which are already present in this area will not suffer long term consequences arising from this land use change.

(d) Monitoring

- Monitoring is required where there may be significant residual impacts despite implementation of mitigation measures. No significant residual impacts are predicted to occur. Mitigation measures are proposed with a high degree of certainty with regard to their success. No further monitoring is proposed.

10.1.6. Solid Waste

(a) Potential Impact of the Proposed Development

Construction Phase

- The construction phase of the development is likely to generate waste from clearing of vegetation, builder's rubble, general construction refuse, oil leakages from construction vehicles/ machinery and minor hazardous waste including paint tins.
- If solid waste is not removed promptly away from the generation points it accumulates in to large heaps harboring rats, flies etc. which transmits disease not to mention bad odors on decomposition.
- The development could therefore impact on the environment by generating solid waste pollution.

Operation Phase

- General solid waste generated from community residing in the area through household activities. Table 11 below indicates the impact assessment of solid waste.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Solid Waste	Negative	Project site	Short term	Low	Definite	Medium	Low
Operation Phase							
Solid Waste	Negative	Project site	Long term	Low	Likely	Low	Low

Table 11: Impact Assessment on Solid Waste

(b) Mitigation

Construction Waste

- Waste must be removed from site promptly and deposited at permitted landfill site
- No construction waste should enter the surrounding environment
- No cleared vegetation to be burnt on-site
- The contractor and developer should ensure that all the waste generated by the development is appropriately disposed of at the recommended waste disposal sites close to the area.
- All construction vehicles should be inspected for oil and fuel leaks regularly, and any vehicle showing signs of leaking should be serviced immediately.

Operation Phase

Solid Waste

- During the operations phase, municipal waste management will service the proposed residential area.
- Provide informative signage to educate the public regarding proper waste disposal practices.

10.1.7. Landscape & Visual Impact Assessment

A development such as this proposal has the potential to impact significantly upon the landscape and visual aspects of the existing environment in a number of ways, at both construction and operational stages. Effects can be short or long term; temporary or permanent. The purpose of this section of the report is to describe the potential effects of such proposed development; upon the visual and landscape aspects of the immediate area, and further afield, where relevant.

(a) Potential Impacts of the Proposed Development

Construction Phase

Potential visual impacts during the construction phase are related to temporary works, site activity, and vehicle movement within and around the subject site. Vehicular movement may increase in the immediate area, and temporary vertical elements such as site fencing, gates, plant and machinery etc., will be required and put in place.

All construction impacts will be temporary, and may include the following:

- Site preparation works and operations
- Site excavations and earthworks
- Site infrastructure and vehicular access
- Construction traffic, dust and other emissions
- Temporary fencing / hoardings
- Temporary site lighting
- Temporary site buildings

Due to the development of residential development, there will be a new visual impact. The site is however surrounded by existing townships of Ka-Tsakani and Seville therefore should not change the visual characteristics of the area dramatically.

Operation Phase

The proposed development will consist of the insertion of new residential buildings, road infrastructure and associated ancillary elements onto the subject site and will replace much of the existing vegetation currently covering the site. The impact of such development, particularly on the pleasant views from the existing amenity lands around the site, could potentially be negative if the existing vegetation is damaged or degraded. The design approach and specific mitigation measures employed to address such sensitive contextual issues and to respect and enhance the local rural environs are outlined in mitigation, below under mitigation (remedial measures). Table 12 below indicates the impact assessment on the landscape & visual impact.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Landscape & Visual Impact Assessment	Negative and Positive	Study area	Short term to Permanent	Medium	Definite	Medium	Low
Operation Phase							
Landscape & Visual Impact Assessment	Negative	Study area	Permanent	Medium	Definite	Medium	Low

Table 12: Impact Assessment on the Landscape & Visual Impact

(b) Mitigation Measures

Construction Phase

- Disturbed areas outside the proposed development site should be rehabilitated as soon as possible after construction.
- Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent /surrounding properties including road verges, roads or public places and open spaces during or after the construction period of the proposed developments but disposed of at an approved landfill / dumping site.
- Architectural styles and paint colours should take cognisance of the character, styles and sense of place of the neighbouring community.
- Maintain buildings and perimeter fencing etc. in order to ensure that they do not deteriorate and result in an aesthetically unpleasing development.
- The building site including a site compound with site offices, site security fencing and temporary works will be visible during the construction phase. This is generally viewed as a temporary and unavoidable feature of construction in any setting. Other mitigation measures proposed during this delivery stage of the development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting, storage of materials, placement of compounds, control of vehicular access, and effective dust and dirt control measures, etc.

