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### **ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR PROPOSED PLANTATIONS FOR MALANGENI EXTENSION OF 433 HECTARES AND BHUKAZI 194 HECTARES**

#### **ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

#### **FINAL SCOPING REPORT FOR EIAR**

**Prepared by:**

**Ezendalo Environmental Consultants**

**On behalf of:**

**Ingquza Hill Local Municipality**

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**August 2020**



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## ENVIRONMENTAL CONSULTANTS

### **Report Title:**

Final Scoping Report: Proposed plantations for Malangeni (extension of 433 hectares) and Bhukazi new plantations of 194 hectares

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## **EXECUTIVE SUMMARY**

This report is the second in a number of reports produced during the Scoping and Environmental Impact Assessment (S&EIA) process for the proposed Malangeni extension and Bhukazi new plantations.

This Scoping Report concentrates on the proposed Malangeni extension of 433 hectares in Lusikisiki, ward 24 and 194 hectares of new plantations in Bhukazi in Lusikisiki, ward 12. The area falls under the jurisdiction of the Ngquza Hill Local Municipality which is situated within the O R Tambo District Municipality.

The site locations which are known as Malangeni and Bhukazi are located in the North Eastern region of the Eastern Cape, in Lusikisiki. The Draft Scoping Report (this document) represents the initial identification of key issues as highlighted by the relevant authorities, Interested and/or Affected Parties (I&AP) and professional judgment of the Environmental Assessment Practitioner. Scoping allows for the identification of the anticipated impacts, particularly those, which require specialist investigations in order to inform decision making in terms of environmental sustainability of the site and natural resource management. The results of all the specialist studies, a full assessment of the impacts and proposed alternatives will form part of the Environmental Impact Assessment Report (EIAR).

The key issues and associated potential impacts include:

### **1.1                      *Geology and Soils***

Impacts related to soil erosion, loss of topsoil and sedimentation. The area also has underlying dolomite rock strata which will present limitations in terms of the type of developments allowed.

### **1.2                      *Hydrology***

Risk of contaminating the surface water is always a possibility with every development activities. Change in the hydrological regime by increased sedimentation, amplified storm water run-off, quality of storm water discharge and higher peak flows may present negative impacts)

### **1.3 Biodiversity**

- Loss of open space, grassland and associated habitats (albeit disturbed).
- Reclamation of disturbed, old quarry (positive impact).
- Removal of alien vegetation (positive impact).

### **1.4 Services and urban planning**

- Increased demand for the supply of electricity.
- Increased demand for the supply of potable water.
- Increased effluent loading on the waste water treatment works.
- Increased demand for handling and disposal of solid waste.
- Traffic volumes and associated safety issues.
- Improved service delivery (Housing & economic activities) for the area.
- Issues around the Urban Edge (EIA Regulations" interpretation v/s Municipal Urban Edge).
- Realisation of municipal planning objectives: SDF, IDP & LED.

### **1.5 Socio-economic Issues**

- Creation of jobs during the construction phase as well as employment opportunities associated with the operational phase (positive impact).
- Extensive economic spin-off can be expected in the area as a direct result of the development (positive impact).
- Development of mixed use residential housing (positive impact).
- Visual impact due to a change in the visual character from open space to residential (negative impact).
- Compromising the rural sense of place (negative impact).

### **1.6 Heritage**

Impact on heritage / cultural attributes (Expected).

## 1.7

### Construction

- Destruction of vegetation.
- Impacts associated with the loss of topsoil (erosion, sedimentation etc.).
- Pollution of the ground and surface water resources.
- Noise pollution.
- Atmospheric pollution in the form of dust.
- Visual intrusion of construction activities (untidy building sites, denuded areas, material stockpiles, dust etc.).
- Social issues associated with construction camps.
- Creation of local employment.
- Generation of building rubble, spoil material, domestic waste, hazardous waste and liquid waste during construction.
- Traffic impact on the R61 Road.
- Unearthing of archaeological artefacts and possible damage of archaeological sites.

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## ABBREVIATIONS

BA	Basic Assessment
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CEL	Cost Estimate Letter
CIA	Cumulative Impact Assessment
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Carbon Dioxide Equivalent
CPA	Communal Property Association
CRR	Comments and Responses Report
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEDEAT	Department of Environmental Affairs and Tourism
DENC	Department of Environment and Nature Conservation
DM	District Municipality
DMR	Department of Mineral Resources
DoE	Department of Energy
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
FSR	Final Scoping Report Ha Hectares HTF Heat Transfer Fluid
I & APs	Interested and Affected Parties
IDP	Integrated Development Plan
LED	Local Economic Development
LM	Local Municipality
LSA	Late Stone Age
MAP	Mean Annual Precipitation
MSA	Middle Stone Age
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NERSA	National Energy Regulator of South Africa
NFA	National Forests Act (Act 84 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NIP	National Infrastructure Plan NWA National Water Act (Act 36 of 1998)
PFS	Pre-feasibility Study PPP Public Participation Process
PoSEIA	Plan of Study for Environmental Impact Assessment
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework SIA Social Impact Assessment
SIP	Strategic Integrated Project

ToR            Terms of Reference  
WULA Water Use Licence Application

## **1. INTRODUCTION**

### **1.1 PURPOSE**

Ezendalo Environmental Consultants submitted an application for Environmental Authorisation for Malangeni extension of 433 hectares in Lusikisiki, at ward 24 and Bhukazi 194 hectares in Lusikisiki at ward 12.

The proposed development is listed in terms of the Environmental Impact Assessment Regulations of 2014 (as amended in April 2017) (Government Notice R984, and R985) under the National Environmental Management Act, Act 107 of 1998 and therefore requires an Environmental Impact Assessment (EIA) to be undertaken and submitted to the Competent Authority – in this case DEDEAT for a decision. The EIA consists of two phases, namely the Scoping Phase and the Environmental Impact Assessment Phase.

The purpose of this document is to identify the initial key issues or concerns as highlighted by the relevant authorities, Interested and/or Affected Parties (I&AP's) and professional judgment of the Environmental Assessment Practitioner. Scoping allows for the identification of the anticipated impacts, particularly those, which require specialist investigations. The document further communicates the process and the project to all stakeholders and compliance organisations in an easily understandable manner.

### **1.2 Background**

The purpose of the Environmental Impact Assessment Phase is to address the issues, potential impacts and feasible alternatives which were identified during the Scoping Phase. This phase will be documented in a separate Environmental Impact Assessment Report (EIAR) which will further contain an Environmental Management Plan.

The following report aims to give context to the proposed development through providing a comprehensive description of the envisaged activities and relevant infrastructure; the identification of significant environmental impacts associated to the proposed project; identification of appropriate alternatives and mitigation measures for reduction of undesired impact, and communication of results in a clear and concise manner to the competent authority and other relevant parties.

### 1.3 Scoping Report Requirement Checklist

This report is based on the content requirements for a Scoping Report as listed in Section 2 (1), of the EIA Regulations 2014 (as amended).

Table 1: Contents of Scoping Report

<b>EIA Regulations, 2014 - Appendix 2 – Content of Scoping Report</b>	<b>Location in this document</b>
(a) details of-	
(i) the EAP who prepared the report; and	<b>Chapter 2, Section 2.1</b>
(ii) the expertise of the EAP, including a curriculum vitae;	<b>Chapter 2, Section 2.2</b>
(b) the location of the activity, including-	
(i) the 21 digit Surveyor General code of each cadastral land parcel;	<b>Chapter 5, Section 5.2</b>
(ii) where available, the physical address and farm name;	<b>Chapter 5, Section 5.2</b>
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	<b>Chapter 5, Section 5.2</b>
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-	<b>Chapter 5, Section 5.2</b>
(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	<b>Chapter 5, Section 5.1</b>
(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	<b>N/A</b>
(d) a description of the scope of the proposed activity, including-	
(i) all listed and specified activities triggered;	<b>Chapter3, Section 3.3</b>
(ii) a description of the activities to be undertaken, including structures and infrastructure;	<b>Chapter 5, Section 5.1</b>

<b>EIA Regulations, 2014 - Appendix 2 – Content of Scoping Report</b>	<b>Location in this document</b>
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	<b>Chapter 3, Section 3.1 &amp; 3.2</b>
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	<b>Chapter 6 Section 6.1</b>
(h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including -	
(i) details of all the alternatives considered	<b>Chapter 7, Section 7.1 and 7.2</b>
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	<b>Section 10</b>
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	<b>Section 10</b>
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	<b>Section 8</b>
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	<b>Section 10</b>

<b>EIA Regulations, 2014 - Appendix 2 – Content of Scoping Report</b>	<b>Location in this document</b>
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	<b>Chapter 11</b>
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	<b>Section 11</b>
(viii) the possible mitigation measures that could be applied and level of residual risk;	<b>Section 101</b>
(ix) the outcome of the site selection matrix;	<b>n/a</b>
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	<b>n/a</b>
(x) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	<b>Section 11</b>
(i) a plan of study for undertaking the environmental impact assessment process to be undertaken, including -	<b>Section 4</b>
(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	<b>Section 7</b>
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	<b>Section 4</b>
(iii) aspects to be assessed by specialists;	<b>Chapter 4, Section 4.2</b>
(iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	<b>Chapter 11, Section 11.1</b>
(v) a description of the proposed method of assessing duration and significance;	<b>Chapter 11, Section 1.1</b>

<b>EIA Regulations, 2014 - Appendix 2 – Content of Scoping Report</b>	<b>Location in this document</b>
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	<b>Chapter 10, Section 10.1</b>
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	<b>Chapter 4, Section 4.1</b>
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	<b>Chapter 11, Section 11.2</b>
(j) an undertaking under oath or affirmation by the EAP in relation to-	<b>Chapter 13</b>
(i) the correctness of the information provided in the report; Appendix D	<b>Chapter 9, Section 9.2</b>
(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and Appendix D	<b>Chapter 9, Section 9.2</b>
(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	<b>Appendix D</b>
(k) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	<b>N/A</b>
(l) where applicable, any specific information that may be required by the competent authority and	<b>N/A</b>

## **1.4 Structure of this report**

The structure of this report is as follows:

### **Chapter 1 – Introduction**

This chapter provides an overview of the proposed project including the background to the project, as well as the purpose and structure of the Scoping Report.

### **Chapter 2 – The Environmental Assessment Practitioner**

The details of the environmental assessment practitioner (EAP), the company, the project team and the public participation officer are provided within this chapter.



### **Chapter 3 – Relevant environmental legislation and guidelines**

This chapter provides a description of the constitution of the republic of South Africa and other relevant legislation and guidelines that have been considered in the preparation of this Scoping Report and outlines the Listed Activities triggered by the proposed development.

### **Chapter 4 – Plan of study for EIA process**

This chapter provides a description of tasks to be undertaken during the EIA process as well as the specialist studies.

### **Chapter 5 – Project Description**

This chapter provides a description of the technical details of the proposed development.

### **Chapter 6 – Need and Desirability**

The motivation for the proposed development is provided within this chapter.

### **Chapter 7 - Alternatives considered**

This chapter provides a description of the fundamental and incremental alternatives to be assessed further during the EIA process.

### **Chapter 8 – Approach and methodology**

This chapter provides information on the scoping and EIAR process.

### **Chapter 9 – Description of the environment**

This chapter provides a brief overview of the biophysical and socio-economic characteristics of the site and its environs that may be affected by the proposed development, compiled largely from published information, but supplemented by information from the initial site visit

### **Chapter 10 – Public Participation Process**

This chapter provides an outline of the registration and notification process and the comments and responses.

## **Chapter 11 – Environmental Impact Assessment**

This chapter provides an outline of the S&EIR process that will be followed with details regarding the Environmental Impact Assessment report (EIR), which will be completed as per Section 23 of the EIA Regulations 2014 (as amended 2017), including the Public Participation Process (PPP) conducted in terms of Section 41. This chapter will include the objectives of the EIA process as outlined in Appendix 3 of the EIA Regulations 2014 (as amended 2017).

## **Chapter 12 – Assumptions, uncertainties and gaps in Knowledge**

This chapter provides the Assumptions, uncertainties and gaps in Knowledge.

## **Chapter 13 – Professional opinion of the EAP and environmental impact statement**

A professional opinion of the EAP is provided as well as an Environmental Impact Statement.

## **Chapter 14 – Recommendations and Conclusions**

This chapter provides a brief summary of the proposed development and outlines recommendations for the proposed way forward.

## **15. References**

A list of references is provided.

## **Appendices**

The appendices contain all supporting and supplementary information.

## **2. ENVIRONMENTAL ASSESSMENT PRACTITIONER**

Ezendalo Environmental Consultants was appointed by the Ingquza Hill Local Municipality as the independent Environmental Assessment Practitioner (EAP) to conduct a full Scoping & EIA process for the proposed project.

Ezendalo Environmental Consultants was established in February 2016. Although the formal establishment of the company took place in 2016, it is backed by years of collective professional service and experience in the environmental field. The qualifications, expertise and experience of our professional team form the backbone of the company's continued success.

Our vision is to provide the highest quality of service to our clients and maintaining high levels of professional ethics and admirable core values. We aim to become the preferred environmental service manager to a range of clients in the private and public sectors in the field of environment consulting.

We are committed to providing expert advice and solutions, embracing modern technology and providing our clients with state of the art environmental information systems. We shall apply environmental laws with integrity and fairness in the process of conducting enviro-legal and due diligence audits and identifying environmental risks and formulating mitigation measures.

## 2.1 Details of the EAP

**Company/entity name:** Ezendalo Environmental Consultants (Pty) Ltd.

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Qualifications: MSc Environmental Science (current) – UKZN

BSc Honours in Environmental Management – UNISA

BSc Environmental Geography – UFS

## 2.2 Expertise of the EAP representative

Ayanda Matiwane, is a Senior Environmental Scientist and Managing Director at Ezendalo Environmental Consultants (Pty) Ltd. His qualifications include an Honours degree in Environmental Management from the University of South Africa, a Bachelors of Science in Environmental Geography from the University of the Free Stat and is currently pursuing her Masters degree in Environmental Science from the University of KwaZulu Natal. Ayanda

Matiwane has 6 years of environmental management experience and brings a strong background in environmental law and monitoring.

### **2.3 Public participation officer**

The entire Public Participation Process for the Scoping as well as EIA phases will also be conducted and coordinated by Ms. Ayanda Matiwane.

See Appendix A for Curriculum Vitae.

### **2.4 Ezendalo Company Profile**

Ezendalo Environmental Consultants (Pty) Ltd is a firm of consultants based in East London, South Africa. The company provides a broad range of environmental consulting to the private and public sector. Ezendalo was established in 2016 and aims to evolve into a well-established South African firm and as a response to the growing need of construction-based projects in the country and across the continent. We are committed to providing expert advice and solutions, embracing modern technology and providing our clients with state-of-the-art environmental information systems.

## **3. RELEVANT ENVIRONMENTAL LEGISLATION AND GUIDELINES**

### **3.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (ACT 108 OF 1996)**

Section 24 of the Constitution of South Africa provides the main national legislative obligation towards sustainable environmental management and development. This section forms the foundation of all other subsequent environmental legislation and governance in South Africa.

Section 24 states the following:

Every person shall have the right –

(a) to an environment that is not harmful to their health nor well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that –

(i) prevent pollution and ecological degradation;

- (ii) promote conservation; and
- (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.” The following sections provide an overview of the relevant environmental legislation and guideline documents applicable to the proposed project.

## **3.2 OTHER RELEVANT LEGISLATIONS**

The Environmental Impact Assessment process is regulated by the Environmental Impact Assessment Regulations of 2014 (amended on April 2017) in terms of Government Notice R984 and R985 of 18 2014) which is promulgated in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998).

### **3.2.1 National**

#### **National Environmental Management Act (Act 107 of 1998) (NEMA)**

NEMA is the principle/framework legislation governing EIA and subsequent EA processes under the authority of the National Department of Environmental Affairs. NEMA makes provisions for co-operative environmental governance by establishing principles for decision making on matters affecting the environment; institutions that will promote co-operative governance; procedures for co-ordinating environmental functions exercised by Organs of State and to provide for matters connected therewith.

#### **National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA)**

NEMBA aims to provide for the management and conservation of the country's rich biodiversity within the framework of NEMA. It aids in the protection of species and ecosystems which warrant national protection and provides for the sustainable usage of the country's indigenous biological resources.

NEMBA and its Regulations was therefore utilised for determining the ecological/biodiversity significance, value and subsequently the adequate management of the proposed project area with regards to ecosystems, habitats and individual species. The Department of Environmental Affairs is responsible for the implementation and overseeing of this legislation along with the South African National Biodiversity Institute (SANBI).

### **National Forests Act (Act 84 of 1998) (NFA)**

The aim of the NFA is to promote the sustainable usage, management and development of forests for the benefit of all in South Africa. The Act also makes special provisions for the protection of specific forests and tree species which duly require formal protection in order to ensure their prolonged existence.

The National Forests Act was therefore utilised to determine the potential presence of any protected forests or tree species in the proposed project area in order to ensure that the correct processes are followed for the approval of any listed activities for which a permit may be necessary regarding such forests or species, should it be required.

Permit applications in terms of the National Forests Act are lodged with the Department of Agriculture, Forestry and Fisheries.

### **Conservation of Agricultural Resources Act (Act 43 of 1983)**

(CARA) CARA aims to provide for the protection and control over utilisation of the country's agricultural resources in order to promote conservation of soils, water and natural vegetation as well as the combatting of weeds and invader plants. Sustainable utilisation is a key objective.

### **National Water Act (Act 36 of 1998) (NWA)**

The NWA aims to ensure sustainable use of water through the protection of the quality of water resources for the benefit of all water users. Its principal focus is the rectification and equitable allocation and use of the scarce and disproportionately distributed water resources of South Africa. The Department of Water and Sanitation is responsible for the implementation and overseeing of this legislation and is also the responsible authority for the issuing of permits for water use.

### **National Heritage Resources Act (Act 25 of 1999) (NHRA)**

The NHRA aims to provide for the integrated and interactive management and conservation of the national heritage resources in South Africa so that they may be bequeathed for future generations.

Section 38 lists categorised development processes which require the South African Heritage Resources Agency (SAHRA) to be notified and furnished with an archaeological and

palaeontological study of a proposed project area in order to obtain project authorisation. The following development processes are triggered during the construction and operational phases of the proposed project:

(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –

(c) any development or other activity which will change the character of a site –

(i) exceeding 5 000m<sup>2</sup> in extent; or

The South African Heritage Resources Agency (SAHRA) has a mandate, in terms of the NHRA, to enforce the conditions of the NHRA, and hence oversees the management of heritage resources together with provincial heritage agencies.

### **THE SPATIAL PLANNING & LAND USE MANAGEMENT ACT (SPLUMA)**

SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa and seeks to promote consistency and uniformity in procedures and decision-making. It requires national, provincial, and municipal spheres of government to prepare SDFs. Chapter 4 of the Act sets out the focus and general requirements to guide the preparation and compilation of SDF products, with Section 12 (1) sets out general provisions requiring that all SDFs must:

- Interpret and represent the spatial development vision of the Municipality;
- Be informed by a long-term spatial development vision;
- Represent the integration and trade-off of all relevant sector policies and plans;
- Guide planning and development decisions across all sectors of government;
- Guide any decision in terms of the (any) Act relating to spatial planning and land use management;
- Contribute to a coherent, planned approach to spatial development;
- Provide clear and accessible information to provide direction for investment purposes;
- Include and integrate previously disadvantaged areas, areas under traditional leadership, rural areas, informal settlements, slums and land holdings of government agencies;
- Address historical spatial imbalances in development;
- Identify the long-term risks of particular spatial patterns of development and the policies and strategies necessary to mitigate those risks;
- Provide direction for strategic developments, infrastructure investment;
- Promote efficient, sustainable and planned investments by all sectors
- Indicate priority areas for investment in land development;

- Promote a rational and predictable land development environment;
- Take cognizance of any environmental management instrument already adopted by an authority;
- Give effect to legislation and policies on mineral resources and sustainable utilisation of agricultural resources

The Development Principles set out in Section 7 of SPLUMA are:

- Spatial Justice
- Spatial Sustainability
- Spatial Resilience
- Spatial Quality; and
- Spatial Efficiency

Other relevant legislative framework, regulations, policy and guidelines which are or may become applicable during the EIA process include, amongst others, the following:

- Constitution of the Republic of South Africa, 1996: The Constitution states that "...everyone has the right to an environment that is not harmful to their health or well-being: and to have the environment protected for the benefit of present and future generations."
- National Environmental Management Act (Act 107 of 1998): The principles underpinning environmental management contained in the National Environmental Management Act (NEMA), must be taken into account by any organ of state in the exercise of any power that may impact on the environment. NEMA provides for further regulation and guidance in terms of sustainable development other than for the EIA process.
- National Environmental Management: Biodiversity Act: The aim of this act is to provide for the management of South Africa"s biodiversity with NEMA"s framework.
- National Environmental Management: Protected Areas Act: The Protected Areas Act provides for the protection and conservation of ecologically viable areas, which are representative of South Africa"s diversity, as well as natural landscapes and seascapes.
- Conservation of Agricultural Resources Act: Regulations 7 and 8 deals with the protection of wetlands and water courses, while regulations 15 and 16 deals with invasive plant species and bush encroachment.



- Convention of Biological Diversity: South Africa is a signatory of the Convention on Biological Diversity, and therefore has a duty to conserve and rehabilitate biological resources which are considered important for the conservation of biological diversity.
- Species of Concern: The IUCN has a system in place which classifies species as threatened. Threatened species are those that are in danger of becoming extinct and the protection of these species is vital.
- Promotion of Access to Information Act, 2000.
- Environmental Conservation Act (Act No. 73 of 1989), also known as ECA.
- Occupational Health and Safety Act (Act No. 85 of 1993).
- Development Facilitation Act (Act No. 67 of 1995)
- Municipal Systems Act (Act No. 32 of 2000).
- Municipal Structures Act (Act No. 117 of 1998).
- National Building Regulations.
- The Gauteng Noise Control Regulations (GN 5479).
- Municipal Bylaws.

### **National Development Plan – 2030 (NDP)**

The executive summary of the National Development Plan (NDP) initiates with the following paragraph, “The National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.”

Chapter 6 of the NDP specifically discusses the role and importance of commercial agriculture in the success of the country’s economy and reaching the objectives of the NDP. It discusses the potential associated with the expansion of irrigated land towards food security and also job creation and capacity building (skills development and experience).

### **3.2.2 Provincial**

#### **Eastern Cape Provincial Development Plan**

In its introduction, the NDP sets out a number of important premises to underpin a reconsidered approach to development. These premises also inform the Eastern Cape’s plan. They are

reiterated here with some rephrasing to reflect emphases from stakeholders consulted in the formulation of this PDP:

- The implementation, monitoring and review cycle of the PDP must encourage the active and critical participation of all citizens of the Eastern Cape in their own development. Key to this will be people-centred local action.
- The PDP and its implementation must be decisive in redressing injustices of the past effectively, while fostering a consciousness for justice in future judgments and arrangements.
- The PDP should foster equitable economic growth and investment, as well as opportunities for meaningful work.
- High-quality education, a healthy population and effective social protection are important to the realisation of a flourishing future for all. The PDP should particularly guarantee an equal start for all children, and ensure that no child suffers from malnutrition.
- The PDP should foster creative links between economic and social strategies to promote inclusive and equitable participation in the economy by an active, hardworking and cohesive society.
- Collaboration between communities, the public and private sectors should be strengthened, with greater attention paid to strengthening the capabilities of a community-anchored agency for sustainable development.
- An effective and capable government and public institutions, with ethically committed leaders, are key to the success of the PDP.
- An ethical, accountable private sector is equally important to the success of the PDP.
- Conscientious leadership is encouraged from all sectors of society and there should be a conscious, ongoing effort to develop and strengthen such leadership.
- The PDP should foster the province's knowledge-driven, evidence-based development.

### **Eastern Cape Provincial Growth and Development Plan (ECPGDP)**

The Provincial Government of the Eastern Cape and its social partners have formulated a Provincial Growth and Development Plan (PGDP) in line with the national policy framework for socio-economic planning at provincial level. The PGDP provides the strategic framework, sectoral strategies and programmes aimed at a rapid improvement in the quality of life for the poorest people of the Province. To do this, the PGDP sets out a vision with quantified and sequenced targets in the areas of economic growth, employment creation, poverty eradication and income redistribution for the 10-year period 2004-2014.

Extensive consultation and input from Provincial Government, public entities, municipalities, business, labour, NGOs, and higher education institutions in the planning process to date also mean that the PGDP will provide the opportunity for long term co-operation between the provincial social partners around a coherent socio-economic development strategy.

The PGDP's vision, as articulated by the stakeholders, is to make the Eastern Cape a compelling place to live, work and invest in.

### **3.2.3 District and Local**

#### **Ingquza Hill Spatial Development Framework (IHSPF)**

#### **OR TAMBO SPATIAL DEVELOPMENT FRAMEWORK**

The OR Tambo SDF made use of the following structuring elements to guide spatial development decision-making:

- Development Nodes – Urban, Rural and Tourism
- Development Corridors
- Settlement and Resource Edges
- Special Development Areas –
  - Priority Needs
  - Priority Agricultural Development
  - Tourism
  - Forestry
  - Other initiatives (Agro-Processing, Water resource development, Hydro and alternative energy, Human Settlement Development)
  - LED
  - Conservation and limited development

#### **Ingquza Hill Local Municipality Integrated Development Plan 2018**

##### **Vision**

A developmental, economically viable and responsive municipality where communities enjoy equitable access to services in an environmentally sustainable manner.

## **Mission**

To Facilitate promotion of sustainable development by ensuring service delivery in a just equitable manner focusing on infrastructural, social services through a skilled, accountable, responsive administration that prioritizes community needs and good governance.

In considering how the Municipal Vision can be translated into a simple spatial concept diagram, the following key components are identified:

- Developmental – implying investment in basic infrastructure and services, livelihoods and strategic economic sectors of opportunity
- Economically viable – implying that infrastructure and services constructed / provided can be sustained (affordability and guaranteed revenue streams to operate and maintain such) and that investment in economic development will result in positive returns / income.
- Just and Equitable – implying that priority will be given to areas of greatest need, to the point where equal-access exist / benefit is derived by the residents of the Municipality

## **Inguza Hill Local Municipality Intergrated Development Plan 2019/20**

Integrated Development Plan (IDP) – a five (5) year plan that gives an overall framework for quality service delivery plan. It is mainly aimed at coordinating the work of government in a coherent way plan to improve the quality of all people inhabiting an area. The plan focuses on socio economic for the area wholly.

## **Vision**

A developmental and responsive municipality.

## **Mission**

To promote sustainable development by ensuring service delivery in an equitable manner prioritizing community needs and good governance.

## **3.3 NEMA LISTED ACTIVITIES TRIGGERED BY THE PROPOSED PROJECT**

In terms of NEMA, the proposed project will trigger listed activities described in Notice GNR 325 and GNR 324 of the National Environmental Management act, 1998 (act no.107 of 1998) as amended in April 2017.

Table 2: Listed Activities Triggered.

LISTED ACTIVITY	PROJECT ACTIVITY THAT TRIGGERS THE LISTED ACTIVITY
<p><b>GNR. 325 (13).</b> The physical alteration of virgin soil to agriculture, or afforestation for the purposes of commercial tree, timber or wood production of 100 hectares or more.</p>	<p>Large areas, definitely greater than 100 ha across all sites, can be classified as virgin soil as it has not been ploughed for more than ten years at least. This will be physically altered during the construction and operation phases.</p>
<p><b>GNR. 325 (15).</b> The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>More than 20 ha of indigenous vegetation will be cleared for the construction and operation of the proposed activity.</p>
<p><b>GNR. 324 (12).</b> The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(a) In Eastern Cape:</p> <p>ii. Within critical biodiversity areas identified in bioregional plans</p> <p>v. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	<p>Large tracts of indigenous vegetation in excess of 100 ha will be cleared. These areas are within CBAs and some of the vegetation can also be classified as sensitive.</p>

### **3.4 NEMA Regulation 21 Scoping report compliance**

NEMA regulation 21 ensures scoping report information compliance regulation 21 of the Environmental Impact Assessment Regulations, 2014 (As amended in April 2017).

Table 3: Contents of Scoping Report

#### **4. PLAN OF STUDY FOR EIA PROCESS**

During the Environmental Impact Assessment phase, the full results of the specialist studies conducted will be integrated into the Final Environmental Impact Report and potential Environmental Impacts will be thoroughly assessed and rated in order to determine their significance to the environment and recommend mitigation measures.

##### **4. 1 TASKS TO BE UNDERTAKEN DURING THE EIA PROCESS**

On the commencement of the Impact Assessment Phase, the key tasks to be undertaken will be as follow:

- Provide a detailed description of the proposed activity and affected bio-physical and socio-economic environment;
- Specialists will complete potential additional studies if required in order to address all significant issues identified during the Scoping Phase. A summary of the findings and recommendations will be provided and copies of the potential additional specialist reports will be included in the appendices of the Final Environmental Impact Report;
- Investigate and conduct a comparative assessment of the identified possible alternatives which include:
  - The potential Environmental Impacts will be fully assessed and evaluated through the use of the impact rating methodologies.
  - A detailed description of the Public Participation Process followed will be provided.
  - An assessment of cumulative impacts will be completed.
  - Account for all assumptions, uncertainties and gaps in knowledge
  - The provision of an Environmental Impact Statement.
  - The assignment of mitigation and management measures for incorporation during the construction and operational phases through the preparation of an Environmental Management Programme (EMPr).

## 4.2 Specialist Studies

The final results of any potential additional specialist studies (if required) will be incorporated into the Final EIR and used to complete the impact ratings process. The required specialist studies are indicated in the table (table 4) below.

Specialist studies are undertaken to investigate issues of concern where these require specialist know-how. The need for specialist studies is identified during the Scoping Phase by means of consultation with relevant stakeholders, I&AP"s and professional judgement.

In an effort to isolate the salient opportunities and constraints of the environment upfront, some of the specialist studies have been undertaken at an early stage, and are thus already included in the Scoping Report. This approach is considered proactive as it enables informed decision making in the planning and design processes.

The following specialist investigations have been conducted or are underway:

Table 4: Specialists appointed for the study

<b>Studies:</b>	<b>Specialist:</b>	<b>Comments:</b>
Biodiversity Assessment	MDelight Group	The areas is currently grazing land but requires a terrestrial biodiversity assessment.
Hydrological Study	Nature Stamp	A water use license is required and was granted. A hydrological study will be conducted.
Archeological and Cultural Heritage Survey	Active Heritage CC	Site inspection revealed heritage features in one site (Malangeni).
Paleontological Impact Assessment	ASG Geoconsultants	The footprint areas on site are underlain by potentially fossiliferous sedimentary rocks of the Dwyka and Ecca Groups and quaternary alluvium. Extensive intrusions of dolerite are present in the footprint area of the Bhukazi Forest.
Landscape and visual impact assessment- Technical drawings	Sivuka Civil Services	Landscape and visual impact studies done and maps representing the plantation layout, informal access roads, fire break bands and loading docks

The following Terms of Reference will be applicable for the appointed specialists:

#### **4.2.1 Terrestrial Biodiversity Assessment**

Describe the existing area to be directly affected by the proposal in terms of its current biodiversity characteristics and the general sensitivity of these components to change.

- Map the current ecological situation and determine the impact and change that the proposed development will have on the environment.
- Describe the likely scope, scale and significance of impacts (positive and negative) on biodiversity components of the area associated with the plantation establishment of the proposals.
- Make recommendations on the scope of any mitigation measures that may be applied during construction to avoid/reduce the significance of the identified plantation establishment-related impacts.
- Describe the likely scope, scale and significance of impacts (positive or negative) on the floral and faunal components associated with the plantation operation or use of the proposed development.
- Make recommendations on the scope of any mitigation measures that may be applied to avoid/reduce the significance of the plantation operations-related impacts. These mitigation measures could also be design recommendations as well as operational controls, monitoring programmes, management procedures and the like.
- It will be particularly important to identify any monitoring measures that can be reasonably applied throughout the life of the project.
- Broadly describe the implications of a 'No-Go' option where the proposals are not established.
- Broadly comment on the cumulative biodiversity/ecological impacts (positive or negative) associated with the construction and/or operation of the proposed development.
- Confirm if there are any outright fatal flaws to the establishment of the proposals at its current location from a botanical perspective.
- Identify and record positions of protected species for permitting purposes.

#### **4.2.2 Hydrological Assessment**

Desktop description of the baseline receiving environment specific to the hydrology of the site (general surrounding as well as site-specific environment);



- Identification and description of surface water features that occur in the study area, and the manner in which these may be affected by the activity;
- Identification of any legal provisions relevant to the specific field of expertise and the proposed activity (including relevant legislation, National and Provincial, Department Guidelines and Management Frameworks).
- Site hydrological assessment, undertaken by the:
  - a. Analysis of surface areas of the site;
  - b. Analysis of sensitive areas on site;
  - c. Analysis of existing storm water structures on site; and
  - d. Determination of areas with clean and dirty water.
- Hydraulic design analysis, illustrated by the:
  - a. Determination of the design storm event (1:2, 1:10 & 1:50 year return period);
  - b. Determination of the capability of existing structures; and
  - c. Recommendation of mitigation options and improvements.
- Flood Hydrology:
  - a. Hydraulic analysis, illustrated by the:
    - Compilation of the river reach model and flood line using HEC-RAS and HEC-geoRAS;
    - Determination of the flood risk and flood hazard throughout the study site; and
    - Recommendation of mitigation options associated with the hydraulic analysis.
  - b. Consolidate results in a report with:
    - Flood line maps; and
    - A final flood line report.
    - Water balance assessment:
    - Analysing climate data from the SAWS and other databases using nearby rainfall stations (input or known data);
    - Determining any water demands and water outputs; and
    - Determining whether water in the system is clean or contaminated.
    - Development of a static water balance. The information gathered in the desktop assessment and during the site visit will be used to create a process water flow diagram.

A series of models will be considered for use in this balance study. The Department of Water Affairs and Forestry,

2006 Best Practice Guideline G2: Water and Salt Balances was followed in this study.

- Produce a water balance study report with recommendations. An average annual water balance will be provided including an average dry and average wet month water balance.

A set of recommendations will be provided to assist in the IWWMP and help the land owners to manage their water appropriately.

#### **4.2.3 Archeological and cultural heritage study**

- To carry out a phase 1 Heritage Impact Assessment.
- Conduct a desktop study of the archaeological databases housed in the KwaZulu-Natal Museum.
- Consult the The SAHRIS website for previous heritage surveys and heritage site data covering the project area. In addition, the available archaeological and heritage literature covering the greater Lusikisiki areas was consulted.
- Aerial photographs covering the area were scrutinised for potential Iron Age and historical period structures and grave sites.
- Conduct a ground survey, following standard and accepted archaeological procedures, was conducted on the 25 January 2020.
- Focus particular attention on the occurrence of potential grave sites and other heritage resources on the footprint.

#### **4.2.4 Paleontological Study**

The Terms of Reference (ToR) for the study are as follows:

1. Undertake a desktop assessment of the palaeontological aspects of the area, which includes inter alia:

- A description of the underlying geology and potential palaeontology on site in terms of relevant plans,
- Policies and legislation

- An assessment of the palaeontological importance of rocks and stata present on site, and the significance of the impact of the proposed development and alternatives on the palaeontological aspects on site, including any cumulative impacts

2. Compile a Chance Find Protocol to accompany the Desktop PIA report.

#### 4.2.5 Landscape and visual impact assessment (Technical drawings)

- GIS establishment
- Civil designer layout
- Access design
- Drawings preparations

## 5. PROJECT LOCATION AND DISCRIPTION

Ingquza Hill Local Municipality, previously known as Qaukeni, is an administrative area in the OR Tambo District of Eastern Cape in South Africa Ingquza Hill local municipality is formed by two small towns which are Lusikisiki and Flagstaff under the O.R.Tambo District municipality. This municipality is informed by 32 wards. Malangeni and Bhukazi are located in the North Eastern region of the Eastern Cape, in Lusikisiki.

### 5.1 Project Description

Table 5: Project Details

Project name	Size/hectare	Ward number	Purpose
Malangeni	433ha	24	Expansion
Bhukazi	194ha	12	New plantation

### 5.2 Project Location

The geographical coordinates of the project site are as follows:

Malangeni:

Longitude: 31° 19' 10.343'' S Latitude: -29° 43' 28.889'' E

Bhukazi:

Longitude: 31° 12' 35.97'' S Latitude: -29° 28' 19.79'' E

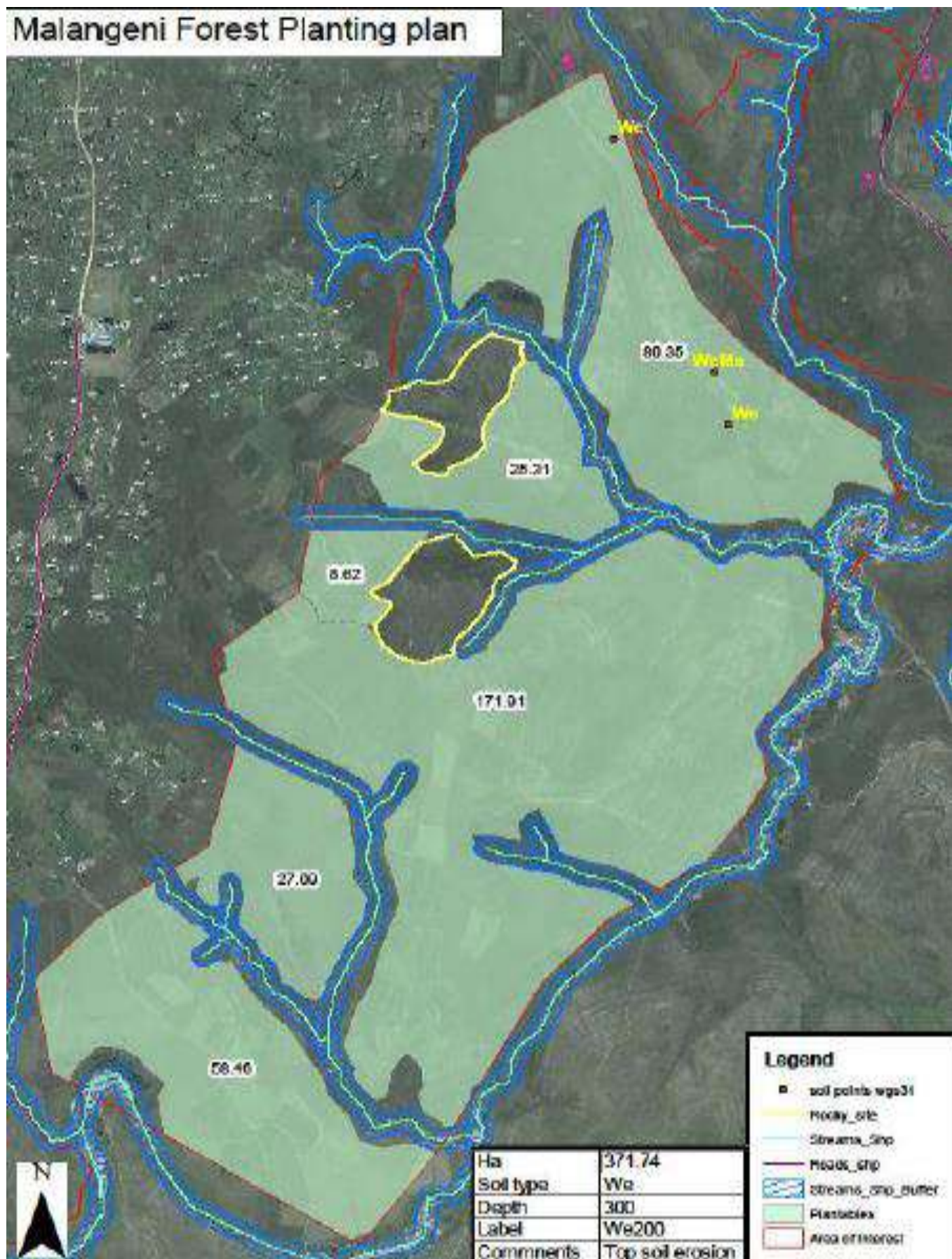


Figure 1: Malangeni Forest Planting Plan 1

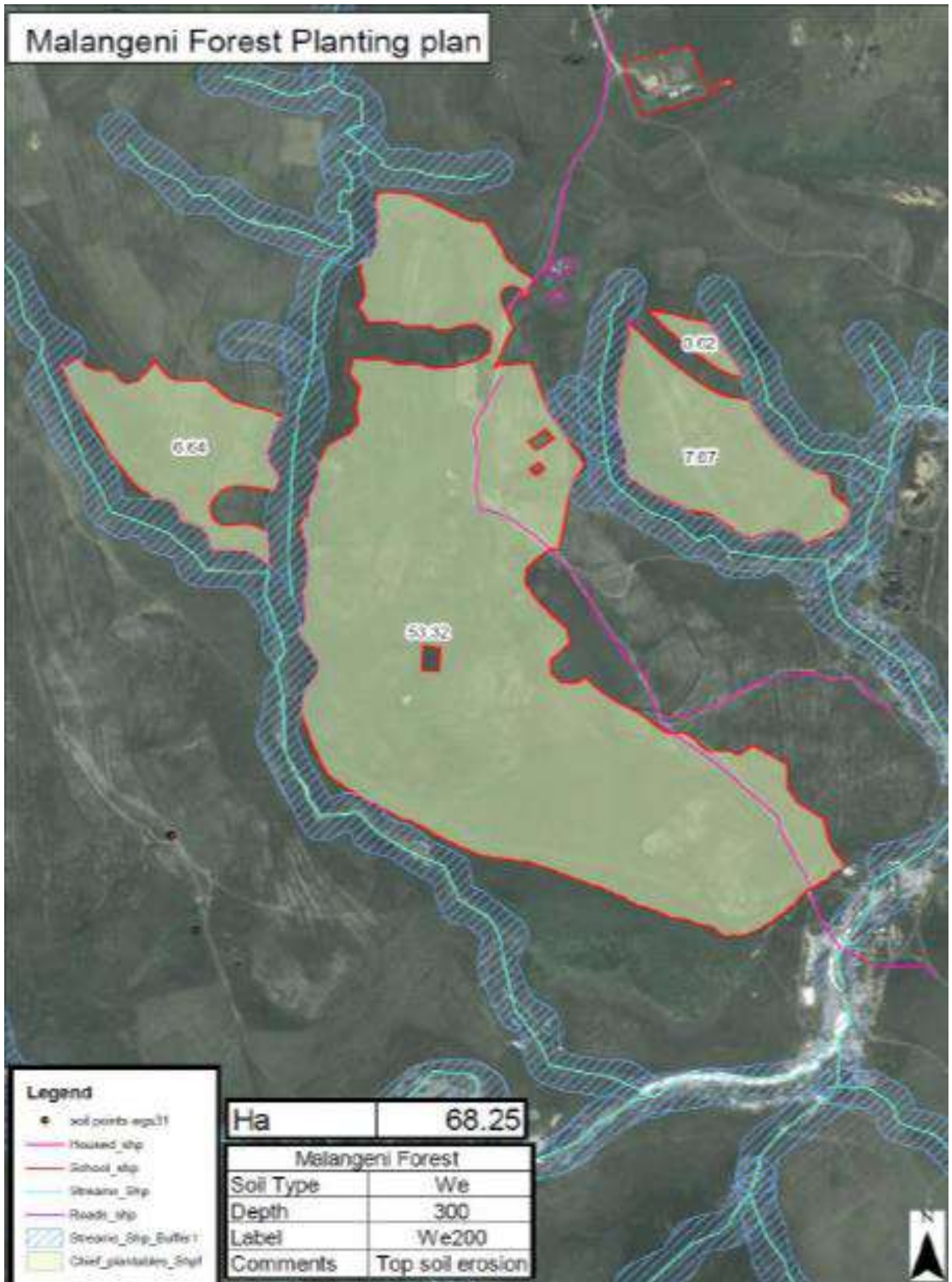


Figure 2: Malangeni Forest Planting Plan 2

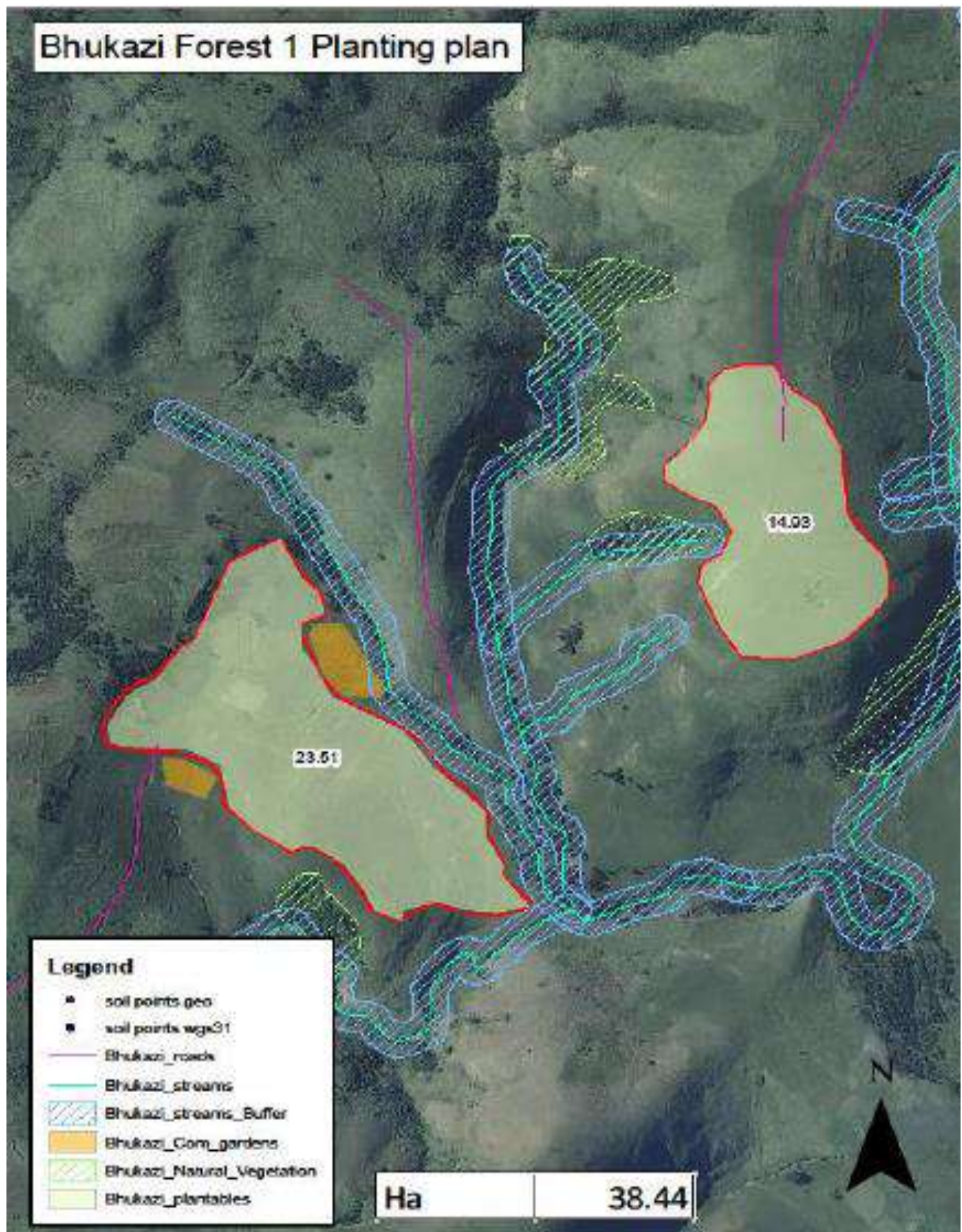


Figure 3: Bhukazi Forest Planting Plan 1

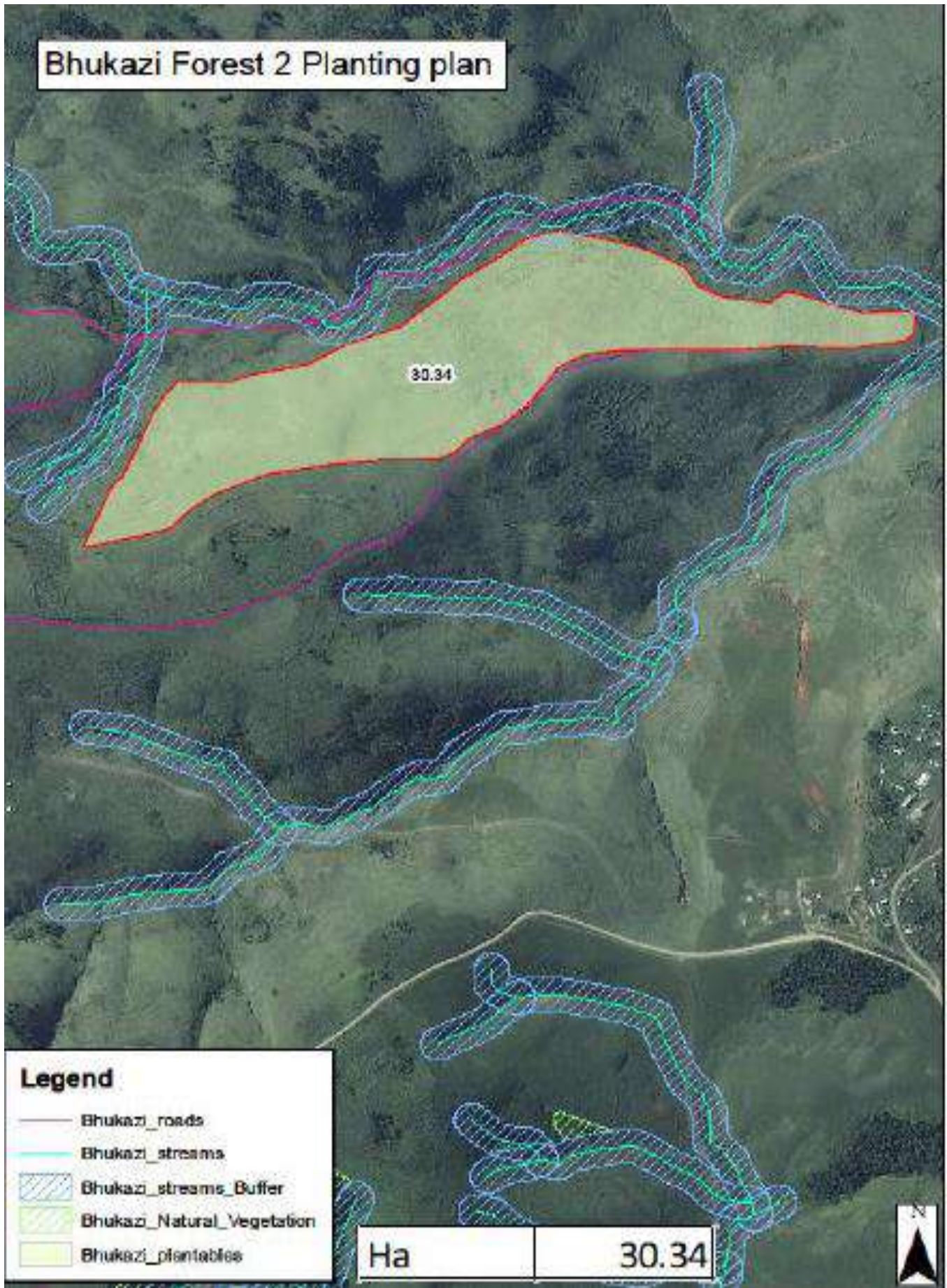


Figure 4: Bhukazi Forest Planting Plan 2

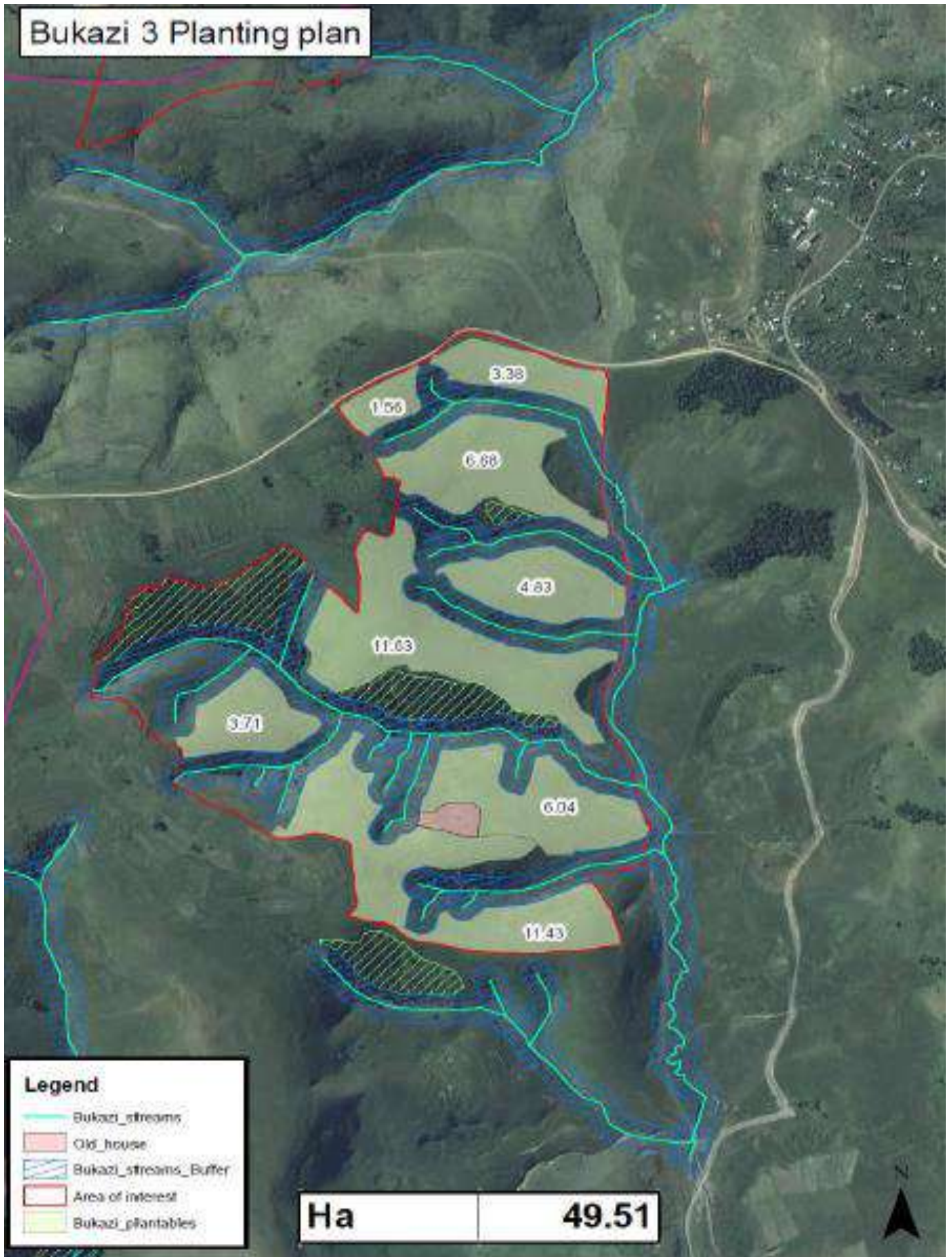


Figure 5: Bhukazi Forest Planting Plan 3



## Details of relevant land owner

Table 6: Details of land owner

<b>MALANGENI FOREST EXTENSION</b>	
Company/entity name:	Malangeni Forest Extensions
Postal address:	P O Box 39 Lusikisiki 4820
Contact person:	Mr Mjoji, Phathisiwe
Designation:	Land Owner
Contact number:	073 199 8998

Table 7: Details of land owner

<b>BHUKAZI NEW PLANTATIONS</b>	
Company/entity name:	Bhukazi Forest Plantations
Postal address:	P O Box 211 Lusikisiki 4820
Contact person:	Mr Xotyeni, Nicholas
Designation:	Land Owner
Contact number:	073 335 8893

## Malangeni

	
<p>Tracks leading to the forest.</p>	<p>Forest patch with poor vegetation biodiversity.</p>
	
<p>The site is relatively flat.</p>	<p>The area is flat with low plant diversity.</p>
	
<p>View showing virgin grasslands.</p>	<p>Virgin grasslands in the central parts of the site.</p>

Figure 6: Malangeni site photos 1

	
<p>Gravesite on site</p>	<p>Mixed wattle and indigenous bush</p>
	
<p>Reasonable vegetation cover in the virgin grassland</p>	<p>Poor vegetation cover on one side of the site due to veld fires.</p>
	
<p>Akassia invasive weed</p>	<p>Invasive weed in the southern section of the site.</p>

Figure 7: Malangeni site photos 2

**Bhukazi**







	
<p>Ridge on the site footprint.</p>	<p>Portion of site already being used for vegetation.</p>
	
<p>Reasonable basal cover in the virgin grassland.</p>	<p>Northern view of the virgin grasslands.</p>
	
<p>The site is steep with one invasive tree.</p>	<p>Area on the Western side of the site.</p>

Figure 8: Bhukazi Site photos 1

	
<p>View showing the fields.</p>	<p>View showing the Northern boundary</p>
	
<p>Reasonable basal cover in the virgin grassland</p>	<p>Section of the site showing dense <i>Aristida</i> sward.</p>
	
<p>Minimum ground cover and low plant diversity.</p>	<p>Secondary grassland of the area.</p>

Figure 9: Bhukazi Site photos 2

## **Alternative 1: Agricultural Activities**

Considering that the historic use of the site was for agriculture, the option of agriculture as a land use needs to be considered. This would, however, imply the following:

- This outcome will be the preservation of a relatively small piece of low to high potential agricultural land (40%) of the site for that purpose. Given the agricultural economy of scale, the site will not provide significant commercial opportunities to whoever is looking to practice intensive agriculture.
- Based on development drivers that exist in the area, this would probably only be a short-term outcome, if it is at all feasible.

## **Alternative 2: Residential Development**

Much of the surrounding land is or has been utilised for rural-residential to residential development and Agriculture and as such, it would make sense that the site be used for agricultural purposes than residential purpose.

As the other land use alternatives are not considered feasible, any further investigations during the EIAR phase would not be warranted. It is, therefore, considered progressive to uphold the proposed development as the preferred alternative, subject to the EIAR phase and provided planning and design aspects are sustainable and the project follows the recommendations of the EIA process.

## **6. NEEDS AND DESIRABILITY OF THE PROJECT**

### **6.1 Competitive Advantage**

Plantation forestry started in South Africa in the late 1880's and has been dominated by three genera of trees: pines, gums and wattles. These trees do well in South Africa because they are bio-climatically suited to large areas along the eastern seaboard of the country, and are not attacked by the insect pests and plant diseases which affect the trees in their country of origin. Careful breeding has also improved the growth characteristics of the species used in commercial forestry resulting in higher yields of wood per hectare. Today South Africa exports close to 2 million tonnes of wood and wood products, making it a vital part our national and regional economies.

In South Africa pines make up 51% of the total commercial afforestation (TCA) and are mainly used for sawlogs, veneer and pulpwood. Eucalyptus or gum trees which from Australia make up 38,9% of the TCA and are used for poles, mining timber, paper pulp and charcoal. Black wattle from Australia makes up 9,5% of the TCA and is used for tannin, paper pulp, mining timber and charcoal.

Detailed studies of the supply and demand of roundwood in South Africa (HA Management Consultants 2004, Crickmay & Associates 2005) show that since 2002 supply does not meet the growing demand, requiring additional commercial plantations (estimated at 1,370,000 hectares).

With this backdrop and from various other DAFF internal reports on timber statistics, DAFF commissioned studies of identifying suitable areas for afforestation. In 2005 DAFF initiated this assessment in the Eastern Cape, and the study was undertaken by Coastal and Environmental Services.

In 2008, DAFF identified that South Africa had capacity to supply 22 million m<sup>3</sup> of roundwood per annum although the demand was estimated at 22.3 million m<sup>3</sup> per annum at that time, with a 25-year demand forecast estimated at of 37.9 million m<sup>3</sup> per annum, excluding wood chip volume, and assuming no change in the current export levels. The shortfall will therefore be over 14 million m<sup>3</sup> per annum.

Until now much of the emphasis of small grower forestry work has been on how communities use forests to support their subsistence needs. The notion of 'community forestry' has come to be associated with micro-level interventions and with forestry's marginal contribution to household subsistence. There has been little interest in more ambitious concepts such as the payment of rent to forest communities for the use of forest land, or their participation in the ownership of companies that have rights to exploit forest resources.

Since 2012/13 DAFF has been on a drive to ensure that to facilitate opportunities of partnership between various rural communities/land owners with corporate forestry companies such as Sappi. In such a model community-based forest participation will ensure that the corporate partner company will assist in the development of community plantations. The corporate partner will provide seedlings, expertise, training and machinery, and the community will provide land and labour to implement such forestry projects.

## **6.2 Job Creation**

The jobs to be created will involve skilled, semi-skilled and a labour component. Today most of the tree harvesting is done by mechanical harvesters so the labour component is mainly made up of labour in the packing shed and labour used for rogueing which is the continual monitoring and removal of any off-types or diseased plants in the seed plantings. None of the work can be regarded as menial labour.

The skilled and semi-skilled staff component will be made up of managers, admin staff, foremen, various machine operators and maintenance personnel.

## **7. ALTERNATIVES CONSIDERED**

The identification of alternatives provides a basis for choice among the options available. The exploration of such alternatives allows for the incorporation of practically, and technologically, the least environmentally impacting options available, whilst still meeting the need and purpose of the proposal. An alternative should thus be practicable, feasible, relevant, reasonable and viable.

The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and or through reducing or avoiding potentially significant negative impacts.

During the Environmental Planning Exercise, opportunities and constraints automatically introduce a dialogue around options. As such, many alternatives have been identified at an early stage and already evaluated in the Scoping Report. However, there are instances where the alternatives have been referred to the EIAR phase for further clarification and /or investigation. Additional alternatives can still be identified, evaluated and if viable, also implemented. These alternatives will then be incorporated in the EIAR phase as additional alternatives.

In addition to giving consideration to the relative impacts of each alternative, weight is also given to the issues raised by I&AP"s, and government stakeholders when determining which of the proposed alternatives should be adopted.



According to Chapter 1 of NEMA EIA Regulations 2014 (as amended in April 2017), Notice R982, “Alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-

(a) The property on which or location where it is proposed to undertake the activity;

- (b) The type of activity to be undertaken;
- (c) The design or layout of the activity;
- (d) The technology to be used in the activity;
- (e) The operational aspects of the activity; and
- (f) The option of not implementing the activity.

These NEMA EIA Regulations 2014 (as amended in April 2017), Notice R982, recognises that details on alternatives need to include “a description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity”.

The consideration of alternatives is therefore a key component of an EIA process. While an EIA process should investigate and comparatively consider all alternatives that have been identified, only those found to be “feasible” and “reasonable” must be comparatively assessed, in terms of the advantages and disadvantages that the proposed activity and alternatives will have on the environment and on the socio-economic aspects of communities that may be affected by the activity.

The “feasibility” and “reasonability” of an alternative are measured by:

- the general purpose and requirements of the activity;
- the need and desirability of the activity;
- opportunity costs;
- the need to avoid and/or minimise negative impacts;
- the need to maximise benefits; and
- how it impacts on the community that may be affected by the activity (DEA&DP, 2013b).

Alternatives considered for the proposed see potato pivots include two layout alternatives and a no-go option. The following section describes those alternatives that have been considered (i.e. identified and investigated) and indicate which alternatives are deemed to be “feasible” and “reasonable” and therefore preferred. It also indicates and compares the advantages and disadvantages of these alternatives.

## **7.1 Location Alternatives**

An alternative viable site location was not identified and evaluated for the project. The specific proposed location for the plantations are preferred as it is the only viable portion of land available in that vicinity which is up for procurement. Procurements arrangements have been made between the applicant and the current land owner. The portion is also situated close to the homesteads of the intending developers/project applicants and this will render the project viable from an economic and logistic perspective.

## **7.2 Layout Alternatives**

Layout Alternative 1 (Preferred Alternative)

The preferred layout alternatives includes the development plantation fields. All of the plantations will be located inside a Critical Biodiversity area 1 and Critical Biodiversity Area 2 (CBA 2) as the identified areas are situated in CBA 1 and CBA 2 areas.

## **7.3 No-Go option**

A no-go alternative is same as keeping operations currently undertaken on the proposed sites. This will imply the assessment of environmental impacts if the proposed project, or any of its alternatives, does not proceed. There will be no negative environmental impact if such an alternative is undertaken. There will however be a negative socio-economic impact. The economic outcomes of the planned afforestation projects will not be realised. The employment opportunities that would have been created by the proposed project will not materialise.

## **8. APPROACH AND METHODOLOGY**

In terms of the South African Environmental Legislative Framework, this project will be subject to the Environmental Authorisation. This process has been implemented by South African National Government to streamline the environmental process due to the number of authorisations required for these types of projects. It is intended to save time, rationalise the management of the number of competent authorities and prevent delays due to the lack of resources and time for the review process. Based on the scope of work, this project requires an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) and the EIA Regulations 2014 (as amended). The process triggered is a Scoping and Environmental Impact Assessment (S&EIA).

The S&EIA must ensure that all parties involved are aware that the assessment is not solely focused on the biophysical environment but is inclusive of social and economic considerations. Ezendalo's approach to the S&EIA process is to adopt a holistic and integrated view of the environment, with equal emphasis on the ecological and social components. Based on previous experience, incorporating both aspects at an early stage leads to a more comprehensive end product. In order to produce comprehensive and complete documents, the S&EIR (S&EIR) must not only identify and evaluate the significance of environmental impacts, but also suggest ways to mitigate any negative impacts and optimise positive impacts.

### **8.1 Scoping and EIA Process**

The process to be followed is dictated by the EIA Regulations 2014 (as amended) for projects requiring an S&EIA (Figure 8). The S&EIA process is initiated through a pre-assessment Public Participation Process (PPP). The pre-assessment process is not a mandatory requirement in terms of the EIA Regulations 2014 (as amended) but is a beneficial option for the client and EAP in order to identify key stakeholders and Interested and Affected Parties (I&APs), as well as to identify any fatal flaws, at the onset of a project.

This phase is followed by the Scoping Phase (inclusive of a notice of intent to the authorities, landowners and other I&APs and Stakeholders). During the Scoping Phase, the Terms of Reference (ToR) for the full EIA is formulated, and requirements from the authorities clarified. The Scoping process serves to bring stakeholders on board by means of consultation with relevant government departments, allowing for the identification of potential issues and concerns.

After completion of the Scoping Phase, a detailed assessment will be undertaken in order to address issues identified during the Scoping Phase. This assessment will not only provide baseline information for the study area, but also to take this study further and identify which project activities will result in significant impacts. The assessment will also suggest ways in which these negative impacts could be mitigated, to reduce their severity.

Table 8: Scoping and Environmental Impact Assessment Process.

SCOPING PHASE	ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PHASE
Project Planning and initial stakeholder engagement	Specialist Studies
Submission of application for environmental authorization to the competent authority	Draft Environmental Impact Assessment Report and Environmental Management Programme
Draft Scoping Report	Mandatory Public Review period (30 days)
Mandatory Public Review period (30 days)	Final EIA Report (10 days following the acceptance of the final scoping report)
Final Scoping Report (10 days following the submission of the application)	Competent authority review period (107 days)
Competent authority review period (43 days)	Amendments required / Accepted
Amendment required / Accepted	Notification of Environmental Authorization and appeal period (14 days following acceptance)

All draft reports are submitted for public review, which is a mandatory period of 30 calendar days. All comments made by I&APs are captured in an Issues and Response Trail (IRT).

All recommendations cited in the EIA report must be detailed in an Environmental Management Programme report (EMPr), which defines the actions to be implemented. The EMPr is recognised as a very important tool for the sound environmental management of projects.

### **8.1.1 Scoping Phase**

The Scoping Phase is outlined in GN R 326, EIA Regulations 2014 (as amended) under Part 3, Regulation 21. The process consists of a desktop review, site visit, public participation, submission of the NEMA Application form and the Scoping Report (draft and final versions).

#### **Desktop Review**

All aspects of the proposed project are first analysed using a high-level desktop study which looks at the basic description of the project and what the initial environmental and social concerns may be. This includes background information for the project area as well as the proposed activity, details of the activity applied for according to the Amended EIA Regulations of 2014 (as amended) (the listed activities) and the type of assessment which will be required. The desktop review involves the interpretation of maps covering the proposed project area, as well as available reports and planning instruments in order to familiarise the project team with the area and the various physical and biological properties of the area. The desktop review also identifies if the project requires any additional licences in terms of water use, waste, air quality, land use or any other environmental requirements.

#### **Site Visit**

Ezendalo consultants made an initial visit to the proposed prospecting sites in October 2019 in order to assess the site and initiate the Scoping Phase.

#### **Public Participation**

The general public, key stakeholders, landowners, adjacent landowners and government authorities at National, Provincial and Local level, were notified of the proposed development on the 11th of December 2018. In addition, a public meeting was held on the 18 October 2018 with the affected landowners and community. The means by which I&APs were notified are described in full in Appendix D.

#### **Submission of Application Form**

An application for EA was submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

#### Draft Scoping Report

The information gathered through the initial PPP phase, as well as the information from the site visit and from the client with regard to the design of the project was integrated into the Draft Scoping Report. The report was made available to the public for a period of 30 calendar days for comment. Registered I&APs will be informed of the release of the DSR by email and via communication with the local Traditional Chief and ward councillors within the study area. The release of the report was advertised in the newspaper. A hard copy of the report was made available in a publicly accessible place, and on the Ezendalo website.

#### Final Scoping Report

Any comments, issues and concerns raised by I&APs and the authorities during the review period of the Scoping Phase will be included in the Final Scoping Report in the form of an Issues and Response Trail (IRT).

### **8.1.2 Environmental Impact Assessment Phase**

The EIA Phase is outlined in GN R 326, EIA Regulations 2014 (as amended) under Part 3, Regulation 23, as well as Appendix 3. This task involves the integrated writing of the EIR. A detailed assessment will be undertaken in order to address issues identified during the Scoping Phase and specialist input will be undertaken during preparation of the Draft EIR. The report will consist of an introductory section, followed by a detailed project description, sections in which the results of all detailed studies are summarised, and an environmental impact section, where impacts are assessed and rated according to a predefined rating scale. Measures to mitigate negative impacts will also be included.

#### Environmental Management Programme

The measures presented in the EMPr will be aimed at enhancing the potential benefits and minimizing the potential negative impacts of the project. The EMPr will specify responsibilities for the implementation and monitoring of the project as well as the periodicity of the audits to be carried out.

## Final Environmental Impact Assessment Report

The EIA Process, the Final EIR will be prepared. This will include the additional comments, issues and concerns raised by I&APs and the authorities, provided in an updated Issues and Response Trail (IRT). The Final EIAR, together with any Specialist Reports and Final EMPr will then be submitted to DEA for decision making. The Final EIR must be submitted to DEA within 106 days of acceptance of the Scoping Report by the competent authority.

According to the EIA Regulations 2014 (as amended 2017) Regulation 24, DEDEAT must, within 107 days of receipt of the Final EIR and EMPr, either grant or refuse the application by means of a positive or negative EA.

### **8.1.3 Environmental Authorisation and Appeals**

Should the EA be granted, it usually carries Conditions of Approval. The project proponent is legally obliged to adhere to all conditions stipulated therein. In accordance with GN R 326, a copy of the EA must be sent to all registered I&APs within fourteen (14) days of the date of issuing the authorisation. The public can then appeal the decision, should they wish to do so. A notice of intent to appeal must be submitted to the relevant competent authority within twenty (20) days upon notice of a decision on the application.

### **8.1.4 Public Participation Process**

Public consultation is a legal requirement throughout the EIA process. Developers are required to conduct public consultation throughout the Scoping and EIA phase. Formal EIA documents are required to be made available for public review and comment by the proponent, these include the Project Brief, Scoping Report and Terms of Reference and Plan of Study (PoS) the EIA, the Draft and Final EIAR, and the decision of the Department.

The method of public consultation to be used depends largely on the location of the development and the level of education of those being impacted on by the project. Required means of public consultation include:

- Site notice(s)
- Newspaper advertisements
- Letter of Notification and information to affected landowner(s), stakeholders and registered I&APs



- Background Information Document (BID) distribution
- Public Meeting (attendance register and meeting minutes)
- Authority and Stakeholder engagement (DWS and DEA).

#### Site Notice

According to Regulation 41(2) of the NEMA EIA Regulations 2014 (as amended) “the person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by:

(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of: (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site.

During the initial site visit, 2 site notices were placed adjacent to the proposed property boundary as well as at the entrance to the Mthatha Dam. Refer to Appendix C for proof of placement.

#### Newspaper advertisement

(b) placing an advertisement in: (i) one local newspaper; or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations; (c) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);

#### I&AP and Stakeholder Notifications

(d) giving written notice, in any of the manners provided for in section 47 D of the Act, to: (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner and to any alternative site where the activity is to be undertaken; (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;

(iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) the municipality which has jurisdiction in the area; (v) any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) any other party as required by the competent authority;

#### Stakeholder Identification and Registered I&APs

A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of: (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP; (b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and (c) all organs of state which have jurisdiction in respect of the activity to which the application relates.

As such, a comprehensive I&AP database, including all identified and registered I&APs, has been included in Appendix C-6 of this report.

#### Issues Raised by I&APs

Comments and issues raised during the Public Meeting are included in the meeting minutes. The Comments and Response Trail of all I&AP comments received to date have been included in this document.

## **9. DESCRIPTION OF THE ENVIRONMENT**

### **Malangeni Extension**



## **9.1 Biophysical Description**

### **9.1.1 Topography, Vegetation and soils**

#### **Malangeni forest extension:**

The roads leading to the forest lays in a flat to gentle steep topography, whilst the sections running from the stream crossings have a relatively steep incline. The area is predominantly covered by Drakensberg Foothill Moist Grassland (Grassland Biome) and the Eastern Valley Bushveld (Savanna Biome) (Mucina & Rutherford 2006). The soil class fall under imperfectly drained soils, often shallow and often with a plinthic horizon (S8) and Lithosols (shallow soils on hard or weathering rock) (S13).

#### **Bhukazi new forest plantations**

The roads leading to the forest lays in a flat to gentle steep topography, whilst the sections running from the stream crossings have a relatively steep incline. The area is predominantly covered by Drakensberg Foothill Moist Grassland (Gs 10 Grassland Biome) and the Eastern Valley Bushveld (SVs 6 Savanna Biome (Mucina & Rutherford 2006). The soil class fall under association of Classes 13 and 16: Undifferentiated shallow soils and land classes (S21) and freely drained, structureless soils (S2).

### **9.1.2 Climate**

The climate along the South Coast varies from temperate sub-tropical in the South to moderate sub-tropical weather further north. The Lusikisiki area specifically has a very comfortable sub-tropical climate. The combination of mountains and sea creates a temperate zone of its own, but also keeps the temperature cool and comfortable in summer. Rainfall occurs mainly in the summer months and the temperature seldom drops below 14°C.

### **9.1.3 Geology**

The geology of the Eastern Cape, in which one of the larger proposed sites falls, is characterised by sediments of the Cape Supergroup and the Karoo Supergroup. Sixty million years ago the Cape Supergroup and Karoo Supergroups were deposited above the Namqua-Natal Belt and the Pan African Belt. The Cape Supergroup was deposited first and is characterised by Witteberg group, Bokkeveld Group rocks and Table Mountain group rocks in the south and Natal Group rocks in the east.

The Cape Supergroup is characterised by highly folded and contorted sandstones, quartzites and shales. Above the Cape Supergroup, the Karoo Supergroup was deposited. The Karoo Supergroup covers two-thirds of the country and is made up of the Dwyka, Ecca and Beaufort Groups, over which the Stormsberg and Drakensberg Groups were deposited. This Karoo Supergroup contains glacial deposits (Tillite) of the Dwyka Group, fossiliferous shale of the Ecca Group and mudstone and sandstone beds of the Beaufort Group. The Drakensberg and Stormsberg group were later formed by the outpouring of basaltic lavas resulting in the prominent outcrop in the northern portions of the province. Not all magma reached the surface, and some intruded into the older Karoo Supergroup rocks, resulting in the many dolerite intrusions found in the province.

## **10. PUBLIC PARTICIPATION PROCESS**

A continual and comprehensive Public Participation Process (PPP) will be undertaken throughout the entire Scoping & EIA process with all stakeholders and Interested and Affected Parties (I & AP's), including the relevant organs of state and competent authority as identified during the Scoping Phase.

The Public Participation Process (PPP) is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner to assist them to:

- During the Scoping Phase:
  - Raise issues of concern and suggestions for enhanced benefits.
  - Verify that their issues have been recorded.
  - Assist in identifying reasonable alternatives.
  - Provide relevant local information and knowledge to the environmental assessment.
- During the Environmental Impact Assessment (EIA) Phase:
  - Contribute relevant local information and knowledge to the environmental assessment.
  - Verify that their issues have been considered in the EIA process.
  - Comment on the findings of the environmental assessments.
- During the decision-making phase:
  - Obtain information on the outcome, i.e. the competent authority's decision, and how and by when the decision can be appealed.

## 10.1 Identification of and Consultation with Key Stakeholders

I&APs and Key Stakeholders will be identified during the Scoping Phase of the project. The identification and engagement if necessary, of I&APs and Key Stakeholders will continue through into the EIA phase of the project as the public participation process is a continuous process that runs throughout the duration of an environmental investigation.

## 10.2 Identification of and Consultation with Key Stakeholders

I&APs and Key Stakeholders will be identified during the Scoping Phase of the project. The identification and engagement if necessary, of I&APs and Key Stakeholders will continue through into the EIA phase of the project as the public participation process is a continuous process that runs throughout the duration of an environmental investigation.

## 10.3 Registration and Notification

All I&AP information (including contact details), together with dates and details of consultations and a record of all issues raised, is recorded within a comprehensive database of I&APs. This database will be updated on an on-going basis throughout the project and will act as a record of the communication and involvement process.

### 10.3.1 List of stakeholders / organs of state / landowners and adjacent landowners that are notified

Table 9: List of I&AP'S

Other forestry stakeholders name of representatives	ORGANISATION	TEL/ CELL	EMAIL ADDRESS
Norman Ngamile	DAFF	043 604 5442	<a href="mailto:ThembelaniN@daff.gov.za">ThembelaniN@daff.gov.za</a>
Daniel Mtati	DAFF	043 604 5301	<a href="mailto:DanielMT@daff.gov.za">DanielMT@daff.gov.za</a>
Tebogo Mathiane	DAFF	012 309 5712	<a href="mailto:TebogoMAT@daff.gov.za">TebogoMAT@daff.gov.za</a>
Elvis Netshivhumbe	DAFF	012 309 5784	<a href="mailto:ElvisNE@daff.gov.za">ElvisNE@daff.gov.za</a>
Nokuthula Ncedani	DAFF	012 309 5789	<a href="mailto:NokuthulaN@daff.gov.za">NokuthulaN@daff.gov.za</a>
Norman Ngamile	DAFF	043 604 5442	<a href="mailto:ThembelaniN@daff.gov.za">ThembelaniN@daff.gov.za</a>
Gwen Sgwabe	DAFF	043 604 5528	<a href="mailto:GwendolineS@daff.gov.za">GwendolineS@daff.gov.za</a>

Qondile Paliso	DEDEAT	071 8748 728	<a href="mailto:gondile.paliso@dedea.gov.za">gondile.paliso@dedea.gov.za</a>
Cecilia Gyan	DEDEAT	043 605 7099	<a href="mailto:Cecilia.gyan@dedea.gov.za">Cecilia.gyan@dedea.gov.za</a>
M. Matebese	DRDLR		<a href="mailto:Nmatebese@ruraldevelopment.gov.za">Nmatebese@ruraldevelopment.gov.za</a>
Lawrence Musisi	DARDA		<a href="mailto:Lawrence.musisi@agric.ecpro.gov.za">Lawrence.musisi@agric.ecpro.gov.za</a>
Hombakazi shumane	Ingquza Hill LM	039 252 0131/ 073 238 0244	<a href="mailto:HTshumane@ihlm.gov.za">HTshumane@ihlm.gov.za</a>
Andile Mbarane	Ingquza Hill LM	073 407 2832	<a href="mailto:AMbaran@ihlm.gov.za">AMbaran@ihlm.gov.za</a> <a href="mailto:andilembarane@yahoo.com">andilembarane@yahoo.com</a>
Phindiwe Magula	ECRDA	079 899 9969	<a href="mailto:MagulaP@ecdra.co.za">MagulaP@ecdra.co.za</a>
Nkosiphendule Quvile	ECRDA	043 604 7015	<a href="mailto:QuvileN@ecdra.co.za">QuvileN@ecdra.co.za</a>
Nardus du Preez	ECRDA	082 787 0986	<a href="mailto:nardus@sainet.co.za">nardus@sainet.co.za</a>
<b>NAME OF REPRESENTATIVES</b>	<b>ORGANISATION</b>	<b>TEL/ CELL</b>	<b>EMAIL ADDRESS</b>
Nkosiphendule Quvile	ECRDA	043 604 7015	<a href="mailto:quvilen@ecdra.co.za">quvilen@ecdra.co.za</a>
Lwazi Khuzwayo	Mkhambati Nature Reserve/ ECPTA	087 285 7752	<a href="mailto:Lwazi.khuzwayo@ecpta.co.za">Lwazi.khuzwayo@ecpta.co.za</a>
L. Nel	IDC		<a href="mailto:lourien@idc.co.za">lourien@idc.co.za</a>
Steve Ngubane	IDC	082 880 7165	<a href="mailto:SteveNg@idc.co.za">SteveNg@idc.co.za</a>
K. Mtintsilana	IDC	043 721 0733	<a href="mailto:kwakhanyaM@idc.co.za">kwakhanyaM@idc.co.za</a>
Thukela Mashologu	IDC	043 721 0733	<a href="mailto:ThukelaM@idc.co.za">ThukelaM@idc.co.za</a>
Thandokazi Ketshangane	IDC	043 721 7015	<a href="mailto:thandokazik@idc.co.za">thandokazik@idc.co.za</a>
Vuyani Dudula	ECDC		<a href="mailto:vdudula@ecdc.co.za">vdudula@ecdc.co.za</a>
I Henderson	Working for Fire	076 3304 155	<a href="mailto:lan.henderson@wofire.co.za">lan.henderson@wofire.co.za</a>
Tafandzwa	DTI	012 394 3559	<a href="mailto:Tnyanzunda@thedti.gov.za">Tnyanzunda@thedti.gov.za</a>
Stella Maphiri	DTI	071 332 9491	<a href="mailto:SMaphiri@thedti.gov.za">SMaphiri@thedti.gov.za</a>
Vuyani Dudula	ECDC		<a href="mailto:vdudula@ecdc.co.za">vdudula@ecdc.co.za</a>
Libhongo	ECSECC		<a href="mailto:libhongo@ecsecc.org.za">libhongo@ecsecc.org.za</a>
Norman Dlamini	Forestry South Africa	033 346 0344/081 017 0978	<a href="mailto:norman@forestrysouthafrica.co.za">norman@forestrysouthafrica.co.za</a>

Nathi Ndlela	Forestry South Africa	033 346 0344	<a href="mailto:nathi@forestrysouthafrica.co.za">nathi@forestrysouthafrica.co.za</a>
Luvuyo Sandi	SEDA - CPPP	043 721 1264	<a href="mailto:lsandi@seda.org.za">lsandi@seda.org.za</a>
Lizna Fourie	DWA	082 8861 746	<a href="mailto:fourieL4@dwa.gov.za">fourieL4@dwa.gov.za</a>
Bheki Kunene	DWA	043 701 0272/082 951 2939/063 716 1709	<a href="mailto:kuneneB@dwa.gov.za">kuneneB@dwa.gov.za</a> <a href="mailto:kuneneb@dwa.gov.za">kuneneb@dwa.gov.za</a>
Zama Memela	DRDLR	082 419 5297	<a href="mailto:Zama.memela@drdlr.gov.za">Zama.memela@drdlr.gov.za</a> <a href="mailto:zzhmemela@ruraldevelopment.gov.za">zzhmemela@ruraldevelopment.gov.za</a>
Sinelindiwe Zanethemba	DEFF	084 413 2685	<a href="mailto:ZanethembaS@deff.gov.za">ZanethembaS@deff.gov.za</a> <a href="mailto:Zanethembas@daff.gov.za">Zanethembas@daff.gov.za</a>
Bulelwa Njilo	IHLM	073 090 3429	<a href="mailto:bnjilo@ihlm.gov.za">bnjilo@ihlm.gov.za</a>
N Lugetye	ORTM	078 217 1355	<a href="mailto:n.lugetye@gmail.com">n.lugetye@gmail.com</a>
S G Gexu	DEFF:IHLM	082 837 9166	<a href="mailto:cgexu@environment.gov.za">cgexu@environment.gov.za</a>
T N Dlamini	ECPTA	087 285 7752	<a href="mailto:thobeka.dlamini@ecpta.co.za">thobeka.dlamini@ecpta.co.za</a>
A Mbarane	IHLM	073 407 2832	<a href="mailto:Andilembarane@yahoo.com">Andilembarane@yahoo.com</a>
Khaya G Gqwabaza	DEDEAT	0833879194	<a href="mailto:khaya.gqwabaza@dedeat.gov.za">khaya.gqwabaza@dedeat.gov.za</a>
V Silo	DEDEA	0664702328	<a href="mailto:Vuyokazi.Silo@dedea.gov.za">Vuyokazi.Silo@dedea.gov.za</a>
O Siganga	ORTDM	0609146289	<a href="mailto:omegasiganga@gmail.com">omegasiganga@gmail.com</a>
F E Sobantu	Disaster Management	0734724377	<a href="mailto:sobantuf@webmail.co.za">sobantuf@webmail.co.za</a>
T Sigwebo	ORTDM Health	0733000118	<a href="mailto:andilesigwebo@gmail.com">andilesigwebo@gmail.com</a>
L Mboyi	ECPTA-N2	0662559827	<a href="mailto:lumko.mbotyi@ecpta.co.za">lumko.mbotyi@ecpta.co.za</a>
L Pani	IHLM	0734689118	<a href="mailto:lpani@ihlm.gov.za">lpani@ihlm.gov.za</a> <a href="mailto:ipani@ihlm.gov.za">ipani@ihlm.gov.za</a>
S Dakwa	IHLM	0733448004	<a href="mailto:sdakwa@ihlm.gov.za">sdakwa@ihlm.gov.za</a>
A Cingo	IHLM	0634184644	<a href="mailto:Amahlecingo44@gmail.com">Amahlecingo44@gmail.com</a>



## 10.4 Advertisements

In terms of the EIA Regulations 2014 (as amended), the availability of the Draft EIR will be advertised in the Daily Dispatch newspaper. The primary aim of this advertisement will be to ensure that the widest group of I&APs possible are informed of the project. Other advertisements to be placed during the course of the EIA phase of the project will relate to the availability of reports for public review, the dates of public meetings, as well as the advertising of the environmental authorisation/decision.

## 9.5 Public Review of the Draft Environmental Impact Assessment Report

The Draft EIR will be made available for a thirty (30) day public review period. The availability of the Draft EIR will be advertised and all registered I&APs will be notified of the availability of the Draft EIR for public comment. In addition (and if required), a public meeting will be held during this public review period.

## 10.6 Public Meetings

The purpose of public meetings is to provide an appropriate format to enable I&APs to raise concerns related to the proposed project. The intention is that I&APs are afforded the opportunity of interacting on a one-on-one basis with the technical and planning representatives of the developer as well as the environmental team. I&APs will be encouraged to complete an attendance register and a comment and registration form to assist I&APs in raising concerns and general views on the project.

## 10.7 Issues and Responses Trail

All issues, comments and concerns raised during the public participation process of the EIA Process will be compiled into an IRT and incorporated and submitted as part of the Final EIAR

**See table below (table 9) with the summary of all comments and responses after completion of the PPP:**

Table 10: Summary of all comments and responses received

See Appendix D for the Public Participation Report.

I&AP	Method	Date	Issue	Response
Lwazi Khuzwayo, Mkhambati Nature Reserve/ ECPTA	E-Mail		No comment received at this stage	
Cecilia Gyan, DEDEAT	E-Mail			
M. Matebese, DRDLR	E-Mail		No comment received at this stage	
Lawrence Musisi, DARDA	E-Mail		No comment received at this stage	
Phindiwe Magula, ECRDA	E-Mail		No comment received at this stage	
Nkosiphendule Quvile, ECRDA	E-Mail		No comment received at this stage	
Nardus du Preez, ECRDA	E-Mail		Dear Ayanda  I have perused the Scoping Report for the forestry development on the two sites, Malangeni of 433 hectares and Bhukazi of 194 hectares in Ngquza Hill LM area.	Good Day Mr du Preez,  This forestry project will surely create jobs for the people of Malangeni and and Bhukazi. We appreciate your support as this development will benefit a lot of people not just the community.

I&AP	Method	Date	Issue	Response
			<p>Forestry can be a financial viable enterprise and it creates much needed jobs in these rural areas. To ensure that best practise forestry norms and standards are adhered to and that a commercial market is secured for mature timber, I would recommend that a private forestry company, such as Sappi who operates already in that area, forms part of the discussions with the communities involved.</p> <p>I support the proposal for forestry establishment and expansion as contained in the Scoping Report.</p>	Kind Regards

I&AP	Method	Date	Issue	Response
			Regards  Nardus du Preez ECRDA Forestry Field Manager	
L. Nel, IDC	E-Mail		No comment received at this stage	L. Nel, IDC
Steve Ngubane, IDC	E-Mail		No comment received at this stage	Steve Ngubane, IDC
K. Mtintsilana, IDC	E-Mail		No comment received at this stage	K. Mtintsilana, IDC
Thukela Mashologu, IDC	E-Mail		No comment received at this stage	Thukela Mashologu, IDC
Thandokazi KetshanganeIDC	E-Mail		No comment received at this stage	Thandokazi KetshanganeIDC
Vuyani Dudula , ECDC	E-Mail		No comment received at this stage	Vuyani Dudula , ECDC
I Henderson, Working for Fire	E-Mail		No comment received at this stage	I Henderson, Working for Fire

I&AP	Method	Date	Issue	Response
Tafandzwa, DTI	E-Mail		No comment received at this stage	Tafandzwa, DTI
Sinelindiwe Zanethemba, DEFF	E-Mail		No comment received at this stage	
Libhongo, ECSECC	E-Mail		No comment received at this stage	
Norman Dlamini, Forestry South Africa	E-Mail		Dear Ayanda  Thanks for the reminder, we will surely go through the report and give you the necessary feedback. On a different note, can you perhaps share with us the reasons that made the Mrhotshozweni community lose interest in the development?	Good Day Mr Dlamini,  The Mrhotshozweni community members declined the proposed development due to the reasons stated below  (which were voiced at the public participation meeting)

I&AP	Method	Date	Issue	Response
			<p>This might help us in assisting communities in the future and also avoid unnecessary expenditure while directing our limited resources appropriately.</p> <p>Kind regards, Norman</p>	<p>.</p> <ul style="list-style-type: none"> <li>• They informed us that they were not aware of the project and some were not even living there during the initial stages of the proposal as it was proposed a long time ago (2012).</li> <li>• The community claimed that the person that communicated with Sappi and DAFF and chose the site, did not contact and communicate with the rest of the community</li> </ul>

I&AP	Method	Date	Issue	Response
				<ul style="list-style-type: none"> <li>• They stated that most of the members that signed the register in 2011/12 had died.</li> <li>• Some members emphasised that they should have been approached when the initial decisions were taken and the lands were selected for the plantations.</li> <li>• They claimed that they would have chosen alternative lands and not the lands selected.</li> </ul> <p>There was a complaint about the land being used by the cattle as grazing land and that</p>

I&AP	Method	Date	Issue	Response
				<ul style="list-style-type: none"> <li>• their cattle had no alternative land to utilize.</li> <li>• They also mentioned that they initially lived on those lands and that there were many family grave sites on the proposed area and they did not want to relocate them.</li> <li>• The community members stated that forests will increase rape cases in the area as many people use the proposed site as a crossing area to go to schools and the local clinic.</li> </ul>



I&AP	Method	Date	Issue	Response
				<ul style="list-style-type: none"> <li>• They also stated that crime rates will increase as the thieves will have a place to hide.</li> </ul> <p>The community members therefore did not support the project proposal and thus declined the development all together.</p> <p>I hope this answers your question.</p> <p>Kind regards.</p>

I&AP	Method	Date	Issue	Response
			<p>Dear Ayanda</p> <p>Thanks for your prompt and comprehensive response. It gives us ideas on how to prevent this from happening in the future.</p> <p>Kind regards,</p> <p>Norman</p>	
Nathi Ndlela, Forestry South Africa	E-Mail		No comment received at this stage	
Luvuyo Sandi, SEDA - CPPP	E-Mail		No comment received at this stage	
Lizna Fourie, DWA	E-Mail		Please send the attachment as I did not received it in the previous email. Apologies as we had a lot	Good Day Lizna,

I&AP	Method	Date	Issue	Response
			of issues with emails in our Department  Regards  Lizna Fourie	Please find the attached document for the Malangeni and Bhukazi Afforestation (plantation) project. I shall await your comments and suggestions.  Kind regards.
O. Notobela, Environmental Affairs	E- Mail		No comment received at this stage	
O Siganga, ORTDM	E-Mail		No comment received at this stage	
F E Sobantu, Disaster Management	E-Mail		No comment received at this stage	
T Sigwebo, ORTDM Health	E-Mail		No comment received at this stage	
L Mboyi, ECPTA-N2	E-Mail		No comment received at this stage	
A Morai, DRDLR	E-Mail		No comment received at this stage	

<b>I&amp;AP</b>	<b>Method</b>	<b>Date</b>	<b>Issue</b>	<b>Response</b>
M. Myolwa	E-Mail		No comment received at this stage	
S Swelindawo,	E-Mail		No comment received at this stage	
M Langa, ECPTA	E-Mail		No comment received at this stage	
B Nodola,	E-Mail		No comment received at this stage	
N Ntola, DEDEA	E-Mail		No comment received at this stage	
Z Nkomfana	E-Mail		No comment received at this stage	
S Dakwa	E-Mail		No comment received at this stage	
L Ndobeni, DEDEA	E-Mail		No comment received at this stage	
S Mhatu, ECPTA	E-Mail		No comment received at this stage	
J Ngaphu,	E-Mail		No comment received at this stage	
N Dubedube, ECPTA	E-Mail		No comment received at this stage	
B Ngebulana, DMR	E-Mail		No comment received at this stage	
S C Gexu	E-Mail		No comment received at this stage	
N Songxaba, NRA	E-Mail		No comment received at this stage	
D Mtati, DEFF	E- Mail		No comment received at this stage	

I&AP	Method	Date	Issue	Response
Bheki Kunene, DWA	E-Mail		No comment received at this stage	
Zama Memela, DRDLR	E-Mail		No comment received at this stage	
N Lugetye, ORTM	E-Mail		No comment received at this stage	
S G Gexu, DEFF:IHLM	E-Mail		No comment received at this stage	
T N Dlamini, ECPTA	E-Mail		No comment received at this stage	
A Mbarane, IHLM	E-Mail		No comment received at this stage	
Khaya G Gqwabasa, DEDEAT	E-Mail		No comment received at this stage	
V Silo, DEDEA	E-Mail		No comment received at this stage	

## **11. ENVIRONMENTAL IMPACT ASSESSMENT**

The following section identifies the potential environmental impacts (both positive and negative) which the construction as well as operational phases of the proposed project will have on the surrounding environment.

Once the potential environmental impacts are identified, they are assessed by rating their Environmental Risk after which the final Environmental Significance is calculated and rated for each identified environmental impact.

The same Environmental Risk rating process is then followed for each environmental impact to determine the Environmental Significance if the recommended mitigation measures were to be implemented.

The objective of this section is therefore firstly to identify all the potential environmental impacts of the proposed project and secondly to determine the significance of the impacts and how effective the recommended mitigation measures will be able to reduce their significance. The potential environmental impacts which are still rated as highly significant, even after implementation of mitigations, can then be identified in order to specifically focus on implement of effective management strategies for them.

### **11.1 IMPACT ASSESSMENT AND RISK RATING**

The tables below indicate and explain the methodology and criteria used/to be used for the evaluation of the Environmental Risk Ratings as well as the calculation of the final Environmental Significance Ratings of the identified potential environmental impacts. Each potential environmental impact is scored for each of the Evaluation Components as per the table below.

The summary tables of the impacts are shown below in the impacts matrix. These tables show only the impacts after mitigation has been implemented. It is the summary of the whole project not the individual sites.

Further than the EAP's assessment of impacts, the discussion in this section have been informed by specialist studies undertaken. Specific site characteristics are taken into consideration when evaluating the impacts of the proposed activities.

Aspects/activities and their specific impacts are listed under four defined development phases and the no-go option.

Table 11: Development phases

Preparation and pre planting	Planting phase	Development phase	Harvesting phase	No-go option
<b>Flora</b>				
Loss of virgin grassland	Loss of plant biodiversity	Loss of indigenous vegetation	Damage to surrounding vegetation other than the commercial trees	Continued environmental degradation
Loss of species of special concern	Damage to seedlings	Effects of herbicide and pesticide on non-target areas and species		Opportunity to rehabilitate the vegetation are
Loss of plant biodiversity		Fire risk - build-up of brush wood		
Alien/exotic plant invasion				
<b>Fauna</b>				
Loss of grazing land for cattle	No impacts predicted	New habitats for animals	Noise	Habitats remain the same
Loss of habitat for wildlife		Effects of herbicide and pesticide on non-target species	Road kill due to increased traffic activity	Land maintained for grazing
Loss of IBA habitats				
<b>Biophysical</b>				

Soil compaction	Reduction in stream flow due to water use for seedlings	Surface erosion and donga formation	Soil compaction from heavy vehicles and machinery	Continued erosion and land degradation
<b>Preparation and pre planting</b>	<b>Planting phase</b>	<b>Development phase</b>	<b>Harvesting phase</b>	<b>No-go option</b>
Change in hydrology/water loss	Herbicide runoff into streams	Soil compaction	Further damage of surrounding vegetation	Wetland conditions remain the same
Land and water body contamination from use of herbicides and pesticides		Change in surface hydrology	Noise from the on-site activities	Visual aspect remains the same
Soil carbon loss		Soil carbon loss	Vehicle fumes	
		Damage to surrounding roads due to increased traffic		
<b>Socio-economic</b>				
Job creation	Job creation	Job creation	Job creation	Loss of employment opportunities
Increase in land value	Health and safety of workers and public	Health and safety of workers and public	Health and safety of workers and public	Loss of economic development opportunities
Health and safety of workers and public				
Contribution to region's economy				
<b>Heritage</b>				



Disturbance of heritage resources	Disturbance of heritage resources	Reduced or no access to graves	Disturbance of heritage resources	Maintenance of current status of heritage resources
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## 11.2 METHODOLOGY FOR IMPACT ASSESSMENT AND RISK RATING

### 11.2.1 Evaluating the Significance of Impacts

All impacts were ranked according to 4 criteria. These include: (1) the severity of the impact, (2) the size or area over which the impact is likely to occur, (3) the timescale or period over which the impact will remain and lastly (4) the likelihood of the impact occurring. Each of these criteria is rated on a scale of 1 to 10, with 1 being the least severe, smallest area, smallest timescale and least likely and a score of 10 being the most severe, largest area, largest timescale and most likely.

Low			Moderate				High		
1	2	3	4	5	6	7	8	9	10

Table 12: Evaluation and significance of impacts

	Low	Moderate	High
Severity	Slight impact, e.g. a few isolated indigenous trees lost due to the activity.	Moderate impact, e.g. a section of indigenous trees lost from a forest due to the activity.	Severe impact, all indigenous trees in a forest lost due to the activity.
Size / Area	Localized, affecting only a small area of the site.	Larger area affected, possibly covering most of the site and areas immediately adjacent to the site.	Regional impact, with the whole site and areas far from the site being affected.
Timescale	Temporary impacts, lasting a few weeks to a few months (less than a year).	Temporary impacts lasting from a few months to less than 5 years.	Long lasting impacts, lasting more than 5 years to permanent impacts.

Likelihood	Impacts are not very likely.	Impacts are possible.	Impacts are defined
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Impacts may be either negative or positive. Negative impacts are those that negatively affect the environment as a consequence of the development. These impacts should be avoided or the effects reduced to a level that is as low as possible by implementing mitigation measures.

Positive impacts are those impacts that have a positive effect on the environment. The positive impacts therefore improve the environment and these should be enhanced as far as possible.

The impacts, whether positive or negative, are scored on a scale between 1 and 10, with 1 being a lowest possible impact and 10 being the highest possible impact. The scores for the four criteria, i.e. temporal, spatial, severity and likelihood, are then averaged to give the ranking. The ranking is calculated as follows: (Temporal Score) + (Spatial Score) + (Severity Score) + (Likelihood Score) / 4

All negative impacts are shown in the red shaded tables, while all positive impacts are shown in the green shaded tables. Examples of these tables are shown below.

### Example

Table 13: Description of negative impacts

Negative impacts					
	Score				Ranking
	Temporal	Spatial	Severity	Likelihood	
Before Mitigation	5	3	7	9	6
After Mitigations	3	3	4	6	4

Table 14: Description of positive impacts

Negative impacts					
	Score				Ranking
	Temporal	Spatial	Severity	Likelihood	
Before Mitigation	5	3	7	9	6
After Mitigations	3	3	4	6	4

The activities that will take place during this phase will be similar in both sites. Therefore, the impacts of activities will be generic. However, there will be unique impacts if there are unique activities that will take place in certain sites. These will be dealt with under each sub-heading of this section.

#### 11.3.1.1 Flora

The impacts on vegetation during the planning and pre-planting phase of the project will be slightly negative. This is due to minimum activities that will take place, together with the footprint of those activities. During this phase, impacts will be related to removal of vegetation during construction, generation of dust and emissions, search and rescue of rare and endangered species, demarcating / fencing of plantation area.

##### *Removal of indigenous vegetation:*

*Impact:* Indigenous vegetation will be lost directly through the construction of access roads / plantation roads to and within the site. These impacts will be of low severity as considering that both these sites have been historically plough lands and already have access roads. These access roads are two-track roads and thus there is no need of developing new roads. Considering that these plough lands have been lying fallow for a very long time, these access roads have been overgrown with grass. That is why we rate the impact to be of low severity instead of no impact.

*Mitigation:* By only clearing overgrown woody vegetation along the two-track roads, loss of natural vegetation will be minimal. However, along these roads search and rescue of rare and endangered species should be carried out before any road upgrading commences.

*Protection of rare and endangered species:*

*Impact:* Rare and endangered species may be discovered on site.

*Mitigation:* Prior to any construction / upgrading of access roads, search and rescue will locate any rare or endangered species, which may then be relocated to a suitable location for protection and / or further study.

*Alien vegetation:*

*Impact:* Alien vegetation will be eradicated while constructing / upgrading access roads. Any alien vegetation within or along access roads / plantation roads will be cleared. However the impact of their removal is viewed to be positive as these species are alien and their removal is contributing positively to conservation activities.

*Mitigation:* There is no mitigation suggested.

*Dust and emissions:*

*Impact:* Dust and emissions generated during construction may cause air pollution, although the amount of dust generated will be low and will be no different to dust generated by surrounding dirt roads.

*Mitigation:* By adhering to normal driving speed, the dust generation and emissions may be kept to a minimum, thereby reducing the negative effects.

### **11.3.1.2 Fauna**

*Barrier to animals:*

*Impact:* Site fencing may act as a barrier to animal movement. This may cause negative impacts to herdsman and the animals themselves. No large wildlife (which would be impacted by fences) was observed on site.

*Mitigation:* A buy-in from the community to change their movements while herding animals will be necessary.

*Terrestrial fauna:*

*Impact:* Animals may be harmed / killed during construction / upgrading of access roads. No reptiles and mammals were observed on site during any site visits, therefore the impact on animals should remain low.

*Mitigation:* During search and rescue, all slow moving animals, such as tortoises, should be relocated to a safe site. All workers should be inducted in the importance of not harming animals. This will form part of pre-work environmental induction of all workers on site. Noise should be reduced to a low level by keeping all plant serviced and in good running order.

*Aquatic fauna:*

*Impact:* Increased silt loading of streams and rivers, due to soil erosion as a result of road upgrading / construction, may harm or kill aquatic fauna. The impact should be low as there will be limited road construction on site, mainly two-track roads.

*Mitigation:* Silt fences should be installed in drainage lines from site and any areas where soil erosion seems likely.

### **11.3.1.3 Physical environment**

*Loss of soil:*

*Impact:* Soil may be lost due to poor practices during road upgrading / construction. However, considering that these will be two-track roads, this impact will be minimal.

*Mitigation:* No mitigation measure is proposed.

*Soil contamination:*

*Impact:* Soil may be contaminated by hydrocarbons due to leaks or spills from vehicles and plant.

*Mitigation:* Roadworthy machinery should be used.

*Water quality:*

*Impact:* Site preparation activities may cause soil erosion, which may lead to higher silt loads of water in streams and rivers, thereby reducing the water quality.

*Mitigation:* Install silt-traps in drainage lines or areas where soil erosion is perceived to be exacerbated.

#### **11.3.1.4 Socio-economics**

*Conflict:*

*Impact:* The promise of jobs may lead to conflict between communities, within communities and between communities and the forestry companies / road construction companies.

*Mitigation:* There should be ongoing discussions between the land owners/developers and communities regarding jobs, with as many jobs as possible being given to local community members. Neighbouring communities should be consulted in discussions if they will be directly affected by the forestry project.

*Living standards:*

*Impact:* Jobs will lead to additional income for the community, which may lead to improved living conditions. In addition, income may lead to new business ventures, which may in turn lead to additional income.

*Mitigation:* No mitigation is proposed

*Noise:*

*Impact:* Construction related noise from vehicles and plant engaged in construction / upgrading of access roads may disturb people.

*Mitigation:* All vehicles should remain in good running condition and should be serviced regularly. Activities should only be carried out during normal working hours to minimize disturbance of people, especially over weekends and public holidays.

*Dust and emissions:*

*Impact:* Dust and emissions generated by construction vehicles may cause air pollution which may negatively impact people, either by causing health problems related to dust or as an irritation.

*Mitigation:* Measures should be enforced to limit the amount of dust generated, such as watering all site areas where vegetation has been stripped and not undertaking activities that generate excessive dust on windy days. All vehicles should be serviced regularly to minimize the amount of emissions. Also, work should be avoided during windy days.

#### **11.3.1.5 Heritage resources**

*Disturbance:*

*Impact:* Construction related activities such as driving of vehicles engaged in construction / upgrading of access roads may disturb graves and old homesteads that have been identified.

*Mitigation:* All heritage resources should be fenced off with palisade fencing or equivalent with a lockable gate at a radius of 10m. This fencing should remain in good condition, monitored and be serviced regularly. Activities should only be carried out during normal working hours to minimize disturbance of people, especially over weekends and public holidays. All Grave Sites occurring between 1 – 30m outside of the proposed site must be demarcated with fencing or equivalent with a lockable gate. A radius of at least 20m should be allowed between all graves and the plantation. All Grave Sites occurring between 31 – 60m should be demarcated with Chain link fencing or equivalent at 10m radius with a lockable gate.

*Conflict:*

*Impact:* If activities take place near the vicinity of the graves, conflict may arise between the family members of those graves and plantation developers or the forestry companies / road construction companies.

*Mitigation:* There should be ongoing discussions and clear communication between the land owners/developers and family members of the graves.

The ranking of various impacts during the planning or pre-planting phase is reflected below

Table 15: Planning, Pre Planting phase

Planning, Pre Planting phase								
	Impact	Mitigation	Score				Rank	
			Temporal	Spatial	Severity	Likelihood		
Flora	Loss of Virgin Grassland	Before	1	1	1	1	1	
		After	1	1	1	1	1	
	Protection	Before	6	1	1	5	3.25	
		After	8	1	1	8	4.5	
	Alien/ exotic Plant removal	Before	4	1	4	6	3.75	
		After	8	1	1	5	4.75	
	Dust	Before	2	1	1	4	2	
		After	1	1	1	1	1	
	<b>Planning, Pre Planting Phase</b>							
		Impact	Mitigation	Score				Rank
			Temporal	Spatial	Severity	Likelihood		
	Harm/Kill Terrestrial	Before	2	1	2	2	1.75	
		After	1	1	1	1	1	
	Harm/Kill Aquatic	Before	1	1	1	1	1	
		After	1	1	1	1	1	
	Soil Loss	Before	2	1	2	3	2	



<b>Physical Environment</b>		After	1	1	1	1	1
	Soil Pollution	Before	1	1	1	1	1
		After	1	1	1	1	1
	Water Quality	Before	2	2	2	2	2
		After	1	1	1	1	1
<b>Socio Economics</b>	Conflict	Before	3	3	3	5	3.5
		After	2	3	2	2	2.25
	Improved Living	Before	3	3	3	4	3.25
		After	3	3	3	4	3.25
	Noise	Before	2	2	2	3	2.25
		After	2	2	1	2	1.75
	Dust	Before	2	2	2	3	2.25
		After	2	2	1	2	1.75
<b>Heritage Resources</b>	Disturbance of resources	Before	8	1	7	4	5
		After	1	1	1	4	1.75
	Conflict	Before	8	1	8	4	5.25
		After	1	1	1	4	1.75

From this assessment it is clear that the pre-planting negative impacts. This is because there will be vehicles driving on site. Also, there might be fences installed on site. However, the severity of these impacts is on the lower side. The positives are that the vegetation that will be fenced will be protected from outside impacts such as grazing and harvesting. Further, there will be people employed in the project. This employment will have positive impacts to their living standards.

### 10.3.2 Planting Phase Impacts

This phase includes the planting of trees and all work associated with that, such as fertilizing the ground, pest control and fire belt establishment / maintenance.