Operational Phase

The proposed development is designed to integrate well within its existing context. This will be accomplished through:

- The provision of additional planting as part of the landscaping of the proposed development will reduce the impact of the new housing.
- The proposed finishing of the buildings in earth tones and natural materials will aid in mitigating any visual impacts the new development might have in the landscape.
- Establishing an integrated relationship between the built development and the existing housing areas and surrounding broader landscape, incorporating aspects of prevalent built forms, scale, texturing, colour and materials.
- The insertion, positioning and modelling of the built elements, in order to assist in the visual reduction.

(c) Predicted Landscape Character Impact of the Proposed Development

Construction Phase

- Initially the erection of site fencing will be completed, site access points established. Early in the construction period, topsoil stripping and excavations for building foundations will commence. Removal and/or storage of excavated materials from site and the delivery of construction materials will generate increased traffic within, to and from the site.
- As construction progresses over the construction period, visual impacts will vary, with the on-going business of construction - delivery and storage of materials, the erection of the buildings, etc. Mitigation measures have been proposed above 'Mitigation (remedial measures)' to minimise the impact of the construction works on the site environs.
- The visual impact will vary from medium and neutral to medium and negative, depending on the stage of construction, and the intensity of site activity. They will be of short term duration.

Cumulative Impacts

For this proposed development, there are no other likely pending or permitted developments considered to be of relevance in creating such 'additional effects' or to have a bearing on this assessment. There are therefore no cumulative effects likely to occur.

10.1.8. Traffic & Transport

(a) Potential Impacts of the Proposed Development

Construction Phase

- During the construction phase there will be an increase in traffic, especially heavy vehicle traffic. It is anticipated the most of the labourers will be local labour and therefore there will be an increase in pedestrian traffic to residential development.

Operation Phase

- During the operation phase of the project there may be an increase traffic flow going to and from the site. Table 13 below indicates the impact assessment on traffic.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Traffic	Negative and Positive	Study area	Short term to Permanent	Medium	Definite	Medium	Low
Operation Phase							
Traffic	Negative	Study area	Permanent	Medium	Definite	Medium	Low

Table 13: Impact Assessment on Traffic

(c) Mitigation Measures

Construction Phase:

- It is important that warning/ informative signs should be erected at the site. The signs should be positioned in a way to be easily viewed by the public and mostly motorists.
- Public / workers must be informed of road safety.
- Traffic control must take place during the construction period.
- Traffic signs must be erected to warn motorist of the construction activities.

Operation Phase

- Road sign should be placed on the site regulate traffic flow
- Speed humps can be created to regulate speed of drivers within the site
- Relevant regulation relating to the traffic management must be adhered all times

10.1.10. Services: Water Supply, Sewage & Power Supply

(a) Potential Impacts of the Proposed Development

Construction Phase

Water Supply

- Cross contamination of potable water supply to construction compound
- Damage to existing underground and overground infrastructure and possible contamination of the existing systems with construction related materials.
- Water is a major concern especially in construction sites. The proposed development may cause some strain to the existing water source since construction activities are known to be heavy water consumers.

Sewage

- Improper discharge of ablution facility from contractor's compound can impact the environment.

Operation Phase

Water Supply

- Increased impermeable surface area will reduce local ground water recharge and potentially increase surface water runoff.
- Accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas).
- Occupants of the development will bring about an increase in water consumption.

Sewage

- Effluent/ sewage resulting from sanitary facilities and wastewater from the proposed developments is of significant concern with respect to the environment.