Table 16: Malangeni site planting phase impacts and mitigation measures

<b>Impact</b>	<b>Mitigation</b>	<b>Impact</b>	<b>Mitigation</b>
<b>Flora</b>			
<i>Removal of indigenous veg</i>		<i>Protection of rare endangered species</i>	
The site is in a good condition. Destruction of indigenous vegetation especially along drainage lines will have a negative impact to vegetation	<ul style="list-style-type: none"> <li>• Do not clear vegetation where it is not absolutely necessary</li> <li>• Perform search and rescue operation</li> <li>• Clearing should as per the planting plan</li> </ul>	The destruction of any protected species will have a negative impact on the environment.	Perform search and rescue operations prior planting
<i>Alien vegetation</i>		<i>Dust and emissions</i>	
There are invasive alien plants that were observed on site, clearing them will be a positive impact	No mitigation required	Air pollution may be caused by the tree-planting process, dust will be minimal low negative impact	Avoid windy days
<b>Fauna</b>			
<i>Barrier to animals</i>		<i>Terrestrial Fauna</i>	
Plantation is not perceived to prevent free animal movement of animals, it is the planning phase that will cause this	No mitigation suggested	No large wildlife that may be prevented by fences observed on site. Therefore, no negative impact is perceived	No mitigation suggested
<b>Biophysical</b>			
<i>Loss of soil</i>		<i>Soil contamination</i>	
There are dongas on site. Soil erosion may be exacerbated by the planting activities	<ul style="list-style-type: none"> <li>• Confine clearing to demarcated areas</li> <li>• Install gabions on the existing dongas</li> </ul>	Fuel leaks and spills from equipment and plant may cause soil pollution	Use equipment and plant that is roadworthy
<b>Water quality</b>			

Soil erosion has a potential of silting up rivers and streams	Install silt traps on drainage lines		
<b>Socio-economic</b>			
<i>Conflict</i>		<i>Living standards</i>	
No impact is envisaged	No mitigation is suggested	Employment opportunities will have a positive impact of improvement of living standards	No mitigation proposed
<i>Noise</i>			
Construction vehicles may cause noise which may impact negatively to people (low impact)	All vehicles should be maintained and kept in good running condition		
<b>Heritage</b>			
Grave sites that exists outside the perimeter of the plantation area may be disturbed by the plantation activities	A 50m buffer should be maintained between the grave site and the		

Table 17: Bhukazi Site impacts and mitigation measures

Impact	Mitigation	Impact	Mitigation
<b>Flora</b>			
<i>Removal of indigenous veg</i>		<i>Protection of rare endangered species</i>	
Currently there is ploughing occurring at some parts of the site	Do not clear vegetation where it is not absolutely necessary	No rare and endangered species observed on this site. So no impact is perceived	No mitigation required
<i>Alien vegetation</i>		<i>Dust and emissions</i>	

There are no invasive alien plants that were observed on site.	No mitigation required	Air pollution may be caused by the tree-planting process, dust will be minimal low negative impact	• Avoid windy days
<b>Fauna</b>			
<i>Barrier to animals</i>		<i>Terrestrial Fauna</i>	
Plantation is not perceived to prevent free animal movement of animals, it is the planning phase that will cause this	No mitigation suggested	No large wildlife that may be prevented by fences observed on site, therefore no negative impact perceived.	No mitigation suggested
<b>Biophysical</b>			
<i>Loss of soil</i>		<i>Soil contamination</i>	
There are dongas on site. Soil erosion may be exacerbated by the planting activities	<ul style="list-style-type: none"> <li>• Confine clearing to demarcated areas</li> <li>• Install gabions on the existing dongas</li> </ul>	Fuel leaks and spills from equipment and plant may cause soil pollution	Use equipment and plant that is roadworthy
<b>Water quality</b>			
Soil erosion has a potential of silting up rivers and streams	<ul style="list-style-type: none"> <li>• Install silt traps on drainage lines</li> </ul>		
<b>Socio-economic</b>			
<i>Conflict</i>		<i>Living standards</i>	
No impact is envisaged	No mitigation is suggested	Employment opportunities will have a positive impact of improvement of living standards	No mitigation proposed
<b>Noise</b>			

Construction vehicles may cause noise which may impact negatively to people (low impact)	All vehicles should be maintained in good running condition		
<b>Heritage</b>			
No impact envisaged	No mitigation required		

Table 18: Planting Phase

Planting Phase							
	Impact		Score				Rank
			Temporal	Spatial	Severity	Likelihood	
<b>Flora</b>	Loss	Before	9	4	3	10	6.5
		After	7	3	2	7	4.75
	Protection	Before	4	3	4	7	4.5
		After	4	3	4	7	4.5
	Alien removal	Before	7	3	5	6	5.25
		After	9	6	8	8	7.75
<b>Fauna</b>	Barrier	Before	6	4	2	3	3.75
		After	6	3	1	2	3
	Harm/Kill Terrestrial	Before	3	2	2	3	2.5
		After	2	2	1	2	1.75
	Harm/Kill Aquatic	Before	3	2	2	3	2.5
		After	2	1	1	1	1.25
<b>Physical Environment</b>	Water Quality	Before	3	2	2	3	2.5
		After	2	1	1	1	1.25
	Soil Loss	Before	3	2	2	3	2.5
		After	2	1	1	2	1.5
	Soil Contamination	Before	3	2	3	3	2.75
		After	2	1	2	2	1.75

<b>Socio Economics</b>	Conflict	Before	1	1	1	1	1
		After	1	1	1	1	1

	Living Standards	Before	3	3	3	4	3.25
		After	4	4	4	6	4.5
	Noise	Before	2	2	2	4	2.5
		After	2	2	1	2	1.75
	Dust	Before	2	2	2	4	2.5
		After	2	2	1	2	1.75
<b>Heritage Resources</b>	Disturbance of resources	Before	8	1	7	4	5
		After	1	1	1	4	1.75
	Conflict	Before	8	1	8	4	5.25
		After	1	1	1	4	1.75

During the planting phase, this project will have a high negative impact to the environment. The greatest impact will be to the indigenous vegetation. This is because the planting process will involve the clearing of vegetation which will be permanently lost to the system. Although there were no wildlife observed on these sites, it is envisaged that there will be negative impacts as small animals such as hares and mice might move away. However, this will be temporal as they will have a potential of moving back to the site. Jobs will be created and land value will increase.

### 10.3.3 Developing Phase

#### Development Phase Impacts

If the proposed mitigations are adhered to, the impacts during this phase will be similar in both sites. This is because, during this phase the main activity is the management of the planted trees. This is the phase when the trees grow, but before they are harvested. This phase will include fertilizing, pest control, fire-belt maintenance, control of alien vegetation from the plantation, weeding within the plantation, maintenance of access and internal plantation roads.

### 11.3.3.1 Flora

*Alien vegetation control:*

*Impact:* The spread of alien vegetation that may be triggered by the afforestation project will be controlled during the development phase. At this phase if the trees planted are not properly managed, they can escape and lead to alien plant invasion.

*Mitigation:* The spread of alien vegetation will be controlled within all buffer areas and within fire belts. This will help minimize the chance of spread of alien vegetation to surrounding areas. The area should be mechanically or hand weeded periodically, which will further control weeds and alien vegetation.

*Alien vegetation spread:*

*Impact:* Alien vegetation may spread from the plantation to surrounding areas during the development phase.

*Mitigation:* Continuous checks of weeds within the 100m distance from the perimeter of the site boundary should be done annually. Identified seedlings should be weeded immediately, which will minimise the opportunities of establishment.

### **11.3.3.2 Fauna**

*Use of pesticides:*

*Impact:* Pesticides may kill other animals, not only those that are targeted by the pesticides. In addition, pesticides could enter streams and rivers, thereby harming or killing aquatic fauna.

*Mitigation:* As far as possible, the use of pesticides should be avoided. Organic pesticides are preferred to inorganic ones. If inorganic pesticides are used, they should be used in non-windy days to minimise opportunities of spread beyond the trees targeted.

### **11.3.3.3 Physical environment**

*Water quality:*

*Impact:* Use of pesticides and fertilizers may result in reduced water quality. Hydrocarbon spillages may pollute streams and rivers.

*Mitigation:* Correct nozzles of knapsacks and other equipment utilised to spray should be used. Aerial sprays should be avoided.

*Soil contamination:*

*Impact:* Use of pesticides and fertilizers could negatively affect soil quality. Hydrocarbon spillages may pollute the soil.

*Mitigation:* Comply with the mitigations proposed under “use of pesticides” and “water quality”. Further, fertilizers should not be applied during rainy days

*Soil Erosion*

*Impact:* The afforestation project could trigger soil erosion due to various activities that will take place on site.

*Mitigation:* There should be a soil erosion monitoring program on each site. If there are signs of soil erosion taking place, prevention mechanisms should be applied. If this erosion is taking place in sheet form, grasses should be planted in eroding areas. If the erosion is in channel form, silt traps should be installed in those channels forming.

#### **11.3.3.4 Socio-economics**

*Conflict:*

*Impact:* The promise of jobs may lead to conflict between communities, within communities and between communities and the forestry companies / road construction companies.

*Mitigation:* There should be ongoing/continuous discussions between land owners and communities regarding jobs, with as many jobs as possible being given to local community members. Neighbouring communities should be consulted if they are directly affected by the forestry project.



*Living standards:*

*Impact:* Jobs will lead to additional income for the community, which may lead to improved living conditions. In addition, income may lead to new business ventures, which may in turn lead to additional income.

*Mitigation:* The local community should receive preference with allocation of jobs.

*Noise:*

*Impact:* Noise from vehicles, plant and machinery engaged in the maintenance of fire belts may disturb people.

*Mitigation:* All vehicles and machinery should remain in good running condition and be serviced regularly.

*Dust and emissions:*

*Impact:* Dust and emissions generated by vehicles may impact on people, either by causing health problems related to dust or as an irritation.

*Mitigation:* All vehicles should be serviced regularly to minimize the amount of emissions. Speed limits should be enforced on all plantation roads to minimize the amount of dust generated

### **11.3.3.5 Heritage**

*Disturbance:*

*Impact:* Maintenance related activities such as driving of vehicles engaged in maintenance operations may disturb graves and old homesteads that have been identified.

*Mitigation:* No Driving should be allowed within the buffer zone of the graves

*Impact:* Seedlings of invasive alien plants may recruit within the heritage sites and in the buffer zone.

*Mitigation:* There should be a continuous maintenance of the buffer zone and the heritage sites such that there is no invasive alien plants seedlings that recruit in them.

*Conflict:*

*Impact:* If activities take place near the vicinity of the graves, conflict may arise between the family members of those graves and plantation developers or the forestry companies / road construction companies.

*Mitigation:* There should be ongoing discussions between the land owners/developers and family members of the graves.

The ranking of potential impacts during the development phase is reflected below

Table 19: Development Phase

Development Phase							
	Impact		Score				Rank
			Temporal	Spatial	Severity	Likelihood	
Flora	Alien Control	Before	5	3	5	9	5.5
		After	9	4	3	3	4.75
	Alien Spread	Before	6	4	4	4	4.5
		After	5	3	2	2	3
Fauna	Pesticides	Before	4	4	4	5	4.25
		After	3	3	3	3	3
	Safe Habitat	Before	4	4	3	4	3.75
		After	7	5	4	7	5.75
Physical Environment	Soil Contamination	Before	3	2	3	4	3
		After	2	1	2	2	1.75
	Water Quality	Before	3	2	2	3	2.5
		After	2	1	1	1	1.25
	Conflict	Before	3	3	3	5	3.5

<b>Socio Economics</b>		After	2	2	2	3	2.25
	Living Standards	Before	3	3	3	5	3.5
		After	4	4	4	7	4.75
	Noise	Before	2	2	2	4	2.5
		After	2	2	1	2	1.75
	Dust	Before	2	2	2	4	2.5
		After	2	2	1	2	1.75
	<b>Heritage Resources</b>	Disturbance of resources	Before	8	1	7	4
After			1	1	1	4	1.75
Conflict		Before	8	1	8	4	5.25
		After	1	1	1	4	1.75

The development stage will also have negative impacts to the environment. The greatest impacts will be due to application of pesticides and herbicides. These are chemicals that would not have been existing naturally to the environment. As a result their application might have soil and air pollution impacts. The positives at this stage are that there will be increased vigilance to the management of invasive alien plants. Considering that the management plan talks to the clearing of all invasive alien plants within a 100m perimeter of the site, it is envisaged that this clearing will not only be focusing on the invasive plants that would have escaped from the plantations, but all invasive alien plants in the prescribed perimeter. It is further envisaged that the plantation of trees will introduce a different habitat that will be advantageous to fauna neighbouring the site. Trees are attractive to a wide diversity of birds. Considering that sites will not be planted wall to wall, this means even grassland species will still exist on the sites as birds that would have been observed flying out during the planting phase, will fly back. Further, insects such as bees, wasps and butterflies will probably use the trees that will have been planted. So, habitat change will have positive impact to diversity of fauna. Jobs will be created and health and safety of workers will be a priority.

#### 11.3.4 Harvesting Phase

Harvesting Phase Impacts

This is the phase when the trees have reached the required stage to be harvested. This includes cutting down the trees, de-branching and removal of harvested trees from site. In addition, this phase may include control of alien vegetation from the plantation and maintenance of fire belt.

#### **11.3.4.1 Flora**

*Damage to natural vegetation:*

*Impact:* Natural vegetation surrounding the plantation or within buffer zones / drainage lines, may be damaged during harvesting of trees.

*Mitigation:* All plantation personnel should remain within the confines of the plantation while harvesting trees. Environmental induction of all personnel must include the importance of protecting natural vegetation.

#### **11.3.4.2 Fauna**

*Animals harmed or killed:*

*Impact:* Personnel working to harvest trees may harm or kill animals.

*Mitigation:* No animals (birds, reptiles, mammals or aquatic fauna) may be harmed by plantation personnel.

#### **11.3.4.3 Physical environment**

*Water quality:*

*Impact:* Hydrocarbon spillages may cause pollution of water in streams and rivers.

*Mitigation:* All plant and machinery used during the harvesting phase should be road worthy.

*Soil pollution:*

*Impact:* Hydrocarbon spillages may pollute soils.

*Mitigation:* All plant and machinery used during harvesting phase should be regularly serviced and road worthy.

#### **11.3.4.4 Socio-economics**

*Conflict:*

*Impact:* The promise of jobs may lead to conflict between communities, within communities and between communities and the forestry companies / road construction companies.

*Mitigation:* There should be ongoing discussions between land owners and communities regarding available jobs, with as many jobs as possible being given to local community members. Neighbouring communities should be consulted if they are directly affected by the forestry project.

*Living standards:*

*Impact:* Jobs will lead to additional income for the community, which may lead to improved living conditions. In addition, income may lead to new business ventures, which may in turn lead to additional income.

*Mitigation:* The local community should receive preference with allocation of jobs.

*Noise:*

*Impact:* Noise from chainsaws, vehicles, plant and other machinery may disturb people.

*Mitigation:* All vehicles and machinery should remain in good running condition and be serviced regularly. No work should be done outside working hours

*Air quality:*

*Impact:* Dust and emissions generated by vehicles and machinery may impact on people, either by causing health problems related to dust / emissions or as an irritation.

*Mitigation:* All vehicles and machinery should be serviced regularly to minimize the amount of emissions. Speed limits should be enforced on all plantation roads to minimize the amount of dust generated.

*Waste:*

*Impact:* Waste materials, such as bark and small branches, may be used for the benefit of the community.

*Mitigation:* Small branches and bark may be used by the community to create mulch, or may be used in a local a charcoal industry.

#### 11.3.4.5 Heritage

*Disturbance:*

*Impact:* Harvesting related activities such as driving of vehicles engaged in harvesting operations may disturb graves and old homesteads that have been identified.

*Mitigation:* No driving should be allowed within the buffer zone of the graves

*Conflict:*

*Impact:* If activities take place near the vicinity of the graves, conflict may arise between the family members of those graves and plantation developers or the forestry companies / road construction companies.

*Mitigation:* There should be ongoing discussions between the land owners/developers and family members of the graves.

Table 20: Harvesting Phase

Harvesting Phase							
	Impact		Score				Rank
			Temporal	Spatial	Severity	Likelihood	
Flora	Vegetation Damage	Before	2	2	2	4	2.5
		After	2	2	1	2	1.75

<b>Fauna</b>	Harm/Kill	Before	4	4	3	3	3.5
		After	3	3	2	2	2.5
<b>Physical Environment</b>	Soil Contamination	Before	3	2	2	3	2.5
		After	2	1	1	1	1.25
	Water Quality	Before	3	2	2	3	2.5
		After	2	1	1	1	1.25
<b>Socio Economics</b>	Conflict	Before	3	3	3	5	3.5
		After	2	2	2	3	2.25
	Living Standards	Before	3	3	3	4	3.25
		After	4	4	4	6	4.5
	Noise	Before	2	2	2	4	2.5
		After	2	2	1	2	1.75
	Air Quality	Before	2	2	2	4	2.5
		After	2	2	1	2	1.75
	Water Recycling	Before	3	3	3	4	3.25
		After	4	4	4	6	4.5
<b>Heritage Resources</b>	Disturbance of resources	Before	8	1	8	4	5.25
		After	1	1	1	4	1.75
	Conflict	Before	8	1	8	4	5.25
		After	1	1	1	4	1.75

The harvesting phase is also dominated by negative impacts. However, their rank is less than the development phase. The major reasons are that this is the time the heavy machinery will be working on site. Also this is the period when the habitat that would have been created is now destroyed. As a result the fauna that would have colonised that “new” habitat will now be extirpated. Jobs will be created and the health and safety of workers and the community members will be a priority.

### 10.3.5 No Go Alternative

No-Go Alternative

#### **10.3.5.1 Flora**

*Loss of and damage to natural vegetation:*

*Impact:* Natural vegetation will continue to be at the current state. No drastic change expected as the land use will remain as current.

*Protection of natural vegetation:*

*Impact:* There will be no protection of natural vegetation as there is currently no protection of it.

*Alien vegetation eradication:*

*Impact:* There will be no programme to remove alien vegetation from site.

#### **11.3.5.2 Fauna**

*Barrier to animals:*

*Impact:* There will be no barriers to animal movement as no roads will be constructed, no trees planted and no fences erected.

*Animals harmed or killed:*

*Impact:* No animals will be harmed or killed by vehicles.

#### **11.3.5.3 Physical environment**

*Water quality / quantity:*

*Impact:* Impact on rivers will remain as it is at present. The plantation activities present a threat of topsoil loss causing water quality to be reduced as a result of silt loading.

*Soil loss:*

*Impact:* The chances of soil loss could be regarded as higher with the “No-go” alternative as there will be no programme to monitor soil erosion.



*Soil contamination:*

*Impact:* There will be less chance of soil contamination with the “No-go” alternative as there will be no increased vehicle usage in the area and no additional use of pesticides or fertilizers.

#### 11.3.5.4 Socio-economics

*Conflict:*

*Impact:* There may be a chance for conflict as there will be more people competing for limited income without the commercial forestry project.

*Improved living standards:*

*Impact:* Living standard will probably remain static or worsen without the forestry project.

*Noise:*

*Impact:* The nuisance of noise on the community will not occur.

Table 21: No Go Alternative

No Go Alternative						
	Impact	Score				Rank
		Temporal	Spatial	Severity	Likelihood	
Flora	Vegetation Loss	5	3	3	3	3.5
	Protection	1	1	1	1	1
	Alien Removal	1	1	1	1	1
Fauna	Barrier	1	1	1	1	1
	Harm/Kill	1	1	1	1	1
Physical Environment	Soil Contamination	1	1	1	1	1
	Soil Loss	3	3	2	3	2.75
	Water Quality/Quantity	2	2	2	2	2
Socio Economics	Conflict	3	2	2	3	2.5
	Living Standards	1	1	1	1	1
	Noise	1	1	1	1	1

	Air quality/Health	1	1	1	1	1
<b>Heritage Resources</b>	Disturbance of resources	1	1	1	1	1
	Conflict	1	1	1	1	1

The “No-go” option is when the status quo remains. Loss of Jobs and loss of economic development opportunities.

## 12. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The processes of investigation which have led to the production of this report, harbours several assumptions, which include the following:

- All information provided by the applicant and his/her assistants to the environmental team was correct and valid at the time that it was provided;
- Strategic level investigations undertaken determined that the development sites represent a potentially suitable and technically acceptable location;
- The public received a fair and sufficient opportunity to participate in the Draft Scoping process, through the provision of adequate public participation timeframes stipulated in the Regulations;
- The need and desirability was based on strategic national, provincial and local plans and policies which reflect the interests of both statutory and public viewpoints;
- The information provided by specialists needs to be accurate and unbiased;
- The Scoping process is a project-level framework and is limited to assessing the anticipated environmental impacts associated with the construction and operational phases of the proposed facility
- Strategic level decision making is conducted through cooperative governance principles with the consideration of sustainable and responsible development principles underpinning all decision making. Given that an EIA involves prediction, uncertainty forms an integral part of the process. Two types of uncertainty are associated with the EIA process, namely process-related and prediction-related.

- Uncertainty of prediction is critical at the data collection phase as final certainty will only be obtained upon implementation of the proposed development. Adequate research, experience and expertise may minimise this uncertainty;
- Uncertainty of values depicts the approach assumed during the Scoping process, while final certainty will be determined at the time of decision making. Enhanced communication and widespread/comprehensive coordination can lower uncertainty;
- Uncertainty of related decision relates to the interpretation and decision making aspect of the EIA process, which shall be appealed once monitoring of the project phases is undertaken.
- The significance/importance of widespread/comprehensive consultation towards minimising the risk/possibility of omitting significant impacts is further stressed. The use of quantitative impact significance

The significance/importance of widespread/comprehensive consultation towards minimising the risk/possibility of omitting significant impacts is further stressed. The use of quantitative impact significance rating formulas (as utilised in this document) can further standardise the interpretation of results and limit the occurrence and scale of uncertainty.

### **12.1 Gaps in knowledge can be attributed to:**

The EIA process is being undertaken prior to the availing of certain information which would be derived from the final project design and layout. As such, technical aspects included herein are mainly derived through personal communication with the applicant and the project manager.

The potential impacts of the cultivation induced soil hydrology and fertility changes on the protected species individuals which are not removed from site is also uncertain to a degree. It is envisaged that an adequate buffer should minimise the risk of such changes potentially impacting on the longevity of these protected individuals.

The principle of human nature also provides for uncertainties with regards to the identified socio-economic impacts of the proposed development.

Ezendalo Environmental Consultants is an independent environmental consulting firm and as such, all processes and attributes of the EIA are addressed in a fair and unbiased/objective manner. It is believed that through the running of a transparent and participatory process, risks associated with assumptions, uncertainties and gaps in knowledge can be and have been acceptably reduced.

### **13. EIA PHASE**

#### **13.1 EIA PHASE**

The EIA phase has four key elements, namely: -

- **Specialist Studies:** After the authority review of the Final Scoping Report, additional specialist studies may be requested by the authorities, and these will be undertaken during the initial phase of the EIA. Appropriately qualified and experienced specialists will be appointed to undertake the various assessments. Specialists will gather baseline information relevant to the study being undertaken and will assess impacts associated with the development. Specialists will also make recommendations to mitigate negative impacts and enhance benefits. The resulting information will be synthesised into the Environmental Impact Report (EIR), whilst the full specialist reports will be attached to the EIR as a Specialist Volume.
- **Environmental Impact Report (EIR):** The main purpose of this report is to gather and synthesise environmental information and evaluate the overall environmental impacts associated with the development, to consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIR also identifies mitigation measures and management recommendations to minimise negative impacts and enhance benefits. The EIR and associated specialist reports are made available for public and authority review and comment. The availability of the report will be

advertised in one provincial and/or one local newspaper and the report will also be made available for public review in easily accessible locations.

- **Comments Report:** The comments report (or an Issues & Response Trail (IRT)) provides a detailed record of comments, issues and concerns raised by I&APs and the authorities during the review period, and also provides relevant responses to these comments.
- **Environmental Management Programme (EMPr):** The EMPr provides guidelines to the project proponent and the technical team on how best to implement the mitigation measures and management recommendations outlined in the EIR during the construction and operational phase.
- In addition to the above, the Public Participation Process (PPP) commenced during the Scoping Phase will be continued, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the proposed project. It is possible that some of the project details may have changed in response to the preliminary findings of the Scoping Report, and as a result of design changes made by the project proponent. I&APs and key stakeholders are given the opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs are included and addressed in the submitted EIR.

### **13.2 Assessment Methodology**

Although specialists, should they be required, will be given relatively free rein on how they conduct their research and obtain information, they will be required to provide their reports to the EAP in a specific layout and structure, so that a uniform specialist report volume can be produced. To ensure a direct comparison between various specialist studies, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed.

Four factors need to be considered when assessing the significance of impacts, namely:

1) Relationship of the impact to **temporal** scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

2) Relationship of the impact to **spatial** scales - the spatial scale defines the physical extent of the impact.

3) The severity of the impact - the **severity/beneficial** scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party.

The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.

4) The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident) and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Each criterion is ranked to determine the overall effect of an activity. The criterion is then considered in two categories namely the effect of the activity and the likelihood of the impact in order to determine its overall significance. The overall significance is either negative or positive.

The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this

reason, impacts of especially a social nature need to reflect the values of the affected society.

Negative impacts that are ranked as being of “**VERY HIGH**” and “**HIGH**” significance will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These impacts may also assist decision makers (i.e. several **HIGH** negative impacts may bring about a negative decision).

For impacts identified as having a negative impact of “**MODERATE**” significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as “**LOW**” significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

### **13. PROFESSIONAL OPINION OF THE EAP AND ENVIRONMENTAL IMPACT STATEMENT**

#### **13.1 PROFESSIONAL OPINION OF THE EAP**

After careful consideration of the findings and outcomes during the Scoping phase, Ezendalo Environmental Consultants is of the opinion that the full Environmental Impact Assessment (EIA) phase of this proposed project should be allowed to continue in order to comprehensively evaluate the potential impacts vs benefits associated with this proposed project and conclude on the project’s final viability.

### 13.2 Declaration by the EAP

I, Ayanda Matiwane

declare that:

- I act as the independent environmental practitioner in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this report are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



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Signature of the EAP:

Ezendalo Environmental Consultants

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Name of company (if applicable):

30 August 2020

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Date:



## **14. RECOMMENDATIONS AND CONCLUSION**

### **14.1 Recommendations**

It is recommended that the following activities form part of the EIA phase:

- Public Participation: public meetings, focus group meetings, public review of documentation;
- Consultation with I&APs regarding possible significance of impacts and suitable mitigation measures;
- Evaluation of impacts prior to mitigation;
- Compilation of practicable and effective mitigation measures;
- Evaluation of impacts after mitigation;
- Provision of an opinion as to whether or not the activity should be authorised;
- Compilation of an environmental impact statement; and
- Compilation of a Draft EMPr.

### **14. 2 CONCLUSION**

In conclusion, although there are a number of potential issues to be addressed in the proposed project, no other environmental fatal flaws were identified during the Scoping Phase. A detailed Environmental Impact Assessment is therefore recommended to further investigate, assess and conclude on these potential issues and the appropriate mitigation measures required.

The objective of the Scoping Phase is to define the range of the impact assessment in order to proceed to the Environmental Impact Assessment Phase. It is believed that this objective has been achieved and adequately documented in the Scoping Report.

It is therefore recommended that this Final Scoping Report be accepted and that the Project of Malangeni Extension and Bhukazi plantations be allowed to proceed to the next phase of EIAR.

## 15. REFERENCES

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National Environmental Management Act (Act 107 of 1998)

National Environmental Management Act (Act 107 of 1998); Environmental Impact Assessment Regulations, 2014

National Environmental Management: Biodiversity Act (Act 10 of 2004)

National Environmental Management: Waste Act (Act 59 of 2008)

National Forests Act (Act 84 of 1998)

National Heritage Resources Act (Act 25 of 1999)

National Water Act (Act 36 of 1998)

## **APPENDIX A – CURRICULUM VITAE OF THE EAP**

# CURRICULUM VITAE

AYANDA MATIWANE

E-mail: [ayandamatiwane91@gmail.com](mailto:ayandamatiwane91@gmail.com)/ [ayanda@ezendalo.co.za](mailto:ayanda@ezendalo.co.za)

Tel: 043 760 0165/ 078 827 3985

## Personal Details

Title	Ms
Name	Ayanda Matiwane
ID Number	910217054082
Gender	Female
Employment Equity	Black
Drivers Licence	Code 8

## Brief Profile

	<p>Matiwane Ayanda completed a Bachelor's Degree in Environmental Sciences (Environmental Geography) at the University of the Free State, which she enrolled for due to a keen interest in the field of natural, earth and environmental sciences. Ms. Matiwane also completed a BSc Honours degree in Environmental Management at the University of South Africa, and is currently studying an MSc degree in Environmental Science at the University of KwaZulu Natal. Ayanda is a person who works smart, learns fast and strives towards precision and accuracy. Ms. Matiwane has 6 years of environmental consulting experience, as she is a director in an Environmental Consultants Company.</p>
--	--

## Key Strengths

	<p>Driven, Goal orientated, assertive, accountable and responsible, hands on work approach, self-starter, fast learner and team player</p>
--	--

## Languages

English	Speak, read and write
Afrikaans	Speak, read and write
IsiXhosa	Speak, read and write

IsiZulu	Speak, read and write
Sesotho	Speak and read

### Education

Qualification	MSc Environmental Science (current)
Institution	University of KwaZulu Natal

Qualification	BSc Hons Environmental Management
Institution	University of South Africa

Qualification	BSc Environmental Geography
Institution	University of Free State

Qualification	Senior Certificate
Institution	Port Rex Technical High School

### Association Membership

Association Membership
<ol style="list-style-type: none"> <li>1. SACNASP: South African Council for Natural Scientific Professionals (119146)</li> <li>2. IAIASA: International Association for Impact Assessment South Africa (5445)</li> <li>3. SAIOSH: South African institute of Occupational Safety and Health (50686499)</li> <li>4. EAPASA: Environmental Assessment Practitioners Association of South Africa</li> </ol>

### Courses Attended

- Certificates/Seminars/Internal Training

Year	Duration	Course	Institution
2019	3 days	Atmospheric remote sensing education and training	UKZN
2019	1 day	Waste legislation training programme	Institute of waste management South Africa (IWMSA)
2018	3 days	Atmospheric remote sensing education and training	UKZN

Year	Duration	Course	Institution
2018	1 week	Health and Safety workshop	SAIOSH-PE
2017	2 days	Environmental quality management forum	DEDEAT
2015	1 day	EIA 2014 legal regime workshop	Imbewu sustainability legal specialist
2015	1 week	EIA Regulations workshop	AURECON

## Work Experience

Period	2016-present
Current Position	<b>Senior Environmental Scientist</b>
Present Company	Ezendalo Environmental Consultants
Responsibilities	<p>Implementation of the National environmental management act, EIA regulations.</p> <p>Compilation of Environmental Impact Assessment Reports.</p> <p>Compilation of Environmental Implementation Plans.</p> <p>Environmental Management and compilation of Environmental Management Programmes.</p> <p>Waste Management</p> <p>Compilation of basic Assessment Reports.</p> <p>Compilation of Environmental Awareness campaigns.</p> <p>Compiling Strategic Environmental Control.</p> <p>Undertaking research relating to environmental impact assessments.</p> <p>Assisting with site visits and collation of data and capturing such data.</p> <p>Analysing data and translate information into environmental reports.</p> <p>Conducting stakeholder engagements.</p> <p>Conducting any other duties that will enhance my understanding of the environmental management and equip me with necessary skills.</p> <p>Conducting site visits.</p> <p>Environmental Auditing.</p> <p>Report Writing.</p>
Most significant Project	<p>EIA for road upgrades and taxi rank- Mnquma Local Municipality</p> <p>Libode Waste Water Treatment Works-O R Tambo District Municipality</p> <p>EIA for Malangeni, Mrhotshozweni and Bhukazi forest plantations- Ingquza Hill Local Municipality</p> <p>Waste Management for the Thuma Mina Green Deeds Project</p>

Period	2016
Position	<b>Environmental Scientist</b>
Company Name	SPM Environmental Consulting
Responsibilities	<p>Implementation of EIA regulations.</p> <p>Compilation of Environmental Impact Assessment Reports.</p> <p>Compilation of Environmental Implementation Plans.</p> <p>Compilation of Environmental Management Programmes.</p> <p>Compilation of basic Assessment Reports.</p> <p>Compilation of Environmental Awareness campaigns.</p> <p>Compiling Strategic Environmental Control.</p> <p>Undertaking research relating to environmental impact assessments.</p> <p>Assisting with site visits and collation of data and capturing such data.</p> <p>Conducting site visits.</p> <p>Environmental Auditing.</p> <p>Report Writing.</p> <p>Tender Documentation.</p>
Most significant Project	<p>Mdantsane road upgrades environmental control</p> <p>EIA Sithukuthezi to Mandlebetshe- Mbizana Local Municipality</p> <p>Flagstaff cemetery subdivision- Ingquza Hill Local Municipality</p>

Period	2015
Position	<b>Junior Consultant</b>
Company Name	SPM Environmental Consulting
Responsibilities	<p>Assisting with site visits and collation of data and capturing such data.</p> <p>Conducting site visits.</p> <p>Environmental Auditing.</p> <p>Report Writing.</p> <p>Tender Documentation.</p>
Most significant Project	<p>EIA for the erection of telecommunication masts</p> <p>EIA for Siphaheni access road</p> <p>EIA for Mdozingeni access road and bridge</p>



## Profile of work

Nyandeni Local Municipality	Employed by Nyandeni Local Municipality for Ndayini Access Road & Bridge Structure designs.
Mbizana Local Municipality	I have conducted a Basic Assessment for Sithukuthezo to Mandlebetshe access road and o crossing two structures and Water use license application to get authorization from Department of Economic Economic Development, Environmental Affairs and Tourism and (DEDEAT) and Department of Water f of Water Affairs. I also conducted a Basic Assessment for Ntshikitshane to Bukuveni Access Road.
Buffalo City Metro Municipality	Conducted Environmental Management Control for the construction of Mdantsane Roads Upgrades for Upgrades, cluster 1 Phase 2 and Cluster 3 Phase 2. SPM is also providing Social Facilitation Services for the construction of Reeston Waste Water Treatment Works. SPM has also completed business plans for the Duncan Village Revitalization business plan.
Ingquza Hill Local Municipality	Full EIA for Malangeni, Mrhotshozweni and Bhukazi forest extension in Lusikisiki under the Ingquza Hill Local Municipality. Full EIA for a Cemetery Subdivision in Flagstaff under the Ingquza Hill Local Municipality. I have also been involved in the EIA process for the Siphaqeni Access Roads and Bridges.
O R Tambo District Municipality	Environmental authorization process for the Good Shepherd Private School in Lusikisiki. Environmental control Officer for Libode Waste Water Treatment Works
Mnquma Local Municipality	EIA for Streets surfacing, construction of taxi rank, access road upgrades Occupation Health and Safety Social Facilitation
Chris Hani District Municipality	Waste Management for the Thuma Mina Green Deeds Project.
Buchule Engineers	Basic Assessment for a Filling Station in Flagstaff, Ingquza Hill Local Municipality.
Chulethu Consulting Engineers	EIA services for Mdozingana construction of an access road.
Mount Ayliff Telecom Masts	EIA for telecommunication masts in Ngqinibeni and Ntshongo in Mount Ayliff and Mount Frere.

Owemihle Pty Ltd	EIA application for telecommunication masts.
------------------	--

### Technical Work Experience

	GIS
	MS Office
	Windows
	MS Word
	Excel

### References

Contact person:	Miss A.I Sontsele
Position:	Director SPM Environmental Consulting
Contact details:	078 267 0192
Contact person:	Mr S Madubela
Position:	Mnquma PMU Manager
Contact details:	073 604 1845
Contact person:	Mr X. Madikizela
Position:	Director Vitsha Civils/SPM
Contact details:	082 481 3362

# EAPASA

Unit 19 Oxford Office Park  
3 Bauhinia Street  
Highveld Techno Park  
Centurion  
0157

Environmental Assessment  
Practitioners Association  
of South Africa

*Advancing environmental assessment practice in South Africa*



VAT : 429 028 4958 REG : 122- 986 NPO

## INVOICE

### INVOICE TO :

Ayanda Matiwane  
9286 NU-3  
Mdantsane  
East London  
5219  
Eastern Cape

**Doc No:** 387/19  
**Acc No:** 2019/1755  
**Terms:** 14 Days  
**Date:** 25 Oct 2019

### Description

Description	Quantity	Unit Price	Total
Application fee to be Registered as an EAP	1	1,304.35	1,304.35

### BANKING DETAILS :

ACCOUNT HOLDER: EAPASA  
BANK: NEDBANK  
BRANCH CODE: 198 765  
ACCOUNT NUMBER: 104-509-8701

Sub total R 1,304.35  
VAT @ 15% R 195.65

Total Amount Payable

**R 1,500.00**

**herewith certifies that**

**Ayanda Matyeni**

Registration Number: 119146

**is a registered scientist**

in terms of section 20(3) of the Natural Scientific Professions Act, 2003  
(Act 27 of 2003)  
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Candidate Natural Scientist)

Effective **6 June 2018**

Expires **31 March 2021**



*Botha*

Chairperson

*M. J. ...*

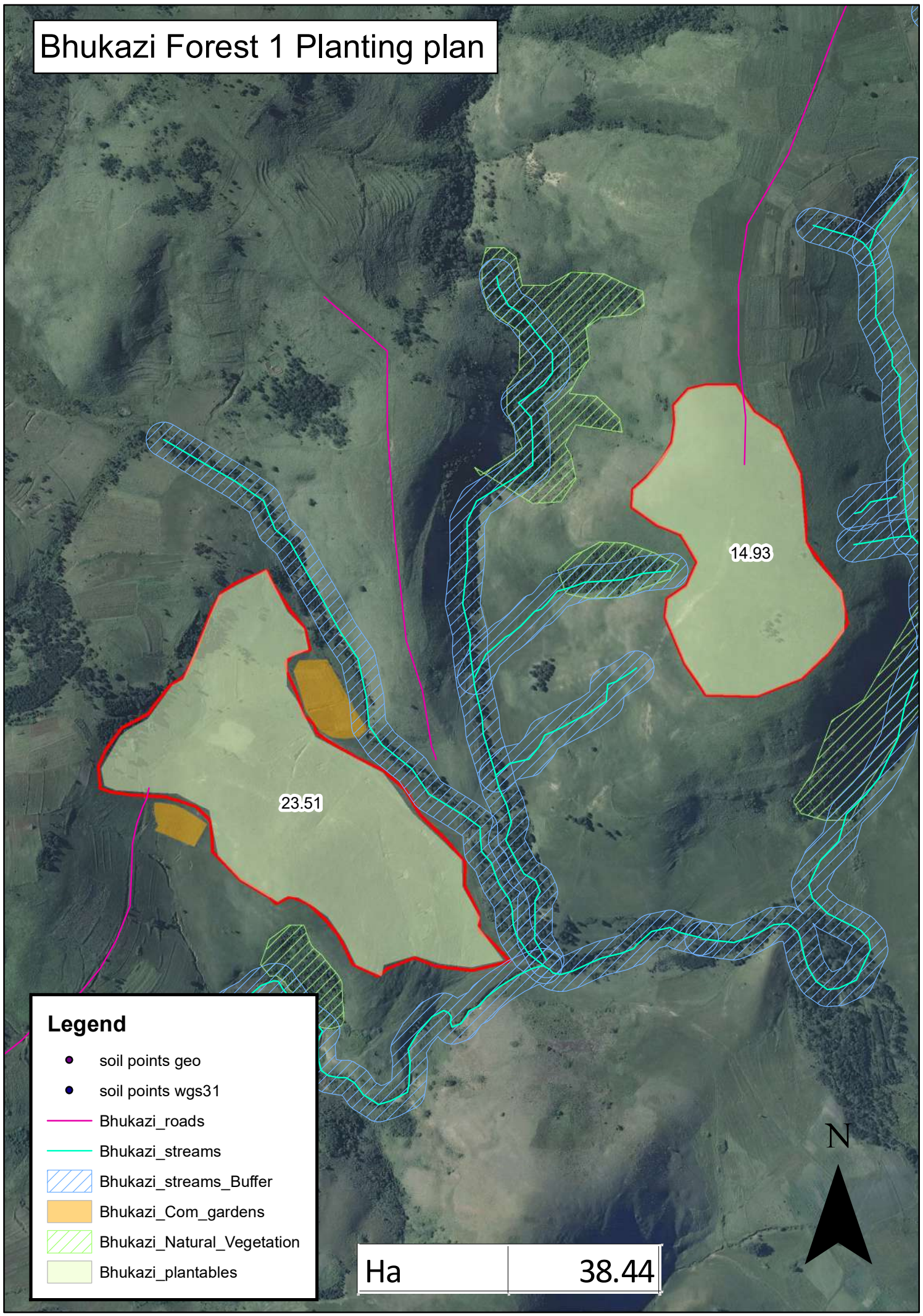
Chief Executive Officer



## **APPENDIX B – PROJECT MAPS**

## LOCALITY MAPS

# Bhukazi Forest 1 Planting plan

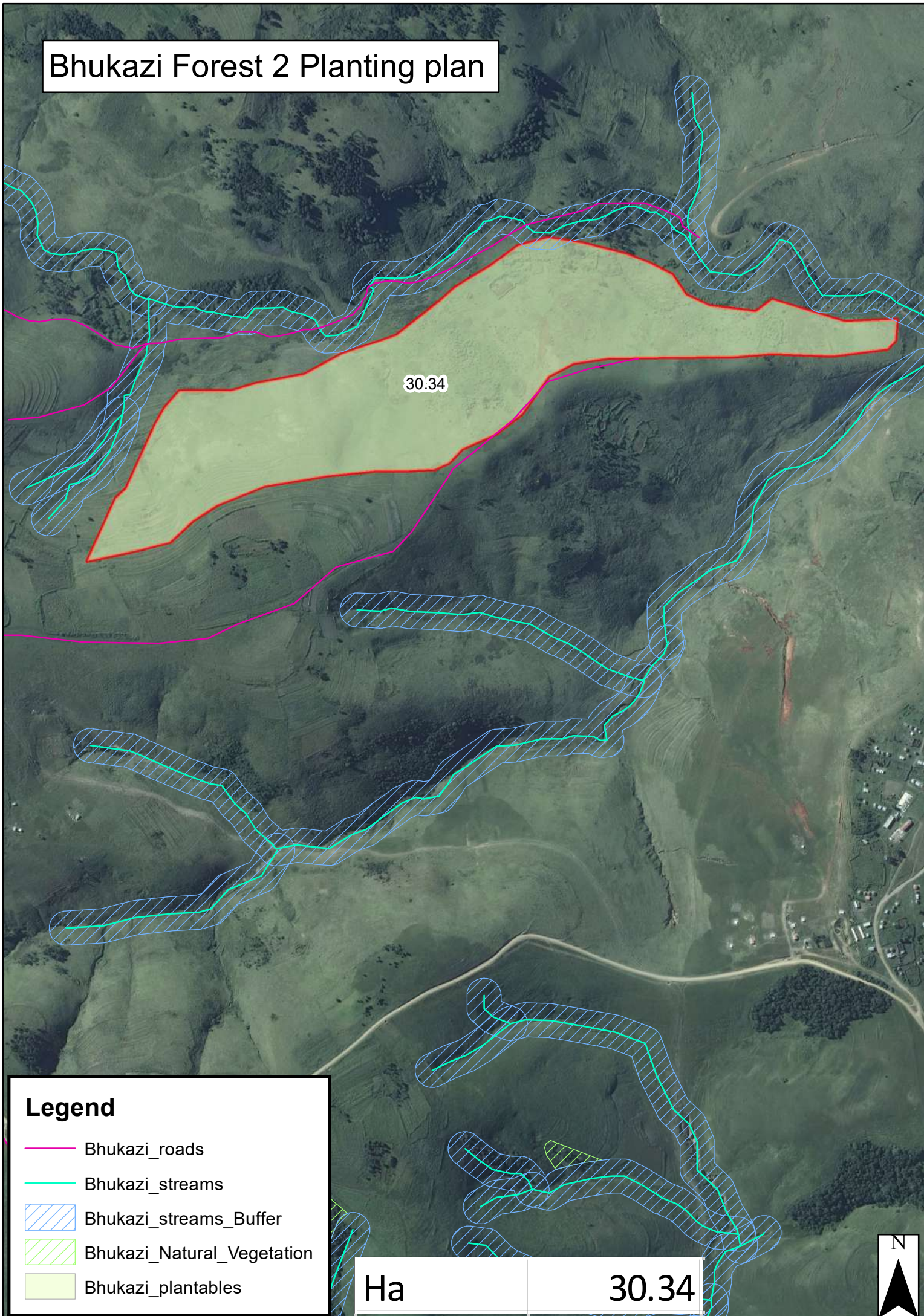


## Legend

- soil points geo
- soil points wgs31
- Bhukazi\_roads
- Bhukazi\_streams
- ▨ Bhukazi\_streams\_Buffer
- Bhukazi\_Com\_gardens
- ▨ Bhukazi\_Natural\_Vegetation
- Bhukazi\_plantables

Ha 38.44

# Bhukazi Forest 2 Planting plan



30.34

Ha 30.34

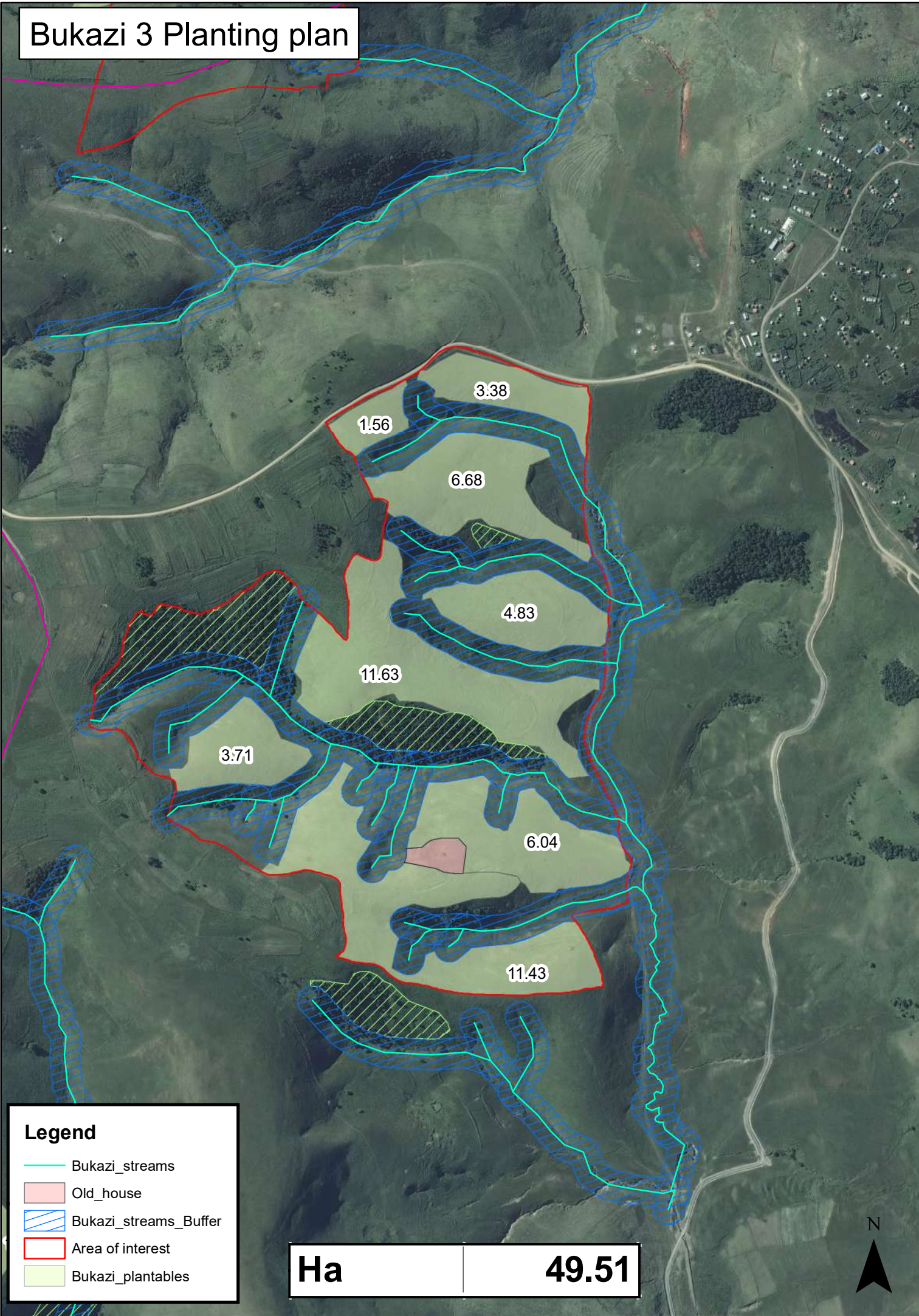
**Legend**

- Bhukazi\_roads
- Bhukazi\_streams
- Bhukazi\_streams\_Buffer
- Bhukazi\_Natural\_Vegetation
- Bhukazi\_plantables










# Bukazi 3 Planting plan



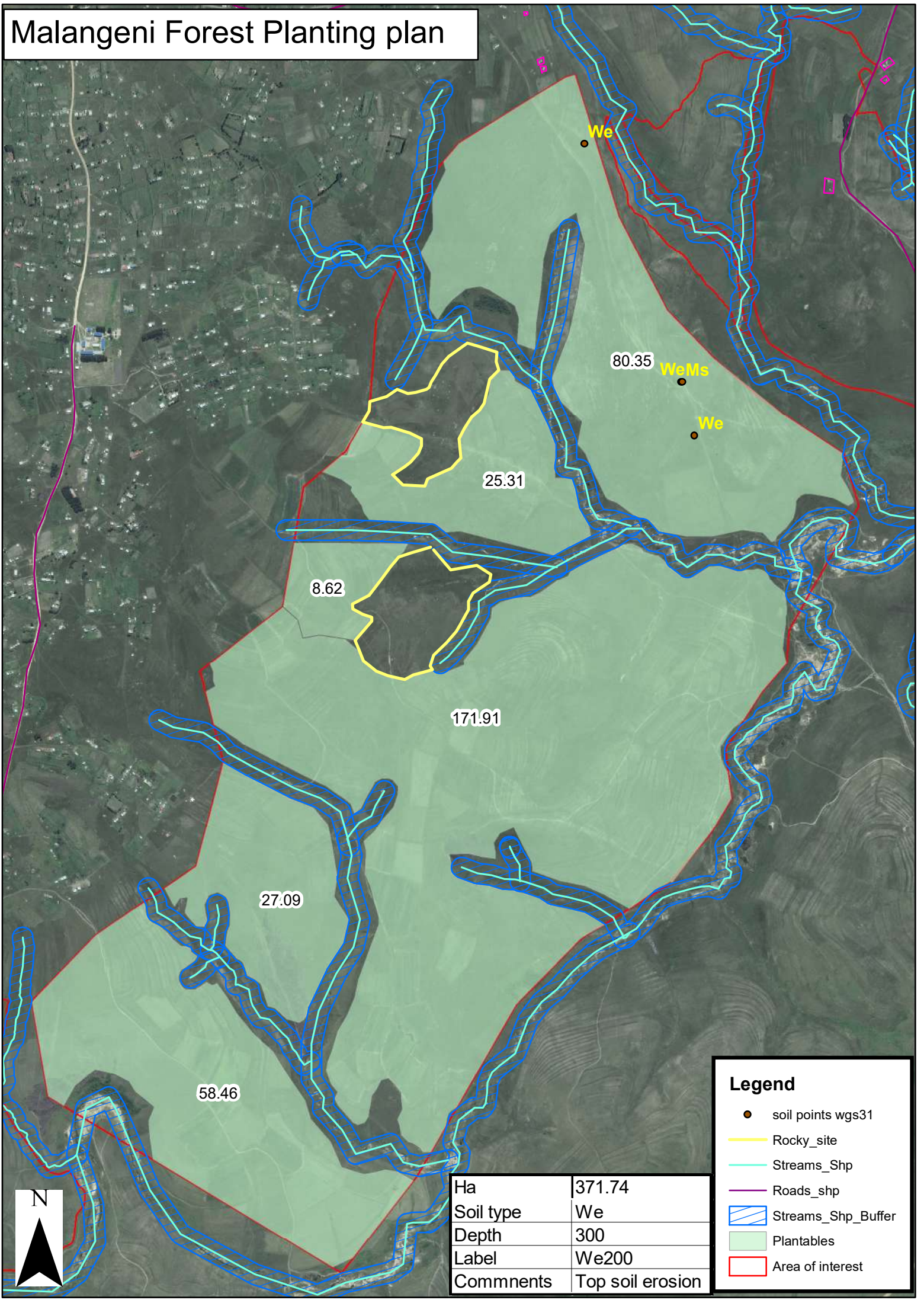
## Legend

-  Bukazi\_streams
-  Old\_house
-  Bukazi\_streams\_Buffer
-  Area of interest
-  Bukazi\_plantables

**Ha** | **49.51**



# Malangeni Forest Planting plan



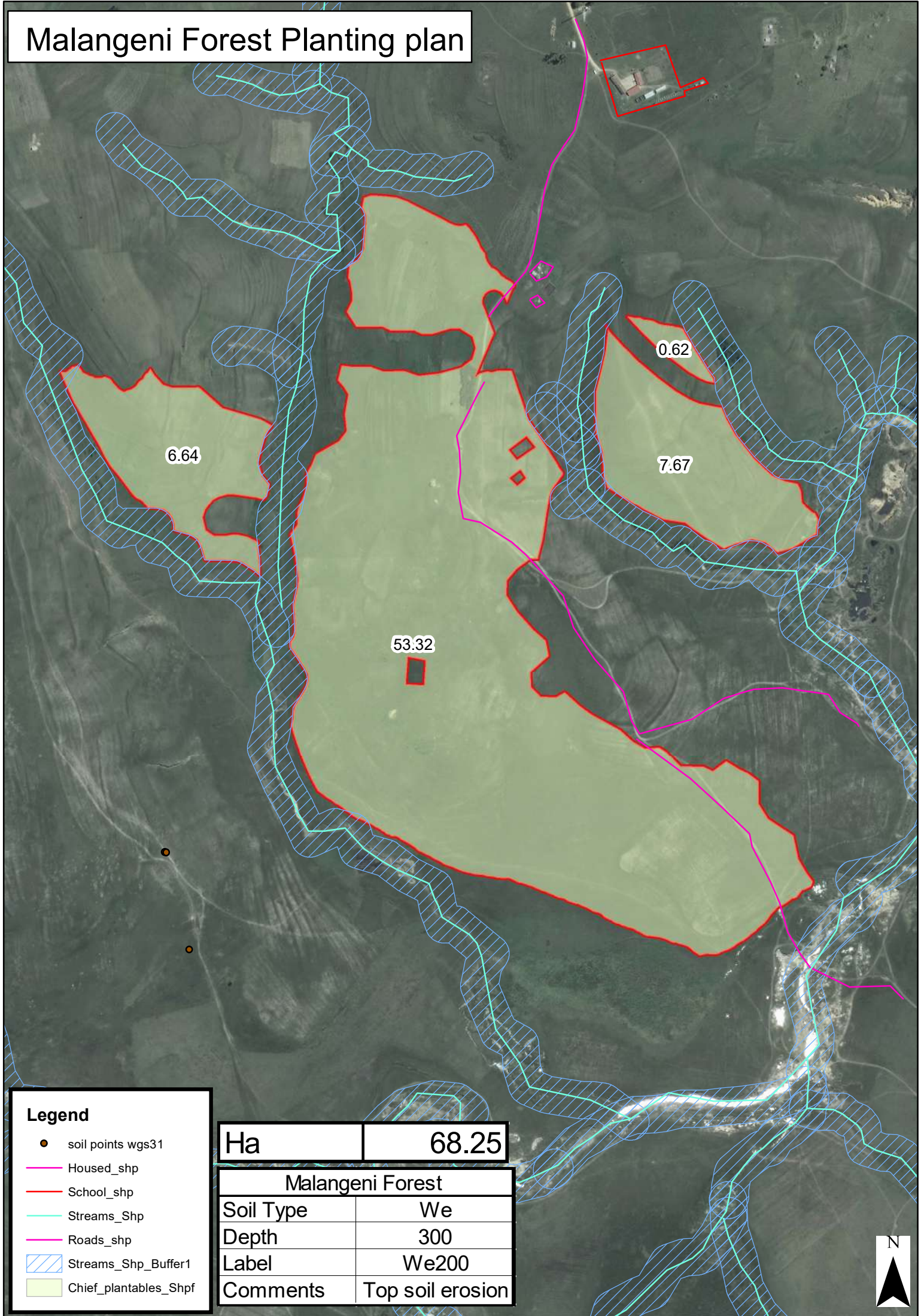
Ha	371.74
Soil type	We
Depth	300
Label	We200
Comments	Top soil erosion

**Legend**

- soil points wgs31
- Rocky\_site
- Streams\_Shp
- Roads\_shp
- ▨ Streams\_Shp\_Buffer
- Plantables
- ▭ Area of interest



# Malangeni Forest Planting plan



## Legend

- soil points wgs31
- Housed\_shp
- School\_shp
- Streams\_Shp
- Roads\_shp
- Streams\_Shp\_Buffer1
- Chief\_plantables\_Shp

Ha	68.25
----	-------

Malangeni Forest	
Soil Type	We
Depth	300
Label	We200
Comments	Top soil erosion



## **SENSITIVITY MAPS**




















## Bukazi Forest Plantations

### Description

Bukazi Forest Plantations



### Legend

-  Primary river catchments
  -  Secondary river catchments
  -  Tertiary river catchments
  -  Quarternary river catchment
- National soils - soil classes**
-  Association of Classes 1 to 4: Undifferentiated structureless soils
  -  Association of Classes 13 and 16: Undifferentiated shallow soils and land classes
  -  Association of Classes 17 and 18: Structureless soils and land classes
  -  Association of Classes 17 and 19: Structureless and textural contrast soils
  -  Association of Classes 17 and 20: Structureless and poorly drained soils
  -  Association of Classes 17 and 21: Structureless soils, podzols and land classes
  -  Association of Classes 17 and 9: Structureless soils and podzols
  -  Association of Classes 5, 6, 10, 11, 12: Undifferentiated texture contrast soils
  -  Association of Classes 8 and 15: Undifferentiated poorly drained soils
  -  Dark clay soils which are not strongly swelling
  -  Dark clay soils, often shallow, on hard or weathering rock
  -  Freely drained, structureless soils
  -  Imperfectly drained sandy soils
  -  Imperfectly drained soils, often shallow and often with a plinthic horizon
  -  Lithosols (shallow soils on hard or weathering rock)
  -  No dominance
  -  Non soil land classes

1: 18 056

























0,9 0 0,46 0,9 Kilometers

# Bhukazi Forest Plantations

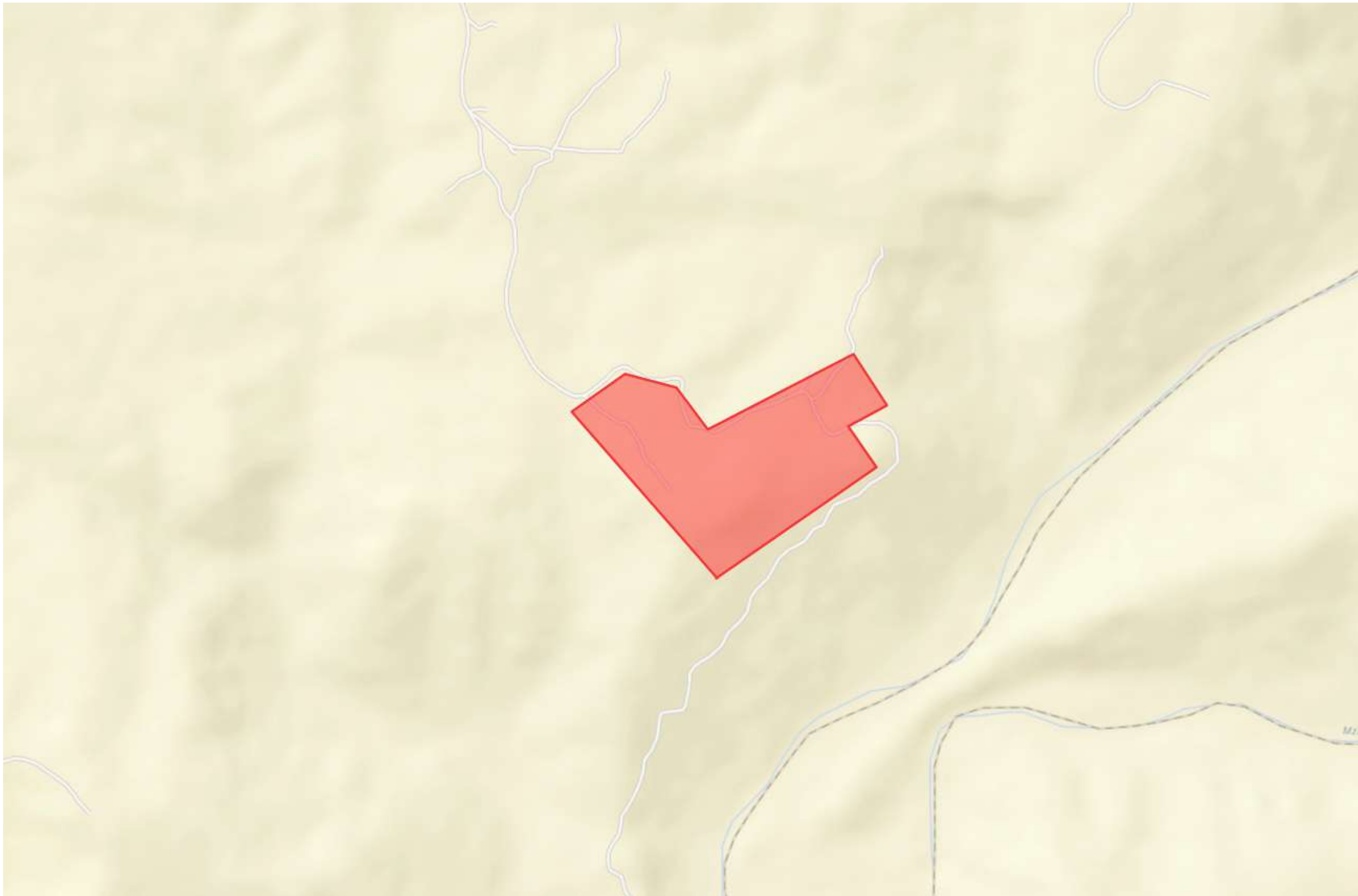
## Description

Bhukazi Forest Plantations

## Legend

-  Primary river catchments
  -  Secondary river catchments
  -  Tertiary river catchments
  -  Quarternary river catchment
- National soils - soil classes**
-  Association of Classes 1 to 4: Undifferentiated structureless soils
  -  Association of Classes 13 and 16: Undifferentiated shallow soils and land classes
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  -  Association of Classes 17 and 19: Structureless and textural contrast soils
  -  Association of Classes 17 and 20: Structureless and poorly drained soils
  -  Association of Classes 17 and 21: Structureless soils, shallow soils and land classes
  -  Association of Classes 17 and 9: Structureless soils and podzols
  -  Association of Classes 5, 6, 10, 11, 12: Undifferentiated structureless soils
  -  Association of Classes 7 and 14: Undifferentiated textural contrast soils
  -  Association of Classes 8 and 15: Undifferentiated poorly drained soils
  -  Dark clay soils which are not strongly swelling
  -  Dark clay soils, often shallow, on hard or weathering rock
  -  Freely drained, structureless soils
  -  Imperfectly drained sandy soils
  -  Imperfectly drained soils, often shallow and often with a plinthic horizon
  -  Lithosols (shallow soils on hard or weathering rock)
  -  No dominance
  -  Non soil land classes

1: 18 056



0,9 0 0,46 0,9 Kilometers



# Malangeni Forest Plantations

## Description

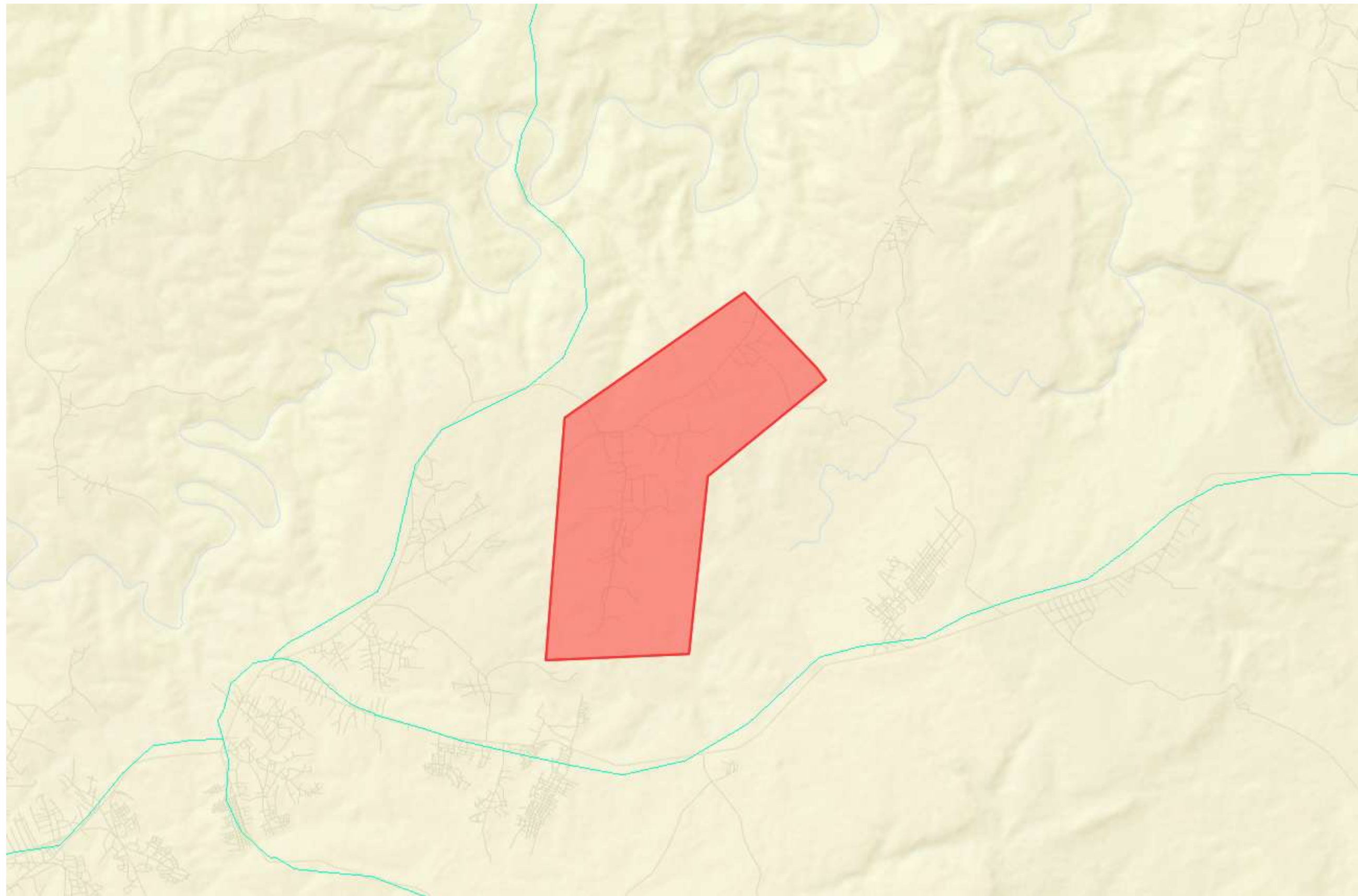
Malangeni Forest Plantations

## Legend

- Primary river catchments
- Secondary river catchments
- Tertiary river catchments
- Quarternary river catchment

### National soils - soil classes

- Association of Classes 1 to 4: Undifferentiated structureless soils
- Association of Classes 13 and 16: Undifferentiated shallow soils and land classes
- Association of Classes 17 and 18: Structureless soils and land classes
- Association of Classes 17 and 19: Structureless and textured soils
- Association of Classes 17 and 20: Structureless and poorly drained soils
- Association of Classes 17 and 21: Structureless soils and land classes
- Association of Classes 17 and 9: Structureless soils and podzols
- Association of Classes 5, 6, 10, 11, 12: Undifferentiated textured soils
- Association of Classes 7 and 14: Undifferentiated textured contrast soils
- Association of Classes 8 and 15: Undifferentiated poorly drained soils
- Dark clay soils which are not strongly swelling
- Dark clay soils, often shallow, on hard or weathering rock
- Freely drained, structureless soils
- Imperfectly drained sandy soils
- Imperfectly drained soils, often shallow and often with a plinthic horizon
- Lithosols (shallow soils on hard or weathering rock)
- No dominance
- Non soil land classes



1: 72 224



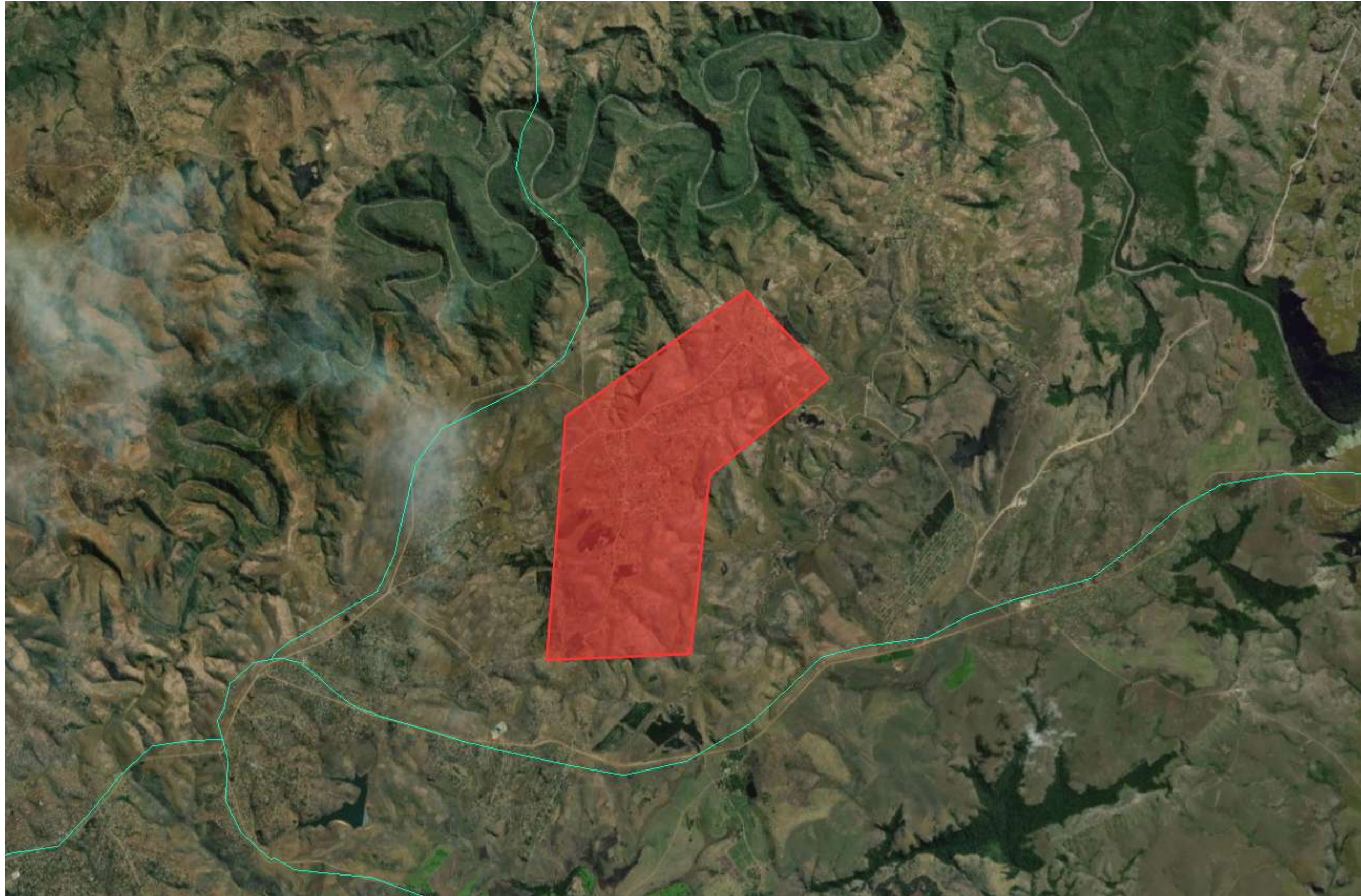
3,7 0 1,83 3,7 Kilometers

























# Malangeni Forest Plantations

## Description

Malangeni Forest Plantations



## Legend

-  Primary river catchments
  -  Secondary river catchments
  -  Tertiary river catchments
  -  Quarternary river catchment
- National soils - soil classes**
-  Association of Classes 1 to 4: Undifferentiated structureless soils
  -  Association of Classes 13 and 16: Undifferentiated shallow soils and land classes
  -  Association of Classes 17 and 18: Structureless soils and land classes
  -  Association of Classes 17 and 19: Structureless and textureless soils
  -  Association of Classes 17 and 20: Structureless and poorly drained soils
  -  Association of Classes 17 and 21: Structureless soils, textureless soils and land classes
  -  Association of Classes 17 and 9: Structureless soils and podzols
  -  Association of Classes 5, 6, 10, 11, 12: Undifferentiated textureless soils
  -  Association of Classes 7 and 14: Undifferentiated textureless contrast soils
  -  Association of Classes 8 and 15: Undifferentiated poorly drained soils
  -  Dark clay soils which are not strongly swelling
  -  Dark clay soils, often shallow, on hard or weathering rock
  -  Freely drained, structureless soils
  -  Imperfectly drained sandy soils
  -  Imperfectly drained soils, often shallow and often with a plinthic horizon
  -  Lithosols (shallow soils on hard or weathering rock)
  -  No dominance
  -  Non soil land classes

1: 72 224



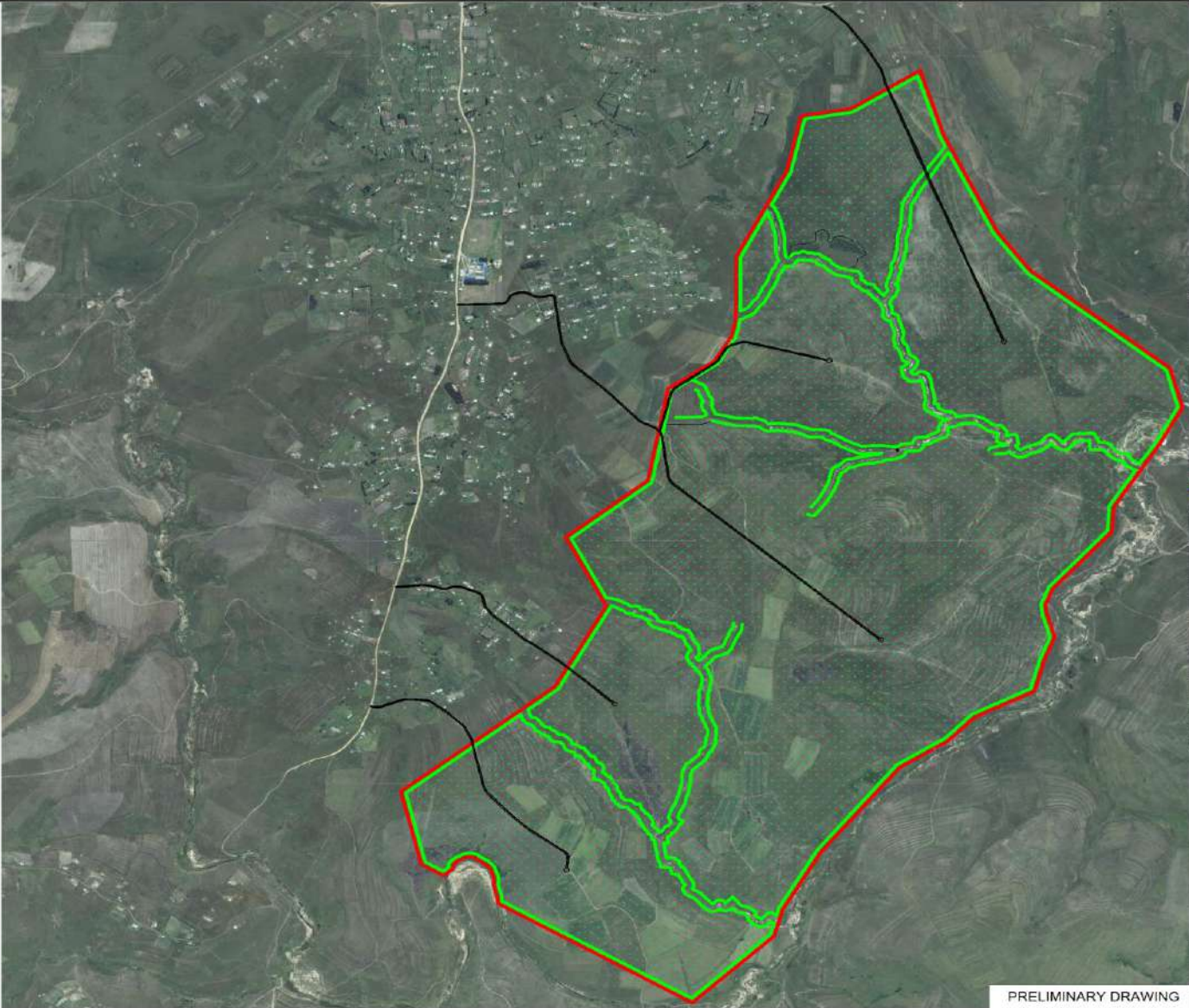
3,7 0 1,83 3,7 Kilometers





## TECHNICAL MAPS

## Malangeni Forest Extension Technical Drawings



- NOTES**
1. THIS DRAWING IS A PRELIMINARY DRAWING AND IS NOT TO BE USED FOR CONSTRUCTION.
  2. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.
  3. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.
  4. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.
  5. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.
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  8. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.
  9. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.
  10. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.

**PROJECT NAME**  
 EZENDELO PLANTATIONS

**CLIENT**  
 MALANGENI PLANTATION 1

**DATE**  
 2024

**PRELIMINARY DRAWING**

**DATE:**

**SIGNED BY:** GONDAWYO SHANJENI

**LEGEND**

[Red Line]	BOUNDARY
[Green Line]	EXISTING WATER MARK
[Black Line]	EXISTING INFRASTRUCTURE
[Dotted Area]	EXISTING INFRASTRUCTURE
[Blue Area]	PROPOSED WATER MARK
[Green Area]	PROPOSED INFRASTRUCTURE
[Red Area]	PROPOSED INFRASTRUCTURE

REV	DESCRIPTION	DATE	DATE

DRAW. NO.	REFERENCE DRAWINGS

**UNDERGROUND SERVICES CHECKED:**

TYPE	DATE	REMARKS
WATER		
SEWER		
ELECTRICITY		
TELEPHONE		
OTHER		

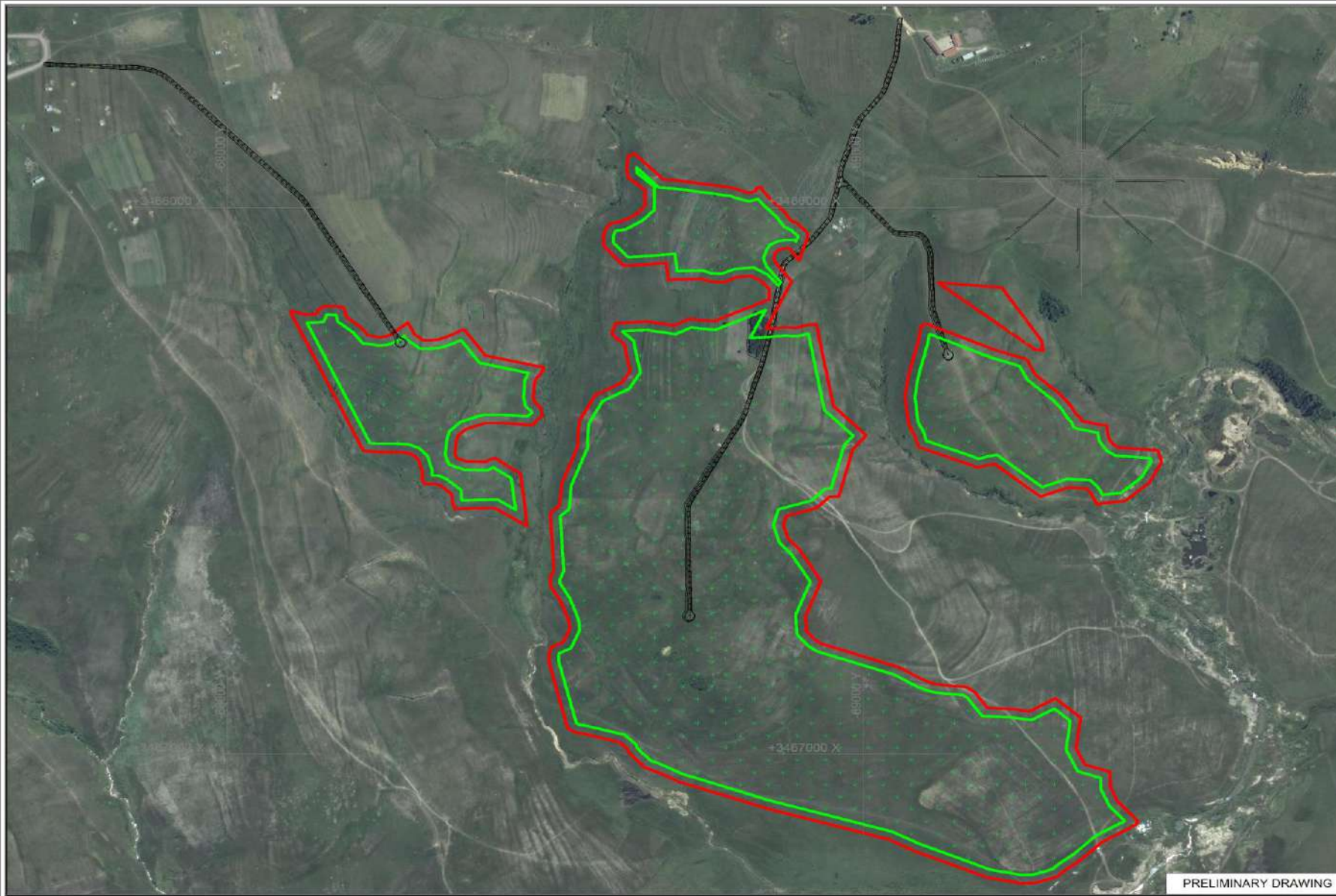


**PROJECT TITLE**  
 EZENDELO PLANTATIONS

**DRAWING TITLE**  
 MALANGENI PLANTATION 1

**DESIGNED BY**  
 AS SHANJENI

DATE	



- NOTES**
1. ALL THE INFORMATION PROVIDED IS FOR INFORMATION ONLY.
  2. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  3. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  4. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  5. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  6. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  7. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  8. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  9. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
  10. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.



INGQUZA HILL LOCAL MUNICIPALITY

PROJECT NO: 12345678  
 DRAWN BY: J. D. M.  
 CHECKED BY: J. D. M.

**PRELIMINARY DRAWING**

DATE: 15/10/2023

DESIGNED BY: J. D. M.  
 CHECKED BY: J. D. M.

NO.	DESCRIPTION	DATE
1	ISSUED FOR TENDERS	15/10/2023
2	ISSUED FOR TENDERS	15/10/2023
3	ISSUED FOR TENDERS	15/10/2023
4	ISSUED FOR TENDERS	15/10/2023
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9	ISSUED FOR TENDERS	15/10/2023
10	ISSUED FOR TENDERS	15/10/2023

NO.	DESCRIPTION	DATE
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10	ISSUED FOR TENDERS	15/10/2023

NO.	DESCRIPTION	DATE
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8	ISSUED FOR TENDERS	15/10/2023
9	ISSUED FOR TENDERS	15/10/2023
10	ISSUED FOR TENDERS	15/10/2023

NO.	DESCRIPTION	DATE
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3	ISSUED FOR TENDERS	15/10/2023
4	ISSUED FOR TENDERS	15/10/2023
5	ISSUED FOR TENDERS	15/10/2023
6	ISSUED FOR TENDERS	15/10/2023
7	ISSUED FOR TENDERS	15/10/2023
8	ISSUED FOR TENDERS	15/10/2023
9	ISSUED FOR TENDERS	15/10/2023
10	ISSUED FOR TENDERS	15/10/2023



INGQUZA HILL LOCAL MUNICIPALITY

PROJECTING: J. D. M.

PROJECT NO: 12345678

PROJECT TITLE: MALANGENI PLANTATION 2 LAYOUT

SCALE: AS SHOWN

NO.	DESCRIPTION	DATE
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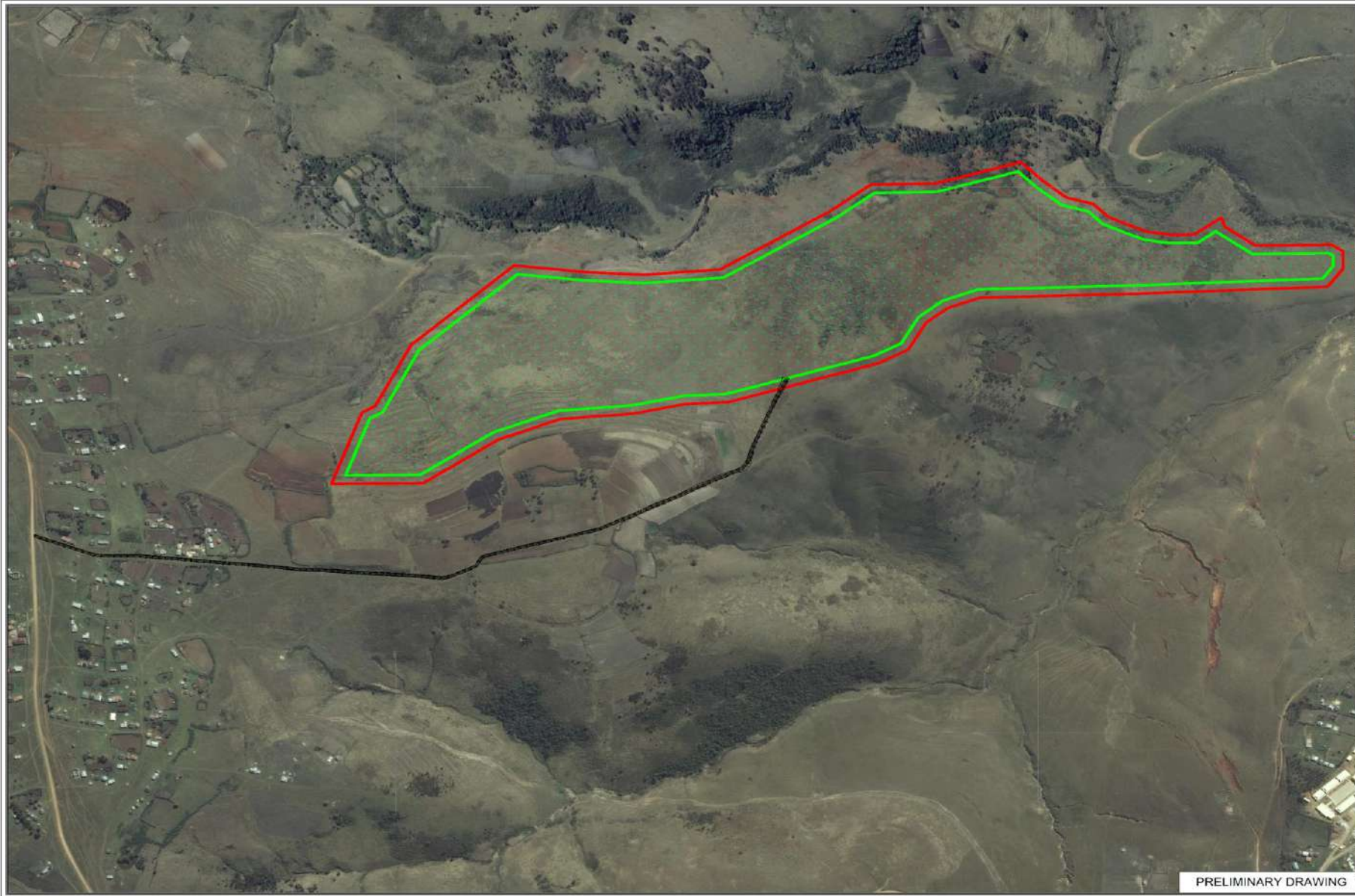
PRELIMINARY DRAWING

SCALE: AS SHOWN



## Bhukazi New Plantations Technical Drawings





- NOTES:**
1. ALL DIMENSIONS SHALL BE IN METERS UNLESS OTHERWISE SPECIFIED.
  2. THE CLIENT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL MUNICIPALITY AND OTHER RELEVANT AUTHORITIES.
  3. THE CLIENT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL MUNICIPALITY AND OTHER RELEVANT AUTHORITIES.
  4. THE CLIENT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL MUNICIPALITY AND OTHER RELEVANT AUTHORITIES.
  5. THE CLIENT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL MUNICIPALITY AND OTHER RELEVANT AUTHORITIES.
  6. THE CLIENT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL MUNICIPALITY AND OTHER RELEVANT AUTHORITIES.
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  10. THE CLIENT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL MUNICIPALITY AND OTHER RELEVANT AUTHORITIES.

**INGQUZA HILL LOCAL MUNICIPALITY**

DATE: \_\_\_\_\_

SCALE: \_\_\_\_\_

PROJECT NO: \_\_\_\_\_

OWNER: \_\_\_\_\_

DESIGNED BY: \_\_\_\_\_

**PRELIMINARY DRAWING**

DATE: \_\_\_\_\_

SIGNED BY: \_\_\_\_\_

**LEGEND**

[Symbol]	BOUNDARY
[Symbol]	EXISTING WATER MARK
[Symbol]	EXISTING SERVICE
[Symbol]	EXISTING INFORMATION
[Symbol]	ELEVATION
[Symbol]	PROPOSED WATER MARK
[Symbol]	PROPOSED SERVICE
[Symbol]	PROPOSED COMPACT
[Symbol]	PROPOSED PLANTATIONS
[Symbol]	PROPOSED FENCE/DRAINAGE

NO.	DESCRIPTION	SCALE	DATE

**REFERENCES DRAWINGS**

DRAWING NO.	DESCRIPTION

**UNDERPINNING SURVEY DATA**

NO.	DESCRIPTION	SCALE	DATE



PROJECT TITLE: \_\_\_\_\_

**EZEMDLO PLANTATIONS**

**BUKAZI FOREST 2 PLANTING PLAN**

DATE: \_\_\_\_\_

NO.	DESCRIPTION	SCALE	DATE

**PRELIMINARY DRAWING**







## APPENDIX C – PHOTOS

BHUKAZI



*Figure 1: Ridge on the site footprint.*



*Figure 2: Portion of the site already being used for vegetation.*



*Figure 3: Reasonable basal cover on the virgin lands*



*Figure 4: Northern view of the virgin grasslands.*



*Figure 5: The site is steep with one tree.*



*Figure 6: Area on the Western side of the site.*



*Figure 7: View showing the fields.*



*Figure 8: View showing the Northern Boundary.*



*Figure 9: Reasonable basal cover in the virgin grasslands.*



*Figure 10: Section of the site showing dense Aristida sward.*





*Figure 11: Minimum ground cover and low plant diversity.*



*Figure 12: Secondary grassland of the area.*

## MALANGENI



*Figure 1: Tracks leading to the forest.*



*Figure 2: Forest patch with poor vegetation biodiversity*



*Figure 3 The site area is relatively flat.*



*Figure 4: The area is flat with low plant diversity.*



*Figure 5: View showing virgin grasslands.*



*Figure 6: Virgin grasslands in the central parts of the site.*



*Figure 7: Gravesite on site.*



*Figure 8: Mixed wattle and indigenous bush.*



*Figure 9: Reasonable vegetation cover in the virgin grasslands.*



*Figure 10: Poor vegetation cover on one side of the site due to veld fires.*



*Figure 11: Invasive weed.*



*Figure 12: Invasive weed in the Southern section of the site.*

## **APPENDIX D –PUBLIC PARTICIPATION REPORT**

Newspaper Advert  
Onsite Notice  
I&AP Notification Letter  
Background Information Document  
Proof of Notifications:  
Initial Notification  
I&AP database  
Public Meeting Minutes  
I&AP Comments and Responses Trail  
Community Land Rights Resolution



## NEWSPAPER ADVERT



**EZENDALO**  
ENVIRONMENTAL CONSULTANTS

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT AND INVITATION TO REGISTER  
AS AN I&AP**

**PROPOSED MALANGENI EXTENSION OF  
433 HECTARES AND BHUKAZI NEW PLANTATIONS OF 194 HECTARES  
(INGQUZA HILL LOCAL MUNICIPALITY)**

Notification is hereby given in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), of the intention of **Ingquza Hill Local Municipality** to conduct an Environmental Impact Assessment for Malangeni extension of 433 hectares and Bhukazi new plantations of 194 hectares.

**Proponent: Ingquza Hill Local Municipality.**

**Locality:** Lusikisiki.

**EZENDALO ENVIRONMENTAL CONSULTANTS** has been appointed by **Ingquza Hill Local Municipality** as independent environmental assessment practitioners (EAP) to undertake the Environmental Impact Assessment Process for the proposed project.

An application for Environmental Authorisation in terms of G.N.R 983-985 will be submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) O R Tambo District Office.

You are hereby invited to register as an Interested and Affected Party (I&AP). Please submit your comments in writing, to **EZENDALO ENVIRONMENTAL CONSULTANTS** within 30 days of the appearance of this advert.

**For more information or submission of comments contact by phone, fax or e-mail:**

**Ayanda Matiwane**

**EZENDALO ENVIRONMENTAL CONSULTANTS**

No. 9 Baldwin Road  
Highgate, Cambridge  
East London  
5247

Cell: 078 827 3985  
Tel: 043 760 0165  
Fax: 086 685 9701  
E-mail: [ayanda@ezendalo.co.za/](mailto:ayanda@ezendalo.co.za)  
[ezendalo.environment@gmail.com](mailto:ezendalo.environment@gmail.com)



**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT AND INVITATION TO REGISTER AS AN I&AP**

**PROPOSED MALANGENI EXTENSION OF 433 HECTARES AND BHUKAZI NEW PLANTATIONS OF 194 HECTARES (INGQUZA HILL LOCAL MUNICIPALITY)**

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Proponent: Ingquza Hill Local Municipality.  
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For more information or submission of comments contact by phone, fax or e-mail:

**Ayanda Matiwane  
EZENDALO ENVIRONMENTAL CONSULTANTS**

No. 9 Baldwin Road Cell: 078 827 3958  
Highgate, Cambridge Tel: 043 760 0165  
East London, 5247 Fax: 086 685 9701

Email: [ayanda@ezendalo.co.za](mailto:ayanda@ezendalo.co.za)  
[ezendalo.environment@gmail.com](mailto:ezendalo.environment@gmail.com)

**For All Your  
Legal And  
Tender Adverts.  
Contact Us At  
039 727 2066  
or E-mail:  
[adverts@kokstadadvertiser.co.za](mailto:adverts@kokstadadvertiser.co.za)**

All interested parties having objection to the issue of such copy are hereby required to lodge the same in writing with the Registrar of Deeds at MTHATHA within two weeks from the date of the publication of this notice.

DATED at PORT ELIZABETH this 21<sup>st</sup> day of August 2020.

APPLICANT: LINDA NIENABER  
EXECUTRIX in the Estate of the late  
DORFLING LANGALIBALELE MAFUNDA

**Isaziso Ngesicelo Sokugunyazwa Kwezemvelo kanye Nesicelo Selayisense Edidiyele Yokusetshenziswa Kwamanzi Maqondana NoMsebenzi Wezezindlu Ohlongozwayo Wokuqedwa Kwemikhukhu EXobho, Ingxenye 0 yeSiza 174 sase-Stuartstown, kuMasipala Wendawo waseBuhlebezwe, KwaZulu-Natali.**

**Inkomba ye-EDTEA: DC43/0006/2020  
kanye ne-KZN EIA/0001375/2020**

I-Metro Projects Developments (Pty) Ltd yaqokwa njenge-ajenti ebalisa umsebenzi (i-Implementing Agent (i-IA)) egameni loMnyango Wezokuhlaliswa Kwabantu (i-DoHS) maqondana nomsebenzi wezezindlu ohlongozwayo Wokuqedwa Kwemikhukhu eXobho, KwaZulu-Natali (e-KZN). UMasipala Wendawo waseBuhlebezwe nguwo ongumsunguli omkhulu womsebenzi, oxhaswe yi-DoHS. I-Metro Projects iqokwe i-NWJ Environmental Consulting (i-NWJ) njengeSikhulu Sokuhlolwa Kwezemvelo (i-EAP) ukuba yenze umsebenzi odingekayo weSicelo Selayisense Yokusetshenziswa Kwamanzi (i-WULA) kanye neSicelo Sokugunyazwa Kwezemvelo (i-EA) salo msebenzi.

Lendawo kungenwa kuyonge-R56 ngaseningizimu neXobho. Umsebenzi ubandakanya ukwakhiwa kwemizi eyimixhaso kahulumeni engama-340, okubandakanya uhlelo lokwakhiwa kwengqalasisinda yemigwaqo, yamanzi, yamathangi okuthuthwa kwendle, kanye nezitamukoko, njengoba kudingeka.

Isicelo se-EA sithunyelelwe uMnyango Wezokuthuthukiswa Komnotho, Ezokuvakasha kanye Nezemvelo (i-EDTEA).

Umsebenzi ohlongozwayo nawo utholakala ngaphakathi kwendawo engama-500m engamakhaphozi futhi engaba nomthelela emgudwini wamanzi/emakhaphozini ngakho kudingeka isicelo salokho ngokweSigaba 21 (c), ukuphazamisa noma ukuchezukisa ukugeleza kwamanzi emgudwini wamanzi kanye (i) nokuthikameza unqenqema, indlela noma izakhi zomgudu wamanzi, soMthetho Wezamanzi Kuzwelonke, 1998 (uMthetho No. 36 we-1998).

Ungathumela izimvo zakho ezibhaliwe ngomhla zingama-28 Septhemba 2020 ku:

**NWJ Environmental Consulting**  
Ucingo: +27 31 813 5526

I-IMEYLI: [natalie@nwjenviroconsulting.co.za](mailto:natalie@nwjenviroconsulting.co.za)  
[co.zamailto:natalie@nwjenviroconsulting.co.za](mailto:co.zamailto:natalie@nwjenviroconsulting.co.za)

Usuku Lwesaziso: 27 Agasti 2020

## ONSITE NOTICE

Bhukazi



Malangeni



## **I&AP NOTIFICATION LETTER**



**EZENDALO**  
ENVIRONMENTAL CONSULTANTS

T: 043 763 0098

C: 078 827 3985

F: 086 587 9523

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Highgate  
Cambridge  
5247

[ezendalo.environment@gmail.com](mailto:ezendalo.environment@gmail.com)

October 2019

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT FOR AFFORESTATION OF MALANGENI (FOREST EXTENSION) AND BHUKAZI FORESTS (NEW PLANTATIONS) UNDER THE INGQUZA HILL LOCAL MUNICIPALITY**

Notification is hereby given in terms of the National Environmental Management Act (Act 107 of 1998) Section 24 (5) as amended, of the intention of **Ingquza Hill Local Municipality** to conduct an Environmental Impact Assessment for the afforestation of Malangeni extension of 433 hectares and Bhukazi 194 hectares

**Proponent: Ingquza Hill Local Municipality.**

**Locality:** Lusikisiki.

**EZENDALO ENVIRONMENTAL CONSULTANTS** has been appointed by **Ingquza Hill Local Municipality** as independent environmental assessment practitioners (EAP) to undertake the Environmental Impact Assessment Process for the proposed project.

An application for Environmental Authorisation in terms of G.N.R 983-985 will be submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) O R Tambo Region.

If you or your organisation requires further information, would like to participate in the Public Participation Process and provide comments throughout the process, please ensure that you register as an interested/affected party and/or submit comments in writing to **EZENDALO ENVIRONMENTAL CONSULTANTS**.

**AYANDA MATIWANE**  
**EZENDALO ENVIRONMENTAL CONSULTANTS**

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5247

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[ezendalo.environment@gmail.com](mailto:ezendalo.environment@gmail.com)



*Environmental conservation & protection is our passion*



## **BACKGROUND INFORMATION DOCUMENT**

**BACKGROUND INFORMATION DOCUMENT**

**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR PROPOSED  
AFFORESTRATION FOR MALANGENI EXTENSION OF 433 HECTARES, AND BHUKAZI  
194 HECTARES**

**INGQUZA HILL LOCAL MUNICIPALITY**



**OCTOBER 2019**

**COMPILED BY:**

**EZENDALO ENVIRONMENTAL CONSULTANTS**



**EZENDALO**  
**ENVIRONMENTAL CONSULTANTS**



**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



## **BACKGROUND**

The Planning and Development department intends to appoint a service provider to conduct an Environmental Impact assessment for the Malangeni extension of 433 hectares in Lusikisiki, at ward 24 and Bhukazi 194 hectares in Lusikisiki at ward 12. Therefore the suitable Environmental Consulting Company is hereby requested to undertake the EIA on behalf of the municipality to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

This document is intended to help the Department better fulfil its responsibilities and obligations in terms of environmental authorisations. It aims to develop a background document to allow for sustainable development of telecommunication masts, taking into account the social, economic and biophysical environment. It further aims to administer and assess masts in a more effective way and to improve communication between the different role-players involved in the erection of masts.

## **PURPOSE OF THIS DOCUMENT**

This Background Information Document (BID) is aimed at introducing key stakeholders and the general public to the Environmental Impact Assessment for Malangeni extension of 433 hectares in Lusikisiki and Bhukazi 194 hectares in Lusikisiki at ward 12.

The purpose of this document is to provide you with the information about the proposed project, and to obtain comments and contributions from you as an interested and affected party (I&AP) with regards to potential impacts on the environment. You are invited to register as a I&AP and to assist the Environmental Assessment Practitioner in identifying possible impacts and to make suggestions for mitigation. These comments will be included as part of the Environmental



**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



Impact Assessment Process which will be submitted to the Department of Economic Development and Environmental Affairs (DEDEA) for authorisation of this project.

This project was identified and agreed upon between the local community and the municipality. The project has subsequently been prioritized amongst the projects of the Ingquza Hill Local Municipality.

### **DESCRIPTION OF THE ACTIVITY**

Ingquza Hill Local Municipality, previously known as Qaukeni, is an administrative area in the OR Tambo District of Eastern Cape in South Africa. Ingquza Hill local municipality is formed by two small towns which are Lusikisiki and Flagstaff under the O.R. Tambo District municipality. This municipality is informed by 32 wards. Malangeni and Bhukazi are located in the North Eastern region of the Eastern Cape, in Lusikisiki.

<b>Project name</b>	<b>Size/hectare</b>	<b>Ward number</b>	<b>Purpose</b>
Malangeni	433ha	24	Expansion
Bhukazi	194ha	12	New plantation

The geographical coordinates of the project site are as follows:

Malangeni:

Longitude: 31° 19' 10.343'' S Latitude: -29° 43' 28.889'' E

Bhukazi:

Longitude: 31° 12' 35.97'' S Latitude: -29° 28' 19.79'' E



**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



## **SCOPE OF THE PROJECT**

The appointed Environmental Consultant is expected to undertake the duties mentioned hereunder, but not limited to:

- Submit the license application form to DEDEAT.
- Undertake the Geohydrological study as part of the license application to DEDEAT.
- Submit the environmental reports that may be demanded by DEDEAT as per application.
- The application must be aligned to the EIA Regs 2017, National Environmental Management Act, Act 107 of 1998; National Environmental Management; Integrated Coastal Management Act, Act no. 24 of 2008 and any other implicated environmental management legislation.
- Technical drawings of the planned and listed facilities.
- Undertake public participation process in accordance with the Act
- Compile Basic Assessment or/ Scoping report for submission to DEDEAT.

## **BIOPHYSICAL CONDITIONS**

### **Topography and Vegetation**

Malangeni forest:

The roads leading to the forest lays in a flat to gentle steep topography, whilst the sections running from the stream crossings have a relatively steep incline. The area is predominantly covered by Drakensberg Foothill Moist Grassland (Grassland Biome) and the Eastern Valley Bushveld (Savanna Biome) (Mucina & Rutherford 2006). The soil class fall under imperfectly drained soils, often shallow and often with a plinthic horizon (S8) and Lithosols (shallow soils on hard or weathering rock) (S13).



**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



### Bhukazi forest extension

The roads leading to the forest lays in a flat to gentle steep topography, whilst the sections running from the stream crossings have a relatively steep incline. The area is predominantly covered by Drakensberg Foothill Moist Grassland (Gs 10 Grassland Biome) and the Eastern Valley Bushveld (SVs 6 Savanna Biome (Mucina & Rutherford 2006). The soil class fall under association of Classes 13 and 16: Undifferentiated shallow soils and land classes (S21) and freely drained, structureless soils (S2).

### Climate

The climate along the South Coast varies from temperate sub-tropical in the South to moderate sub-tropical weather further north. The Lusikisiki area specifically has a very comfortable sub-tropical climate. The combination of mountains and sea creates a temperate zone of its own, but also keeps the temperature cool and comfortable in summer. Rainfall occurs mainly in the summer months and the temperature seldom drops below 14°C.

## **ENVIRONMENTAL AUTHORISATION PROCESS**

In terms of NEMA, the proposed project will trigger listed activities described in Notice GNR 325 and GNR 324 of the National Environmental Management Act, 1998 (act no.107 of 1998) as amended in April 2017.

<b>LISTED ACTIVITY</b>	<b>PROJECT ACTIVITY THAT TRIGGERS THE LISTED ACTIVITY</b>
<b>GNR. 325 (13).</b> The physical alteration of virgin soil to agriculture, or afforestation for the purposes of commercial tree, timber or wood production of 100 hectares or more.	Large areas, definitely greater than 100 ha across all sites, can be classified as virgin soil as it has not been ploughed for more than ten years at least. This will be physically altered during the construction and operation phases.
<b>GNR. 325 (15).</b> The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-	More than 20 ha of indigenous vegetation will be cleared for the construction and operation of the proposed activity.



**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



<p>(i) the undertaking of a linear activity; or  (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	
<p><b>GNR. 324 (12).</b> The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.  (a) In Eastern Cape:  ii. Within critical biodiversity areas identified in bioregional plans  v. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	<p>Large tracts of indigenous vegetation in excess of 100 ha will be cleared. These areas are within CBAs and some of the vegetation can also be classified as sensitive.</p>

A Water Use License Application (WULA) has been granted for the projects.

**POTENTIAL ENVIRONMENTAL ISSUES**

- The Use of Land: The proposed development will include site clearance which may lead to soil erosion as a result of the removal of topsoil.
- Clearing of Natural vegetation: Natural vegetation will be cleared thus care should be taken so as not to cause a huge amount of damage to the areas which still will not be utilized.
- Climate: Should work activities be conducted during periods of high rainfall, chances of erosion and sedimentation will increase.
- Topography: The topography of the area is characterized by undulating to mountainous. The road traverses a fairly steep area. Proper storm water management measures which will ensure minimum alteration to topography must be adhered to and planned before during and after commencement of work activities on site.



**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



- The visibility of trenches dug by unmanaged stormwater pattern, improper drainage patterns may also affect the topography of the area.
- Erosion and Sedimentation Control: Erosion control measures such as revegetation, erosion control blankets etc. should be implemented to areas that are sensitive to erosion.
- Geology and Soils: The sub-catchment soils are on average moderate to deep, clayey loam textured with an undulating to steep topography. Excessive excavating and clearing of vegetation may lead to soil instability and increases the possibility for erosion which has an impact on the re - vegetation of the area.
- Air quality: Dust generation during excavation/digging is likely to occur on site. Dust particles could also be released from stockpiling of soils, burning of waste and cleared vegetation, exhaust fumes from construction vehicles and machinery.
- Storm water Runoff, Erosion and sedimentation: The disturbance of the soil in terrestrial by construction activities will likely result in erosion, if not carefully controlled. Stormwater run - off and erosion control measures should be applied to the construction sites to minimise erosion risks, especially on steeper slopes. Extra precaution needs to be taken around the stream area to minimize or prevent erosion in order to avoid eroded soil entering the stream bed and causing sedimentation.
- Drainage and Hydrology; There is a high potential for erosion before stormwater management, the existing road currently has minimal storm water drainage in place which causes problems during rainy season.
- Waste Water Management: Water containing waste must not be discharged into the natural environment. Measures must be taken to contain the water containing waste and to dispose it safely.
- Safety of road users, local people and domestic animals: As potentially dangerous equipment is used during construction, with open excavations on site, there is no potential for people and animals to get hurt as the site boundaries is far and in the forest area.





**BACKGROUND INFORMATION DOCUMENT**  
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**433 HECTARES AND BHUKAZI 194 HECTARES**



- To prevent or minimise risk, the site boundaries must be clearly demarcated, no local residents who are not labourers may be allowed on site, and all labour must wear protective clothing at all times on site. Construction workers must operate and work with caution being alert for any wandering children and domestic animals.
- Socio – economic: The value of the surrounding community will be increased as a result of this proposed development. Employment opportunities (short - term) will be created for the local community resulting in skills transfer.

### **PUBLIC PARTICIPATION PROCESS (PPP)**

#### **WHO ARE THE INTERESTED AND AFFECTED PARTIES (I&APs)?**

I&APs are the persons who will be directly or indirectly involved and/or affected by the project.

Your role as an I&AP is to:

- Register with the environmental consultants, who will include you on a database of I&APs in order for you to receive future project information and/or formally record issues and concerns; and;
- Contact the consultants to obtain further information and / or raise issues and concerns.

### **COMMENTING ON THE PROJECT**

You have been identified as a potential I&AP and are hereby encouraged to participate in the process by registering as an I&AP in writing and submitting any comments or concerns that you may have concerning the proposed project.