Power Supply

- There will be high power consumption. However, the occupants will be encouraged to conserve as much energy as possible and energy conserving appliances should be used. Energy conservation involves proper use of electrical appliances, lighting systems and other electrical gadgets used for different purposes. Table 14 below indicates the impact assessment on water supply, sewage & power supply.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Material Assets: Water Supply	Negative	Study area	Short term to Permanent	Medium	Definite	Medium	Low - ve
Material Assets: Sewage	Negative	Project site	Short term	Medium	Likely	Low	Low - ve
Operation Phase							
Material Assets: Water Supply	Negative	Study area	Permanent	Medium	Definite	Medium	Low - ve
Material Assets: Sewage	Negative	Project site	Long term	Medium	Likely	Medium	Low - ve
Material Assets: Power supply	Negative and Positive	Project site	Long term	Medium	Likely	Low	Medium +ve

Table 14: Impact Assessment of Water Supply, Sewage & Power Supply.

(b) Mitigation Measures

Construction Phase

Water Supply

- Encourage water reuse / recycling during construction phases
- Avoid wasting the water supplied to the site
- The contractors should use water bowsers to bring in water for construction activities especially during periods of high water demand subject to authorization
- Provision of notices and information signs within the project to notify on means and needs to conserve water resource
- The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials

Sewage

- The construction compound will include adequate staff facilities including ablution facility and potable water supply. The ablution discharge from the construction compound must be

transferred off site to a licensed facility until a connection to the public foul drainage network has been established.

Operational Phase

Water Supply

- Install water meters for the development to ensure accountability and responsibility.
- Roof catchments should be provided with rainwater harvesting systems to enhance collection and storage of rain water. Such water can be used to water flower gardens and all kind of cleaning required on site.
- Encourage water reuse / recycling during operational phases.

Sewage

- Ensure no undue interference with the laid drainage system.
- All drain pipes passing under the building, driveway or parking should be of heavy duty PVC pipe tube encase in 150mm concrete surround. All manholes on drive ways and parking areas should have heavy-duty covers set and sealed airtight as approved by specialists.
- All waste pipes should have cleaning roding eyes accessible from outside and free to every part of the system for inspection, cleaning and repair.
- Sanitary facilities should be kept clean always through regular cleaning.
- Ensuring the effluent is not overloaded to increase efficiency and minimize or eliminate incidences of untreated sewer spills to the environment
- Servicing the treatment plant to maintain its efficiency.

Power Supply

- All electrical appliances should be switched off when not in use such as lights.
- Use a design that is environmentally sound to avoid use of electricity for air conditioning.
- Use energy conserving electric lamps for general lighting.
- Utilize natural light inside buildings to avoid using electricity for lighting during the day.

(c) Interactions and Potential Cumulative Impacts

(i) Interactions

- Soils and Geology: Trench excavations to facilitate site service installation will result in exposure of subsoils and bedrock to potential erosion and subsequent sediment generation.

(ii) Potential Cumulative Impacts

- No potential cumulative impacts are anticipated in relation to water supply, Bushbuckridge Local Municipality has advised that water supply is through provision of boreholes in Seville and that bulk water supply will be provided in the outer years which is an ongoing project in the Greater Manyeleti area.
- Should any other developments be under construction or planned in the vicinity of the site, they are likely to have similar impacts during the construction phase in relation to services.
- Should the construction phase of any developments coincide with the development of this proposed site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented.

Human Health

A risk to the human health of the installer from built services can occur as a result of any excavation work in areas where built services exist, through coming into contact with live electricity lines or water mains.

From the perspective of the end user of the networks the risks to human health include:

- Contamination of potable water supply.
- The installation of services will tightly be monitored and controlled by Municipality to ensure the protection of human health. Therefore, the risk of effect on human health is not considered significant.

With the implementation of the aforementioned mitigation measures, the impact of the proposed services on human health is likely to be negligible.