### **CONTACT DETAILS FOR REGISTRATION AND COMMENTS**

**Ezendalo Environmental Consultants**

**Contact Person: Ayanda Matiwane**



**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



**9 Baldwin Road Highgate, Cambridge East London 5247**

**Tel: 043 760 0165**

**Cell: 078 827 3985**

**Fax: (086) 685 9701 and**

**E - Mail: [ezendalo.environment@gmail.com](mailto:ezendalo.environment@gmail.com) and [ayanda@ezendalo.co.za](mailto:ayanda@ezendalo.co.za)**

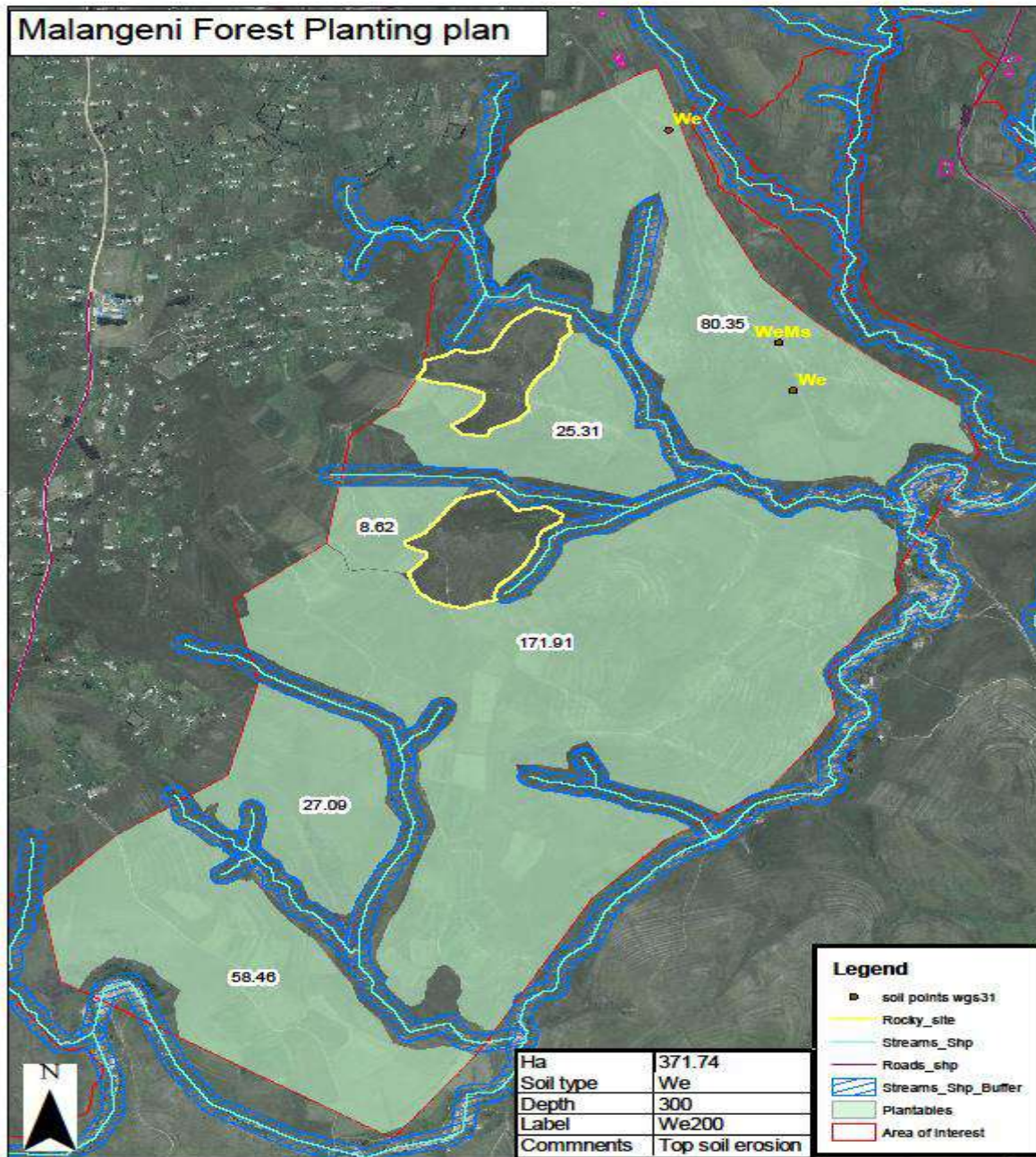


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**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
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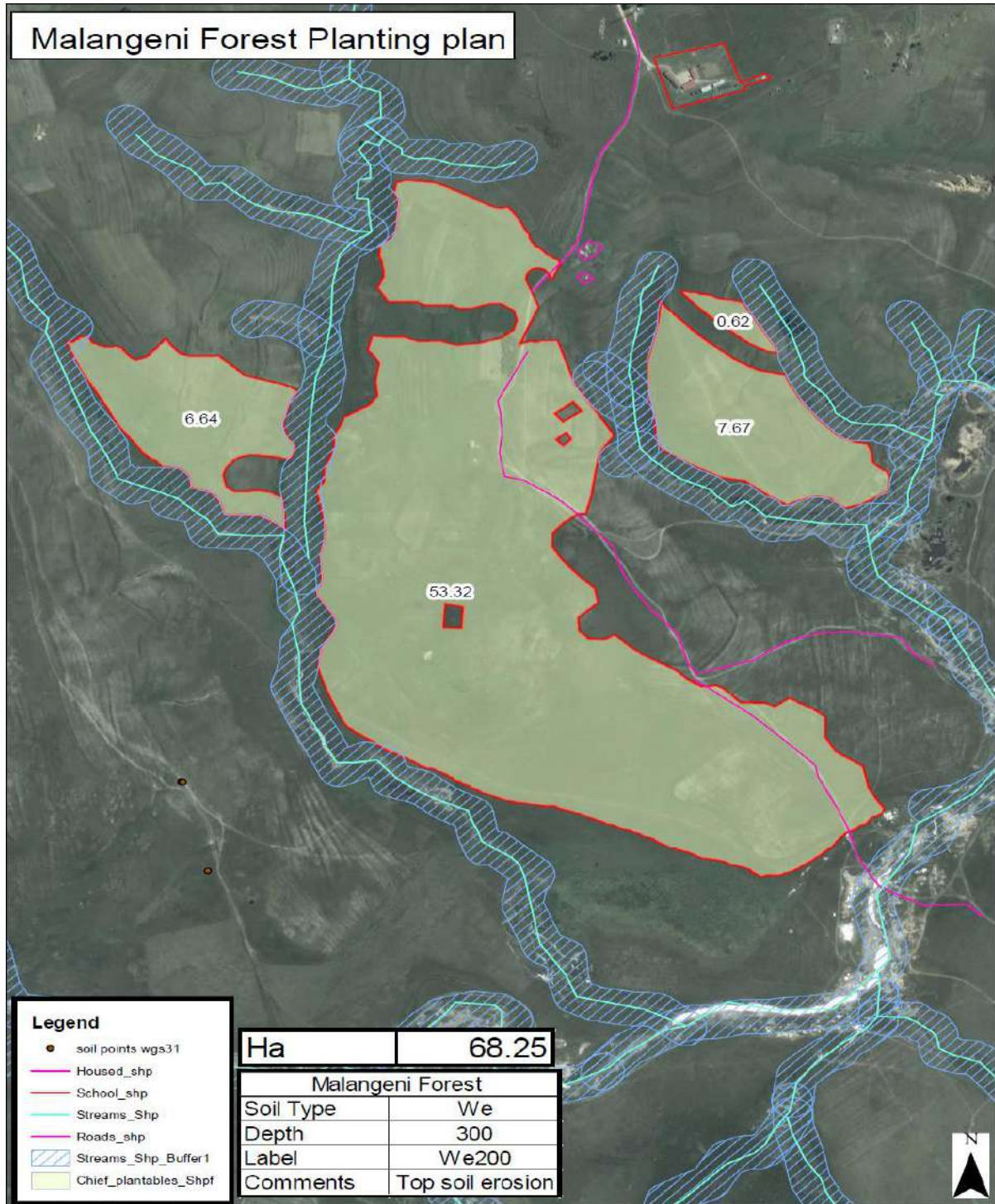
**Appendix 1: Facility illustrations**

Malangeni forest extensions





**BACKGROUND INFORMATION DOCUMENT**  
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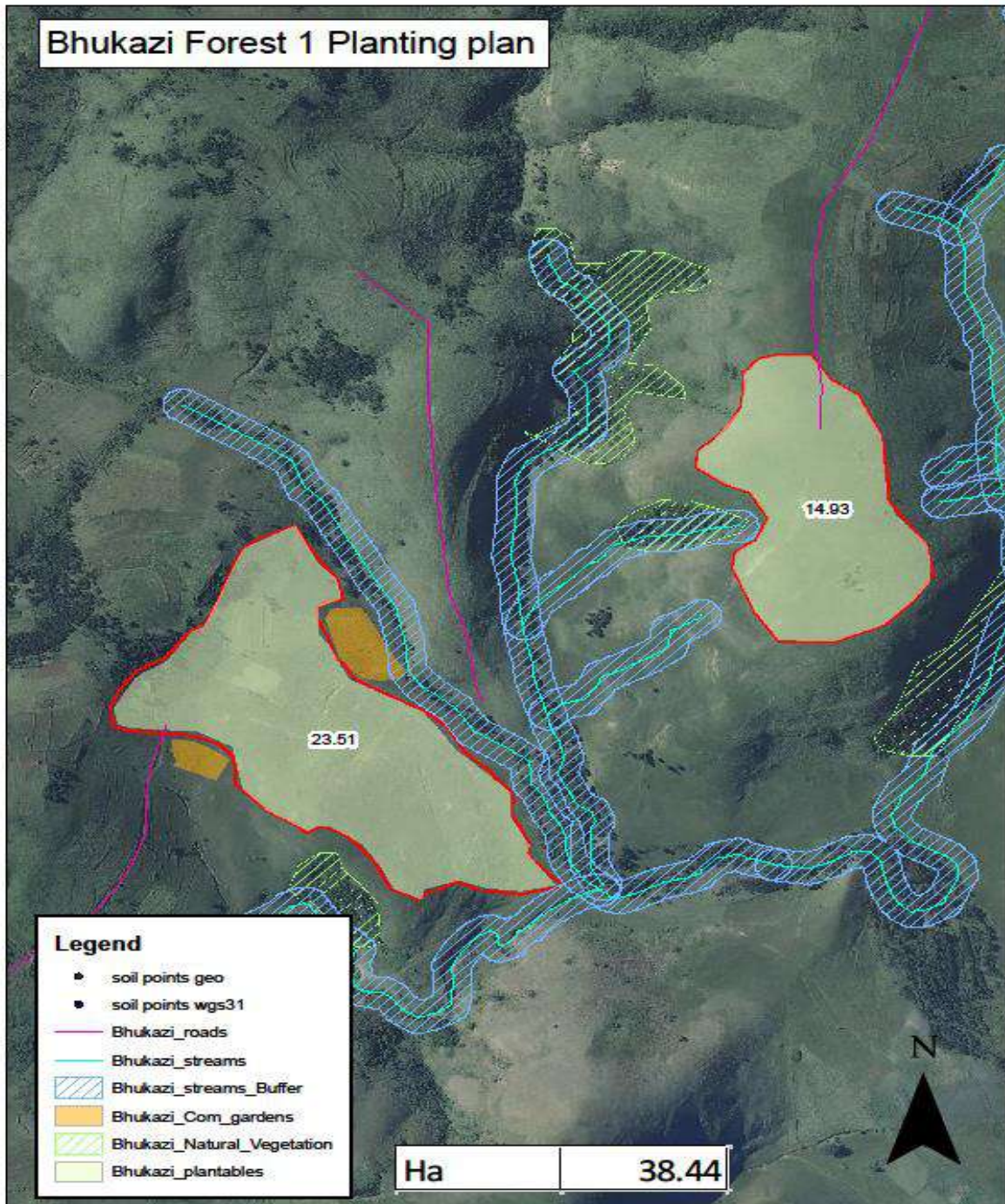




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**EZENDALO**  
ENVIRONMENTAL CONSULTANTS

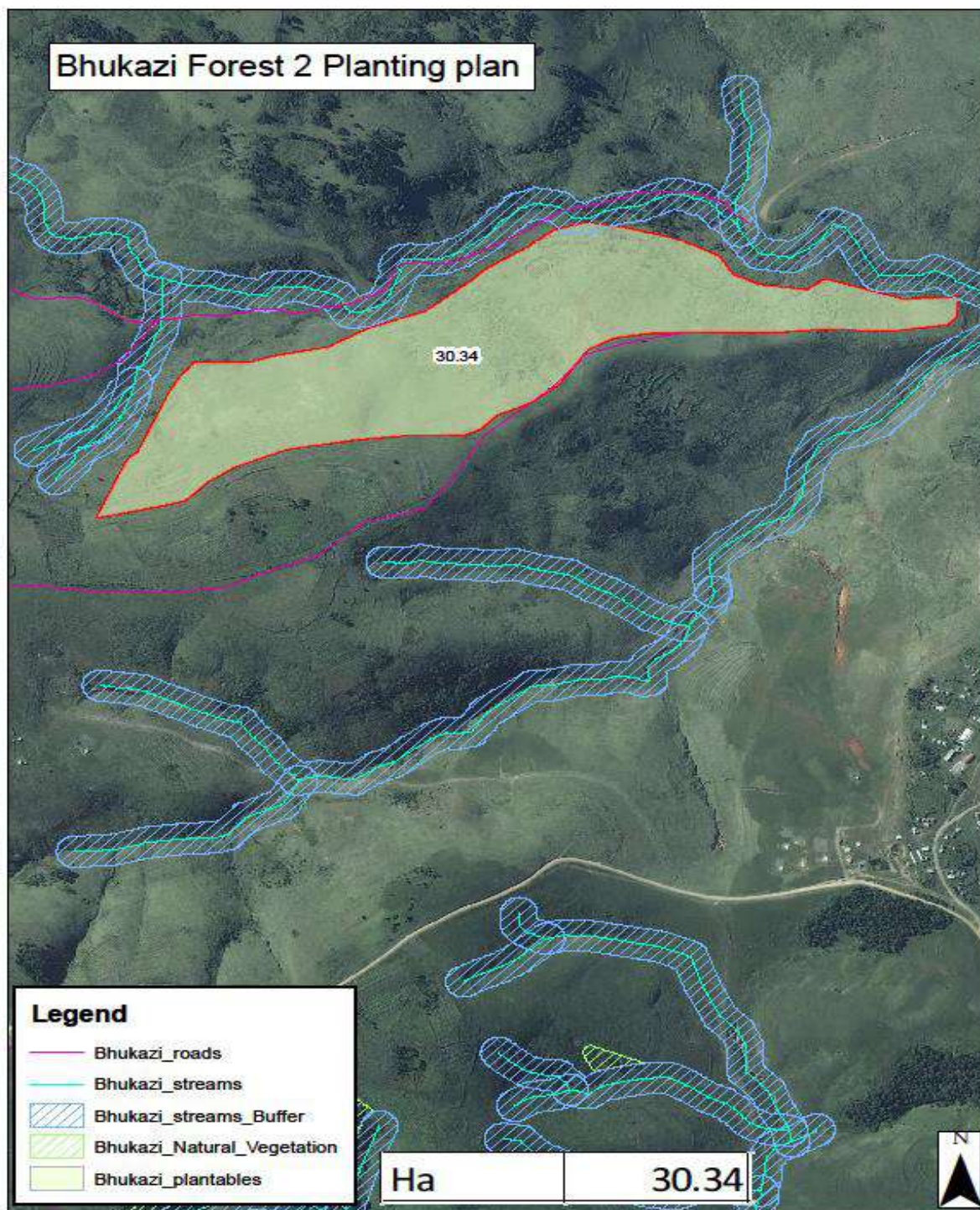




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**EZENDALO**  
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**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



**Appendix 2: Photos Taken at Proposed Project Sites: Malangeni Forest:**

	
Gravesite on site	Mixed wattle and indigenous bush
	
Reasonable vegetation cover in the virgin grassland	Poor vegetation cover on one side of site due to veld fires.
	





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Gravesite on site

Mixed wattle and indigenous bush



Reasonable vegetation cover in the virgin grassland

Poor vegetation cover on side of the site due to veld fires.



Akassia invasive weed

Invasive weed in the southern section of the site.



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**Bhukazi**



Ridge on the site footprint.



Portion of site already being used for vegetation.



Reasonable basal cover in the virgin grassland.



Northern view of the virgin grasslands.





**BACKGROUND INFORMATION DOCUMENT**  
**AFFORESTRATION FOR MALANGENI EXTENSION OF**  
**433 HECTARES AND BHUKAZI 194 HECTARES**



The site is steep with one invasive tree.



Area on the Western side of the site.



View showing the fields



View showing the Northern boundary



Reasonable basal cover in the virgin grassland



Section of the site showing dense Aristida sward.



Minimum ground cover and low plant diversity.

Secondary grassland of the area.



**PROOF OF NOTIFICATIONS:**

**INITIAL NOTIFICATION**

Request to I&APs to be a part of database

mail.google.com/mail/u/0/?tab=mm&ogbl#search/5626APs/Qgrc:HSBmtaTts/snrRtkBXZwtxHDvGmWqxcB

Request to I&APs to be a part of database

**Ezendalo Environment** <ezendalo.environment@gmail.com> to info  
Mon, Feb 10, 10:52 AM

Good Day,

I hope this communication find you well. We as Ezendalo Environmental Consultants have been appointed by the Ingquza Hill Local Municipality to conduct environmental Impact Assessments for the Malangeni forest extension of 433 hectares in Lusikisiki ward 24 and Bhukazi forest of 194 hectares in Lusikisiki ward 12.

We will be conducting the Environmental Impact Assessment of behalf of the Municipality to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

We would like to request that you become a part of the list of Interested and Affected Parties (I&APs) for further communication and commenting to help for a more effective public participation process.

We have already conducted a heritage Impact Assessment which has recommended that the graves be not disturbed. The developers need to maintain a 25m buffer zone around the grave sites and they would also need to erect a fence prior to construction.

Could you kindly respond to this email and also supply us with your contact details for future communication.

Kind regards  
Mrs Ayanda Matiwane-Matiyoni  
Environmental Scientist  
Ezendalo Environmental Consultants  
Environmental Management, Science and Engineering

Windows taskbar: Type here to search, 22:24, 09/05/2020

## I&AP DATABASE

## LIST OF I&APs OF REPRESENTATIVES

Name of I&APs	ORGANISATION	TEL/ CELL	EMAIL ADDRESS
Norman Ngamile	DAFF	043 604 5442	<a href="mailto:ThembelaniN@daff.gov.za">ThembelaniN@daff.gov.za</a>
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Tebogo Mathiane	DAFF	012 309 5712	<a href="mailto:TebogoMAT@daff.gov.za">TebogoMAT@daff.gov.za</a>
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Norman Ngamile	DAFF	043 604 5442	<a href="mailto:ThembelaniN@daff.gov.za">ThembelaniN@daff.gov.za</a>
Gwen Sgwabe	DAFF	043 604 5528	<a href="mailto:GwendolineS@daff.gov.za">GwendolineS@daff.gov.za</a>
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M. Matebese	DRDLR		<a href="mailto:Nmatebese@ruraldevelopment.gov.za">Nmatebese@ruraldevelopment.gov.za</a>
Lawrence Musisi	DARDA		<a href="mailto:Lawrence.musisi@agric.ecpro.gov.za">Lawrence.musisi@agric.ecpro.gov.za</a>
Hombakazi shumane	Ingquza Hill LM	039 252 0131/073 238 0244	<a href="mailto:HTshumane@ihlm.gov.za">HTshumane@ihlm.gov.za</a>
Andile Mbarane	Ingquza Hill LM	073 407 2832	<a href="mailto:AMbaran@ihlm.gov.za">AMbaran@ihlm.gov.za</a> <a href="mailto:andilembarane@yahoo.com">andilembarane@yahoo.com</a>
Phindiwe Magula	ECRDA	079 899 9969	<a href="mailto:MagulaP@ecdra.co.za">MagulaP@ecdra.co.za</a>
Nkosiphendule Quvile	ECRDA	043 604 7015	<a href="mailto:QuvileN@ecrda.co.za">QuvileN@ecrda.co.za</a>
Nardus du Preez	ECRDA	082 787 0986	<a href="mailto:nardus@sainet.co.za">nardus@sainet.co.za</a>
Nkosiphendule Quvile	ECRDA	043 604 7015	<a href="mailto:quvilen@ecrda.co.za">quvilen@ecrda.co.za</a>
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K. Mtintsilana	IDC	043 721 0733	<a href="mailto:kwakhanyaM@idc.co.za">kwakhanyaM@idc.co.za</a>
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Vuyani Dudula	ECDC		<a href="mailto:vdudula@ecdc.co.za">vdudula@ecdc.co.za</a>



Name of I&APs	ORGANISATION	TEL/ CELL	EMAIL ADDRESS
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Tafandzwa	DTI	012 394 3559	<a href="mailto:Tnyanzunda@thedti.gov.za">Tnyanzunda@thedti.gov.za</a>
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Libhongo	ECSECC		<a href="mailto:libhongo@ecsecc.org.za">libhongo@ecsecc.org.za</a>
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Nathi Ndlela	Forestry South Africa	033 346 0344	<a href="mailto:nathi@forestrysouthafrica.co.za">nathi@forestrysouthafrica.co.za</a>
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Zama Memela	DRDLR	082 419 5297	<a href="mailto:Zama.memela@drdlr.gov.za">Zama.memela@drdlr.gov.za</a> <a href="mailto:zzhmemela@ruraldevelopment.gov.za">zzhmemela@ruraldevelopment.gov.za</a>
Sinelindiwe Zanethemba	DEFF	0844132685	<a href="mailto:ZanethembaS@deff.gov.za">ZanethembaS@deff.gov.za</a> <a href="mailto:Zanethembas@daff.gov.za">Zanethembas@daff.gov.za</a>
Bulelwa Njilo	IHLM	0730903429	<a href="mailto:bnjilo@ihlm.gov.za">bnjilo@ihlm.gov.za</a>
N Lugetye	ORTM	0782171355	<a href="mailto:n.lugetye@gmail.com">n.lugetye@gmail.com</a>
S G Gexu	DEFF:IHLM	0828379166	<a href="mailto:cgexu@environment.gov.za">cgexu@environment.gov.za</a>
T N Dlamini	ECPTA	0872857752	<a href="mailto:thobeka.dlamini@ecpta.co.za">thobeka.dlamini@ecpta.co.za</a>
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F E Sobantu	Disaster Management	0734724377	<a href="mailto:sobantuf@webmail.co.za">sobantuf@webmail.co.za</a>
T Sigwebo	ORTDM Health	0733000118	<a href="mailto:andilesigwebo@gmail.com">andilesigwebo@gmail.com</a>
L Mbotyi	ECPTA-N2	0662559827	<a href="mailto:lumko.mbotyi@ecpta.co.za">lumko.mbotyi@ecpta.co.za</a>

Name of I&APs	ORGANISATION	TEL/ CELL	EMAIL ADDRESS
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O. Notobela,	DEA		<a href="mailto:onotobela@environment.gov.za">onotobela@environment.gov.za</a>
O Siganga,	ORTDM		<a href="mailto:omegasiganga@gmail.com">omegasiganga@gmail.com</a>
F E Sobantu	Disaster Management		
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A Morai,	DRDLR		<a href="mailto:abraham.morai@drdlr.gov.za">abraham.morai@drdlr.gov.za</a>
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S Swelindawo			<a href="mailto:jongumhlaba@gmail.com">jongumhlaba@gmail.com</a>
M Langa,	ECPTA		<a href="mailto:mongezi.langa@ecpta.co.za">mongezi.langa@ecpta.co.za</a>
B Nodola			<a href="mailto:nodolab@yahoo.com">nodolab@yahoo.com</a>
N Ntola	DEDEA		<a href="mailto:nosinodi.ntola@dedea.gov.za">nosinodi.ntola@dedea.gov.za</a>
Z Nkomfana			<a href="mailto:nkomfanaz@gmail.com">nkomfanaz@gmail.com</a>
S Dakwa			<a href="mailto:sbosh.dakwa@gmail.com">sbosh.dakwa@gmail.com</a>
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S Mhatu	ECPTA		<a href="mailto:siphiwo.mhatu@ecpta.co.za">siphiwo.mhatu@ecpta.co.za</a>
J Ngaphu			<a href="mailto:jabungaphu@gmail.com">jabungaphu@gmail.com</a>
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B Ngebulana	DMR		<a href="mailto:brenda.ngebulana@dmr.gov.za">brenda.ngebulana@dmr.gov.za</a>
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## **PUBLIC MEETING MINUTES**



## BHUKAZI MINUTES OF PUBLIC PARTICIPATION MEETING

13 NOVEMBER 2019



**EZENDALO**  
ENVIRONMENTAL CONSULTANTS

### Minutes

<b>Meeting/Subject</b>	Bhukazi New Plantations Public Participation Meeting
<b>Meeting number</b>	01
<b>Date</b>	13 November 2019
<b>Time</b>	09:00
<b>Venue</b>	Komkhulu (Headmans Kraal)
<b>Attendees</b>	Mr Makabeni (Chief/head of Bhukazi)
	Ms H Ginyamanzana (Ward Committee)
	Hombakazi Tshumane, Bulelwa Njilo (Ingquza Hill Local Municipality)
	Busiwe Nomzitshi, Nndie Setuse (Sappi)
	Community members
	Ayanda Matiwane, Malibongwe Matyeni (Ezendalo)
<b>Apologies</b>	MS. Ntungo (Ward councillor)

### Discussions

Item	Action Required
1	<b><u>Opening &amp; Welcome</u></b> <ul style="list-style-type: none"><li>Mr Mbutho called the meeting to order at 10h00 and welcomed all those who were present an opening prayer then followed. He then provided a brief introduction of the reason of the meeting and handed it over to Ezendalo Environmental Consultants to elaborate further.</li></ul>
2	<b><u>Agenda</u></b> <ul style="list-style-type: none"><li>Prayer &amp; Opening</li></ul>

	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Introduction of the project and details by Ezendalo</li> <li>• Comments and Questions</li> <li>• Closure</li> </ul>
3	<p><b><u>Adoption Of The Agenda</u></b></p> <ul style="list-style-type: none"> <li>• Agenda was adopted</li> </ul>
4	<p><b><u>Purpose Of The Meeting</u></b></p> <ul style="list-style-type: none"> <li>• Ayanda Matiwane addressed the community about the project in relation to what it entails and as to how the environment will be affected. Ayanda also mentioned that their role was to assess the environment which will be affected by the proposed project which includes the biophysical as well as socio economic environment. She further explained that a report will be compiled which will include all assessment information and forwarded to commenting authorities and eventually be submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) for a decision, only then may the project on the ground commence. SPM further explain why there is a need for the Public Participation; that communities should be aware of any development to be undertaken from where they reside. That government always want to ensure that communities are consulted for any development to be conducted in their area so that they are aware of the development and agree with such developments or not and raise their concerns and queries pertaining the project. Due to poor attendance the meeting had to be postponed to the following week (21 November 2019 at 09:00 at the headman’s Kraal (Komkhulu).</li> </ul>
5	<p><b><u>Comments and Questions</u></b></p> <ul style="list-style-type: none"> <li>• The Community Members that were present generally welcomed the project but we could not continue with the meeting due to lack of public attendance.</li> </ul>
6	<p><b><u>Closure</u></b></p> <ul style="list-style-type: none"> <li>• The meeting was rescheduled for the 21 November 2019 November 2019.</li> </ul>

- |  |   |
|--|---|
|  | <ul style="list-style-type: none"><li>• Mr Mbutho thanked the attendants for their participation and decision during the meeting and adjourned the meeting at 10: 30 p.m.</li></ul> |
|--|---|



# BHUKAZI PUBLIC PARTICIPATION MEETING



NOVEMBER 2019

@ KOMKHULU

**EZENDALO**  
ENVIRONMENTAL CONSULTANTS

## ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS	SIGNATURE	TEL/CELL.NO
Bulewa Niilo	IHLUM			073 0903 429
Busiwe Nomzeshi	SAPPI KHULISA			0724418827
Hombaleni Tshumane	IHLUM			073 23 80 244
Nandie Setse	SAPPI			0127338555.
Sibulelo Sepikana		S Sepikana		-
Macokoko M KILLER	MBUTHO			0834336393 0630337215
N.	MButho			0731255095
M.	MButho			0731283780
B.	Dube			0836935169
S Buthi	Sandile			X
S Votay	"			
C	HIOKHULU			
B. TIPA	COMMUNITY Manager			+
T Nseenga	"			
T Dewhlalo	"			
H. GUMAMAZANA	WARD COMMITTEE			0733357139
M Gagi	"			0710809939
AYANDA MOTIWARE	EZENDALO			078 827 3785
MAIRONGWE M.	EEC			079 997 7399



## BHUKAZI MINUTES OF PUBLIC PARTICIPATION MEETING

21 NOVEMBER 2019



### Minutes

<b>Meeting/Subject</b>	Bhukazi New Plantations Public Participation Meeting
<b>Meeting number</b>	02
<b>Date</b>	21 November 2019
<b>Time</b>	10:00
<b>Venue</b>	Komkhulu (Headmans Kraal)
<b>Attendees</b>	Mr Makhabeni (Chief/head of Bhukazi)
	Mr B Ntungo (Ward Councillor)
	Miss H Ginyamanzana, Mrs N Noqekeda (Ward Committee)
	Bulelwa Njilo (Ingquza Hill Local Municipality)
	Busiwe Nomzitshi (Sappi)
	Community members
	Ayanda Matiwane, Malibongwe Matyeni (Ezendalo)
<b>Apologies</b>	Mrs Mnqinelwa (Former Ward councillor)

### Discussions

Item	Action Required
1	<p><b><u>Opening &amp; Welcome</u></b></p> <ul style="list-style-type: none"><li>Mr Ntungo (ward Councillor) called the meeting to order at 10h00 and welcomed all those who were present and an opening prayer then followed. The community member welcomed IHLM, Sappi and Ezendalo. Mr Ntungo then provided a brief introduction of the reason of the meeting and handed it over to Ezendalo Environmental Consultants to elaborate further.</li></ul>



2	<p><b><u>Agenda</u></b></p> <ul style="list-style-type: none"> <li>• Prayer &amp; Opening</li> <li>• Introduction</li> <li>• Introduction of the project and details by Ezendalo</li> <li>• Comments and Questions</li> <li>• Closure</li> </ul>
3	<p><b><u>Adoption Of The Agenda</u></b></p> <ul style="list-style-type: none"> <li>• Agenda was adopted</li> </ul>
4	<p><b><u>Purpose Of The Meeting</u></b></p> <ul style="list-style-type: none"> <li>• Ayanda Matiwane addressed the community about the project in relation to what it entails and as to how the environment will be affected. Ayanda also mentioned that their role was to assess the environment which will be affected by the proposed project which includes the biophysical as well as socio economic environment. She further explained that a report will be compiled which will include all assessment information and forwarded to the commenting authorities and eventually be submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) for a decision, only then may the project on the ground commence. Ezendalo further explained why there is a need for the Public Participation process, communities needed to be aware of any development to be undertaken from where they reside. That government always wants to ensure that communities are consulted for any development to be conducted in their area so that they are aware of the development and agree or disagree with the developments, and raise their concerns and queries pertaining the project. The floor was then opened to the community members for any question and comment pertaining to the project.</li> </ul>
5	<p><b><u>Comments and Questions and Responses</u></b></p> <ul style="list-style-type: none"> <li>• Community Members generally welcomed the project and the fact that it will bring jobs to the people of Bhukazi.</li> <li>• The community members asked if we were happy with the proposed location that we received from them for the plantations.</li> </ul>

Sappi stated that they are happy with the current location as it will yield good trees but if the Bhukazi had more land to offer they would be gladly accept the additional land.

Ezendalo also conquered as they had done a site inspection.

- They asked for the start date of the project.

Ezendalo responded that the start date was not yet finalized as we would await responses and communication from Environmental Affairs in order to commence to the next stage.

- The community was concerned about their current environment and if it won't be altered or impacted by the proposed project.

Ezendalo assured them that their environment would not be negatively altered or impacts and that our job (Ezendalo) was to ensure environmental conservation and protection).

- The community stated that the land was now being used by cattle for grazing but it was not a problem as they had alternative locations/would look for alternative locations for the cattle to graze at.

- They asked if this project would eventually bring timber factories closer to the rural areas.

Sappi responded that there are currently no talks of factories being located near Bhukazi but in future it might be a reality.

- They agreed that the project would create jobs for the local community.

- They asked about salaries and how much would the labourers receive.

Sappi responded that they are merely there to assist the Contractor with a loan but the person that will be contracted to do the job will inform them of the rates.

	<p>Ingquza Hill Local Municipality also reminded them that they will be paid as per discussed in the initial meetings</p> <ul style="list-style-type: none"> <li>• Community members asked who will be employed and how they (employees) will be selected.</li> </ul> <p>Sappi informed them that again it will depend on the contractor and his/her specifications. But the goal is to employ people who are ready and willing to work.</p> <ul style="list-style-type: none"> <li>• The community members asked if they could form the forest committee now that will be needed in future.</li> </ul> <p>A committee of 8 members was forms during the meeting.</p>
6	<p><b><u>Closure</u></b></p> <ul style="list-style-type: none"> <li>• Mr Ntungo thanked the attendants for their participation and decision during the meeting and adjourned the meeting at 12:00 p.m.</li> </ul>



# BHUKAZI PUBLIC PARTICIPATION MEETING



**EZENDALO**  
ENVIRONMENTAL CONSULTANTS

NOVEMBER 2019

## ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS- SIGNATURE	TEL/CELL.NO
AYANDA MATIWANE	EZENDALO	<i>AMati</i>	078 827 3986
BUSISO Nomzi SW	SAPPI KHULISA	<i>B. Nomzi</i>	0724418807
Nolungile. Nopked B. NJILO	WARD Comette LHUM	N.N. <i>[Signature]</i>	0733358893 073 0903 429
Cllr Ntungo	W/d Councilor		083
B. DUBE	ward Bukazi	B.D	0780226174
Dr P. Delibazo	Bukazi	P.D	
N. MOUNZA		<i>[Signature]</i>	078 5452040
S. Soyikana		S.S	
M. Tiba		M.T	
M. macofeni		M.M	
J. JOYI	Bukazi	J.J	
S. Gogwana	Bukazi	S.S.	
J. Mbutho	Bukazi	J.m	
m. Mbutho	Bukazi	M.M	
T. Nofenga	Bukazi	T.N	
S. magutswana	Bukazi	S.M	
Z. JOYI	Bukazi	Z.J.	0783965984
P. Zazane	Bukazi	P.Z	0736267288
S. Mqinelwa	Bukazi	S.M	
S. Tiba	Bukazi	S.T	0836098507
M. Ngweni		<i>[Signature]</i>	078 322 7310
Z. Mthabane	Bukazi	Z.M	
M. Mjau	NKONGILO	M.M	



# BHUKAZI PUBLIC PARTICIPATION MEETING



NOVEMBER 2019

EZENDALO  
ENVIRONMENTAL CONSULTANTS

## ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS SIGNATURE	TEL/CELL.NO
M. ngqileka	Bukazi	M.N	
B. Tyobeni	Nkomolo	B.T	0787251180
D. Khikazo	Bukazi	D.	0633435529
B. Motoyi	Bukazi	<del>AB</del>	0731148996
A. Joyi	Bukazi	<del>AB</del>	073 754 0954
S MARBELE	Bukazi	<del>S</del>	0810222922
N. Gqingana	Bukazi	M.G	
S MZIMAVANE	BUKAZI	<del>MS</del>	
Gabriso Lajiso	Bukazi	<del>GL</del>	078747961
ZAKAZA MONCI	BUKAZI	<del>ZM</del>	063 8704088
Bangimpi	Asanda	<del>BA</del>	078813493
P Mamelele	Redhill	P mamelele	0639242488
Ebonqoke	Nyama	<del>EB</del>	
MButo	SIFISO	<del>MB</del>	0640706070
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G. Ayanda			
Dhaghoru	Ayanda	<del>DA</del>	071 419 3023
Mogamele	Nkosinathi	<del>MG</del>	073 4678110
A. Bokha	BK I.	<del>AB</del>	0785299501
A. Ximpans	BK2	<del>AX</del>	0717732130
O. mbewana	BK2	<del>OM</del>	0731329499
A. Joyi	BK2	<del>AJ</del>	083 8571350
A Meggiwa	BK2	<del>AM</del>	0716068360
V. Mfuywa	BK2	<del>VM</del>	0710713061



# BHUKAZI PUBLIC PARTICIPATION MEETING



NOVEMBER 2019

EZENDALO  
ENVIRONMENTAL CONSULTANTS

## ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS SIGNATURE	TEL/CELL.NO
O. Magondana	Bukazi		—
S. Walter	Bukazi		—
S. Magandi + S. Ntsho	Bukazi		073 924 2559
Xolile	Mbutho		0718296747
BROWN	Mngulo		0633112337
N. Mbutho	Bukazi		
M. Nonyongo	Bukazi		063 5211672
L. Mpiyonke	Bukazi		
L. Ntsho	Bukazi	L.N	
C. Mthembu	Bukazi		
Z. Lenzi	Bukazi		0605709945
S. Mavula	Bukazi		
T. Msihla	Bukazi Nkongolo	T.m	
B. Mpiyonke	Nkongolo	B.m	
P. Maganyiyana	Bukazi	P.m	
T. Sina S. Ntsho	Bukazi		
M. Mlungiseleli	Bukazi		
S. DELIHQAZO	Bukazi	S.D	0638131041
J. Mathingwa	Bukazi	J.m	
A. Mbutho	Bukazi	A.m	0633502424
A. Rholobhile	Bukazi	A.R.	
L.M. Mthethwa	Bukazi		078 6983 420
G. Lindokuhle	Bukazi		0710 99 1034



# BHUKAZI PUBLIC PARTICIPATION MEETING



NOVEMBER 2019

**EZENDALO**  
ENVIRONMENTAL CONSULTANTS

## ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS	SIGNATURE	TEL/CELL.NO
L. Duman	Bukazi			0836383035
O. Zakaiza	BUKAZI			0810140096
S. T'ba	Bukazi		—	071993370
B mgqinelwa	Bukazi			0736576488
L Hlokhulu	Bukazi			
V. Latsiba	Bukazi	v.l		
M mabhala	Bukazi			
Z. mhluphaki	BUKAZI	Z.M		0630023458
Melu Zoleka	e bi			
N. Magabiyane	Bukazi	N. Magabiyane		0732201288
N. hlanywa	Bukazi			
B. Ntoko	Bukazi			0789733663
M Tiba	Bukazi			0604776572
Mzaminidawo	Bukazi	M.N		
Z. Mbutso	<del>Mbutso</del> Bukazi			0833909627
V. Mashukuca	BUKAZI	V.M		0632767294
S. Tyatyaga	Bukazi			0717537158
S. MAVELA	BUKAZI			0784283948
Z Jikika	Bukazi			0832046199
S Mashukuca	Bukazi			—
N. Mdolo	Bukazi		N. Mdolo	0789589291
T. GUNYENI	BUKAZI			0982312342
N. MAHAMBHA	BUKAZI		N.M.	—
N. Nogaekeda	BUKAZI		N.N	0780413195
Nobesutshu				



# BHUKAZI PUBLIC PARTICIPATION MEETING



NOVEMBER 2019

EZENDALO  
ENVIRONMENTAL CONSULTANTS

## ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS SIGNATURE	TEL/CELL.NO
Siphokazi	Bukazi		013 723 7033
Lindokuhle	Bukazi		078 635 3602
Mobuhle	Bukazi		073 184 2694
Nozuto	Bukazi	N. N	060 407 2048
Nozuko	Bukazi	N. J	060 394 9913
Philiswa	Bukazi		060 302 6118
Zandile M	Bukazi		073 114 0711
Zinkhita	Bukazi	GZ	
Reanetse T.	Bukazi		078 923 9296
Ncebakazi K.	Bukazi		063 316 9198
Mompumelele M	Bukazi	N. M	073 265 3163
Yine N	Bukazi		071 945 5149
Nomsa X	Bukazi		078 783 4968
Nosibusiso X	Bukazi		078 031 2313
Momvano M	Bukazi		063 635 3356
Zizipho G	Bukazi		073 890 3870
ONGEZIWE M	Bukazi		078 306 6110
Smazo M	Bukazi		083 621 2507
Zizile D	Bukazi		073 330 4356
MBUTO Montsasa	Bukazi		073 869 5836
MBawana Faniswa	Bukazi		-
Utoledo Kasheke	Bukazi		071 776 7871
Mogere Mokuphwa	Bukazi		078 153 4692
GUNYAMENCANA KASHEKE	Bukazi		071 981 4616
Tiba Zenande	Bukazi		071 951 9883











## MALANGENI MINUTES OF PUBLIC PARTICIPATION MEETING

14 NOVEMBER 2019



### Minutes

<b>Meeting/Subject</b>	Malangeni New Plantations Public Participation Meeting
<b>Meeting number</b>	01
<b>Date</b>	14 November 2019
<b>Time</b>	12:00
<b>Venue</b>	Malangeni Community
<b>Attendees</b>	Mr Phathisiwe Mjoji (Chief)
	Mr. T Somadlangatha (Ward Committee)
	Busiwe Nomzitsha, Nndie Setue (Sappi)
	Euglyn Ruleni, Lungiswa Rubela, Mawane Mnyanda, Mziwekhaya Saphulana (Fire and Rescue)
	Community members
	Ayanda Matiwane, Malibongwe Matyeni (Ezendalo)
<b>Apologies</b>	Ward Councillor Hombakazi Tshumane, Bulelwa Njilo (Ingquza Hill Local Municipality)

### Discussions

Item	Action Required
1	<b><u>Opening &amp; Welcome</u></b> <ul style="list-style-type: none"><li>Chief Mjoji called the meeting to order at 12h30 and welcomed all those who were present. An opening prayer then followed. He Ezendalo Environmental Consultants, and provided a brief introduction of the reason of the meeting and its importance and handed over to Ezendalo to elaborate further.</li></ul>

2	<p><b><u>Agenda</u></b></p> <ul style="list-style-type: none"> <li>• Prayer &amp; Opening</li> <li>• Introduction by ward Councillor</li> <li>• Introduction of the project and details by SPM</li> <li>• Comments and Questions</li> <li>• Closure</li> </ul>
3	<p><b><u>Adoption Of The Agenda</u></b></p> <ul style="list-style-type: none"> <li>• Agenda was adopted</li> </ul>
4	<p><b><u>Purpose Of The Meeting</u></b></p> <ul style="list-style-type: none"> <li>• Ayanda Matiwane addressed the community about the project in relation to what it entails and as to how the environment will be affected. Ayanda also mentioned that their role was to assess the environment which will be affected by the proposed project which includes the biophysical as well as socio economic environment. She further explained that a report will be compiled which will include all assessment information and forwarded to commenting authorities and eventually be submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) for a decision, only then may the project on the ground commence. SPM further explain why there is a need for the Public Participation; that communities should be aware of any development to be undertaken from where they reside. That government always want to ensure that communities are consulted for any development to be conducted in their area so that they are aware of the development and agree with such developments or not and raise their concerns and queries pertaining the project. The floor was opened for any comments, queries or clarity seeking questions and general questions.</li> </ul>
5	<p><b><u>Comments and Questions</u></b></p> <ul style="list-style-type: none"> <li>• Community Members generally welcomed the project and the fact that it will bring jobs to the people of Malangeni.</li> <li>• There was a comment about the hectares of the land that have decreased due to corn field/plantations.</li> </ul>

	<ul style="list-style-type: none"> <li>• They stated that the corn fields had been fenced off and thus the plantation extensions would not affect that project.</li> <li>• The community stated that the land was now being used by cattle for grazing but it was not a problem as they had alternative locations for the cattle to graze at.</li> <li>• They agreed that the project would create jobs as they had planned to carry it out in different stages to ensure maximization of job opportunities.</li> <li>• Veld fires are a major problem but people were pleaded to not smoke close to forests and also to report any veld fires to Fire and Rescue.</li> <li>• The community members emphasised that they would take care of the forests as it forms part of the environment and they believe in environmental conservation.</li> <li>• The Chief stated that the community would sit their own meetings and inform us if there are any new developments or changes.</li> </ul>
6	<p><b><u>Closure</u></b></p> <ul style="list-style-type: none"> <li>• Councillor thanked the attendants for their participation during the meeting and adjourned the meeting at 10: 30 p.m. the meeting was then closed with prayer.</li> </ul>



**MALANGENI PUBLIC PARTICIPATION MEETING**



**NOVEMBER 2019**

**ENVIRONMENTAL CONSULTANTS**

**ATTENDANCE REGISTER**

NAME OF PERSON	COMMUNITY	ADDRESS	SIGNATURE	TEL/CELL NO
AYANDA MATIWANE	EZENDAW		<i>Aldi</i>	078 827 3985
BUSINE NOMWISHI	SAPPI KHULISA		<i>B. Nomwishi</i>	0724418827
AKHONA NOCKANTSI	IBHIVONE		<i>A. Nockantsi</i>	0768316756
Maliboyne Matieni	TULIMA GROUP		<i>Maliboyne</i>	0814133223
NANDIE SETWE	SAPPI		<i>Nandie</i>	0727338555
EUGLIM. RUKENI	FIRE & RESCUE		<i>E. Rukeni</i>	0761052310
LUNGISWA RUBELA	FIRE & RESCUE		<i>L. Rubela</i>	076 071 7439
MANANDE MUNDANDA	FIRE & RESCUE		<i>M. Munda</i>	071 033 2740
Mziwekhaya SAPHULA	FIRE & RESCUE		<i>M. Saphula</i>	0781787567
Lungisile Mwanangwa	IBHIVONIA		<i>L. Mwanangwa</i>	078522824
LANGA WANDA	MALANGENI		<i>L. Wanda</i>	0731621129
AM. Gochongo	Malangeni		<i>A. Gochongo</i>	078611881
Z. Nyangwa	Malangeni		<i>Z. Nyangwa</i>	0787608608
V.A. MKUSANE	Malangeni		<i>V. Mkusane</i>	0733404137
B.V. MADIKIZA	Malangeni		<i>B. Madikiza</i>	0789132016
B. BOOI	Malangeni		<i>B. Booi</i>	0830394678
N. MALIWA	Malangeni		<i>N. Maliwa</i>	0736298964
N. MAMAKU	Malangeni		<i>N. Mamaku</i>	073 896 3057
N. NAGANAI	Malangeni		<i>N. Naganai</i>	
N.V. NUNGE	Malangeni		<i>N. Nunge</i>	0605502416
NG. MKUSANE	Malangeni		<i>Ng. Mkusane</i>	C N
M. MDINWA	Malangeni		<i>M. M.</i>	0634613834
Z. Mankwira	Malangeni		<i>Z. M.</i>	083, 52, 86, 537
M.V. Hwangu	MALANGENI		<i>M. V. Hwangu</i>	0735955172



MALANGENI PUBLIC PARTICIPATION  
MEETING



NOVEMBER 2019

ENVIRONMENTAL CONSULTANTS

ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS SIGNATURE	TEL/CELL NO
NTOMBEHI MJOZI	MALANGENI	[Signature]	0835862995
NOMARUNDI MATOLA	MALANGENI	[Signature]	N/A
BONGIWE MADIKIZA	Malangeni	[Signature]	0635213433
N-Ng'elsetha	Malangeni	[Signature]	0631697457
M. Buzwana	July	[Signature]	
N. Dlamini	MALANGENI	N. Dlamini	0736636348
M. Nopitumbu	MALANGENI	M. N.	X
N. Mahlangabeza	Malangeni	N M	0839992369
N. Madinwa	Malangeni	N M	X
M. Vundiso	Malangeni	[Signature]	0750597787
N. Mbatwa	Malangeni	[Signature]	0758859179
E. Kanana	Malangeni	[Signature]	X
T. Nkhatshi	Malangeni	[Signature]	0788311082
N. Booli	Malangeni	N. Booli	0930803449
J. M. Buzwana	Malangeni	Jm	-
N. Jwani	Malangeni	[Signature]	0784480845
Z. Olinebe	Malangeni	[Signature]	-
Ng. Musau	Malangeni	[Signature]	0737706218
Nomfundo	Malangeni	[Signature]	-
N. Nkumbile Z	Malangeni	[Signature]	
M. Mduisa	Malangeni	[Signature]	0634613834
Z. Mankwira	Malangeni	[Signature]	0835286537
Nogwile Hlayi	Malangeni	[Signature]	





# MALANGENI PUBLIC PARTICIPATION MEETING



NOVEMBER 2019

ENVIRONMENTAL CONSULTANTS

## ATTENDANCE REGISTER

NAME OF PERSON	COMMUNITY	ADDRESS	SIGNATURE	TEL/CELL.NO
MJOJI PHATHISIWEA	MALANGENI			0731998998
MZUNGU MGINGANA	MALANGENI		X	0837409856
Sipho Pakade	"			0813815583
LINDILE MAUNDLA	Malangen			0837820292
SIGWILI BUBELE	"			0736547427
LANGE W.	Malangen			0731621129
ANDILE NQOMBE	"			0605993512
Mabuya Masingane	Malangen			0734831970
M. M. M. M. M.	Malangen			
Qu Mjazi	Malangen			
Mathole Mchilo	Malangen			
Zamele Chunele	Malangen			0737478848
Mabuya Masingane	Malangen			0734831970
M.V. HLANGU	MALANGENI		X	0735955173
Z. MANKONKWANA	MALANGENI		X	0835286537
M. Madimwa	MALANGENI		X	0634613834
B.C. MADIKIZA	MALANGENI			0635013433
Nqumane	Malangen			0784480848
N. Boo	Malangen		N.B	
I. Ntlabathi	Malangen			0788311082
M. Kundiso	Malangen			0750597787
N. Mbanjwa	Malangen			0758839479
Ea Khandu	Malangen			
N. DLAMINI	Malangen	N. Dlamini		0736636348
M. NOPHUNGU	Malangen	N.M.		X



## I&AP COMMENTS AND RESPONSES TRAIL

I&AP	Method	Date	Issue	Response
Key Stakeholders				
Landowners				
Mr Mjoji, Phathisiwe Bhukazi	Written Notice	22 February 2020	Mr Mjoji accepted the proposal.	Noted, With Thanks
Mr Xotyeni Nickolas Malangeni	Written Notice	22 February 2020	Accepted the development as it will bring jobs for the local community members	Noted, with appreciation.
Norman Ngamile, DAFF	E-Mail	12 March 2020	No comment received at this stage	
Daniel Mtati, DAFF	E-Mail		No comment received at this stage	
Tebogo Mathiane, DAFF	E-Mail		No comment received at this stage	
Elvis Netshivhumbe, DAFF	E-Mail		No comment received at this stage	
Nokuthula Ncedani, DAFF	E-Mail		No comment received at this stage	
Norman Ngamile, DAFF	E-Mail		No comment received at this stage	
Gwen Sgwabe, DAFF	E-Mail		No comment received at this stage	
Qondile Paliso, DEDEAT	E-Mail		No comment received at this stage	

I&AP	Method	Date	Issue	Response
Lwazi Khuzwayo, Mkhambati Nature Reserve/ ECPTA	E-Mail		No comment received at this stage	
Cecilia Gyan, DEDEAT	E-Mail			
M. Matebese, DRDLR	E-Mail		No comment received at this stage	
Lawrence Musisi, DARDA	E-Mail		No comment received at this stage	
Phindiwe Magula, ECRDA	E-Mail		No comment received at this stage	
Nkosiphendule Quvile, ECRDA	E-Mail		No comment received at this stage	
Nardus du Preez, ECRDA	E-Mail		Dear Ayanda  I have perused the Scoping Report for the forestry development on the two sites, Malangeni of 433 hectares and Bhukazi of 194 hectares in Ngquza Hill LM area.	Good Day Mr du Preez,  This forestry project will surely create jobs for the people of Malangeni and and Bhukazi. We appreciate your support as this development will benefit a lot of people not just the community.

I&AP	Method	Date	Issue	Response
			<p>Forestry can be a financial viable enterprise and it creates much needed jobs in these rural areas. To ensure that best practise forestry norms and standards are adhered to and that a commercial market is secured for mature timber, I would recommend that a private forestry company, such as Sappi who operates already in that area, forms part of the discussions with the communities involved.</p> <p>I support the proposal for forestry establishment and expansion as contained in the Scoping Report.</p>	Kind Regards

I&AP	Method	Date	Issue	Response
			Regards  Nardus du Preez ECRDA Forestry Field Manager	
L. Nel, IDC	E-Mail		No comment received at this stage	L. Nel, IDC
Steve Ngubane, IDC	E-Mail		No comment received at this stage	Steve Ngubane, IDC
K. Mtintsilana, IDC	E-Mail		No comment received at this stage	K. Mtintsilana, IDC
Thukela Mashologu, IDC	E-Mail		No comment received at this stage	Thukela Mashologu, IDC
Thandokazi KetshanganeIDC	E-Mail		No comment received at this stage	Thandokazi KetshanganeIDC
Vuyani Dudula , ECDC	E-Mail		No comment received at this stage	Vuyani Dudula , ECDC
I Henderson, Working for Fire	E-Mail		No comment received at this stage	I Henderson, Working for Fire

I&AP	Method	Date	Issue	Response
Tafandzwa, DTI	E-Mail		No comment received at this stage	Tafandzwa, DTI
Sinelindiwe Zanethemba, DEFF	E-Mail		No comment received at this stage	
Libhongo, ECSECC	E-Mail		No comment received at this stage	
Norman Dlamini, Forestry South Africa	E-Mail		<p>Dear Ayanda</p> <p>Thanks for the reminder, we will surely go through the report and give you the necessary feedback. On a different note, can you perhaps share with us the reasons that made the Mrhotshozweni community lose interest in the development?</p>	<p>Good Day Mr Dlamini,</p> <p>The Mrhotshozweni community members declined the proposed development due to the reasons stated below (which were voiced at the public participation meeting)</p>



<b>I&amp;AP</b>	<b>Method</b>	<b>Date</b>	<b>Issue</b>	<b>Response</b>
Bheki Kunene, DWA	E-Mail		No comment received at this stage	
Zama Memela, DRDLR	E-Mail		No comment received at this stage	
N Lugetye, ORTM	E-Mail		No comment received at this stage	
S G Gexu, DEFF:IHLM	E-Mail		No comment received at this stage	
T N Dlamini, ECPTA	E-Mail		No comment received at this stage	
A Mbarane, IHLM	E-Mail		No comment received at this stage	
Khaya G Gqwabasa, DEDEAT	E-Mail		No comment received at this stage	
V Silo, DEDEA	E-Mail		No comment received at this stage	

I&AP	Method	Date	Issue	Response
			<p>This might help us in assisting communities in the future and also avoid unnecessary expenditure while directing our limited resources appropriately.</p> <p>Kind regards, Norman</p>	<p>.</p> <ul style="list-style-type: none"> <li>• They informed us that they were not aware of the project and some were not even living there during the initial stages of the proposal as it was proposed a long time ago (2012).</li> <li>• The community claimed that the person that communicated with Sappi and DAFF and chose the site, did not contact and communicate with the rest of the community</li> </ul>

I&AP	Method	Date	Issue	Response
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				<ul style="list-style-type: none"><li>• They stated that most of the members that signed the register in 2011/12 had died.</li><li>• Some members emphasised that they should have been approached when the initial decisions were taken and the lands were selected for the plantations.</li><li>• They claimed that they would have chosen alternative lands and not the lands selected.</li></ul> <p>There was a complaint about the land being used by the cattle as grazing land and that</p>

I&AP	Method	Date	Issue	Response
				<ul style="list-style-type: none"><li>• their cattle had no alternative land to utilize.</li><li>• They also mentioned that they initially lived on those lands and that there were many family grave sites on the proposed area and they did not want to relocate them.</li><li>• The community members stated that forests will increase rape cases in the area as many people use the proposed site as a crossing area to go to schools and the local clinic.</li></ul>

I&AP	Method	Date	Issue	Response
				<ul style="list-style-type: none"> <li>•They also stated that crime rates will increase as the thieves will have a place to hide.</li> </ul> <p>The community members therefore did not support the project proposal and thus declined the development all together.</p> <p>I hope this answers your question.</p> <p>Kind regards.</p>

I&AP	Method	Date	Issue	Response
			<p>Dear Ayanda</p> <p>Thanks for your prompt and comprehensive response. It gives us ideas on how to prevent this from happening in the future.</p> <p>Kind regards,</p> <p>Norman</p>	
Nathi Ndlela, Forestry South Africa	E-Mail		No comment received at this stage	
Luvuyo Sandi, SEDA - CPPP	E-Mail		No comment received at this stage	

Lizna Fourie, DWA	E-Mail		Please send the attachment as I did not received it in the previous email. Apologies as we had a lot	Good Day Lizna,
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I&AP	Method	Date	Issue	Response
			of issues with emails in our Department  Regards  Lizna Fourie	Please find the attached document for the Malangeni and Bhukazi Afforestation (plantation) project. I shall await your comments and suggestions.  Kind regards.
O. Notobela, Environmental Affairs	E- Mail		No comment received at this stage	
O Siganga, ORTDM	E-Mail		No comment received at this stage	
F E Sobantu, Disaster Management	E-Mail		No comment received at this stage	
T Sigwebo, ORTDM Health	E-Mail		No comment received at this stage	

L Mboyi, ECPTA-N2	E-Mail		No comment received at this stage	
A Morai, DRDLR	E-Mail		No comment received at this stage	
<b>I&amp;AP</b>	<b>Method</b>	<b>Date</b>	<b>Issue</b>	<b>Response</b>
M. Myolwa	E-Mail		No comment received at this stage	
S Swelindawo,	E-Mail		No comment received at this stage	
M Langa, ECPTA	E-Mail		No comment received at this stage	
B Nodola,	E-Mail		No comment received at this stage	
N Ntola, DEDEA	E-Mail		No comment received at this stage	
Z Nkomfana	E-Mail		No comment received at this stage	
S Dakwa	E-Mail		No comment received at this stage	
L Ndobeni, DEDEA	E-Mail		No comment received at this stage	
S Mhatu, ECPTA	E-Mail		No comment received at this stage	
J Ngaphu,	E-Mail		No comment received at this stage	
N Dubedube, ECPTA	E-Mail		No comment received at this stage	
B Ngebulana, DMR	E-Mail		No comment received at this stage	



S C Gexu	E-Mail		No comment received at this stage	
N Songxaba, NRA	E-Mail		No comment received at this stage	

# COMMUNITY LAND RIGHTS RESOLUTION

Annexure D: Pro forma (Approved at PC of 10 September 1998)

LAND RIGHTS HOLDERS' RESOLUTION<sup>1</sup> IN TERMS OF THE "INTERIM PROCEDURES GOVERNING LAND DEVELOPMENT DECISIONS WHICH REQUIRE THE CONSENT OF THE MINISTER OF LAND AFFAIRS AS NOMINAL OWNER OF THE LAND" WHICH WAS APPROVED BY POLCOM ON 20 NOVEMBER 1997 AND AMENDED ON 14 JANUARY 1998 & ALSO IN TERMS OF SECTION 3(1)(A)(II) OF ACT 112 OF 1991 AS AMENDED BY ACT 34 OF 1996

1. At a meeting of the Bhukazi Land Rights Holders at Bhukazi, district of Walcot's province of Eastern Cape on the 22 day of FEBRUARY 2012 before Headman councillors, community leaders and representatives, Land Rights Holders present.
  
2. The PURPOSE of the meeting being: To get the consent of the community for the establishment of a Community Forest assisted by Sappi on communally owned land  
The Application is for 182 Hectares around Bhukazi
  
3. That the Land Rights Holders were informed of the meeting .....days/ months prior thereof, through the following CHANNELS OF COMMUNICATION ANNOUNCEMENTS in community

<sup>1</sup> A Land Rights Holders Resolution known previously as a tribal or community resolution

Gatherings i.e. Meetings, Funerals etc.

4 by means of (specify the type of **MEDIA** used)

N/A

5. That the Land Rights Holders consists of approximately 151 members. Of which 91 adult males and 60 adult females who attended the meeting.

6. That 151 of the members who attended the meeting voted in favour of the above resolution and NONE voted against it.

7. That I am satisfied that the majority of the adult members present at the meeting were in favour of the above resolution.

8. **The Land Rights Holders' Statement of Resolution.** The land rights holders/ community have resolved that they agree to the proposal raised for the establishment of a community for the following reasons:-

- ① They as the community users eager to get assistance from Sappi (Technical Support)
- ② Hoping for forests bi-products at cheaper prices & wanting to have a forest of their own
- ③ Job opportunity for local children
- ④ Getting technical skills on how to manage and run the forest.
- ⑤ Have a legal entity be it a Trust, cooperative etc to run the processes of the project
- ⑥ Having a trust Account to benefit the community by developing other community Based projects.
- ⑦ Having a Constitution that would guide the project

9. It was further **RESOLVED** that

9.1 The following signatories will sign the agreement taken by the community on their behalf to give effect to the decision to alienate/ develop the land

9.1.1 Name: Jonguuya Mbuthe Capacity: Head of Bhulcazi  
Signature: [Signature] Date: 2012-02-22

9.1.2 Name: M. J. James Capacity: Traditional Councilor  
Signature: [Signature] Date: 2012-02-22

9.1.3 Name: B. E. Ntulo Capacity: VED OFFICER  
Signature: [Signature] Date: 2012-02-22

9.2 The following signatories will co-sign the lease agreement on behalf of the community to give effect to the decision to alienate/ develop the land. (The parties to the lease agreement are the community, the investor/ developer and the Minister of Land Affairs)

9.2.1 Name: L. P. Somdaka Capacity: Sapi  
Signature: [Signature] Date: 2012-02-22

9.2.2 Name: Bennie Ntubane Capacity: DRDLR  
Signature: [Signature] Date: 2012-02-22

9.2.3 Name: C. M. Sijou Capacity: DAFF

Signature: [Handwritten Signature] Date: 2012-02-22

9.3 The following signatories will sign the agency agreement on behalf of the community. (The agency agreement is a trust contract with the agent who will hold and administer the funds for the benefit of the community, following the decision to alienate/ develop the land).

9.3.1 Name:.....Capacity.....

Signature:.....Date:.....

9.3.2 Name:.....Capacity.....

Signature:.....Date:.....

9.3.3 Name:.....Capacity.....

Signature:.....Date:.....

10. The co-signatories in section 9.1, 9.2 and 9.3 signed on behalf of and with full consent of the Land Rights Holders present or represented in the meeting.

The Bhukazi / Masakeni  
~~Tribal / Local / Community~~ Authority and the

Bhukazi..... Land Rights Holders/  
~~Community~~ and other structures residing on the land **shall be bound in law** by this land rights holders' resolution.

10. This Land Rights Holders constitutes a legal document and to give effect to it, the community have approved that they approve to this resolution document and that the following **SIGNATORIES** sign this Land Rights Holders' Resolution on their behalf:

10.1 Name: Nobongile Mkhalelo Capacity: Community Member

Signature: N.M. Mkhalelo Date: 2012-02-22

10.2 Name: Nompumelelo Mhambane Capacity: Community Member

Signature: [Signature] Date: 2012-02-22

10.3 Name: Nombikayise Nyambani Capacity: Community Member

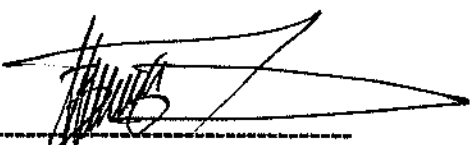
Signature: N. Al Date: 2012-02-22

**CERTIFICATE**

I Bennie Z. Ntubane.....the duly appointed Investigating Official from the Department of Land Affairs hereby certify that:-

- (i) I have attended the meeting of the Bhukazi.....  
Tribe/ Community/ Land Rights Holders under the chair/leadership of  
Hladman Jonguuyyo Mbuthe.....  
convened for purposes of considering this resolution.
- (ii) the facts set out in the above resolution are to the best of my knowledge, true and correct and this resolution is a true record of the proceedings at the meeting.
- (iii) the nature of the rights are.....  
**Strike out where necessary:**  
(a) The development ~~will~~ will not lead to a change in these rights  
(b) Those whose rights are affected have been/ ~~have not been~~ accommodated  
(c) ~~There are/~~ there are no overlapping land rights  
(d) New rights & benefits are created/ ~~no new rights & benefits~~ are created  
(e) The rights of women have improved/ ~~stays the same/~~ is worse of because of the development decision
- (iv) the signatories affixed their signatures to this document in my presence.
- (v) I have to the best of my ability explained the purpose and legal implications of the said resolution to those present and represented at the meeting.

SIGNED ON THE 22 DAY OF February 2012 AT Bhukazi/Kusikisiki

  
-----  
OFFICIAL'S SIGNATURE

Project Coordinator  
-----  
DESIGNATION

NB! SEE ATTACHED ATTENDANCE REGISTER of rights holders attending the meeting



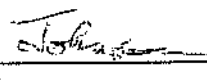
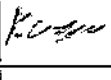
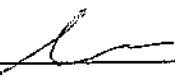


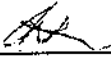


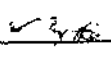
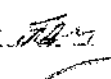

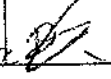



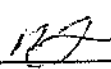
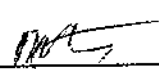

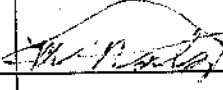


ATTENDANCE REGISTER

MEETING OF Bhukazi COMMUNITY / TRIBE / LAND RIGHTS  
 HOLDERS

VENUE Bhukazi

DATE: 2012-07-27

No.	Name & Surname	Place /Section	Telephone	Signature
1.	J. Josi	Bukazi	0736318499	
2.	Y. Wilim	Bukazi	—	
3.	J. UGAMBA	Bukazi	0732992476	
4.	M. Kibwili	Bukazi	0834762063	
5.	Z. GUMELA	Bukazi	—	Z. GUMELA
6.	N. KOTJENSI	Bukazi	0719182851	
7.	E. MABONG	Bukazi	0825739704	
8.	E. CUBETA	Bukazi	0736468844	ELIAS
9.	B. CHAKISO	Bukazi	—	
10.	D. MACOPELA	Bukazi	—	
11.	D. MACELE	Bukazi	—	
12.	B. DUBO	Bukazi	—	
13.	Z.	Bukazi	—	
14.	Z. MHLINISWANA	Bukazi	0719123742	
15.	M. MACEKOCOKO	Bukazi	0834220353	
16.	B. KALOBILE	Bukazi	0732736511	

17.	Z. MHLAMBELEWA	Bukazi	—	Z. MHLAMBELEWA
18.	S. SIKAWANI	Bukazi	07836129793	X
19.	B. Jwili	Bukazi	—	B. Jwili
20.	J. TIBA	Bukazi	—	J. TIBA
21.	M. TIBA	Bukazi	—	M. TIBA
22.	N. MALAZI	Bukazi	0783641588	N. MALAZI
23.	B. CINGO	Bukazi	—	B. CINGO
24.	S. JISI	Bukazi	0783607288	S. JISI
25.	M. DINGYANA	Bukazi	0786297360	X
26.	S. TIBA	Bukazi	—	X
27.	S. CHUMBEWE	Bukazi	—	S
28.	B. MALENDE	Bukazi	0784036575	
29.	M. MALINA	Bukazi	0786250602	
30.	A. NYAMUYANA	Bukazi	078308183	
31.	C. BAZE	Bukazi	—	
32.	M. NSTERU	Bukazi	—	
33.	A. NYAMBA	Bukazi	—	A. NYAMBA
34.	S. SOSIKANA	Bukazi	0812864881	
35.	M. BILISO	Bukazi	0783785009	

36	M. MASILIKA	Bukazi	0789711948	<del>AAAT</del>
37	Z. KWAH	Bukazi	073361889	<del>ZZ</del>
38	S. MASIKA	Bukazi	0784285426	<del>EA</del>
39	L. NZANJA	Bukazi	0737035741	L
40	P. MANICHEBU	Bukazi	0718273088	P
41	M. DOBOSHIMANE	Bukazi	—	<del>V</del>
42	S. MTHANDABA	Bukazi	0785691812	<del>SS</del>
43	F. ZOMINDAWO	Bukazi	075266932	<del>FF</del>
44	N. NOTASI	Bukazi	—	<del>JW</del>
45	A. SOTSHA	Bukazi	—	<del>A. SOTSHA</del>
46	Z. MANGULO	Bukazi	071988211627	Z. MANGULO
47	M. ZAKHATA	Bukazi	—	<del>X</del>
48	D. DANILE	Bukazi	—	<del>DD</del>
49	B. MAVEHA	Bukazi	—	<del>BB</del>
50	M. NDUBA	Bukazi	—	<del>M NDUBA</del>

51 F. DOBOSHIMANE Bukazi 0750410510 ~~FF~~

52 M.G. YONGER Bukazi 0789277624 ~~YY~~

53 M.KOSI TARETHILE VUMOGNATILE Bukazi 0933928452

54 V. ZAKAZA Bukazi 0787860579 ~~X~~

55 Z. MBUTHO Bukazi — ~~X~~

56 A. MAFEDO Bukazi — ~~X~~

57 M. BELABANTO Bukazi 0736739052 ~~X~~

ATTENDANCE REGISTER

MEETING OF Bhulcazi ~~COMMUNITY~~ / ~~TRIBE~~ / LAND RIGHTS

HOLDERS

VENUE Bhulcazi

DATE: 2012-02-22

No.	Name & Surname	Place /Section	Telephone	Signature
1.	E.B. Mhlayi	Bukazi	0781391901	<i>[Signature]</i>
2.	O. Mngqeniwa	Bukazi	0837227195	<i>[Signature]</i>
3.	Z.P. Gintamanzana	Bukazi	0735337959	<i>[Signature]</i>
4.	Z. Gintamanzana	Bukazi	0735337959	Z.G.
5.	M. Mkhahlele	Bukazi	0786663715	<i>[Signature]</i>
6.	N. Goboshitana	Emathunzini	0719895000	<i>[Signature]</i>
7.	N. Dumani	Emathunzini	0730215903	<i>[Signature]</i>
8.	Z. Ndweni	Emathunzini	0736132745	<i>[Signature]</i>
9.	T. Mngqanule	Emathunzini	0788780722	<i>[Signature]</i>
10.	T. Mangaliso	Bukazi	0737071362	<i>[Signature]</i>
11.	N. Tiba	Bukazi		<i>[Signature]</i>
12.	N. Mkhahali	Bukazi	0787917348	<i>[Signature]</i>
13.	T.P. Mngandi	Bukazi	0730463019	<i>[Signature]</i>
14.	P. Mngandi	Bukazi	0730462040	<i>[Signature]</i>
15.	N. Gabela	Bukazi	0786620780	<i>[Signature]</i>
16.	N. Ntalo	Bukazi	0780054847	<i>[Signature]</i>

17.	F. LUFELA	BUKAZI	0717982091	✓
18.	N. HLOKHULO	BUKAZI	071252175	N. HLOKHULO
19.	M. JOYI	BUKAZI		M. JOYI
20.	B. MTOLOWO	BUKAZI	0732786185	B. MTOLOWO
21.	N. JOYI	BUKAZI	073599385	N. JOYI
22.	M. GAZI	BUKAZI	078540677	M. GAZI
23.	A. GAZI	BUKAZI	072243912	A. GAZI
24.	N. JOYI	BUKAZI	0738201288	N. JOYI
25.	N. MBUTHO	BUKAZI	0788749070	N. MBUTHO
26.	M. JOYI	BUKAZI	0781349558	M. JOYI
27.	M.B. BAM	BUKAZI	0783164912	<del>M.B. BAM</del>
28.	N. Mahamba	BUKAZI	0714029208	<del>N. Mahamba</del>
29.	B. Dalihlazo	BUKAZI	0736626570	B.D.
30.	V. Magayiyana	BUKAZI	0755059441	<del>V. Magayiyana</del>
31.	E. Nosenga	BUKAZI	-	⊙
32.	N. NDZELU	BUKAZI	0711603663	<del>N. NDZELU</del>
33.	N. Ginyamanzani	BUKAZI	-	<del>N. Ginyamanzani</del>
34.	N. MOKOTHA	BUKAZI	0758160250 078812576	N. MOKOTHA
35.	F. MBUTHO	BUKAZI	0739795900	⊙

36	N. NDZEKU	BUKAZI	071732055	<del>N. NDZEKU</del>
37	N. giyo	BUKAZI	0710542757	N. giyo
38	M. Tiba	Bu kazi	-	(MT) 69
39	M.T Tiba	Bukazi	0732855	MT/Be
40	M Nompapa	BUKAZI		X
41	V. Makuleni	BUKAZI	0835851100	X
42	M. Mbewena	Bu kazi	0732941580	N. Mbewena
43	L MJOBO	BUKAZI	0730304 <sup>911</sup>	MD
44	N TShekiso	BUKAZI	073082437	<del>DT</del>
45	Zoko M.	BUKAZI		X
46	N. Zoko	BUKAZI	0780039539	+
47	I.N. Phindwa	BUKAZI		I.N. Phindwa
48	J. Diko	BUKAZI		+
49	N. Zamindwa	BUKAZI	0717804502	X
50	M. Mngqinelwa	BUKAZI	0738270798	(MN)

MEETING OF BUKAZI A/A COMMUNITY / TRIBE / LAND RIGHTS  
 HOLDERS

VENUE: Bhukazi

DATE: 2012 - 09 - 22

No.	Name & Surname	Place /Section	Telephone	Signature
1.	M. Mangongoza	BUKAZI	0735239827	M.M.
2.	N. NJANSANA	BUKAZI	0730274696	N.A
3.	T. Nosenga	BUKAZI	0736037700	T. Nosenga
4.	C. CADISA	BUKAZI	0787554960	C. CADISA
5.	Mtoldo A.	BUKAZI	0780417868	A. A. A. A.
6.	M. Njangaia	BUKAZI	0786548546	M. Njangaia
7.	N. Maganyiya	BUKAZI	0710470306	N. Maganyiya
8.	Z. MBUTHO	BUKAZI	0780230703	Z. M. M.
9.	N. MPOWANG	Emathuzini		N. MPOWANG
10.	S. Siqathule	BUKAZI		S. S.
11.	A. Njansana	BUKAZI		A. Njansana
12.	V. Minkhela	BUKAZI	0794396791	V. M.
13.	M. Mdiya	BUKAZI	0728214594	M. Mdiya
14.	J. Mbuthe	BUKAZI	0787543643 <del>078543643</del>	J. M.
15.	B. NJILO	IMLMI	0392520131/ 0785050616	B. N.
16.	A.Z. MHATU	SAPPRI	0823297108	A.Z. M.

*[Handwritten signature]*

## ATTENDANCE REGISTER

MEETING OF Bhukazi ..... ~~COMMUNITY~~ / ~~TRIBE~~ / LAND RIGHTS  
HOLDERSVENUE Bhukazi .....DATE: 2012-02-22 .....

No.	Name & Surname	Place /Section	Telephone	Signature
1.	H. MINGILO	Bukazi	078 2750 769	
2.	W. GUMBA	Bukazi	073 065859	
3.	B. MAHAMBWA	Bukazi	—	
4.	J. NDOEKEDA	Bukazi	—	
5.	N. BOBOSHIAWE	Bukazi	—	
6.	Z. SIKALA MIMBO	Bukazi	07856 78165	X
7.	T. ZAKAZA	Bukazi	0733006828	X
8.	N. KHWALI	BUKAZI	0733631536	
9.	T. NDOEKEDA	Bukazi	0790203259	T. NDOEKEDA
10.	N. MAHAMBWA	Bukazi	—	N. MAHAMBWA
11.	T. ZAMINDAHO	Bukazi	—	
12.	N.D. NBYIKOZA	" "	<del>083 356355</del>	
13.	S. CHACHISO	Bukazi	0731928083	G.S
14.	S. MANDANI	Bukazi	0720247080	
15.	L. MTSOTSO	Bukazi	0731614254	
16.	G. CWEBE	Bukazi	0766991825	



17.	M. C. GAZI	BUKAZI	0838932313	<del>AK</del>
18.	<del>Mr. M. M. M. M. M.</del>	<del>REMIHIL</del>	<del>083984685</del>	<del>M. M. M. M. M.</del>
19.	M. BOBOLIHANE	BUKAZI	0731964550	M. M. M. M. M.
20.	A. BOBOLIHANE	BUKAZI	0738905070	<del>AK</del>
21.	M. DOKUSINI	BUKAZI		<del>AK</del>
22.	P. M. M. M. M.	BUKAZI	0758834574	P. M. M. M.
23.	C. MATHANDELE	BUKAZI	0788432673	COM
24.	A. KHINALI	BUKAZI	0783538213	AK
25.	P. LAZANE	BUKAZI	0195875548	P. M. M. M.
26.	N. MANJALISO	BUKAZI	0730644267	N. Manjalis
27.	C. M. SIJAZU	DAFF MATARA	07317391558	<del>AK</del>
28.	B. B. Ntubane	DRDLR	0829097443	<del>AK</del>
29.				
30.				
31.				
32.				
33.				
34.				
35.				

Annexure D: Pro forma (Approved at PC of 10 September 1998)

LAND RIGHTS HOLDERS' RESOLUTION<sup>1</sup> IN TERMS OF THE "INTERIM PROCEDURES GOVERNING LAND DEVELOPMENT DECISIONS WHICH REQUIRE THE CONSENT OF THE MINISTER OF LAND AFFAIRS AS NOMINAL OWNER OF THE LAND" WHICH WAS APPROVED BY POLCOM ON 20 NOVEMBER 1997 AND AMENDED ON 14 JANUARY 1998 & ALSO IN TERMS OF SECTION 3(1)(A)(II) OF ACT 112 OF 1991 AS AMENDED BY ACT 34 OF 1996

1. At a meeting of the Malangezi Land Rights Holders at Malangezi, district of Lusitisisi province of Eastern Cape on the 17 day of Feb 2012 before Headman councillors, community leaders and representatives, Land Rights Holders present.
  
2. The PURPOSE of the meeting being  
To Get the Consent of the Community for the extension of 433 Hectares to the 106 Hectares previously Agreed.
  
3. That the Land Rights Holders were informed of the meeting ..... days/ months prior thereof, through the following CHANNELS OF COMMUNICATION  
Announcements at Community Gatherings

<sup>1</sup> A Land Rights Holders Resolution known previously as a tribal or community resolution

i.e. Funerals, Meetings etc.

4 by means of (specify the type of **MEDIA** used)

N/A

5. That the Land Rights Holders consists of approximately...183...members. Of which 113...adult males and...70...adult females who attended the meeting.

6. That...183...of the members who attended the meeting voted in favour of the above resolution and .....None.....voted against it.

7. That I am satisfied that the majority of the adult members present at the meeting were in favour of the above resolution.

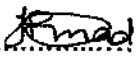
8. **The Land Rights Holders' Statement of Resolution.** The land rights holders/ community have resolved that they support the Development for the following reasons

- ① More Job opportunities for Local Children
- ② More benefits in terms of profit from the project.
- ③ A number of abled children will be trained in their numbers on how to run, manage and own the forest on behalf of the community of Malangen
- ④ Open room for further/Future expansion of development in the Area & not only wood but other commodities.

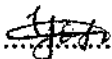
9. It was further **RESOLVED** that

9.1 The following signatories will sign the agreement taken by the community on their behalf to give effect to the decision to alienate/ develop the land


9.1.1 Name: T. B. Madyibi Capacity: Head of Malangenzi

Signature:  Date: 2012-02-17

9.1.2 Name: T. Jotile Capacity: Ward Councillor

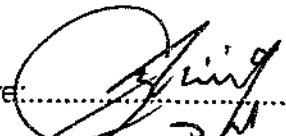
Signature:  Date: 2012-02-17

9.1.3 Name: M. Mtile Capacity: Traditional Councillor

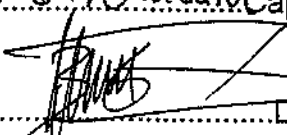
Signature:  Date: 2012-02-17

9.2 The following signatories will co-sign the lease agreement on behalf of the community to give effect to the decision to alienate/ develop the land. (The parties to the lease agreement are the community, the investor/ developer and the Minister of Land Affairs)

9.2.1 Name: A. Z. Mhatu Capacity: DAPP

Signature:  Date: 2012-02-17

9.2.2 Name: D. Z. Ntubane Capacity: DRDLR-Mthatha

Signature:  Date: 2012-02-17

9.2.3 Name: C. M. Sijadu Capacity: DAPP

Signature: [Signature] Date: 2012-02-17

9.3 The following signatories will sign the agency agreement on behalf of the community. (The agency agreement is a trust contract with the agent who will hold and administer the funds for the benefit of the community, following the decision to alienate/ develop the land).

9.3.1 Name:.....Capacity.....

Signature:.....Date:.....

9.3.2 Name:.....Capacity.....

Signature:.....Date:.....

9.3.3 Name:.....Capacity.....

Signature:.....Date:.....

10. The co-signatories in section 9.1, 9.2 and 9.3 signed on behalf of and with full consent of the Land Rights Holders present or represented in the meeting.

The MALANGENI.....


~~Tribal~~ / Local/ ~~Community~~ Authority and the

MALANGENI..... Land Rights Holders/

Community and other structures residing on the land **shall be bound in law** by this land rights holders' resolution.

10. This Land Rights Holders constitutes a legal document and to give effect to it, the community have approved that they approve to this resolution document and that the following **SIGNATORIES** sign this Land Rights Holders' Resolution on their behalf:


10.1 Name: N. SOMXOXG Capacity Community Member

Signature:  Date: 2012-02-17

10.2 Name: N. Maja /a Capacity Community Member

Signature: N.M Date: 2012-02-17

10.3 Name: B. Pooi Capacity Community Member

Signature:  Date: 2012-02-17

**CERTIFICATE**

I Bennie Z. NTUBANE.....the duly appointed Investigating Official from the Department of Land Affairs hereby certify that:-

(i) I have attended the meeting of the MALANGENI.....  
~~Tribe/ Community/~~ Land Rights Holders under the chair/leadership of  
HEADMAN ZANOXOLO MJOJI.....  
convened for purposes of considering this resolution.

(ii) the facts set out in the above resolution are to the best of my knowledge, true and correct and this resolution is a true record of the proceedings at the meeting.

(iii) the nature of the rights are.....

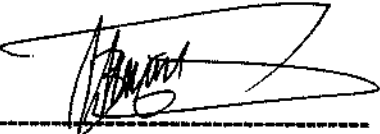
**Strike out where necessary:**

- (a) The development ~~will~~ will not lead to a change in these rights
- (b) Those whose rights are affected have been/ ~~have not been~~ accommodated
- (c) There are/ ~~there are no~~ <sup>NO</sup> overlapping land rights
- (d) New rights & benefits are created/ ~~no new rights & benefits are created~~
- (e) The rights of women have improved/ ~~stays the same, i.e. worse~~ of because of the development decision

(iv) the signatories affixed their signatures to this document in my presence.

(v) I have to the best of my ability explained the purpose and legal implications of the said resolution to those present and represented at the meeting.

SIGNED ON THE 17 DAY OF FEBRUARY 2012 AT MALANGENI



OFFICIAL'S SIGNATURE

Project Coordinator

DESIGNATION

*NBI SEE ATTACHED ATTENDANCE REGISTER of rights holders attending the meeting*

ATTENDANCE REGISTER

MEETING OF Malangenii COMMUNITY / ~~TRIBE~~ / LAND RIGHTS  
HOLDERS

VENUE Headman's kraal - Malangenii  
DATE: 2012-02-17

No.	Name & Surname	Place /Section	Telephone	Signature
1.	MBulelo Msoji		0782328924	
2.	SIPHISO MAFA	Malangenii	0825040075	
3.	NONZALISEKO CHITA	MALANGENI	0780300502	
4.	MABONA SIMTHEWIG	MALANGENI	0740387060	
5.	B. Booi	Malangenii	0719928667	
6.	B. NJILO	IHLAM	0185950616	
7.	B.Z. Nkubane	JRDUR	0829097448	
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10.	E.M. Sijabhu	DAFF	0734394358	
11.	Z.W. MABHAKU	MALANGENI	0834025104	
12.	TIB. Madyibi	Malangenii	0837676359	
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14.	M-EMPONGWANA	HEALTH	0823616308	
15.	N. Twalu	HEALTH	039-2531152	
16.	N. X. Panta	HEALTH	039 2531152	



17.	N. UMISO MPINDA	MALANGENI	—	X
18.	JENI NOPHUNGU	MALANGENI	—	X
19.	BV MADIKIZA	MALANGENI	0787194335	<del>ADMA</del>
20.	MFEKETHO SOMPALAZA	MALANGENI	—	+
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27.	N.M KWATA	MKUNZIMBINI	0833891097	<del>XXXXXXXXXX</del>
28.	N. MATANDABULO	MKUNZIMBINI	083506409	<del>XXXXXXXXXX</del>
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3

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37	NDZogiyahimwe	Malangeni	0784132319	<del>IVK</del>
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48	M. N. M. M. M.	Malangeni	0776080112	<del>MA</del>
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## **APPENDIX E –SPECIALIST REPORTS**

# HYDROLOGICAL IMPACT ASSESSMENT



# HYDROLOGICAL ASSESSMENT

*FOR AFFORESTRATION OF MALANGENI EXTENSION OF 433 HECTARES  
AND BHUKAZI OF 194 HECTARES, INGQUZA HILL LOCAL MUNICIPALITY,  
OR TAMBO DISTRICT OF THE EASTERN CAPE*

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**February 2020  
DRAFT REPORT**

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## Annexures

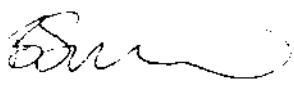

ANNEXURE A Percentage exceedance of flow at the outlet of the simulated catchment

## Specialist Details & Declaration

This report has been prepared in accordance with Section 13: General Requirements for Environmental Assessment Practitioners (EAPs) and Specialists as well as per Appendix 6 of GNR 982 – Environmental Impact Assessment Regulations and the National Environmental Management Act (NEMA, No. 107 of 1998 as amended 2017) and Government Notice 704 (GN 704). It has been prepared independently of influence or prejudice by any parties.

The details of Specialists are as follows –

Table 1 Details of Specialist

Specialist	Task	Qualification and accreditation	Client	Signature
Bruce Scott-Shaw NatureStamp	Design, GIS & report	BSc, BSc Hon, MSc, PhD Hydrology	Ezendalo Environmental Consultants	 Date: 15/02/2020
Nick Davis Isikhungusethu Environmental Services	Design & GIS	BSc, BSc Hon, MSc Hydrology	Ezendalo Environmental Consultants	 Date: 15/02/2020

### Details of Authors:

Bruce is a hydrologist, whose focus is broadly on hydrological perspectives of land use management and climate change. He completed his MSc under Prof. Roland Schulze in the School of Bioresources Engineering and Environmental Hydrology (BEEH) at the University of KwaZulu-Natal, South Africa. Throughout his university career he has mastered numerous models and tools relating to hydrology, soil science and GIS. Some of these include ACURU, SWAT, ArcMap, Idrisi, SEBAL, MatLab and Loggernet. He has some basic programming skills on the Java and CR Basic platforms. He has spent most of his spare time doing field work for numerous companies and researchers. Bruce has completed his PhD which focuses on rehabilitation of alien invaded riparian zones and catchments using indigenous trees. The aim is to select Working for Water (WfW) sites throughout the country and use micro-meteorological techniques to measure the water use of both the indigenous and alien tree species in the riparian areas. This research will assist in land rehabilitation and restoration in the highly sensitive riparian areas. A modelling approach has been incorporated into the research to improve the spatial resolution of the research and to work as a management tool. Bruce has worked on numerous projects for the CSIR and Ezemvelo KZN wildlife which has included micrometeorological work, EIAs and wetland mapping for KZN. Bruce has presented his research around the world, where most recently he represented South Africa at the Singapore International Water Week on water policy and implementation.

Nicholas Davis is a hydrologist whose focus is broadly on hydrological perspectives of land use management, climate change, estuarine and wetland systems. Throughout his studies and subsequent work at UKZN he has mastered several models and programs such as ACURU, HEC-RAS, ArcMap, QGIS, Indicators of Hydrologic Alteration software (IHA) and Idrisi. He has moderate VBA programming skills, basic UNIX and python programming skills.



# 1. INTRODUCTION

## 1.1 Project Background and Description of the Activity

An Environmental Impact assessment is being undertaken for the Malangeni forestry extension of 433 hectares in Lusikisiki, at ward 24 and 194 hectares Bhukazi in Lusikisiki at ward 12. Ingquza Hill Local Municipality, previously known as Qaukeni, is an administrative area in the OR Tambo District of Eastern Cape in South Africa. Ingquza Hill local municipality is formed by two small towns which are Lusikisiki and Flagstaff under the O.R.Tambo District municipality. This municipality is informed by 32 wards. Malangeni, Bhukazi and Mrhotshozweni are located in the North Eastern region of the Eastern Cape, in Lusikisiki. The details of each proposed site can be seen in Table 1.

Table 1 Details of the two forestry sites

Project Name	Size (ha)	Ward Number	Purpose	Coordinates
Malangeni	433	24	Expansion	31° 19' 10.343"S; -29° 43' 28.889"E
Bhukazi	194	12	New Plantation	31° 17' 46.93"S; -29° 28' 17.19"E

The location of the sites can be seen in Figure 1.

As part of additional specialist study requirements, a hydrological assessment was requested, with a focus on investigating the potential impacts of the activities on water resources.

Pre-development assessments are required to gain an understanding of the natural environment and guide the developmental process in order that site-specific mitigation measures can be put in place and that best practice can be followed.

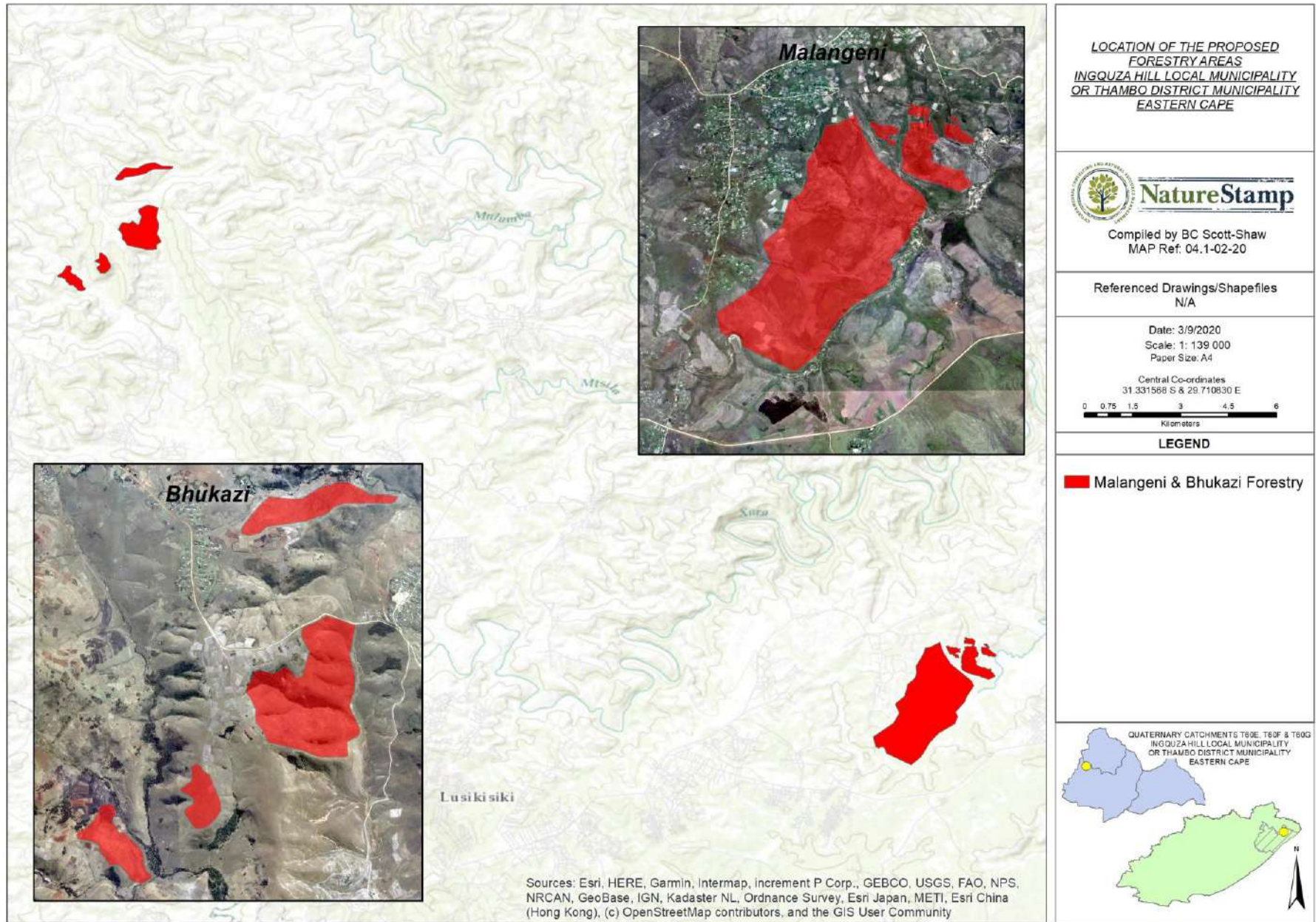


Figure 1 Locality map of the proposed site

## 1.2 Terms of reference

### i. Hydrological Assessment

- Desktop description of the baseline receiving environment specific to the hydrology of the site (general surrounding as well as site-specific environment);
- Identification and description of surface water features that occur in the study area, and the manner in which these may be affected by the activity;
- Identification of any legal provisions relevant to the specific field of expertise and the proposed activity (including relevant legislation, National and Provincial, Department Guidelines and Management Frameworks).
- Site hydrological assessment, undertaken by the:
  - a. Analysis of surface areas of the site;
  - b. Analysis of sensitive areas on site;
  - c. Analysis of existing storm water structures on site; and
  - d. Determination of areas with clean and dirty water.
- Hydraulic design analysis, illustrated by the:
  - a. Determination of the design storm event (1:2, 1:10 & 1:50 year return period);
  - b. Determination of the capability of existing structures; and
  - c. Recommendation of mitigation options and improvements.
- Flood Hydrology:
  - a. Hydraulic analysis, illustrated by the:
    - Compilation of the river reach model and flood line using HEC-RAS and HEC-geoRAS;
    - Determination of the flood risk and flood hazard throughout the study site; and
    - Recommendation of mitigation options associated with the hydraulic analysis.
  - b. Consolidate results in a report with:
    - Flood line maps; and
    - A final flood line report.
- Water balance assessment:
  - *analysing climate data from the SAWS and other databases using nearby rainfall stations (input or known data);*
  - *determining any water demands and water outputs; and*
  - *determining whether water in the system is clean or contaminated.*
  - *Development of a static water balance. The information gathered in the desktop assessment and during the site visit will be used to create a process water flow diagram. A series of models will be considered for use in this balance study. The Department of Water Affairs and Forestry, 2006 Best Practice Guideline G2: Water and Salt Balances was followed in this study.*
  - *Produce a water balance study report with recommendations. An average annual water balance will be provided including an average dry and average wet month water balance. A set of recommendations will be provided to assist in the IWWMP and help the land owners to manage their water appropriately.*

## 1.3 Gauged versus Ungauged Catchments

Flood hydrology assessments can be limited if the information available is scant. In the Ingquza Hill area (which has recently experienced a drought) most of the smaller tributaries (excluding large rivers) do not flow all year round as they have done in the past. This can be explained by changes in land use through intensification and increased areas under crops or commercial forests, an increase in water extraction (irrigation, dams, industrial needs and human needs), cyclic drought and climate change. Much of the flow in these rivers is not always accurately recorded by weirs. When a flood hydrology assessment is undertaken, depending on the data available, either gauged or ungauged catchments can be assessed. Gauged data are the most accurate approach assuming that the data quality is reliable and over a long period of time. In the absence of such data, an ungauged catchment is assessed using observed rainfall. This data (assuming it is of good quality) is used as an input to a rainfall-runoff model. The design flood is determined using a statistical analysis of the rainfall and the catchment characteristics.

In large catchment areas the antecedent moisture content is important for 1:100 year flood events. If the catchment is very dry before such an event, dams may fill up first from the flood waters and part of the rainfall

may infiltrate, resulting in a reduced flow through the system, whereas a saturated catchment would result in a shorter lag time and a larger flow volume in the channel. This can lead to a difference in a simulated flood using design rainfall (ungauged) and a flood using observed streamflow (gauged). Furthermore, the large flood events are often poorly recorded in weirs due to poor maintenance and overtopping.

## 2. STUDY SITE

The sites are located within Quaternary Catchments T60E, T60F and T60G, which falls under the Mzimvubu to Keiskamma Water Management Area (WMA). The site is within the catchment area of the Msikaba river. The Msikaba river is classified as a Class B (largely natural) NFEPA river. The proposed Bhukazi forestry area is at the headwaters of the Xurana river, which merges with the Xura and subsequently the Msikaba near the Malangeni site.

The majority of land comprises of natural grassland surrounded by scattered rural dwellings. Some areas of natural forest exist along the drainage lines.

Rainfall in the region occurs in the summer months (mostly December to February), with a mean annual precipitation of 828 mm for Bhukazi and 1184 mm for Malangeni. The reference potential evaporation (ET<sub>o</sub>) is approximately 1 559 mm (A-pan equivalent, after Schulze, 2011) and the mean annual evaporation is 1200 mm, which exceeds the annual rainfall. This suggests a high evaporative demand and a water limited system. Summers are warm to hot and winters are cool. The mean annual temperature is approximately 18.5 °C (6.0 °C minimum and 22.0 °C maximum (Tables 2 & 3). The footprint area of the Malangeni Forest extension is underlain by sedimentary strata of the Late Carboniferous to early Permian Dwyka Group whereas that of the proposed new Bhukazi Forest plantation is underlain predominantly by sedimentary rocks of the early Permian Eccca Group, with extensive intrusions of Jurassic dolerite sills and dykes. Both areas have small patches underlain by more recent quaternary alluvial deposits, associated with the rivers adjacent to the development sites (Groenewald, 2020).

Table 2 Mean monthly rainfall and temperature observed at Bhukazi (derived from historical data)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
<b>Mean Rainfall (mm)</b>	92	106	92	51	24	11	6	16	38	71	91	96	<b>828</b>
<b>Mean Temperature (°C)</b>	20.8	21.4	20.3	17.2	15.0	12.9	12.9	14.4	16.7	17.1	18.6	20.1	<b>17.3</b>

Table 3 Mean monthly rainfall and temperature observed at Malangeni (derived from historical data)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
<b>Mean Rainfall (mm)</b>	128	133	126	64	30	15	15	30	66	104	131	124	<b>1184</b>
<b>Mean Temperature (°C)</b>	22.0	22.8	21.5	18.8	16.5	14.5	14.4	15.4	17.3	18.1	19.8	21.3	<b>18.5</b>

This site is dominated by Ngongoni veld (SVs 4, Mucina and Rutherford, 2006). This occurs within the sub-escarpment savanna biome. The desktop analysis revealed that the area is a vulnerable area, with the potential for some flagged fauna and flora (e.g. red data species and endangered wildlife) being found from the C-plan, SEA and MINSET databases. However, this does not necessarily mean that rare or endangered species will occur in the area of interest. The following information was collected for the vegetation unit SVs 4 (Mucina & Rutherford, 2006; Scott-Shaw & Escott, 2011). The characteristics of this grassland are described as:

- Undulating plains and hilly landscape mainly associated with drier coast hinterland valleys in the rain-shadow of the rain-bearing frontal weather systems from the east coast.
- Sour sparse wiry grassland dominated by unpalatable Ngongoni grass (*Aristida junciformis*) with this mono-dominance associated with low species diversity.
- In good condition dominated by *Themeda triandra* and *Tristachya leucothrix*.
- Wooded areas are found in valleys at lower altitudes, where this vegetation unit grades into KwaZulu-Natal Hinterland Thornveld and Bisho Thornveld.
- Termitaria support bush clumps with *Acacia* species, *Cussonia spicata*, *Ehretia rigida*, *Grewia occidentalis* and *Coddia rudis*.

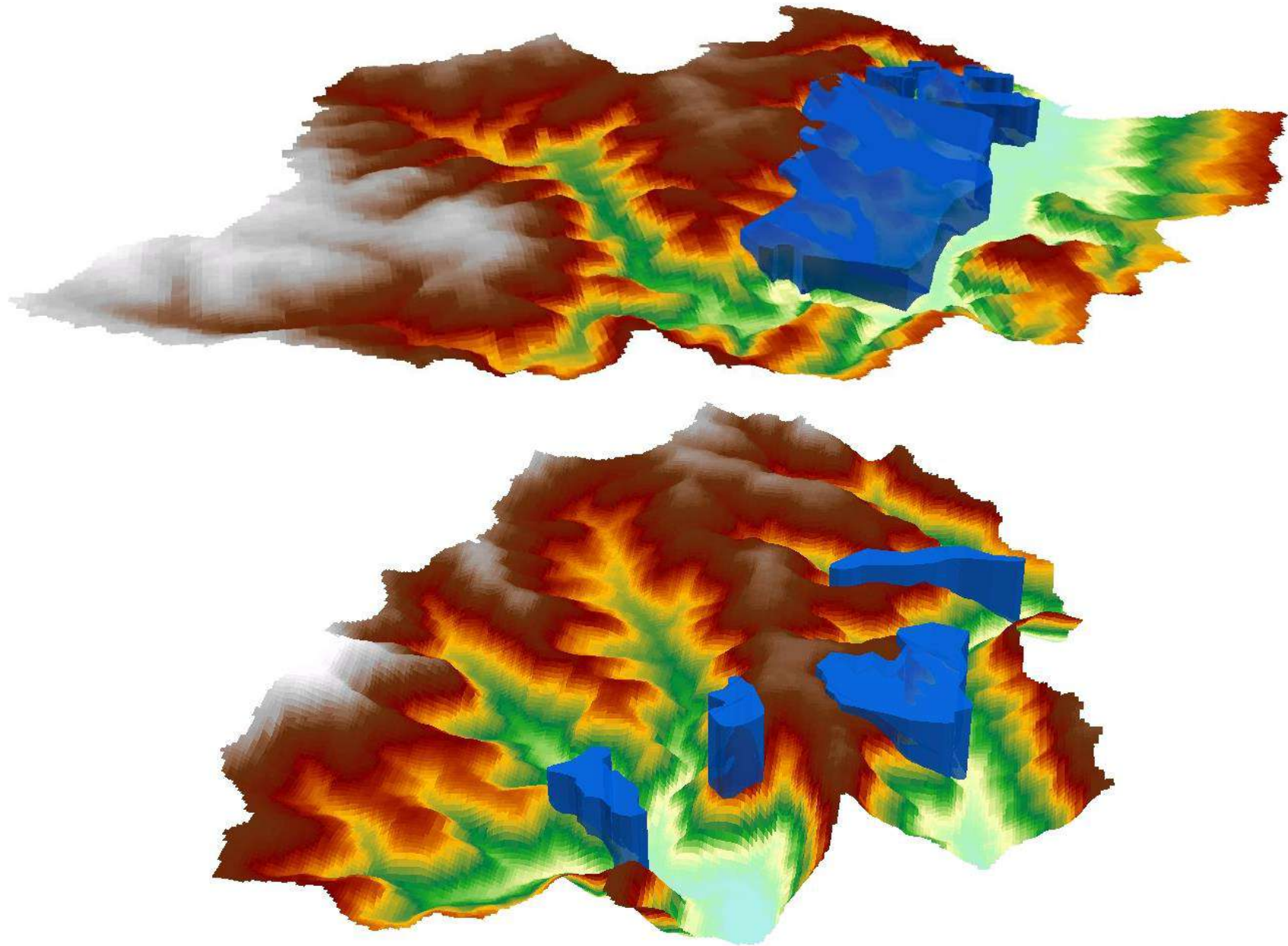


Figure 2 Terrain model for Bhukazi (above) and Malangeni (below) showing proposed forestry in blue

### 3. METHODOLOGY

The following methodology was followed in order to meet the objectives as detailed in the terms of reference.

#### 3.1 Site Assessment

A site visit was conducted by Bruce Scott-Shaw of NatureStamp on the 5<sup>th</sup> March 2020. The pre-development conditions were assessed as follows:

- The vegetation characteristics of the watercourse were assessed for the determination of the Manning's n-values;
- The presence and dimensions of any crossings, such as culverts and bridges, that would act as a barrier to a flow events and that may be damaged during the occurrence of such an event were noted;
- The overall state of drainage channels, streams and rivers was assessed;
- The slope of the study site as well as evidence of flood damage and erosion around the site were noted;
- The state of existing gauging stations was assessed to determine if the structure is accurately recording streamflow (e.g. evidence of under cutting or damaged features); and
- The elevation at the water level and proposed area level in order to verify contour data.

#### 3.2 Critical Catchment Delineation and River Reach Analysis

The critical contributing catchment area was determined for use in both the watershed delineation tool and HEC-HMS and SWAT models. The sub-catchments were delineated using the 5m contour set as an input. This was used to create a Digital Elevation Model (DEM) that was then used as an input to the watershed tool (Figure 3).

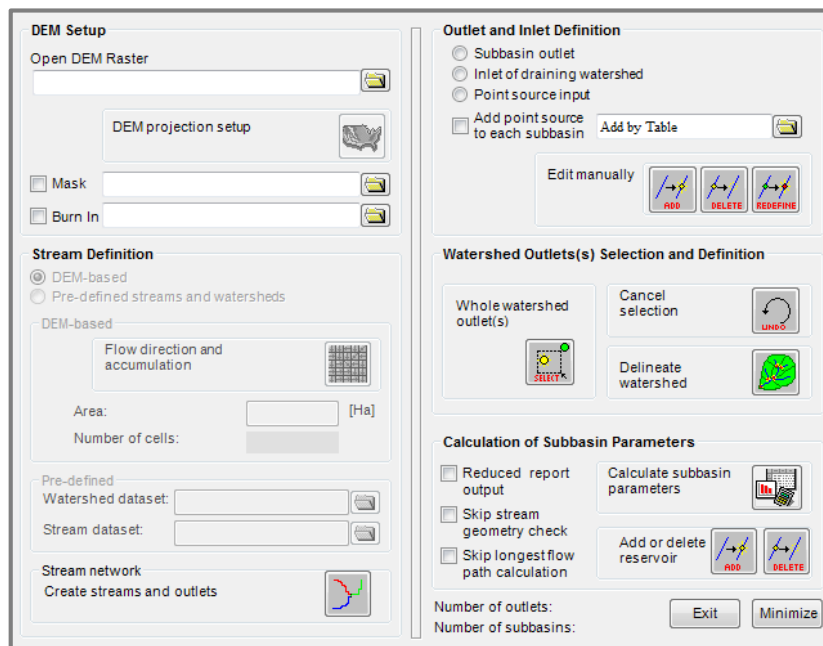


Figure 3 Soil Water Assessment Tool (SWAT) watershed delineation tool for sub-catchment delineation and stream network creation

#### 3.3 Model Selection

Arguably one of the most important components of a scientifically sound simulation model is that it should be as easy as possible to understand in light of the assumptions and mechanisms represented in the simulator, so that critical evaluations can be made of the predictions (Thornley, 1998). Models in the public domain are promoted and explained differently, resulting in model comparisons being difficult. Numerous models developed for a variety of uses are available. As such a predicament exists as to which model or sub-model is best suited for the intended use. Some models are designed and developed for specific purposes, while

others are more general and integrated in their applicability (Schulze, 2007). Model complexity is a major determinant as to which model is selected, as the input data available, time constraints and budget significantly influence model selection. The level of detail on processes, on spatial disaggregation and temporal disaggregation should also be considered in models (Schulze et al., 1995).

Comparisons of simple and complex models provide insights on the model structure in order to decide on a suitable model. According to Schulze et al. (1995), models of differing complexity range from simple formulae to complex physiologically-based models. The advantage of simple models is that simple and readily obtainable inputs are required in order to provide estimations (Schulze et al., 1995). Simple models cannot be expected to provide a detailed estimation, but may be accurate in terms of general large-scale modelling. Simple models should not be used for extrapolation of estimates under different conditions from the ones under which these models were developed, nor for risk analysis (Schulze et al., 1995). More complex models can provide accurate estimates of hydrological components in comparison to simple models, provided that quality information is readily available and time and money are not limited. "The development of complex models from the processes of analysis, assembly of data, model construction and validation, take up costly resources in the form of skilled man hours and computer time" (Schulze et al., 1995, AT19-3).

In South Africa, models such as the Agricultural Catchments Research Unit (ACRU), the Soil Water Assessment Tool (SWAT), Système Hydrologique Européen (SHE) model group and WAVES are just some of the models used. Due to the available data at the site of interest, the recent development of the ArcSWAT GIS interface and the level of land use information required for the project, SWAT was chosen as the most appropriate model to use. The input required for ArcSWAT is spatially explicit soils data, landcover/management information, and elevation data to drive flows and direct sub-basin routing (Arnold, 2005). ArcSWAT lumps the parameters into hydrologic response units (HRU), effectively over-riding the underlying spatial distribution. These HRUs are grouped according to the topography, soils (type/structure/depth/chemical properties), landcover and slope (Figure 5).

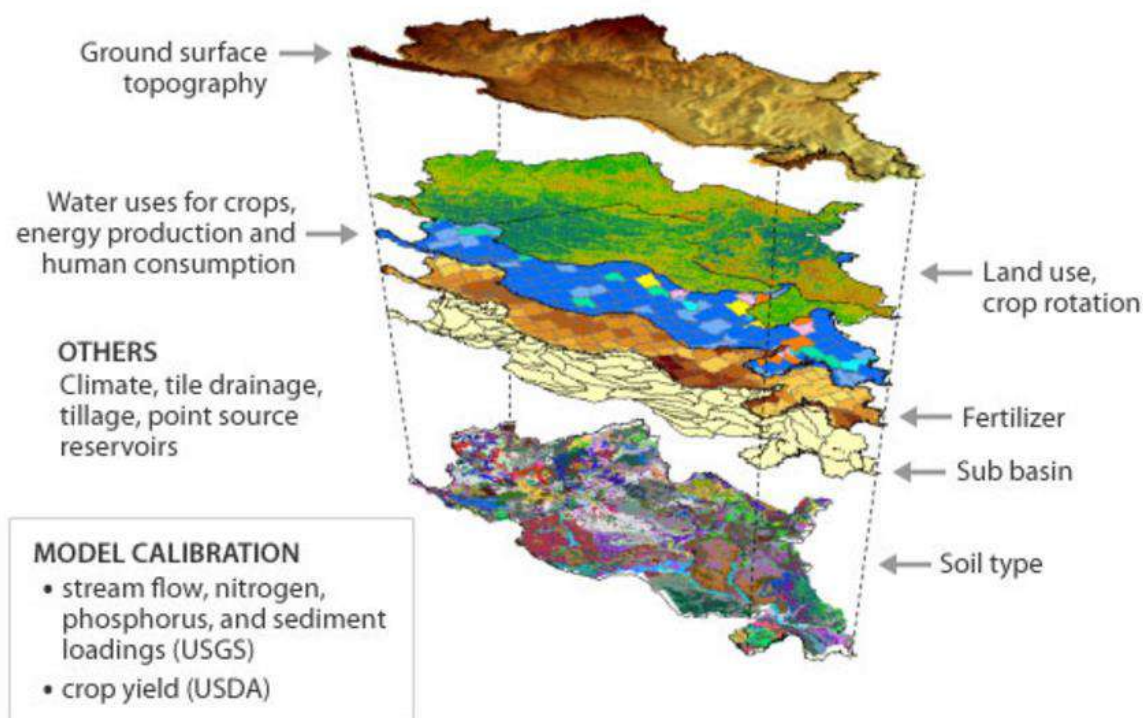


Figure 4 Conceptual layout of the ArcSWAT model setup (Arnold et al., 2012)

One of the most important drivers is the meteorological data, which has been vastly improved in this model over recent years. ArcSWAT has options to use measured solar radiation, wind speed, relative humidity and evaporation data. Daily rainfall and temperature data may be generated if unavailable or missing for the

simulation period and there are no limitations to the number of rainfall and temperature gauges that can be used in the simulation (Neitsch et al., 1999).

The SWAT model uses the water balance equation (Equation 1) in its simulation of the hydrological cycle (Arnold et al., 2009).

$$SW_t = SW_0 + \sum_{i=1}^t (R_{day} - Q_{surf} - E_a - W_{seep} - Q_{gw}) \quad \text{Eq. 1}$$

Where  $SW_t$  is the final soil water content (mm);  $SW_0$  the initial soil water content on day i (mm);  $R_{day}$ : being the precipitation on day i (mm);  $Q_{surf}$  the surface runoff on day i (mm);  $E_a$  the total evaporation on day i (mm);  $W_{seep}$  the water entering the vadose zone on day i (mm) and  $Q_{gw}$  the return flow on day i (mm).

### 3.4 Soil Water Assessment Tool (SWAT)

The SWAT model was adopted as the primary hydrological model to assess the following:

- The impact of the proposed development on downstream users;
- The increase in runoff as a result of the proposed development; and
- Any areas of concern or requiring intervention to reduce probable impacts.

#### 3.4.1 Modelling requirements

Catchment information was collated for the site. This model is highly dependent on the resolution of the input data, in particular the Digital Elevation Model (DEM) and landcover. A large amount of manipulation is required for modelling outside of the United States. Therefore, much of the time spent during this modelling exercise was on translating data into suitable input data. A key requirement for this modelling process was a high level of detail in the landcover component. An overview of the core input variables has been provided in Table 4.

Table 4 Summary of key SWAT input variables (after Arnold et al., 2012)

File name	Description
<i>File.cio</i>	<i>Watershed file that names catchment levels for output parameters</i>
<i>.fig</i>	<i>Watershed configuration file</i>
<i>.pcp</i>	<i>Precipitation input file (up to 300 stations)</i>
<i>.tmp</i>	<i>Temperature file with daily minimum and maximum temperatures</i>
<i>Crop.dat</i>	<i>Land cover/plant growth database file containing plant growth parameters</i>
<i>.hru</i>	<i>HRU level parameters</i>
<i>.sol</i>	<i>Soil input file</i>

#### 3.4.2 Model Inputs

Given that a model can only be as good as the data used for its input, a large amount of time and effort was spent collecting and translating data.

##### Elevation & Topography

A digital elevation model (DEM) was used to configure the catchment by dividing it into sub-basins or sub-catchments. The automatic watershed delineation tool, which is the first step undertaken in the model, allows for the creation and selection of outlet nodes and the determination of sub-catchment properties and river reach attributes. Depending on the resolution of the DEM used, either a manual or automatic setup can be chosen.

The 30m Shuttle Radar Topography Mission (SRTM) 1 Arc-Second Global DEM was used at the starting point. The resolution of this DEM is 30 m by 30 m. However, this DEM does not provide accurate heights in areas of tall vegetation. Verified point and contour data was used to correct these errors and interpolate a higher



resolution model. WGS 1984 UTM Zone 36S was used as the projection for this area (ArcSWAT requires all layers to be projected uniformly and UTM is the most commonly used projection for hydrological studies).

### Landcover

A combination of existing databases and user defined boundaries was used to create a new land use shapefile. The steps taken to construct the landcover layer is as follows:

- The EKZMW landcover layer (converted from raster to shapefile) was used as a point of departure;
- The site visit allowed for the confirmation of the current land use; and
- The client sent through the proposed development footprint which was merged with the surrounding land use to provide an input for the proposed scenario (Scenario 2).

The land use definition tool was used in ArcSWAT. This tool clips the land use to the catchment boundary and provides it with a code as determined by the user in GIS. A text file containing this code and the subsequent SWAT land code was compiled by the user for each scenario. This text file is used to reclassify the land use layer to match attributes contained in the SWAT database.

### Soils

Soils information was taken from a literature and database investigation. Some soil samples were taken on-site to further improve the soil detail. The structure, depth, number of layers and texture were used to construct a moderately detailed soil layer with up to five variable soil horizons. The soils component is one of the more difficult definitions to translate outside of the United States. The database (Usersoils) was edited to include attributes for each soil type identified in the spatial layer. A text file was used to code the data from the spatially explicit polygon to match the code in the database. Soils data was checked using the GIS interface and modified if required (Figure 6).

Soil properties that influence runoff potential are those that impact the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen (Everson et al., 2006). These properties include: depth to seasonally high-water table, saturated hydraulic conductivity, and depth to a very slowly permeable layer. Soil may be placed in one of four groups of increasing runoff potential: A, B, C, and D, or three dual classes, A/D, B/D, and C/D. These are tabulated in Table 5.