10.1.11. Archaeology and Cultural Heritage

(a) Potential Impacts of the Development

This assessment has employed a wide variety of sources in conjunction with non-intrusive survey to make a coherent assessment of the cultural heritage risk associated with the project. The following conclusions are presented in order to ascertain any likely significant potential direct and indirect impacts which the proposed development may have:

- The overall site is large in scale, however, no places designated for spiritual or social gatherings, archaeological or historical materials were found within the proposed development site apart from apart from a site (SX002) consisting of the ephemeral remains of a possible homestead just outside of the impact area.
- Findspots consisting of scatters of undiagnostic ceramics and background scatter of MSA lithics. These findspots are isolated and out of context and are of no significance.

Table 15 below indicates impact assessment of the proposed development on archaeology and cultural heritage.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Archaeology and Cultural Heritage	Negative	Project site	Short term	Medium	Likely	Low	Low
Operation Phase							
Archaeology and Cultural Heritage	Negative	Project site	Permanent	Medium	Unlikely	Low	Low

Table 15: Impact Assessment on Archaeology and Cultural Heritage

(b) Avoidance and Remedial Measures

Construction Phase

- There will no significant adverse impacts on the archaeology and cultural heritage during the construction phase. The township layout plan was revised to ensure a 50 m buffer, which will protect the identified grave site from any impact. Therefore, no remedial or reductive measures are required to mitigate impacts.
- If during construction any cultural heritage resources or graves are unearthed, all work has to be stopped at that site until the site has been inspected and mitigated by a heritage practitioner.

Operational Phase

- It is not anticipated that any archaeological works will be necessary at this stage.

(c) Predicted Impacts of the Development

Construction Phase

The greatest threat to unrecorded, buried archaeological sites/ features occur during construction stage and include all ground disturbance works undertaken at this stage (excavations and other groundworks including the provision of access roads and service trenches), movement of machines and storage of material in sensitive areas.

Operation Phase

No potential impacts are foreseen at this moment that will occur during the operational phase as it is anticipated that issues of archaeological, architectural and cultural heritage interest will have been resolved prior to or during the construction phase.

Residual Impacts

It is not anticipated that there will be any residual impacts on archaeological features or sites encountered, as it is understood that any archaeology encountered will be resolved in advance of the construction stage of the proposed redevelopment.

10.1.12. Impact from the Provision of Structures and Infrastructure Services (Roads and Storm Water)

(a) Characteristics of the Proposed Development

Site development works will include stripping of thick topsoil layer and excavation. It is expected that all stripped topsoil will be reused on site.

(b) Potential Impact of the Proposed Development

Construction Phase

- The construction phase of the development is likely to generate waste from clearing of vegetation, builder's rubble, general construction refuse, oil leakages from construction vehicles/ machinery.
- Construction of internal roads and storm water infrastructure might cause soil erosion
- Dust generation can also occur during extended dry weather periods as a result of construction activities.

Operation Phase

- Poor designs of stormwater infrastructure might lead to structural failures. Table 16 below indicates the impact assessment of infrastructure services.

	Nature	Extent	Duration	Intensity	Probability	WOM	WM
Construction Phase							
Infrastructure services	Negative	Project site	Short term	Low	Definite	Medium	Low
Operation Phase							
Infrastructure services	Negative	Project site	Long term	Low	Likely	Low	Low

Table 16: Impact Assessment of Infrastructure Services

(c) Mitigation

Construction Waste

- No construction waste should enter the surrounding environment
- No cleared vegetation to be burnt on-site
- Ensure that the provision of all services are in accordance with relevant Council requirements.

- Any amendments, upgrading or changes to the infrastructure must be approved by the relevant Councils.
- The installation of services should be tightly monitored and controlled by the relevant authorities.
- Infrastructure must be designed according to the minimum requirements of the relevant councils and must therefore be submitted to the Local authority for approval.
- Earthworks plant (e.g. dump trucks) and vehicles delivering construction materials to site have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion.
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

Operation Phase

- The monitoring of the proposed development must be done on a bi-annual basis to ensure that structural faults do not result in the unnecessary contamination of ground water.
- Provide informative signage to educate the public regarding proper waste disposal practices.
- All stormwater management infrastructure must divert flow away from areas susceptible to erosion.

11. PUBLIC PARTICIPATION PROCESS UNDERTAKEN

11.1. Introduction and Objectives

The public participation process is an important component of the Environmental Impact Assessment process (Scoping and Environmental Impact Assessment) and is therefore, critical to the success of the project / application. The purpose of the public participation process is to ensure that all the views and concerns of all the stakeholders / authorities, interested and affected parties are identified, recorded and addressed during the EIA process.

The key objectives of the public participation process are to:

- Identify a broad range of stakeholders / authorities and interested & affected parties, and inform them about the proposed project
- Understand and clearly document all issues, underlying concerns and suggestions raised by the stakeholders / authorities and interested & affected parties
- Identify areas that require further specialist investigation.

11.2. Methodology

The public participation process was undertaken in accordance with the plan of study as part of the scoping phase that was accepted in terms of Regulation 22 (a) of the NEMA Regulations. The following activities have already been undertaken as part of this process:

- Advertisement / publication on the local newspaper
- Placement of the on-site notices/ notice boards
- Delivery of project background information notices to the landowners adjacent to the proposed development site.
- Email consultations with stakeholders / authorities and interested & affected parties.

11.2.1. Newspaper Advertisement

The proposed project / development was advertised in the local newspaper namely, Hazyview Herald (see appendix 6.4) on the 28th of September 2022 to inform people about the project and to request them to register their names and comment on the proposed development.

11.2.2. On-Site Notices

Site notices were placed at various points on and around the proposed development site (appendix 6.5).

11.2.3. Background Information Notices/ Letters

Notices regarding the background information of the proposed development were also hand delivered to the landowners adjacent to the proposed development site (appendix 6.3).

11.2.4. Consultations with Stakeholders / Authorities and Interested & Affected Parties

All scoping reports and draft EIA report were circulated to all stakeholders and interested & affected parties and this final EIA report will also be circulated observation.

12. COMPARATIVE ASSESSMENT OF THE IMPLICATIONS OF PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES:

12.1. Advantages of the Proposed Activity and Alternatives

- The proposed development will eliminate the scarcity of accommodation by provide housing and related services for the local community
- Temporary and permanent employment opportunities for the locals will be created
- The implementation of this activity will contribute greatly on the socio-economic transformation and growth of the municipality
- The establishment of this township will help prevent land invasions

12.2. Disadvantages of the Proposed Activity and Alternatives

- Domestic animal grazing land will be converted to residential area
- Water use, waste, sanitation and other impacts will be impacted should they not be managed correctly. This can lead to extra environmental degradation
- The cumulative impacts that the development will have in terms of pollution and other impacts can lead to extra environmental degradation, especially if not managed correctly.

13. CONCLUSIONS

The purpose of this report is to provide the Competent Authority, Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs with sufficient information regarding the potential impacts of the development to make an informed decision regarding the approval of the proposed township establishment.

The proposed development has no fatal flows in terms of the biophysical and socio economic environment. In fact, it is believed that the proposed development compliments the required and desired balance to be achieved between the socio-economic and environmental factors.

The environmental management plan and all the mitigation measures provided in the specialist reports should be strictly adhered to, therefore mitigating impacts as far as possible. Should this site not be developed, it will remain as isolated and an unconnected area that will be vulnerable to crime, illegal waste dumping and potential illegal informal occupation.

14. RECOMMENDATIONS

The EAP recommends that the “township establishment” option which has been identified as the preferred alternative is used. It is further recommended that this application be approved with the following conditions:

- The conditions of the Environmental Authorisation from the Competent Authority (MDARDLEA) must be adhered to at all times.
- The responsibilities to obtain any further authorisations and/or licenses will rest on the proponent or applicant of the project, **PRIOR** to the commencement of any activities on site
- An ECO must be appointed to monitor compliance with the environmental authorisation and develop compliance reports to be submitted to the Competent Authority during the construction phase of the township.
- The EMP attached and the mitigation measures related to it must be adhered to at all times and the appointed ECO must ensure that the developer complies with the environmental management plan.

- Communication or awareness must be undertaken to the project team to ensure maximum participation and compliance to the conditions of the environmental authorisation.
- All the recommendations in the specialist reports that are included as a part of this application should be implemented & strictly adhered to in order to counteract adverse environmental impacts.