Table 5 Soil hydrological group for ArcSWAT input

Group	Description
A	(Low runoff potential). The soils have a high infiltration rate even when thoroughly wetted. They chiefly consist of deep, well-drained to excessively-drained sands or gravels. They have a high rate of water transmission.
B	The soils have a moderate infiltration rate when thoroughly wetted. They chiefly are moderately deep to deep, moderately-drained to well-drained soils that have moderately-fine to moderately-coarse textures. They have a moderate rate of water transmission.
C	The soils have a slow infiltration rate when thoroughly wetted. They chiefly have a layer that impedes downward movement of water or have moderately-fine to fine texture. They have a slow rate of water transmission.
D	(High runoff potential). The soils have a very slow infiltration rate when thoroughly wetted. They chiefly consist of clay soils that have a high swelling potential, soils that have a permanent water table, soils that have a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. They have a very slow rate of water transmission.

### Slope

The slope definition uses the base DEM. This tool allows the user to define the slope classes. More slope classes would result in more HRUs. Once the user has chosen the slope classes, the layers are used to create the final HRUs. For this study, five slope classes were used:

- 0 – 10 %

- 10 – 20 %
- 20 – 30 %
- 40 – 50 %
- 50 – 99 %

## Climate

Weather Data Definitions were modified to allow for user defined data to be included. All the data was obtained from various climatic databases such as the rainfall extraction utility (Kunz, 2003). A table was created for each rainfall station including the Station ID, location and altitude. This was edited into the SWAT2012.mbd. Individual text files containing daily rainfall, temperature, solar radiation, relative humidity and wind speed were created that could be linked to the modified database. The co-ordinates provided in the variable location file allowed for the climate variability throughout the catchment to be captured. A skewed distribution was used in the simulation to interpolate the variable data throughout the catchment area.

### 3.4.3 Model Simulation

Once all the input data had been thoroughly checked, the model was run with an initial simulation period of 30 years (using the maximum amount of climate data available) at a daily time step with a five-year warm-up period. A summary of the HRU definitions generated through the GIS interface is provided in Figure 6. 207 HRUs were developed for the site. An inlet discharge was included to exclude upstream catchment areas that are complex and needed to be excluded from this assessment.

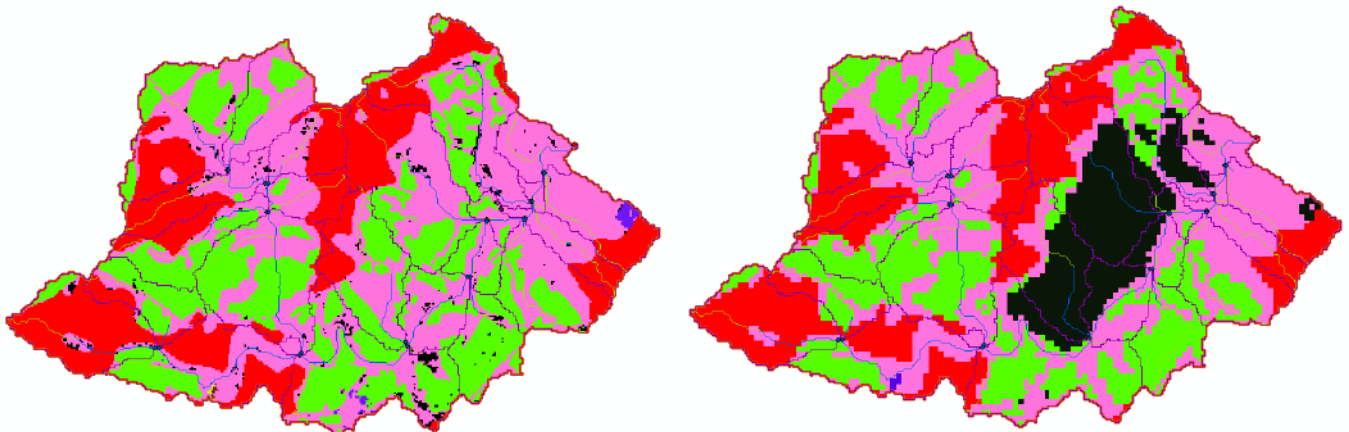


Figure 5 Summary of the steps involved in the ArcSWAT setup with Scenario 1 & 2 Land use and the final HRU compilation at malangeni

### 3.5 Design Flood Determination

The peak flows for the 1:5, 1:10, 1:50 and 1:100 flood events were calculated for the catchments using the rational method, the SCS-SA model, the rational method and the Standard Design Flood Method as outlined in the SANRAL Drainage Manual (2013) in areas where flow data was not available. Additionally, an area corrected flow was also calculated using catchments with flow data to compare to the design rainfall/runoff calculations.

The SCS-SA model is a hydrological storm event simulation model suitable ideally for application on catchments that have a contributing catchment of less than 30 km<sup>2</sup>. The model has been used widely both internationally and nationally for the estimation of flood peak discharges and volume (Schulze *et al.*, 1992). The type of surface in the drainage basin is also important.

The Rational Method becomes more accurate as the amount of impervious surface, such as pavements and rooftops, increases. As a result, the Rational Method is most often used in urban and suburban areas (ODOT Hydraulics Manual, 2014).

### 3.6 Flood Line Determination

Modelling of the flood lines was undertaken using the U.S. Army Corps of Engineers' HEC-RAS v4.1 programme, which is commonly used throughout South Africa. Numerous cross sections were created throughout the contributing area (Figure 5). Ineffective areas/hydraulic structures were digitized and included in the model. Land use coverage was used to determine the Manning's n-values in a GIS platform. Each cross section may have had numerous values on either side of the channel depending on the site characteristics. Manning's N-values were obtained from the HEC-RAS Hydraulic Reference Manual (2010) for the channel areas (a value of between 0.03 and 0.04 was used depending on the presence or absence of rock features and debris). Design flood values were used as an input for the relevant reaches.

Given the slope of the catchment and the distance to downstream hydrological infrastructure, some inundation within the study site would occur but not from external features on the watercourse. As such, Normal Depth was selected for the reach boundary conditions. The slope of the channel was used as the value for the backwater calculation of the initial condition. Some inundation structures were included in the cross sections where these were structures present (Figure 7). Varying reach boundary conditions were set for these sites.

Figure 7 provides an overview of one of the impeding structures along the river. A cross-section shows the delineated area with unique station variables at each site.

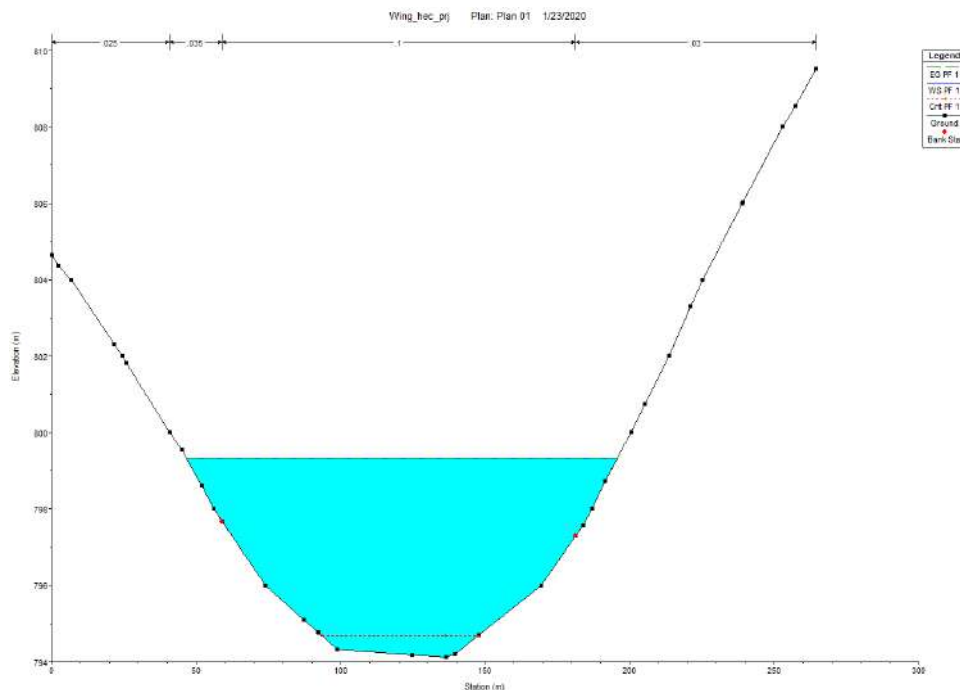


Figure 6 Channel cross sections developed for a section of a tributary to the Msikaba

At each profile, a unique peak flow was calculated for each return period. 18 different volumes (linked to the 18 unique profiles) were calculated using either flow or design rainfall calculations.

### 3.7 Flood Line Determination for Minor Channels

As HEC-RAS and HEC-geoRAS are highly sensitive to the resolution of the terrain data used in the model, small non-perennial channels such as drainage lines are often not captured within the model. In most cases the flood output is not required for such channels as the flood generated would be negligible. However, it is good practice to ensure that all channels or drainage lines are adequately covered. As such, the author has developed a simple model to generate a flood depth through GIS. The model considers the flood generated for nearby smaller catchments and applies an area weighted correction. The model generates a flood height based on this estimation within the existing terrain model. Figure 8 provides a schematic of this model.

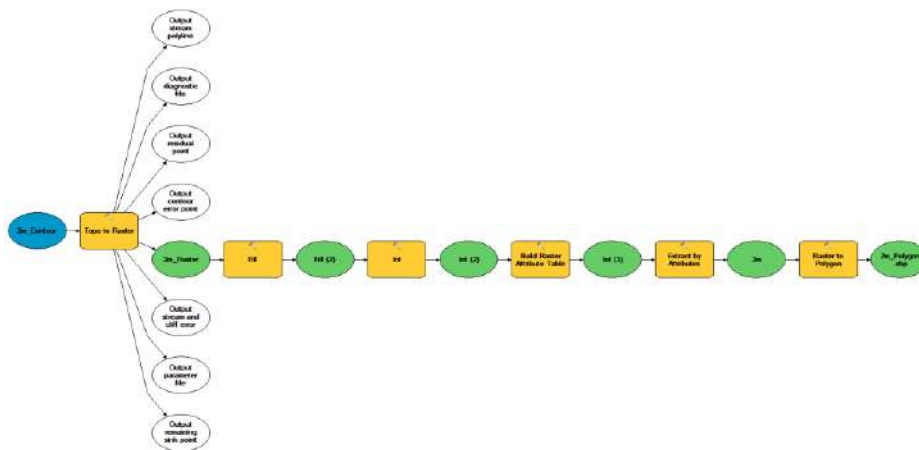


Figure 7 GIS model for flood generation in small channels

## 4. LIMITATIONS AND ASSUMPTIONS

In order to apply generalized and often rigid design methods or techniques to natural, dynamic environments, a number of assumptions are made. Furthermore, a number of limitations exist when assessing such complex hydrological systems. The following constraints may have affected this assessment:

- A Garmin GPSMAP 64 was used in the mapping of waypoints on-site. The accuracy of the GPS is affected by the availability of corresponding satellites and accuracy ranges from 1 to 3 m after post-processing corrections have been applied.
- A Munsell Soil Colour Chart was used to assess soil morphology. This tool requires that a dry sample of soil be assessed. However, due to in-field time constraints, slightly wet soil samples were assessed. Wet samples would have consistently lower values than dry soils; and this is taken into consideration.
- There was little to no data on flows out of the system. The catchment is very small and the watercourse associated with the site has been transformed for previous agricultural uses. In addition, boreholes nearby are negligible.
- All of the inputs and outputs from the infrastructure will be contained within the site. However, there will be an input of water from garden watering/irrigation from the groundwater abstraction.
- Manning's  $n$  - values (the channels roughness coefficient) was estimated on site. However,  $n$ - values in areas outside of the study area were estimated using a desktop approach due to the extent of the catchment.
- 2-meter contour interval data and Digital Elevation Models (DEMs) were used in areas outside of the area of interest. Within a 1 km radius of the site, a topographical verification was undertaken. Given the type of development, this resolution was considered to be of sufficient accuracy for the flood line determination.

## 5. RESULTS AND DISCUSSION

### 5.1 Background Information

#### 5.1.1 Climate Analysis

A detailed assessment of the rainfall stations was undertaken for the contributing catchment area. Rainfall stations were considered based on their proximity to the site, altitude and length/reliability of the data record. In similar vein, flow gauging stations were considered only if good quality data with a reasonable record length was available. No flow gauging stations were of relevance to the catchment area.

Daily rainfall since 1900 has been obtained. This data was populated in an electronic database so that this data could be statistically analyzed. The long-term mean annual rainfall of the site was 670 mm (Figure 8). However, rainfall in excess of 1000 mm have been recorded in the area, indicating the variable nature of the rainfall at Ingquza Hill.

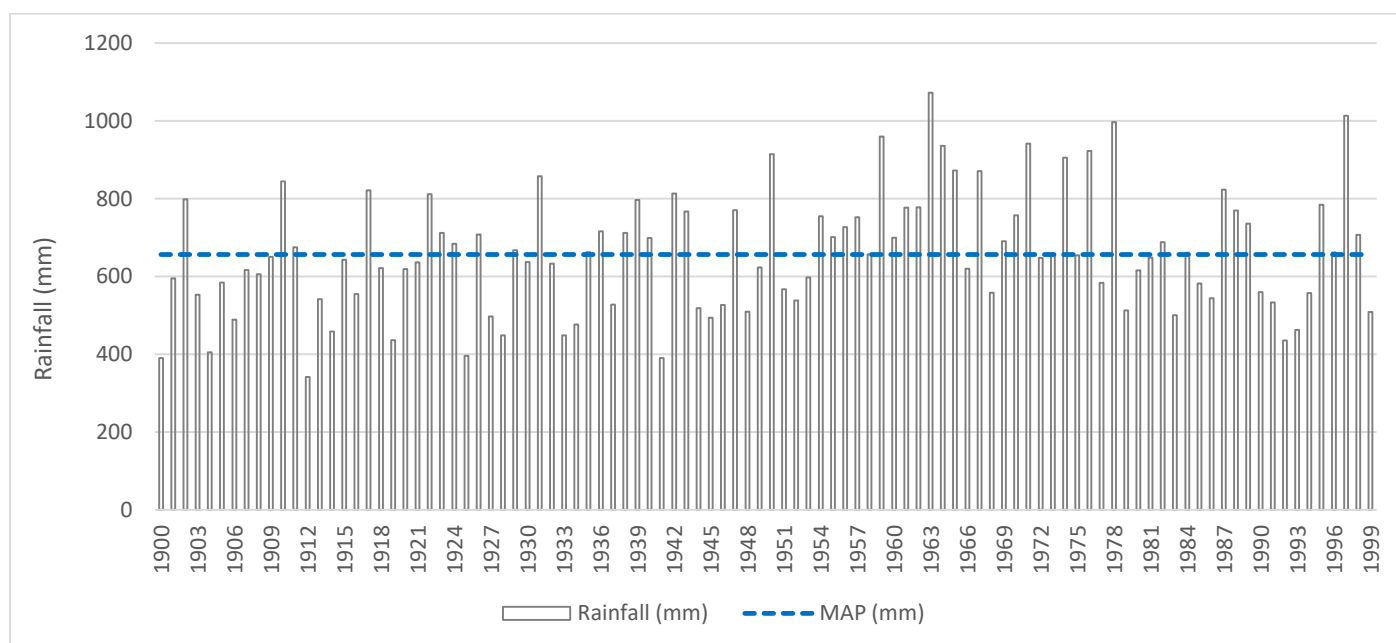


Figure 8 Long-term annual rainfall at Ingquza Hill

#### 5.1.2 WR2012 Analysis

The data obtained for the site showed a mean annual evaporation of 1 150 mm. The naturalized flow mean annual runoff for the greater catchment is between 28.81 and 101.56 million m<sup>3</sup> for the catchment areas of between 198 and 464 km<sup>2</sup>.

Table 6 WR2012 data relevant to the proposed Ingquza Hill

BASIC INFORMATION								NATURALISED FLOW MARs			
	Catchment area		S-pan evaporation			Rainfall		1920 - 1989 MAR (WR90)	1920 - 2004 MAR (WR2005)	1920 - 2009 MAR (WR2012)	Change in MAR WR2005 to WR2012
	Gross (km <sup>2</sup> )	Net (km <sup>2</sup> )	evap zone	MAE WR2005 (mm)	MAE WR90 (mm)	Rainfall zone	MAP (mm)	Net (mcm)	Net (mcm)	Net (mcm)	(percent)
Quaternary catchment	198	198	30C	1150	1150	T6B	885	28.70	26.79	28.81	7.50
	464	464	30C	1150	1150	T6B	940	80.60	89.20	93.56	4.90
	360	360	30C	1150	1150	T6B	1116	101.60	96.41	101.56	5.30

## 5.2 Soil Water Assessment Tool (SWAT)

### 5.3.1 Baseline and Projected Flow Conditions

The model simulated comparison between the pre- and post-development scenarios show that under the 33 percentile of non-exceedance, there is a low but notable difference in monthly flows. From February to July there were reductions in flows at the outlet of the catchment. This is partially related to the following:

- An increase in water use by the plantations; and
- A change in management of the land.

Table 7 Comparison between monthly baseline yield and monthly yield with the inclusion of the forestry area

Pre-development Scenario Frequency Analysis												
Percentile	October	November	December	January	February	March	April	May	June	July	August	September
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	0.065	0.119	0.197	0.164	0.241	0.171	0.063	0.033	0.027	0.02	0.025	0.023
20	0.055	0.089	0.137	0.11	0.23	0.141	0.062	0.026	0.022	0.017	0.016	0.016
33	0.043	0.055	0.106	0.093	0.169	0.112	0.048	0.02	0.011	0.008	0.009	0.011
50	0.033	0.04	0.083	0.082	0.116	0.084	0.041	0.014	0.009	0.004	0.005	0.009
67	0.027	0.03	0.065	0.07	0.084	0.07	0.032	0.011	0.007	0.004	0.003	0.006
70	0.026	0.025	0.059	0.068	0.074	0.066	0.031	0.009	0.006	0.004	0.003	0.005
80	0.021	0.021	0.05	0.057	0.045	0.057	0.018	0.006	0.004	0.002	0.002	0.004
90	0.014	0.015	0.034	0.051	0.037	0.041	0.016	0.004	0.002	0.001	0.001	0.003
95	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Post-development Scenario Frequency Analysis												
Percentile	October	November	December	January	February	March	April	May	June	July	August	September
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	0.065	0.119	0.197	0.164	0.241	0.171	0.063	0.033	0.027	0.02	0.025	0.023
20	0.055	0.089	0.137	0.11	0.23	0.141	0.062	0.026	0.022	0.017	0.016	0.016
33	0.043	0.055	0.106	0.093	0.169	0.112	0.048	0.02	0.011	0.008	0.009	0.011
50	0.033	0.04	0.083	0.082	0.116	0.084	0.041	0.014	0.009	0.004	0.005	0.009
67	0.027	0.03	0.065	0.07	0.084	0.07	0.032	0.011	0.007	0.004	0.003	0.006
70	0.026	0.025	0.059	0.068	0.074	0.066	0.031	0.009	0.006	0.004	0.003	0.005
80	0.021	0.021	0.05	0.057	0.045	0.057	0.018	0.006	0.004	0.002	0.002	0.004
90	0.014	0.015	0.034	0.051	0.037	0.041	0.016	0.004	0.002	0.001	0.001	0.003
95	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

### 5.3.2 Water Balance

A more comprehensive water balance approach was adopted using the SWAT model. This is in alignment with the "Best practice Guidelines for Water Resource Protection in the South African Mining Industry" (DWAf, 2008) – Guideline 2 on Water and Salt Balance. The site was isolated within the model to only model the area within and around the catchment of the two proposed sites. This allowed for the model to isolate the impacts on the hydrological caused by the proposed changes on downstream water users.

The water balance (Figure 9) shows the change in partitions between the hydrological partitions between the two simulated scenarios. The results show changes to the water balance. An reduction in surface flow can be seen, particularly in the summer months during peak rainfall. Through the calculations, 1.11 million m<sup>3</sup> decrease in discharge would occur during an average year. There would be subsequently less lateral flow as there would be less water infiltrating into the soil profiles. Additionally, there would be less water yield in general as it is lost to plant ET. There would be slightly less sediment loss as the vegetation is using more water and does not contribute to sediment discharge. However, it must be noted that there could be an increase in erosion risk due to poor management practices, especially on the slope edges.

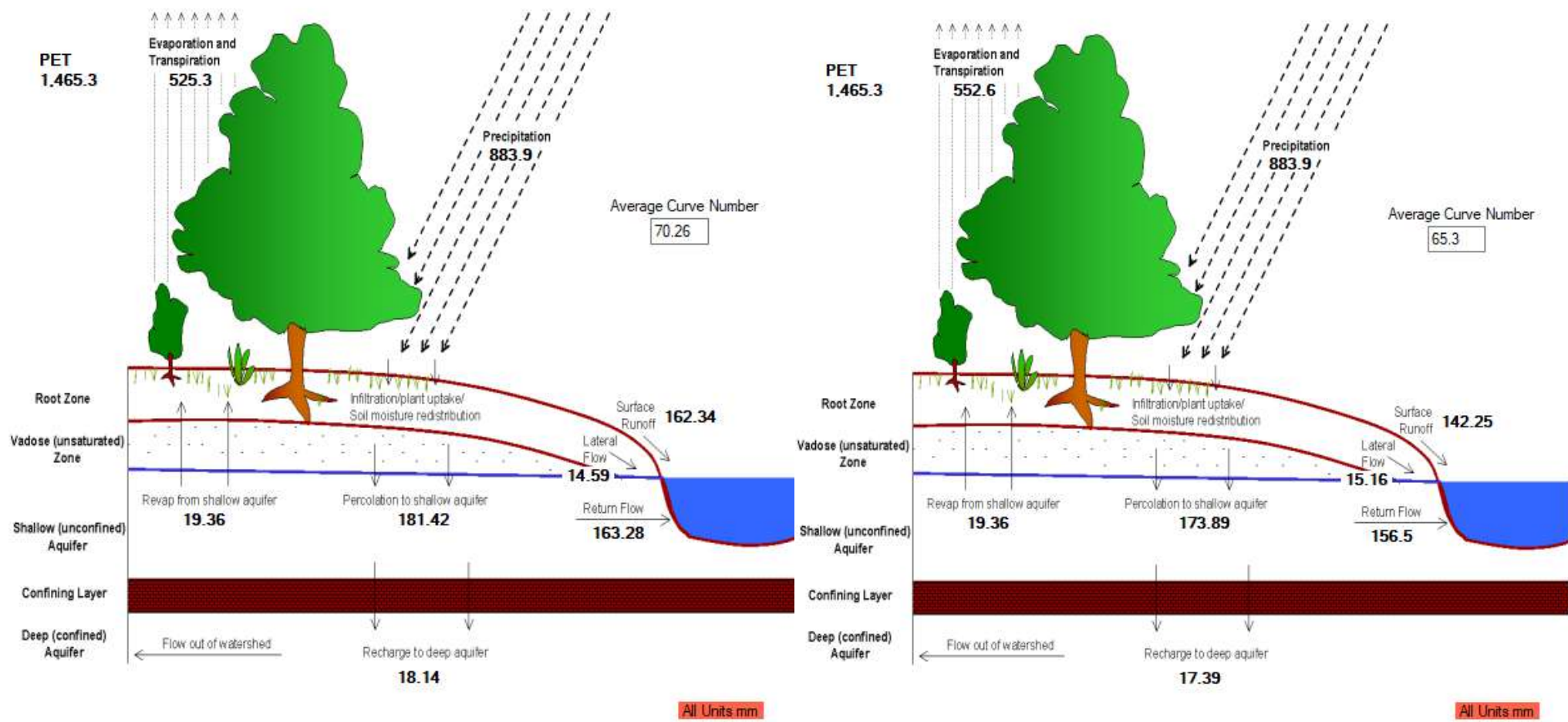


Figure 9 Water balance for Scenario 1 (left) and Scenario 2 (right) including the proposed forestry

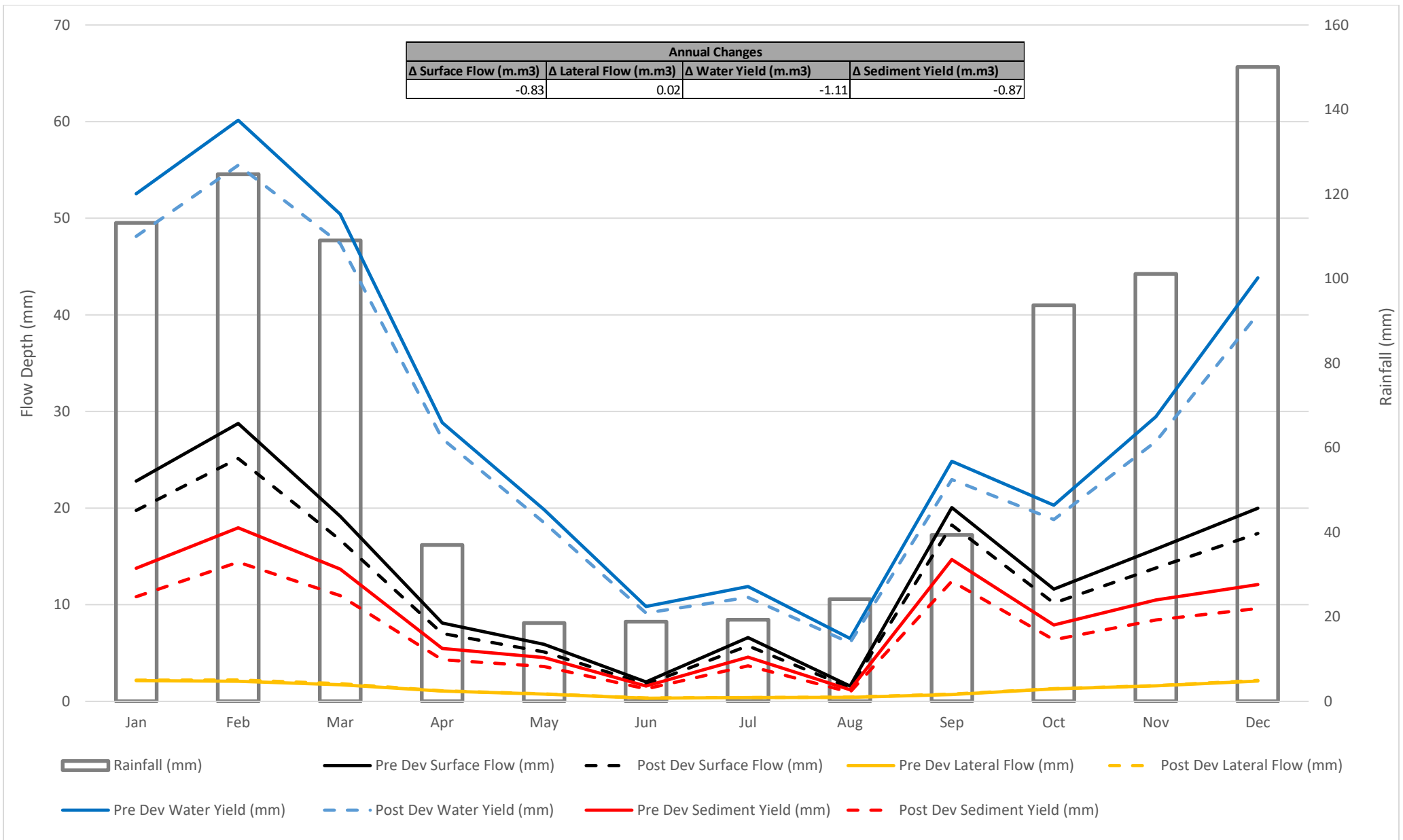


Figure 10 Monthly flow partitions pre- and post-development at Malangeni Forestry area



## 5.3 Potential Impacts & Mitigation

### 5.6.1 Potential Surface Water and Groundwater Quality Concerns

The specialist recommendations need to address the following key questions:

- Will downstream water users be affected by the forestry area?
- Will the proposed forest result in a change in the surface water and groundwater quality?
- What actions can be taken to ensure no impact on surface water and groundwater resources occurs?

From a **groundwater quality** perspective, the downstream users **will not be** affected by the proposed forestry area. This is based on the following findings/reasons:

- The proposed activity is not associated with heavy chemicals;
- The site has deep groundwater levels and the forestry areas, although having deep roots will not be directly impacting upon the deep aquifer.

From a **surface water quality** perspective, the downstream users **will not be** affected by the proposed forestry area. This is based on the following findings/reasons:

- The proposed activity does not discharge waste or use excessive chemicals which could contaminate surface water resources;

From a **groundwater quantity** perspective, the downstream users **will be slightly** affected by the proposed forestry area. This is based on the following findings/reasons:

- There are no boreholes within the groundwater catchment area;
- The direct loss of water could prevent some infiltration to the shallow and deep aquifers.

From a **surface water quantity** perspective, the downstream users **will be** affected by the proposed forestry area. This is based on the following findings/reasons:

- The proposed activity is a high water user in contrast to the vegetation it replaces (grassland). This is due to it having deep roots and being a quick growing species;

These impacts could be reduced if proper site management occurs. Additionally, as the site is currently degraded, this risk is further reduced.

Even though there is a lack of boreholes around the proposed site, it is unnecessary for an observation borehole be installed to monitor the groundwater quality. Focus should rather be placed on ensuring the integrity of surface water resources.

Effort should be made to ensure that the forestry areas stay outside of a recommended buffer of surface water resources.

### 5.6.3 Potential Impacts

Due to the proposed development, the following impacts may occur:

#### **Construction:**

- Decrease in water quality due to contaminants from heavy machinery (oil & fuel) infiltrating towards groundwater resources.
- Decrease in water quality due to chemicals and effluent relating to staff ablution facilities during construction.
- Decrease in water quality due to concrete spills during construction.
- Increase in peak flows.

#### **Operation:**

- Potential spills from the vehicles and machinery used for felling/planting.

- Loss of streamflow in the catchment.
- Reduced sustained flows (reduced infiltration and sustained streamflow recharge).

## 6. CONCLUSION

The developers of the proposed forestry area must note that watercourses are protected by nine Acts and two Ordinances in KwaZulu-Natal<sup>1</sup>, which verifies that both national and provincial authorities recognise these systems as highly valuable multiple-use resources and are committed to their conservation.

The work undertaken for this report provides information on the general hydrological characteristics, the differences between the current state and the proposed state as well as general impacts including those on downstream users.

Effective mitigation of the potential impacts can be achieved through following the recommendations and conditions of the WQMP put forward by the specialist.

Monitoring and follow up assessments are essential to maintaining the overall health and continued management of the watercourse system. Focus should be placed on the wetland functionality assessment and the impact the development may have on the PES and EIS. It is important that strict adherence to recommended buffers is undertaken.

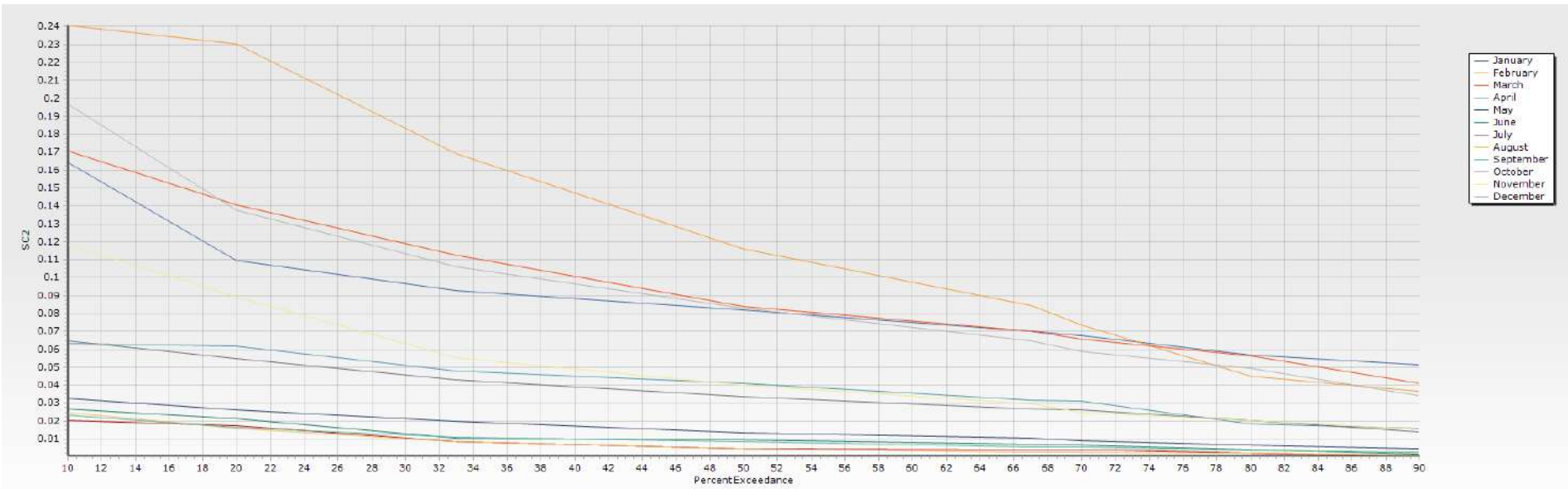
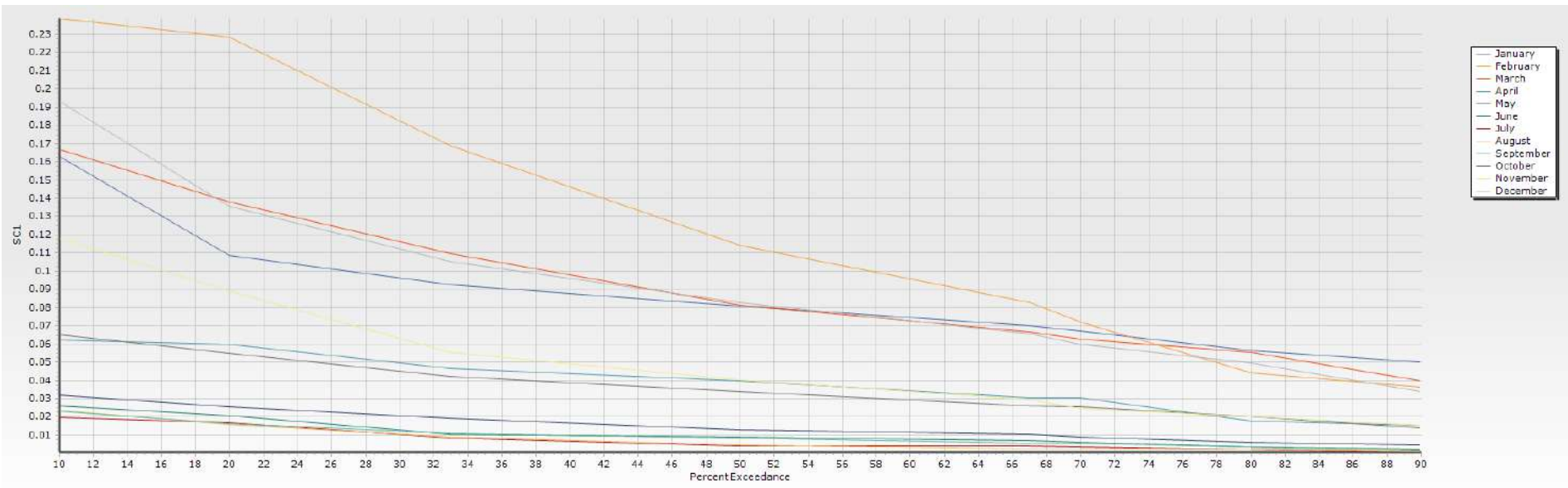
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<sup>1</sup> The Lake Areas Development Act, Act No. 39 of 1975; The National Water Act, Act No. 36 of 1998; The Mountain Catchment Areas Act, Act No. 63 of 1976; The Environmental Conservation Act, Act No. 73 of 1976; The National Environmental Management Act, Act No. 107 of 1998; The Conservation of Industrial Resources Act, Act No. 43 of 1983; The Town Planning Ordinance 27 of 1949; The Physical Planning Act, Act No. 88 of 1967; The Forest Act, Act No. 84 of 1998; The Natal Nature Conservation Ordinance No. 15 of 1974; The KwaZulu Nature Conservation Act, Act No. 8 of 1975

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## ANNEXURE A Percentage exceedance of flow at the outlet of the simulated catchment



# TERRESTRIAL BIODIVERSITY ASSESSMENT

**BIODIVERSITY IMPACT ASSESSMENT REPORT FOR THE PROPOSED  
AFFORESTATION FOR MALANGENI EXTENSION OF 433 HECTARES,  
INGQUZA HILL LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE.**

Date: February 2020

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## EXECUTIVE SUMMARY

Biodiversity impact assessment can be defined as a decision-support tool to help biodiversity inclusive development planning and implementation. It aims at ensuring that development proposals integrate biodiversity considerations and are legally compliant, and include mechanisms for the conservation of biodiversity (with the aim of no net loss of biodiversity), result in sustainable use of biodiversity resources, and provide fair and equitable sharing of the benefits arising from use of biodiversity.

The overall objective of the biodiversity assessment is to optimise the biodiversity outcome of plan, programme or project development. In order to achieve this, the proposal in question needs to be informed by the current state of biodiversity and the potential assets derived from biodiversity in the area. Provided that the necessary knowledge base on the current state of biodiversity in the area exists the assessment can then predict potential impacts of the proposal on biodiversity, which in turn allows for its revision in order to minimize impacts on biodiversity and/or realize opportunities; the overall objective being no net biodiversity loss.

This report sets out findings of the Biodiversity Impact Assessment undertaken by Ezendalo Environmental Consultants for the proposed afforestation for Malangeni extension of 433 hectares, and Bhukazi new plantations of 194 hectares in Ingquza Hill Local Municipality, Eastern Cape province. The main findings of the terrestrial biodiversity assessments undertaken are summarised separately below.

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## LIST OF ACRONYMS

ACRONYM	DESCRIPTION
AoC	Areas of Concern
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CAS	Consulting and Analytical Services
CBA	Critical Biodiversity Areas
CR	Critically endangered – a Red Data classification used by the IUCN for describing species in serious danger of facing extinction
CI	Conservation Important Species
DD	Data Deficient – a Red Data classification used by the IUCN for describing species for which there is inadequate data available to assess their danger of facing extinction
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DWA	Department of Water Affairs (Previously known as DWAF)
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation (Previously known as DWA)
ECA	Environmental Conservation Act (Act 73 of 1989)
ECBCP	Eastern Cape Biodiversity Conservation Plan
EI	Ecological Importance
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
EMPR	Environmental Management Programme Report
EN	Endangered – a Red Data classification used by the IUCN for describing species in danger of facing extinction
ES	Ecological Sensitivity
FEPA	Freshwater Ecosystem Priority Areas
GG	Government Gazette
GN	Government Notice
IHLM	Ingquza Hill Local Municipality
IUCN	International Union for the Conservation of Nature, based in Gland, Switzerland LC Least Concern – a Red Data classification used by the IUCN for describing species not in danger of facing extinction
MB	Mining and Biodiversity Guideline
NAEHMP	National Aquatic Ecosystem Health Monitoring Programme
NBSAP	National Biodiversity Strategy and Action Plan
NEM:AQA	National Environmental Management: Air Quality Act (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NFA	National Forest Act (Act 48 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas

NHRA	National Heritage Resources Act (Act 25 of 1999)
NMPRD	National Mineral and Petroleum Resources Development Act (Act 28 of 2002)
NSBA	National Spatial Biodiversity Assessment
NSS	Natural Scientific Services CC
NVFFA	National Veld and Forest Fire Act (Act 101 of 1998)
NWA	National Water Act (Act 36 of 1998)
NT	Near Threatened – a Red Data classification used by the IUCN for describing species not yet in danger of facing extinction, but close to such a state
PES	Present Ecological State
PS	Protected Species
QDGS	Quarter Degree Grid Square – the basic unit used by the Surveyor General for creation of 1:50 000 topographical maps
RHP	River Health Programme
SAIAB	South African Institute for Aquatic Biodiversity
SANBI	South African National Biodiversity Institute
SASS5	South African Scoring System version
SMP	Strategic Management Plans
ToR	Terms of Reference
TSP	Threatened Species Programme – a programme managed by SANBI to assess the Red Data status of South African plants
WMA	Water Management Area
WQ	Water Quality
WSA	Water Service Act (WSA, Act 108 of 1997)

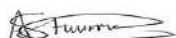
## DECLARATION

This is to certify that the following assessment report has been prepared independently of any influence or prejudice as may be specified by the Department of Environmental Affairs (DEA).

<b>Document Title</b>	Terrestrial Biodiversity Impact Assessment report for the proposed afforestation for Malangeni extension of 433 hectares, and Bhukazi new plantations of 194 hectares in Ingquza Hill Local Municipality, eastern cape province.
<b>Report prepared by</b>	Andisiwe Stuurman
<b>Field of Practice:</b>	Environmental Science
<b>Date:</b>	20 February 2020

This is to certify that the report has been prepared independently of any influence or prejudice as may be specified by the Department of Environmental Affairs (DEA).

Sign:



.....

Date:

20 February 2020

.....

## 1. Introduction

In South Africa, recent legislation has affirmed the national commitment to conservation. The National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) has been assented by the South African President and was published in the Government Gazette in June 2004 (Vol. 467; No. 26426). The objective of this Act is to provide for, amongst others the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; and the sustainable use of indigenous biological resources.

### 1.1 Project Location and background

Ezendalo was appointed by Ingquza Hill Local Municipality to undertake an application for Environmental Authorisation (EA) for the proposed Malangeni extension of 433 hectares in Lusikisiki, at ward 24 and Bhukazi 194 hectares in Lusikisiki at ward 12. Ingquza Hill Local Municipality, previously known as Qaukeni, is an administrative area in the OR Tambo District of Eastern Cape in South Africa. Ingquza Hill local municipality is formed by two small towns which are Lusikisiki and Flagstaff under the O.R.Tambo District municipality. This municipality is informed by 32 wards. Malangeni and Bhukazi are located in the North Eastern region of the Eastern Cape, in Lusikisiki. The details of each proposed site can be seen in Table 1.

Table 1: List of site coordinates

Project Name	Size (ha)	Ward Number	Purpose	Coordinates
Malangeni	433	24	Expansion	31° 19' 10.343"S; -29° 43' 28.889"E
Bhukaz1	194	12	New Plantations	

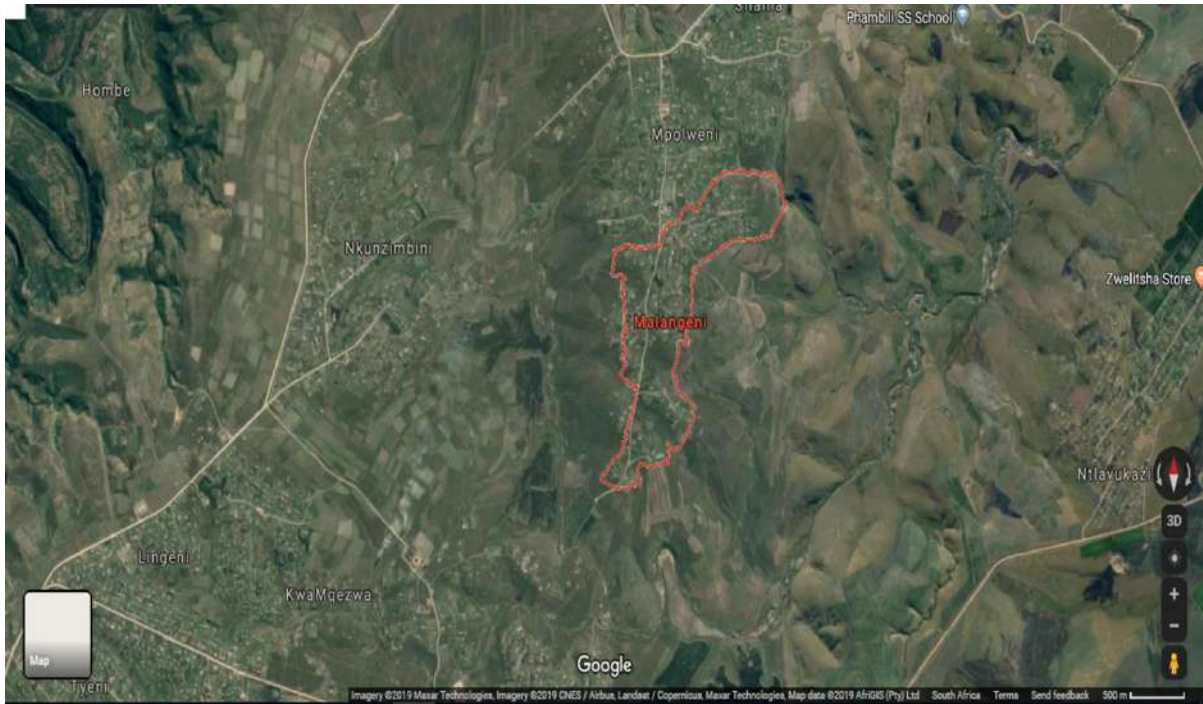


Figure 1: Locality Map showing the proposed Malangeni site.

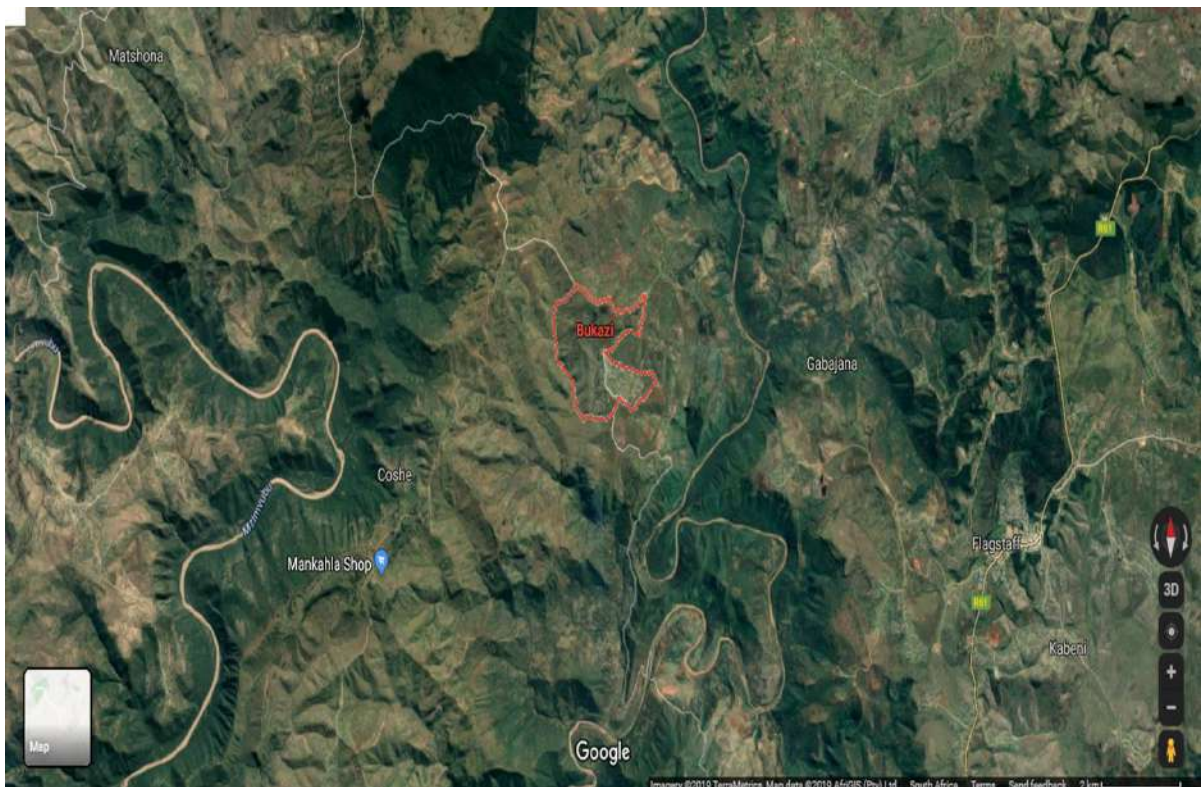


Figure 2: Locality Map showing the proposed Bhukazi site.

## 1.2 Development Description

The proposed development will involve the afforestation of Malangeni and Bhukazi forest. Malangeni is an extension of an existing forest while Bhukazi will be new plantations.

## 1.3. Study Site Description

### 1.3.1 Locality & Land Use

Ingquza Hill local municipality is formed by two small towns which are Lusikisiki and Flagstaff under the O.R.Tambo District Municipality. The two sites, Malangeni and Bhukazi are located in the North Eastern region of the Eastern Cape, in Lusikisiki. From historical imagery, it is clear that the majority of the area over the last 20 years has been under agriculture (crop fields). Although, some Small and localized areas have been transformed to (homesteads and cultivated lands).

### 1.3.2 Climate

The climate along the South Coast varies from temperate sub-tropical in the South to moderate sub-tropical weather further north. The Lusikisiki area specifically has a very comfortable sub-tropical climate. The combination of mountains and sea creates a temperate zone of its own, but also keeps the temperature cool and comfortable in summer. Rainfall occurs mainly in the summer months and the temperature seldom drops below 14°C.

### 1.3.3 Geology and Soils

For Malangeni Forest, the roads leading to the forest lays in a flat to gentle steep topography, whilst the sections running from the stream crossings have a relatively steep incline. The area is predominantly covered by Drakensberg

Foothill Moist Grassland (Grassland Biome) and the Eastern Valley Bushveld (Savanna Biome) (Mucina & Rutherford 2006). The soil class fall under imperfectly drained soils, often shallow

and often with a plinthic horizon (S8) and Lithosols (shallow soils on hard or weathering rock) (S13).

For Bhukazi, the roads leading to the forest lays in a flat to gentle steep topography, whilst the sections running from the stream crossings have a relatively steep incline. The area is predominantly covered by Drakensberg Foothill Moist Grassland (Gs 10 Grassland Biome) and the Eastern Valley Bushveld (SVs 6 Savanna Biome (Mucina & Rutherford 2006). The soil class fall under association of Classes 13 and 16: Undifferentiated shallow soils and land classes (S21) and freely drained, structureless soils (S2).

#### 1.3.4 Hydrology

The sites are located within Quaternary Catchments T60E, T60F and T60G, which falls under the Mzimvubu to Keiskamma Water Management Area (WMA). The site is within the catchment area of the Msikaba river. The Msikaba river is classified as a Class B (largely natural) NFEPA river. The proposed Bhukazi forestry area is at the headwaters of the Xurana river, which merges with the Xura and subsequently the Msikaba near the Malangeni site.

The majority of land comprises of natural grassland surrounded by scattered rural dwellings. Some areas of natural forest exist along the drainage lines.

Rainfall in the region occurs in the summer months (mostly December to February), with a mean annual precipitation of 828 mm for Bhukazi and 1184 mm for Malangeni. The reference potential evaporation (ET<sub>o</sub>) is approximately 1 559 mm (A-pan equivalent, after Schulze, 2011) and the mean annual evaporation is 1200 mm, which exceeds the annual rainfall. This suggests a high evaporative demand and a water limited system. Summers are warm to hot and winters are cool. The mean annual temperature is approximately 18.5 °C (6.0 °C minimum and 22.0 °C maximum (Tables 2 & 3). The footprint area of the Malangeni Forest extension is underlain by sedimentary strata of the Late Carboniferous to early Permian Dwyka Group whereas that of the proposed new Bhukazi Forest plantation is underlain



predominantly by sedimentary rocks of the early Permian Ecca Group, with extensive intrusions of Jurassic dolerite sills and dykes. Both areas have small patches underlain by more recent quaternary alluvial deposits, associated with the rivers adjacent to the development sites (Groenewald, 2020).

### 1.3.5 Regional and Local Vegetation

This site is dominated by Ngongoni veld (SVs 4, Mucina and Rutherford, 2006). This occurs within the sub-escarpment savanna biome. The desktop analysis revealed that the area is a vulnerable area, with the potential for some flagged fauna and flora (e.g. red data species and endangered wildlife) being found from the C-plan, SEA and MINSET databases. However, this does not necessarily mean that rare or endangered species will occur in the area of interest. The following information was collected for the vegetation unit SVs 4 (Mucina & Rutherford, 2006; Scott-Shaw & Escott, 2011). The characteristics of this grassland are described as:

- Undulating plains and hilly landscape mainly associated with drier coast hinterland valleys in the rain-shadow of the rain-bearing frontal weather systems from the east coast.
- Sour sparse wiry grassland dominated by unpalatable Ngongoni grass (*Aristida junciformis*) with this mono-dominance associated with low species diversity.
- In good condition dominated by *Themeda triandra* and *Tristachya leucothrix*.
- Wooded areas are found in valleys at lower altitudes, where this vegetation unit grades into KwaZulu-Natal Hinterland Thornveld and Bisho Thornveld.
- Termitaria support bush clumps with *Acacia* species, *Cussonia spicata*, *Ehretia rigida*, *Grewia occidentalis* and *Coddia rudis*.

### 1.4 Purpose of the Assessment

In terms of NEMA, the proposed project will trigger listed activities described in Notice GNR 325 and GNR 324 of the National Environmental Management Act, 1998 (act no.107 of 1998) as amended in April 2017.

The Biodiversity Impact Assessment was divided into two distinct phases:

- Phase 1: Scoping Phase Assessment and Report
- Phase 2: Detailed EIA Phase Assessment and Report

#### 1.5 Scope of work

- Undertake a site visit and study the vegetation types within and immediately surrounding the proposed footprint.
- Establish the current state of this vegetation and its level of intactness, modification and degradation.
- Conduct a desktop study of supporting biodiversity literature.
- Prepare a report that meets the requirements of the Terms of Reference and the EIA Regulations.
- Review the report by a registered professional natural scientist.
- Submit and make amendments as may be required.

Methodology and approach is outlined below:

1. Conduct a desktop study relating to vegetation and flora and fauna of the site and surrounding area.

2. Conduct a detailed site visit to assess the following:

- Detailed field survey of vegetation, flora, fauna and habitats present,
- Comprehensive species list, highlighting species that are of special concern, threatened, Red Data species and species requiring permits for destruction/relocation in terms of NEMBA and the Provincial Nature Conservation Ordinance No. 19 of 1974.
- Detailed mapping of the various habitat units and assessment of habitat integrity, ecological sensitivity, levels of degradation and transformation, alien invasion and species of special concern, the outcome being a detailed sensitivity map ranked into high, medium or low classes.

3. Reporting comprised of a draft detailed Assessment Report (for review and comment) and a Final Assessment Report for submission. The draft and final detailed reports address the following:

- Indicate any assumptions made and gaps in available information. Assessment of all the vegetation types and habitat units within the relevant Regional Planning Frameworks;
- A detailed species list highlighting the various species of special concern categories (endemic, threatened, Red Data species and other protected species requiring permits for destruction/relocation and invasive/exotic weeds);
- Description and assessment of the habitat units and site sensitivities ranked into high, medium or low classes based on sensitivity and conservation importance. A standard methodology has been developed based on other projects in the specific area;
- A habitat sensitivity map will be compiled, indicating the sensitivities as described above;
- A map indicating buffers (if required) in order to accommodate Regional Planning requirements;
- Assessment of Impacts and Mitigation Measures, as well as specific measure that may be required for alternative development plans;

#### 1.6. Project Team

The following team members are proposed for this specialist assessment:

Table 2. Details of team members

Ms. A. Stuurman	Project Leader- Environmental Scientist
Mr S. Maqubela	Project Manager- Quality Review

#### 1.7. Relevant Environmental Legislation

##### 1.7.1 International Agreements

- (Bonn) Convention on the Conservation of Migratory Species of Wild Animals.
- Convention on Biological Diversity including eco-systems and genetic resources.

- Agenda 21 regarding the sustainable development at global and national levels.

#### 1.7.2 International Policies and Agreements

International Council on Mining and Metals (ICMM): good practice guidance on mining and biodiversity (Johnson & Starke, 2006).

#### 1.7.3 Regional Agreements

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

#### 1.7.4 National Legislation

- Conservation of Agricultural Resources Act (CARA, Act 43 of 1983).
- Environmental Conservation Act (ECA, Act 73 of 1989).
- Constitution of the Republic of South Africa (Act 108 of 1996).

Water Services Act (WSA, Act 108 of 1997).

- National Water Act (NWA, Act 36 of 1998).
- National Forests Act (NFA, Act 84 of 1998) and Protected Tree Species.
- National Veld and Forest Fire Act (NVFFA, Act 101 of 1998).
- National Environmental Management Act (NEMA; Act 107 of 1998).
- National Heritage Resources Act (NHRA, Act 25 of 1999).
- National Mineral and Petroleum Resources Development Act (NMPRD, Act 28 of 2002).
- National Environmental Management: Protected Areas Act (NEM: PAA, Act 57 of 2003).
- National Environmental Management: Biodiversity Act (NEM:BA; Act 10 of 2004):
  - Threatened, Protected, Alien and Invasive Species Regulations (2007).
  - Alien and Invasive Species Regulations (Government Gazette [GG] 37885, 1 August 2014).
  - National list of Ecosystems Threatened and in need of Protection under Section 52(1) (a) of NEM: BA (GG 34809, Government Notice [GN] 1002, 9 December 2011).

- National Environmental Management: Air Quality Act (NEM: AQA, Act 39 of 2004).
- Transport Infrastructure Act (Act No 8 of 2001)
- Government Notice (GN) R. 704: regulating the use of water for mining and related activities.
- National Water Resource Strategy (2004). 4.5. National Policies, Guidelines and Program

#### 1.7.5 National Policies, Guidelines and Programmes

- National Biodiversity Strategy and Action Plan (NBSAP) (DEA, 2005).
- National Spatial Biodiversity Assessment (NSBA) (Driver et al. 2004) including Priority Areas and Threatened Ecosystems.
- National Aquatic Ecosystem Health Monitoring Programme (NAEHMP) & River Health Programme (RHP) (initiated by the DWAF, now the DWS).
- National Freshwater Ecosystem Priority Areas project (NFEPA) (Driver et al. 2011).
- National Water Resource Strategy (DWAF, 2013).
- SANBI Grasslands Programme.
- Threatened Grassland Species Programme of the Endangered Wildlife Trust (EWT).

#### 1.7.6 Eastern Cape Legislation, Policies & Guidelines

In its introduction, the NDP sets out a number of important premises to underpin a reconsidered approach to development. These premises also inform the Eastern Cape's plan. They are reiterated here with some rephrasing to reflect emphases from stakeholders consulted in the formulation of this PDP:

- The implementation, monitoring and review cycle of the PDP must encourage the active and critical participation of all citizens of the Eastern Cape in their own development. Key to this will be people-centred local action.
- The PDP and its implementation must be decisive in redressing injustices of the past effectively, while fostering a consciousness for justice in future judgments and arrangements.

- The PDP should foster equitable economic growth and investment, as well as opportunities for meaningful work.
- High-quality education, a healthy population and effective social protection are important to the realisation of a flourishing future for all. The PDP should particularly guarantee an equal start for all children, and ensure that no child suffers from malnutrition.
- The PDP should foster creative links between economic and social strategies to promote inclusive and equitable participation in the economy by an active, hardworking and cohesive society.
- Collaboration between communities, the public and private sectors should be strengthened, with greater attention paid to strengthening the capabilities of a community-anchored agency for sustainable development.
- An effective and capable government and public institutions, with ethically committed leaders, are key to the success of the PDP.
- An ethical, accountable private sector is equally important to the success of the PDP.
- Conscientious leadership is encouraged from all sectors of society and there should be a conscious, ongoing effort to develop and strengthen such leadership.
- The PDP should foster the province's knowledge-driven, evidence-based development.

## 2. Approach and Methodology

### 2.1 Data source consulted

The following data sources and GIS spatial information listed in Table 1 was consulted to inform the specialist assessment. The data type, relevance to the project and source of the information has been provided.

Table 3. Data source and GIS information

	DATA/COVERAGE TYPE	RELEVANT	SOURCE
Biophysical Context	Colour aerial photography	Desktop mapping of drainage network	National Geo-Spatial Information (NGI)
	Latest Google Earth™ imagery	To supplement available aerial photography where needed	Surveyor general (2006)
	Geomorphological Provinces of South Africa	Understand regional geomorphology controlling the physical environment	Partridge et al. (2010)
	South African Vegetation Map (GIS Coverage)	Classify vegetation types and determination of reference primary vegetation	Mucina & Rutherford (2006)
Conservation Context	National Biodiversity Assessment - Threatened Ecosystems (GIS Coverage)	Determination of national threat status of local vegetation types	SANBI (2012)
	Eastern Cape Biodiversity Conservation Plan (GIS Coverage)	Determination of provincial terrestrial freshwater conservation priorities and biodiversity buffers	Hayes <i>et al.</i> (2007) Berliner & Desmet (2007)
	SANBI's PRECIS (National Herbarium Pretoria computerized Information System) (electronic database)	Determination of conservation important plant species	SANBI
	Red Data Books (Data Lists of Plants, Mammals, Reptiles and Amphibians)	Determination of conservation important plants, mammals, reptiles and amphibians	Various sources
	Animal Demography unit	Determination of conservation important birds	ADU, 2016

Table 4. Key biophysical setting details of the study area.

Biophysical Aspect	Desktop Biophysical Details	Source
Elevation a.m.s.l	435 -510 m	Google Earth
Mean annual precipitation	1114.3	(Shulze, 1997)
Rainfall seasonality	Mid-summer	(DWAF, 2007)
Mean annual temperature	18-20 °C	(DWAF, 2007)
Potential evaporation (mm) mean Annual a-pan equivalent	1475.7	Shulze, 1997)
Median Annual Simulated Runoff (mm)	328.3	(Shulze, 1997)
Geology	Dwyka Tillite (Diamictite)	RSA Geology dataset
Water Management Area	Keiskamma	DWA
Quaternary Catchment	T60G	DWA
DWA Eco Region	North Eastern Coastal Belt	CSIR, 2011

Understanding the conservation context and importance of the study area and surrounds is important to inform decision making regarding the management of aquatic and terrestrial ecosystems, habitats and associated biodiversity in the area. In this regard, national, provincial and regional conservation planning information available was used to obtain an overview of the study site.



Table 5. Key conservation context details of the vegetation area.

NATIONAL LEVEL CONSERVATION PLANNING CONTEXT			
Conservation Planning Dataset	Relevant Conservation Feature	Location in Relation to Project Site	Conservation Planning Status
National Vegetation Types (Mucina & Rutherford, 2006)  Ecosystem Threat Status NBA 2011	Ngongoni Veld (SVs4)	Untransformed <i>Aristida</i> grassland within the project area	Vulnerable, hardly protected
The National Freshwater Ecosystem Priority Area (NFEPA) Assessment (CSIR, 2011)	KwaDlambu River	Within 100 m downstream of the site, catchment areas of KwaDlambu River	FEPA River, Upstream Management Area
	Wetlands	Intact wetland areas surrounding the site	Sub-Escarpment Savanna Veg group: (Endangered)

Table 6. Provincial and regional level conservation planning context

PROVINCIAL AND REGIONAL LEVEL CONSERVATION PLANNING CONTEXT			
Conservation Planning Dataset	Relevant Conservation Feature	Location in Relation to Project Site	Conservation Planning Status
National Vegetation Types (Berliner and Desmet, 2007)	Ngongoni Veld	Untransformed <i>Aristida</i> grassland within the project area	Endangered
EC Aquatic Conservation Plan (Berliner and Desmet, 2007)	Catchment area	Entire site and catchment area	Critical Biodiversity Area 2 (Estuary)
EC Terrestrial Conservation Plan (Berliner and Desmet, 2007)	Intact terrestrial grassland	Site and surrounds	Critical Biodiversity Area 2 (T2)

### 2.1.1 National Threatened Ecosystems

A national process has been undertaken to identify and list threatened ecosystems that are currently under threat of being transformed by other land uses. The first national list of threatened terrestrial ecosystems for South Africa was gazetted on 9 December 2011 (National Environmental Management: Biodiversity Act or NEMBA: National list of ecosystems that are threatened and in need of protection, December 2011). The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems (SANBI, 2011). The NEMBA provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. There are four main types of implications of listing ecosystems:

- Planning related implications which are linked to the requirement in the Biodiversity Act (Act 10 of 2004) for listed ecosystems to be taken into account in municipal IDPs and SDFs;
- Environmental authorisation implications in terms of NEMA and the EIA regulations;
- Proactive management implications in terms of the National Biodiversity Act; and
- Monitoring and reporting implications in terms of the Biodiversity Act.

According to the Threatened Ecosystem coverage for the country which was interrogated, the project area and planned development site is located within the **Ngongoni Veld** national vegetation type (Figure 3) which is considered **Vulnerable** (in terms of its threat status) and is hardly protected at a national level.

## 2.2 Approach to the Assessment

The assessment approach involved the following components:

### 1. Desktop Assessments, including:

- Review of biophysical and conservation context in a Geographical Information System (GIS) using available municipal, provincial and national datasets;
- Review of the potential occurrence of flora and fauna; and

- Desktop mapping and risk screening of water resources within a 500m radius of the proposed development. This was used to inform the assessment requirements based on likelihood of development activities triggering a water use.

## 2. Baseline Assessments, including:

- Field delineation of watercourses (wetlands and riparian zones);
- Description of vegetation communities characterising delineated watercourses;
- Obtaining the following information on the terrestrial habitat and biodiversity:
  - Condition of ecosystems/habitat;
  - Vegetation type and ecosystem status;
  - Vegetation composition and structure;
  - Species and features of special concern; and
  - Sensitivity of vegetation communities.
- Assessment of Present Ecological State (PES) or condition of freshwater habitats;
- Assessment of Ecological importance & Sensitivity (EIS) of freshwater habitats; and
- Assessment of the supply, demand and importance of the ecosystem services provided by the freshwater habitats.

## 3. Setting the Recommended Ecological Category (REC) and Management Objectives.

## 4. Impact Assessment and Mitigation Measures, including:

- Impact identification and description;
- Provision of planning and design phase recommendations; and
- Provision of practical onsite construction and operation phase mitigation measures (where necessary, in addition to those provided in the EMPr developed for the EIA phase of the project).

### 2.3 Assumptions, Limitations and Gaps in the Information Presented

- The following limitations and assumptions apply to this assessment:
- The site visit and fieldwork was undertaken over a period of 1 day. The assessment therefore does not cover the seasonal variation in conditions at the site and seasonality is likely to influence the species of flora encountered at the site.
- This report deals exclusively with a defined area and the extent of aquatic and terrestrial habitat/ecosystems in that area.
- All watercourses were desktop delineated and the boundaries of watercourses identified within and in the immediate vicinity of the proposed development site were refined based on sampling points along transects. The outer boundary of wetland and riparian areas between the transects and sampling points was extrapolated using knowledge of the site, aerial photography, contours and the author's experience.
- Sampling was undertaken at level that provides moderate confidence on infield delineated watercourses.
- Watercourse and vegetation community boundaries are based largely on the GPS locations of sampling points and key morphological features (e.g. like the top of an active/macro channel bank). GPS accuracy will therefore influence the accuracy of the mapped sampling points and therefore water resource boundaries and a margin of error of 3-5m can be expected.
- With ecology being dynamic and complex, there is the likelihood that some aspects (some of which may be important) may have been overlooked. This is a key limitation given the rapid nature of the initial screening assessment.
- Sampling by its nature, means that generally not all aspects of ecosystems can be assessed and identified.
- A second site visit during summer to confirm the presence of protected plants was not undertaken.
- Instead a conservative approach was taken to assume that protected plants are present on site. Prior to construction a plant search and rescue must be conducted.

- Whilst limited faunal search was conducted, the assessment was focused more on desktop information with limited field verification.
- While disturbance and transformation of freshwater habitats can lead to shifts in the type and extent of freshwater ecosystems, it is important to note that the current extent and classification is reported on here.
- The PES, EIS and functional assessments undertaken are largely qualitative assessment tools and thus the results are open to professional opinion and interpretation. The author has made every effort to substantiate all claims where applicable and necessary.
- It should be noted that while WET-Health (Macfarlane et al., 2008) is the most appropriate technique currently available to undertake assessments of wetland condition/integrity, it is nonetheless a rapid assessment tool that relies on qualitative information and expert judgment. It therefore provides an indication of the PES of the system rather than providing a definitive measure.
- The EIS assessment did not specifically address in detail all the finer-scale ecological aspects of the water resources such as a detailed list of aquatic fauna likely to occur (i.e. amphibians and fish) within these systems.
- The assessment of impacts and recommendation of mitigation measures was informed by the site specific ecological concerns arising from the field survey and based on the assessor's working knowledge and experience with similar development projects in Eastern Cape.
- The impact descriptions and assessment are based on the author's understanding of the proposed development based on the site visit and information provided.
- Evaluation of the significance of impacts with mitigation takes into account mitigation measures provided in this report and standard mitigation measures included in the Environmental

Management Programme (EMPr).

- Additional information used to inform the assessment was limited to data and GIS coverage's available for the province and district municipality at the time of the assessment.

### 3. Findings of the ecological Assessment

#### 3.1. Background Information

The two sites, Malangeni and Bhukazi are located in the North Eastern region of the Eastern Cape, in Lusikisiki. The sites are in Ingquza Hill Local Municipality under the O R Tambo jurisdiction.

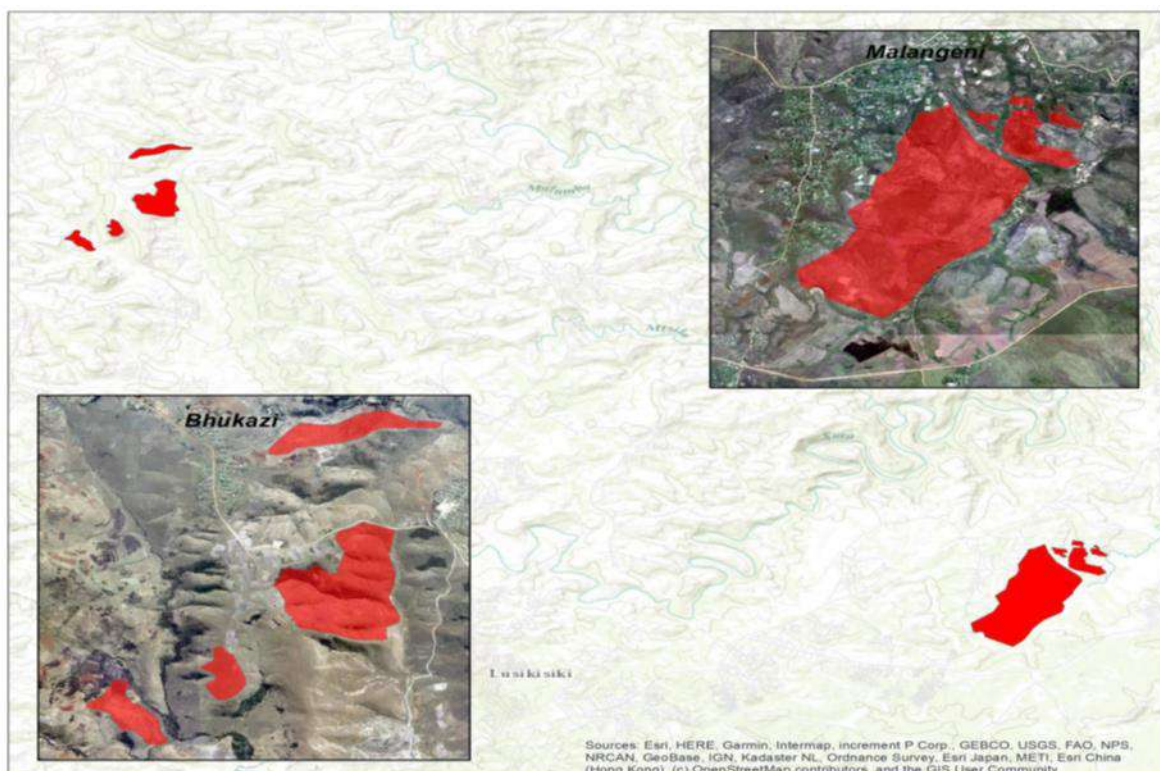


Figure 3: Overview showing the location of the proposed sites.

#### 3.1.1 Vegetation & Floral Communities

As this is an ecological scan for a 433 and 194 hectare sites, transformed through previous excavation (mining) activities, detailed sampling for vegetation communities was not conducted. Due to the extent of the site, the field investigation included an additional 35 ha around the site.

Although the site was largely disturbed and transformed, sampling methods such as Braun-Blanquet cover-abundance approach (Mueller-Dombois & Ellenberg, 1974) was, however, used as a basis to form broader habitat units but not analysed using TWINSpan. The vegetation component therefore included:

- A desktop assessment of the vegetation within the region and potential community structure based on the information obtained from:
  - SANBI's1 Plants of South Africa (POSA) 2626B and specifically 2626BA QDS Mucina & Rutherford's (2006) vegetation map of southern Africa.
  - CI plant species records in the study region obtained through POSA
- A one day field investigation walking transects through the site:
  - Noting species, habitats and cover abundance. Sampling points are presented in Figure 6-1. Plant taxa were identified to species level (some cases, would be used if identification was limiting –means 'confer' or 'looks like'). Scientific names follow POSA (Accessed, March 2016).
  - Recording any observed alien and invasive plant species on site was also conducted. The identification of declared weeds and invader species as promulgated under: the NEMBA August 2014 regulations (GG37885); and the amended regulations (Regulation 15) of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Reporting including vegetation community descriptions, mapping of broad habitat types / vegetation communities and CI species analysis. For CI floral species, Likelihood of Occurrence (LO) rating is assigned to each species based on the availability of suitable habitat using the following scale: Present; Highly likely; Possible; Unlikely or No Habitat available.

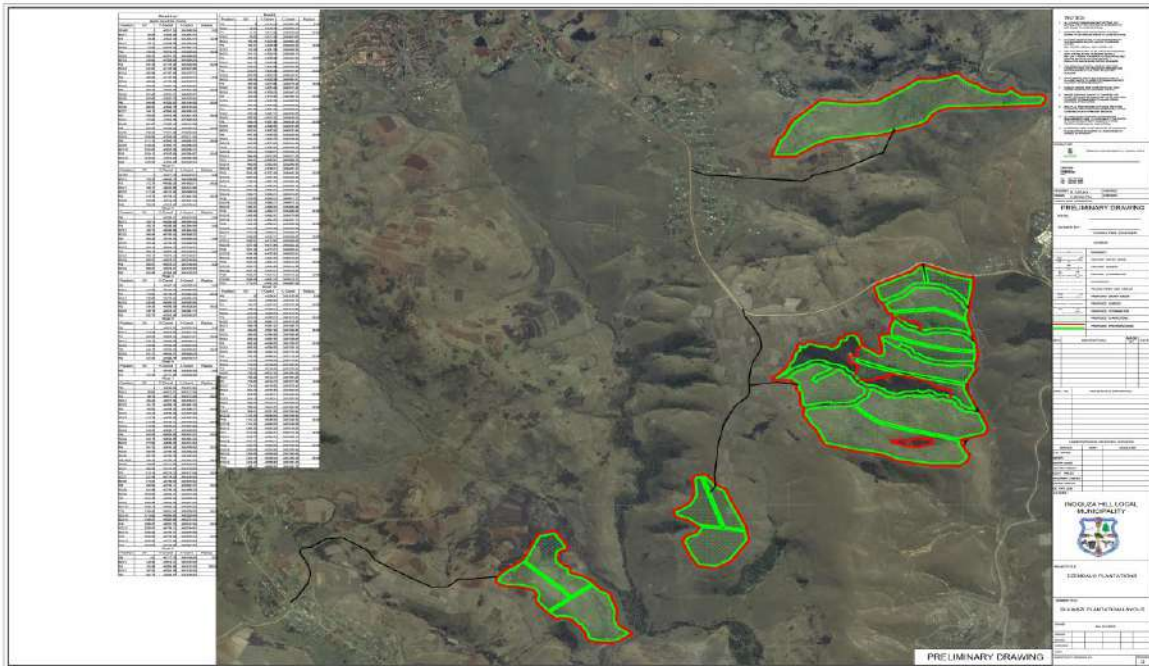


Figure 4: Vegetation Map showing the Bhukazi study site.

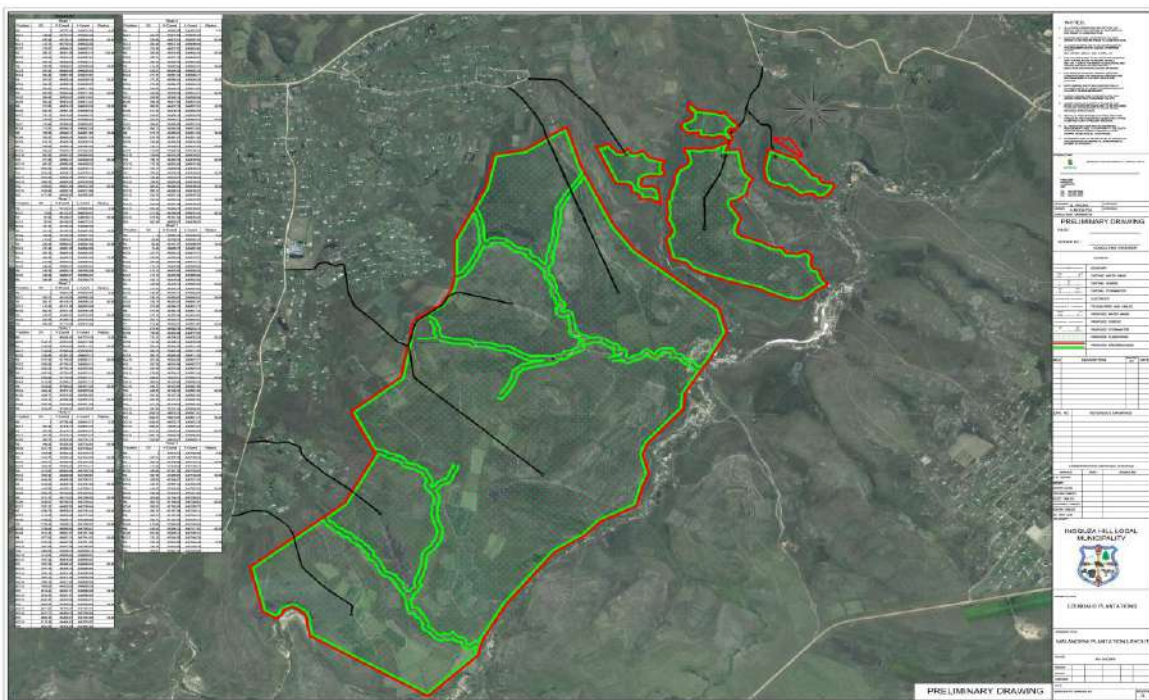


Figure 5: Vegetation Map showing the Malangeni study site



### 3.1.2 Limitations

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

- The small, fragmented nature of the site and disturbances from past excavation and farming activities on site.
- The short duration of fieldwork and the timing of the fieldwork, which occurred after a few months of below average rainfall.
- Some plant species, which are small, have short flowering times, rare or otherwise difficult to detect may not have been detected even though they were potentially present on site.
- Reporting including vegetation community descriptions, mapping of broad habitat types / vegetation communities and CI species analysis. For CI floral species, Likelihood of
- Occurrence (LO) rating is assigned to each species based on the availability of suitable habitat using the following scale: Present; Highly likely; Possible; Unlikely or No Habitat available

### 3.2 Fauna

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

- Mammals using the published species distribution maps in Friedmann & Daly (2004),
- Stuart & Stuart (2007) and Monadjem et al. (2010) as well as online species distribution data from Mammal Map (2016).
- Birds, using the latest online list of bird species from the first and second Southern African
- Bird Atlas Projects (SABAP 1 & 2) for pentad 2600\_2630. Bird species were grouped according to a modified version of Newman's (2002) 12 bird categories.

- Reptiles, using the published species distribution maps in Bates et al. (2014) and online species distribution data from ReptileMap (2016).
- Frogs, using the published species distribution maps in Minter et al. (2004) and online species distribution data from FrogMap (2016).
- Butterflies, using LepiMap's (2016) online list of recorded butterfly species from QDS 2626BA, and supplemental information published in Mecenero et al. (2013).
- Scorpions, using the published species distribution maps in Leeming (2003). Currently,

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

1 Present: the species, or signs of its presence, was observed on Site or in the immediate surrounding area by NSS, or in the region by SABAP observers.

2 High: the species is highly likely to occur, based on available distribution data, and observed habitats.

3 Moderate: the species may occur, based on available distribution data, and observed habitats and disturbances.

4 The species is unlikely to occur based on marginal distribution or a lack of suitable habitat.

### 3.2.2 Fieldwork

Faunal observations were made while driving, walking, and inspecting different habitats on site and in the area. Taxa were identified based on observations specimens, spoor, droppings, burrows and other evidence. Rocks and logs were turned in search of reptiles, scorpions, frogs and invertebrates. A sweep net was used to catch butterflies.

### 3.3 Conservation Status of Species

In the appended faunal lists, the Global IUCN Red List status of species is provided, in addition to the status of species as indicated on the Threatened or Protected Species list (ToPS2015) under the National Environmental Management: Biodiversity Act (NEM:BA 2004), and as determined during the latest national assessment for:

- Mammals by Friedmann & Daly (2004).
- Birds by Taylor et al. (2015).
- Reptiles by Bates et al. (2014).
- Frogs by Minter et al. (2004) and Measey (2011).
- Butterflies by Mecenero et al. (2013).
- Dragonflies and damselflies (i.e. odonata) by Samways (2006).

An atlas and Red Data book for South African scorpion or baboon spider species has not yet been published. Note that due to spatio-temporal variation in human disturbances, the conservation status of some species differs between the IUCN, the relevant national Red Data assessment publication, and the ToPS list. Unless otherwise stated, the most threatened status of a species is provided (in abbreviated form) in text, whether this is at a global or national scale

### 3.3.1 Limitations

- Our visit was limited to a single day and, therefore, not all potentially occurring (especially nocturnal) species were likely to be detected.
- Some species, which are uncommon, small, migratory, secretive or otherwise difficult to detect may not have been detected even though they were potentially present.

## 4. Impact Assessment

### ***Terrestrial Vegetation Communities and Habitat Types***

Following a walk-through site visit conducted over a 2-day period in late winter (24 - 25 August 2016) the following vegetation communities were identified for the site and surrounding area (shown mapped in Figure 11):

- i. Terrestrial Ngongoni Veld grassland which can be subdivided into the following sub communities;
  - a. Degraded Primary Grassland; and
  - b. Secondary Grassland.

- ii. Small and localized areas of scrub invasion, mostly comprised of alien species; and
- iii. Small and localized transformed areas (homesteads and cultivated lands).

It is worth noting that the site visit was undertaken at the end of a notably dry winter coinciding with a regional drought period, and before the arrival of the spring rains. As such it is likely that some plant species, particularly the more inconspicuous and dormant herbs/forbs, were not observed/recorded because of their deciduous nature or 'die-back' in winter. Furthermore, a large part of the grasslands in the study area had also been subject to recent burning, supposedly to provide a "green-bite" for grazing livestock (cattle).

Burning removes above ground plant material, thus making plant identification very difficult if not impossible in many instances. Essentially then, fieldwork was undertaken under conditions that were not considered favourable for a thorough grassland vegetation assessment required for the amount and kind of plant biodiversity recorded. In spite of this, there was a small amount of growth of grassland plants, enabling some degree of useful reporting.

#### **A. Ngongoni Veld Grassland community**

The Transkei region of the Eastern Cape has been settled and grazed for a long period of time. Generally speaking, grasslands in proximity to human settlements and where there is active livestock grazing are frequently degraded and most often depleted of natural plant diversity, and very often, only unpalatable grasses and weeds remain.

The grassland identified on site is quite unusual in that it is primary in the sense that there is still modest herbaceous and geophyte diversity (of which there are over 60 species) and the area is not comprised of weeds commonly associated with disturbance. It has, however, been degraded and appears to suffer from anthropogenic impacts including over-burning and overgrazing.

It is overwhelmingly comprised of *Aristida junciformis* subsp. *junciformis* (Ngongoni Grass) that overexpresses in response to overgrazing and over-burning and there appears to have

been some loss of species diversity, and more particularly, plant abundance. During the survey undertaken herbaceous and geophytic abundance was estimated between 1 and 5 species per m<sup>2</sup>.

However, given that the survey was undertaken at time preceding the typical growing season for this vegetation type, it is possible that during the rainy season, higher abundances and diversities could be recorded. Notable species characterising the degraded primary grassland included *Moraea elliotii* (widespread but due to grasslike leaves only visible during short flowering, usually on overcast days), a single specimen of a *Dierama sp.* (not in flower and only could be identified to genus level) and the orchid *Eulophia hians var. hians*. Additional specimens of the orchid species and other species are expected to still appear in the coming summer months after good rains.

The grassland contained numerous shallow rock exposures where the grass *Microchloa caffra* was recorded. The bulbs *Albuca setosa* and *Ornithogalum juncifolium* were found occurring in this 'rocky' habitat (the latter was abundant on the edge of the outcrops, but diminutive, with small, thread-like leaves). A small number of *Aloe maculata* plants were also seen near one of the outcrops (these species are not rare in the eastern parts of South Africa). The rock exposures provide habitat for *Brachystelma species*, some of which are rare, but which if present will only be seen further into the summer.

Approximately four (4) specimens of a plant were observed that appeared to resemble *Helichrysum pannosum*, which is an endangered species (Raimondo *et al.*, 2009). However, plants had leaves only just growing-out and there are some other species such as *H. appendiculatum*, *H. cephaloideum* and *H. auriceps* that are very difficult to distinguish from one another at an early growth stage. *Senecio cf. umgeniensis* is an uncommon species formerly red listed as Vulnerable, but now Data Deficient (Raimondo *et al.*, 2009). Again, one plant was just emerging from recently burnt ground.

A selection of photographs taken of relevant features and habitat characteristics the terrestrial grassland areas assessed during the site visit

<p>Degraded Primary <i>Aristida</i> Grassland community.</p>	<p>Mixed wattle and indigenous bush</p>
<p>Reasonable vegetation cover in the virgin grassland</p>	<p><i>View of the Ornithogalum sp. On site.</i></p>
<p>Secondary Grassland Community, poor groundcover due to recent over-burning and over-grazing.</p>	<p>View of the Degraded Primary <i>Aristida</i> Grassland community.</p>

Figure 6: Bhukazi forest plants

<p>View of the Degraded Primary <i>Aristida</i> Grassland community with one indigenous tree on site</p>	<p>View showing the Northern boundary</p>
<p>Reasonable basal cover in the virgin grassland</p>	<p>Section of the site showing dense <i>Aristida</i> sward.</p>
<p>Degraded Primary <i>Aristida</i> Grassland community.</p>	<p>Secondary grassland of the area.</p>

Figure 7: Malangeni forest plants

## 5. Terrestrial Biodiversity Results

### 5.1. Fauna

Habitat diversity within the small relatively flat chert-dominated site is low and as such a low faunal diversity is expected to occur. In spite of this a number of Conservation Important Species (CIS) may utilise the site albeit sporadically. Few (if any) are likely to be resident and most CIS will not be dependent on the site.

In total nine mammal, 32 bird, 5 reptile and 6 butterfly species were detected on site during the ecoscan.

## 6. Areas of Significance

The Site Significance assessment, which includes a significance map for terrestrial biodiversity on the site, was based on the findings from the ecological scan, as well as relevant international, national and provincial planning and other biodiversity conservation initiatives as described below.

### 6.1. International Areas of Significance

On an International level the site does not fall into any:

- Ramsar Sites
- World Heritage Sites
- Important Bird Areas (IBAs)



## 6.2. National and Regional Areas of Significance

On a National level the site does not fall into any (refer to Figure 8-1 and Figure 8-2):

- Protected Areas

Considerable international, regional and national legislation and guidelines promote the protection of biodiversity. This includes the National Environmental Management: Protected Areas Act (NEM:PAA; Act 57 of 2003), which is focused on the conservation management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. There are no Protected areas within or surrounding the site.

- Terrestrial Priority Areas & Threatened Ecosystems

Nine terrestrial Priority Areas were identified for conservation in South Africa (Driver et al., 2004). These Priority Areas were allocated where broad-scale habitat remained unprotected, or was inadequately conserved. Threatened Ecosystems within each Priority Area was gazetted on 9 December 2011 in the National Environmental Management: Biodiversity Act (NEM: BA; Act 10 of 2004). The identified Threatened Ecosystems occupy 9.5% of South Africa. The site does not fall within either Priority or Threatened Ecosystems

- Freshwater Ecosystem Priority Areas (FEPAs)

The National Freshwater Ecosystem Priority Area (NFEPAs) project (Driver et al., 2011) provides strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources in South Africa. There were no NFEPAs located on or surrounding the site.

The C Plan was based on a provincial Biodiversity Assessment (Desmet et al. 2009), and provides important guidance for biodiversity conservation and sustainable development in the province. Among other things, the C Plan will be used to inform the development of provincial biodiversity Sector Plans, bioregional plans, Spatial Development Frameworks (SDFs), Environmental Management Frameworks (EMFs), Strategic Environmental Assessments (SEAs) and the Environmental Impact Assessment (EIA) process in the province.

According to the NW:C Plan, the study area is situated in a Category 1 Critical Biodiversity Area (CBA 1). CBAs are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems, and the delivery of ecosystem services. If these areas are not maintained in a natural or near-natural state, then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses. Similarly to Protected Areas, Category 1 CBAs also include “natural” landscapes where:

- Ecosystems and species remain fully intact and undisturbed;
- These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost then targets will not be met.
- These are landscapes that are at or past their limits of acceptable change.

### 6.3. Local Areas of Significance

A map was compiled based on the above and Eco scan assessment to depict local Areas of Significance for the conservation of terrestrial flora and fauna. Areas of significance include areas that have been highlighted because of their:

- Ecological sensitivity (including renewability/success for rehabilitation);
- Level/Extent of disturbance.
- Presence of CI species (identified at the vegetation unit/habitat level); and

- Conservation value (at a regional, national, provincial and local scale);

Identified habitat units within the study site were ranked into High, Medium-high, Medium, Medium-low or Low classes in terms of significance. This was undertaken according to a sensitivity-value analysis (scoring in Table 7) and included input based on knowledge of the area, on the ground investigations and experience when dealing with ecological systems and processes. A summary overview of scoring the Areas of Local Conservation Significance is presented in the table below:

Table 7. Overview of scoring of the Areas of Local Conservation Significance

Category	Scoring Range	
	Upper	Lower
High	15	11
Moderate - High	10.9	7
Moderate	Moderate 6.9 3	3
Moderate – Low	2.9	-1
Low	-1.1	-5
Low to None	No rating (no habitat remaining)	

## 7. Impact Assessment & Recommendations

Due to the conservation threat status and high levels of irreplaceability associated with the primary *Aristida* grassland at the site of the proposed stone quarry, a suitable 'Biodiversity Offset' is proposed as a means of compensating for the irreplaceable loss of approximately 22 hectares of primary Ngongoni grassland. Existing commitments and recommendations have already been defined in the Biodiversity Offset Report for the SANRAL N2 Wildcoast Highway (Botha & Brownlie, 2015), which accounts for grassland loss due to stockpiling/quarries, determines the required offset area to compensate for habitat/vegetation loss and proposes a number of candidate offset receiving areas.

According to the Report by Botha and Browlie (2015), “such offsets would not undermine conservation targets or lead to irreplaceable loss of biodiversity, and would be commensurate with the residual impacts (i.e. after all applicable mitigation has been implemented) of the proposed activity”.

It must be highlighted that the Biodiversity Offset Report already makes provision for the offsetting of approximately 60ha of the Transkei Coastal Belt Dolerite & Shale Grassland (including Ngongoni Veld) which has been estimated to be impacted by the stockpiling of 1.5 million tons of dolorite or tillite rock that would be excavated during the cut and fill procedures, and/or establishment of borrow pits/ quarries to supply additional road material (Botha & Brownlie, 2015). In all likelihoods, it should be entirely possible to accommodate any biodiversity offset requirements associated with the stone quarry within the existing Biodiversity Offset Agreement for the N2 Wildcoast Highway (Botha & Brownlie, 2015) based on preliminary indications.

#### 7.1. Construction and Operational Phases

Mitigation measures and site controls specific to the ecological impacts identified and discussed in this report have been provided below and are intended to augment standard mitigation measures included in the construction Environmental Management Programme (EMPr).

##### A. Finalization of Designs and Plans

The following plans will need to be completed and approved prior to commencement of construction:

- An EMPr must be compiled for the construction phase by an environmental assessment practitioner and the EMPr must incorporate all below listed mitigation measures.

- The road layout drawings.

#### B. Demarcation of any Development Footprint

- Prior to commencement of construction, any quarry close to the site must be fenced off using a 1.8m or higher, high-visibility bonnox fence or other suitable fencing material.
- A green or khakhi shade cloth should be fixed to the bonnox fence to screen the quarry and catch dust.
- All demarcation work must be signed off by the ECO before any work commences.

#### C. Demarcation of No-Go areas

- Terrestrial areas outside of the development footprint and operational area are to be considered sensitive 'No-Go' areas. Access through and construction activities within the No- Go areas are strictly prohibited in these areas and need to be strictly controlled. Any contractors found working inside the no-go areas should be fined as per fining schedule/system setup for the project.
- The demarcation work must be signed off by the Environmental Control Officer (ECO) before any work commences.
- Maintain site demarcations in position until the cessation of construction works.
- Do not paint or mark any natural feature. Marking for surveying and other purposes must be done using pegs, beacons or rope and droppers.
- Access must be confined to the existing road infrastructure where possible and disturbed areas within the road reserve.

#### D. Accidental Incursions into 'No-Go' Areas

- All disturbed terrestrial areas beyond the development footprint that are intentionally or accidentally disturbed during the construction phase must be rehabilitated immediately to the satisfaction of the ECO as per the rehabilitation guidelines (included below).
- Where adjoining areas have been disturbed, there should re-vegetated as per the relevant revegetation/ re-planting plan.

#### E. Managing the Extent of Disturbance

- Vegetation removal/stripping must be limited to the construction footprint. No areas outside the construction footprint may be cleared.
- Grubbing is not permitted as a method of clearing vegetation. Any trees needing clearing must be cut down using chain saws and hauled from the site using appropriate machinery.
- The working servitude must be limited to a 10m width on either side of the development footprint where practically possible.
- Vegetation clearing/stripping must only be done as the construction front progresses.
- No clearing of indigenous vegetation outside of the defined working servitudes is permitted for any reason (i.e. for fire wood or medicinal use).

#### F. Protection of Conservation-important Flora (plants)

- Prior to commencement of construction, a qualified and skilled botanist must be appointed to survey the construction footprint and working servitude, identify all conservation importance species and apply for necessary permits and licences to cut, disturb, damage, destroy, remove or translocate them.

- Demarcate areas identified as harbouring protected plants using suitable measures (such as fencing these areas or using perimeter stakes with high visibility/barrier tape for example).
- The commencement of construction must be preceded by a plant rescue programme which must be conducted only when plant permits and licences have been issued by the relevant authority.
- Conservation-important plants falling just outside the construction footprint must be fenced off to minimise any accidental impacts such as destruction.
- No material storage or laydown is permitted under trees.
- No heavy equipment, machinery and vehicles may be parked under any tree, unless authorized by the ECO.
- No open fires to be permitted outside of designated areas.
- No harvesting of plants for firewood, medical purposes or other uses is to be permitted.

#### G. Financial Penalty Clause

An appropriate fining system should be developed and implemented for any infringements to the EMPr.

Given the high abundance of conservation-important species, the following financial penalty clause is recommended to encourage the contractor and developer to adhere to the recommendations of the specialists as well as recommendations contained in the EMPr. The following financial penalty clause must be included in the EMPr and contract for the project:

- The penalty clause for stripping vegetation within the construction footprint but without approval from the ECO shall be R50, 000 per incident.

- The penalty clause for stripping vegetation outside the construction footprint without approval from the ECO shall be R100, 000 per incident and the disturbed areas shall be revegetated with trees saplings to match the tree density of adjoining habitats.
- The penalty clause for stripping vegetation without any relevant plant permits and licences shall be R100, 000 per incident.

#### H. Alien plant/weed control

- All invasive alien plants that have colonised the construction site must be removed, preferably by uprooting.
- All bare surfaces across the construction site must be checked for IAPs every two weeks and IAPs removed by hand pulling/uprooting and adequately disposed.
- Herbicides should be utilised where hand pulling/uprooting is not possible. ONLY herbicides which have been certified safe for use in wetlands by independent testing authority are to be used.

#### I. Wildlife Management

- Education of workers/employees onsite on not to harm wildlife unnecessarily will assist in mitigating this impact. Contractor induction and staff/labour environmental awareness training needs are to be identified and implemented through staff/contractor environmental induction training. This should include basic environmental training based on the requirements of the EMP, including training on avoiding and conserving local wildlife.
- No wild animal may under any circumstance be hunted, snared, captured, injured, killed, harmed in any way or removed from the site. This includes animals perceived to be vermin (such as snakes, rats, mice, etc.).
- Any fauna that are found within the construction zone must be moved to the closest point of natural or semi-natural habitat outside the construction corridor.



- The handling and relocation of any animal perceived to be dangerous/venomous/poisonous must be undertaken by a suitably trained individual.
- All vehicles accessing the site should adhere to a low speed limit (30km/h is recommended) to avoid collisions with susceptible species such as reptiles (snakes and lizards).
- No litter, food or other foreign material should be disposed of on the ground or left around the site or within adjacent natural areas and should be placed in demarcated and fenced rubbish and litter areas that are animal proof.
- Ensure that workers accessing the site conduct themselves in an acceptable manner while on site, both during work hours and after hours.
- Temporary noise pollution should be minimized by ensuring the proper maintenance of equipment and vehicles, and tuning of engines and mufflers as well as employing low noise equipment where possible.
- No activities should be permitted at the site after dark (between sunset and sunrise), except for security personnel guarding the development site.

#### **J. Fire Management**

- No open fires to be permitted on construction sites. Fires may only be made within the construction camp and only in areas and for purposes approved by the ECO.
- Fire prevention facilities must be present at all hazardous storage facilities.
- Ensure adequate fire-fighting equipment is available and train workers on how to use it.
- Ensure that all workers on site know the proper procedure in case of a fire occurring on site.
- Smoking must not be permitted in areas considered to be a fire hazard.

#### **7.2. Post Construction/ Decommissioning Phase**

During construction, there is bound to be disturbance of terrestrial vegetation outside the actual development footprint (for access by vehicles/workers, storage of equipment/material, etc.). Such disturbance may be inevitable and will require rehabilitation post-construction, which is in line with a number of laws that compel the rehabilitation of disturbed natural areas. Of particular importance is the requirement of 'duty of care' with regards to environmental remediation: stipulated in Section 28 of NEMA (National Environmental Management Act, Act 107 of 1998):

Duty of care and remediation of environmental damage: "(1) Every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorized by law or cannot be reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment."

The following guidelines provide a clear and practical means of implementing such rehabilitation once construction activities have ceased or as and when disturbance is created at the site:

#### A. Land preparation measures

The following are general land preparation requirements for all areas requiring rehabilitation (prior to any revegetation occurring):

- All rubble, litter, foreign materials and waste products needs to be removed from the construction area and disposed of at proper local waste disposal/landfill facilities. Minimise additional disturbance by limiting the use of heavy vehicles and personnel during clean-up operations.
- Any soil stockpiles/spoil material must spread evenly on the ground to match the natural slope.
- All Invasive Alien Plants (IAPs) and weeds must be removed from target sites, preferably by uprooting.
- All embankments are to be shaped to the specification of the project or recommendations of the engineer/ECO.
- Any erosion features within the construction site must be stabilised. Compacted soil infill, rock plugs, gabions, excavation and reshaping or any other suitable measures can be used for this purpose.
- Where significant soil compaction has occurred, the soil may need to be ripped in order to reduce its bulk density thus improving the chances of such that vegetation can become established at the site. Rip and / or scarify all disturbed and compacted areas of the construction site. The ECO with the assistance of the engineer will specify whether ripping and / or scarifying is necessary, based on the site conditions.
- Immediately after ripping and scarifying disturbed areas, about 300mm of topsoil must be applied on top. The thickness of the topsoil maybe reduced at the instruction of the engineer only if the recommended 300mm of topsoil compromises the integrity of the works.
- Topsoil must be placed in the same area from where it was originally stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas. Where topsoil is lost during construction as a result of erosion, topsoil will need to be imported to the site and reestablished.
- Such topsoil must be sourced commercially and legally.

- The topsoil must be compacted to similar compaction levels as natural soils in the area. The engineer will provide detailed advice on this.
- For seeding, the soil needs to be prepared to optimise germination. This is typically undertaken by hand hoeing to loosen the soil in the seedbed but should be firm enough to facilitate good contact between the seeds and the soil.

#### B. Stabilizing steep slopes/Road batters

The following is recommended for stabilisation of steep slopes and steep road batters:

##### **Prior to revegetation:**

- Prior to rehabilitation the site must be stabilised using soft interventions including Grass Fences,
- Sand bags, geo-cells, fibre rolls and creating benches on the slope. The purpose of these mitigation measures is to reduce soil erosion which may compromise rehabilitation efforts.
- Sediment retaining structures such as silt fences, sandbags, hay bales, brush packs, timber logs must be placed in continuous lines across the slope at regular intervals. The interval between rows of sediment retaining structures will depend on the slope gradient. The steeper it is, the shorter the interval.
- Temporary sediment barriers will need to remain in place until such time as re-vegetation and stabilization of disturbed areas is judged to be a success and the risk of erosion/sedimentation has been reduced to a respectfully low level.
- Creating a benched slope will also help in controlling the velocity of runoff.
- It is important to note that bioengineering interventions are vulnerable to failure if not adequately implemented or poorly maintained.

##### **Post re-vegetation through seeding:**

- Immediately after planting the recommended seed mix (hydroseeding / broadcasting of seed), all slopes must be covered with an erosion control blanket such as a SoilSaver. The SoilSaver serves to conserve moisture and hold seeds and soil firmly in place.
- The SoilSaver will require pegging with wooden pegs which can be made from vegetation cleared from the construction footprint.

### **C. Management of disturbed terrestrial areas**

Immediately after preparing the soil, revegetation must commence in order to help bind the soil and prevent soil erosion and to inhibit IAP/weed establishment which will compete with the natural vegetation for space, light, nutrients and water. In this regard, the following mitigation measures must be implemented for road batters, roadside drains and disturbed terrestrial habitats/vegetation:

#### **Method 1: Planting of plugs / sprigs (for disturbed grassland areas)**

The following recommendations apply to re-vegetation of areas disturbed during construction:

- The timing of planting is best done shortly before or at the beginning of the growing season (i.e spring, or at the onset/early summer).
- Once the soil surface is prepared and stabilised, plugs are to be established at moderate densities in alternating rows / patches with areas to be planted. The pattern of planting is to be determined as part of the detailed plan for implementation.
- When using vegetation plugs, the spacing of plugs should not be too wide and planting should be done in patches rather than wider spacing.
- If the soil into which the plugs are to be planted is dry, it will be necessary to add a suitable hydroscopic gel to the receiving cavity at the time the plug is planted (Granger, 2014).

- It is essential that when a plug is planted that the receiving cavity is slightly deeper than the length of the root ball so that when the cavity is pinched closed a slight depression remains around the base of the leaves. This is especially important if the plugs are small and planted into dry soil even though hydroscopic gel has been added to the cavity.
- Live plugs of *Aristida junciformis* subsp. *junciformis* can be obtained from well-vegetated 'donor grassland sites' within the study area.
- Note that any harvesting from donor grassland areas must be undertaken with caution so as not to unduly disturb the donor site. For whole/growing plants, ensure that plants are dug up with as much of their roots intact and such that the soil around the roots is not disturbed (i.e. intact root ball). Care also needs to be taken that weeds/alien plants are not transplanted with the donor plants.
- Collected plants should be replanted as quickly as possible following removal (i.e. within hours of harvesting).
- Large clumps of plants can be carefully separated into smaller clumps or into several individual stems with attached roots, known as slips.
- The plants should be planted with their roots in as much of the original soil medium as possible from which they were removed.
- When planting the material, dig a hole deep enough to ensure that the roots do not bend upwards.
- The soil around the plant should be firmly compacted.
- Temporary erosion protection measures must only be removed once good vegetation cover has established.
- It is essential that survival of all plants be monitored closely for at least the first eight weeks from the day following their planting and any dead plants be replaced as soon as possible.
- No exotic/alien plants are to be used in re-vegetation.

## **Method 2: Seeding by broadcasting or hydroseeding (for areas with bare soils/completely cleared of vegetation)**

- The advantages of hydroseeding include faster germination, increased plant survival, and the ability to cover large, often inaccessible areas rapidly.
- The slurry (basic materials) for hydroseeding must consist of water, seed, fertiliser, anti-erosion compounds (soil binders) and organic supplements to enhance grass growth.
- Prior to seeding, water must be sprayed over target area to provide added moisture.
- The target groundcover of re-vegetated areas shall be no less than 80% of specified vegetation and there must be no bare patches of more than 500 x 500 mm in maximum dimension.
- Ideal species for seeding are mat forming or tufted pioneer grasses that can become quickly established at the site to provide immediate cover in order to stabilise soils and reduce erosion risk. The intention here is that initial pioneer grass cover (annuals) will then be replaced by subclimax and climax grass species naturally occurring at the site, such as *Aristida junciformis* subsp. *junciformis*, which will typically outcompete pioneer grasses over time through natural successional processes. Recommended pioneer grasses for attaining an initial cover at disturbed sites (based on the climate and soil occurring at the site) may include *Cynodon*
  - *dactylon* (Couch grass), *Chloris gayana* (Rhodes grass), *Eragrostis tef* and *Urochloa*
  - *mosambicensis* (Bushveld signal grass).
  - No exotic/alien plants are to be used in re-vegetation.

### 7.3 Management and mitigation recommendations

#### **A. Alien Plant/Weed Monitoring and Control**

In line with the requirements of the NEM:BA, which obligates the landowner/developer to control IAPs on his property, it is recommended that IAPs be controlled or eradicated where necessary according to the legislation, on an on-going basis.

## B. Erosion Control and embankment stability Concerns

Where soil erosion or bank instability concerns exists at the site, particularly for embankments, it is recommended that these areas be monitored to inform the need for further intervention. Where erosion/instability concerns persist, these will need to be addressed as per the following guidelines:

- Identify eroded areas and assess whether soft or hard engineered options will be required to stabilise eroded areas such as gullies.
- Methods such as shaping of eroded areas and revegetation of bare surfaces may be considered for minor eroded areas.
- Larger eroded areas, such as large erosion gully's, created by concentrated flows may require hardened interventions such as concrete/gabions to halt erosion and rehabilitate these areas. In these instances, a rehabilitation engineer would need to be involved in recommending and designing interventions to halt erosion.

## C. Waste minimisation, reuse and recycling

- A culture of “conserve, reduce, reuse & recycle” should be promoted amongst workers at the quarry with regards to the use and disposal of products to minimise resource consumption and reduce the amount of potential waste. This may be in the form of signs/information boards, etc., displayed at central locations at the site.
- Project design can also promote the conservation and efficient utilisation of water, implement rainwater harvesting measures, the recycling / re-use through grey water systems and use water efficient fittings.
- Adequate scavenger-proof rubbish bins and waste disposal facilities are to be provided onsite.
- All solid waste generated must be collected and placed in bins prior to being disposed of appropriately at landfill.



## **Recommendations**

Monitoring is required in order to ensure that terrestrial ecosystems and associated biodiversity associated with the proposed development is protected and maintained without incurring net loss as a result of the project. It is recommended that a Monitoring Programme be developed and implemented in accordance with the following guidelines:

### **A. Responsibilities for Monitoring**

Compliance monitoring will be the responsibility of a suitably qualified/trained ECO (Environmental Control Officer) with any additional supporting EO's (Environmental Officers) having the required competency skills and experience to ensure that monitoring is undertaken effectively and appropriately.

### **B. Construction Monitoring Objectives**

Key monitoring objectives during the construction-phase should include:

- Ensuring that management and mitigation measure are adequately implemented to limit the potential impact on aquatic resources; and
- Ensuring that disturbed areas have been adequately to stabilise and rehabilitated to minimize residual impacts to affected resources.

### **C. Record keeping**

- The ECO shall keep a record of activities occurring on site, including but not limited to:
- Meetings attended;
- Method Statements received, accepted and approved;
- Issues arising on site and cases of non-compliance with the EMP; and
- Corrective actions taken to solve problems that arise;
- Penalties/fines issued; and
- Complaints from interested and affected parties.

#### **D. Construction Phase Monitoring Requirements**

This involves the monitoring of construction related impacts as identified in this report. Regular monitoring of the construction activities is critical to ensure that any problems with are picked up in a timeous manner. In this regard, the following potential concerns should be taken into consideration:

Destruction of habitat outside the construction zone including 'No Go' areas;

- Destruction of conservation important/protected plants and trees.
- Signs of intense or excessive erosion (gullies, rills, scouring and head cuts) and/or sedimentation within, along the edge and/or immediately downslope of the construction zone;
- Erosion of disturbed soils, road batters and soil stockpiles by surface wash processes;
- Pollution of soils and water (with a particular focus on hazardous substances such as fuels, oils and cement products);
- Poorly maintained and damaged erosion control measures (e.g. sand bags, silt fences and silt curtains).
- These risks can be monitored visually on-site by the ECO (together with construction staff) with relative ease and should be reported on regularly during the construction process. Any concerns noted should be prioritised for immediate corrective action and implemented as soon as possible.

#### **G. Directly after construction (rehabilitation effectiveness)**

This involves monitoring the effectiveness of rehabilitation activities. The monitoring and evaluation of rehabilitation activities and outcomes is critical in assessing the extent to which the rehabilitation has achieved what it set out to accomplish. Monitoring the condition of the re-established vegetation cover will be necessary to assess particular aftercare or plant

maintenance requirements. Visual monitoring of the site must be carried out in accordance with the rehabilitation plan at regular intervals during the rehabilitation process. The benefit of regular monitoring will be that problems can be quickly identified and easily addressed during the process whilst rehabilitation teams are busy at the site.

## **8. Conclusion**

With adequate mitigation and impact management then, most impacts can be effectively managed and reduced to estimated low/moderately-low significance levels. In summary then, the various mitigated impacts are unlikely to result in significant ultimate negative consequences that could impact on:

- i) Conservation targets for the grassland vegetation/habitat types;
- ii) Grassland ecological functioning and ecosystem services supply; or
- iii) Species of conservation concern.

Overall, the proposed development can be considered acceptable from an ecological perspective based on the provision that the various mitigation measures proposed in this report are strictly adhered to during the various phases of the quarry development project.

It is therefore recommended that the relevant sections of the report that deal with 'Impact Mitigation and Management' for aquatic and terrestrial ecosystems and habitats be included in the Construction Environmental Management Programme (EMPr) for the project and also referenced in the Environmental Authorisation (EA) for this project as a specific condition of the EA.

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## ANNEXTURE A: Species List – Flora

\*Species of conservation importance are highlighted in “green”, exotic/alien plants in “red” text.

No	Latin Name*	Common Name	Location	Threat Status	Growth Form
1.	<i>Acacia mearnsii</i>	Black Wattle	Terrestrial Shrubland (TS)	Exotic/Alien	Tree
2.	<i>Albuca setosa</i>	Gib'iziphoso or Ingcino (Z)	Grassland (TG)	Least Concern (LC)	Bulb. herb
3.	<i>Aloe maculata</i>	Soap Aloe	TG	LC	Herb
4.	<i>Alysicarpus rugosus</i>	Red Moneywort	TG	LC	Herb
5.	<i>Anthospermum herbaceum</i>	Levant Cotton	TG	LC	Herb
6.	<i>Argyrolobium harveyanum</i>		TG	LC	Herb
7.	<i>Aristea torulosa</i>		TG	LC	Herb
8.	<i>Aristida junciformis</i>	Ngongoni Grass	TG, Wetland Habitat (WH), River Habitat (RH)	LC	Grass
9.	<i>Asparagus sp.</i>	Asparagus	TG	LC	Herb
10.	<i>Berkheya speciosa</i>	Umaphola (Z)	TG	LC	Herb
11.	<i>Berkheya umbellata</i>	Ikhakhasana Eincane (Z)	TG	LC	Herb
12.	<i>Caesalpinia decapetala</i>	Mauritius Thorn	TS	Exotic/Alien	Tree
13.	<i>Calpurnea sericea</i>	Mountain Calpurnea	TS	LC	Shrub. Tree
14.	<i>Canthium ciliatum</i>		TS	LC	Shrub, tree
15.	<i>Centella asiatica</i>	Marsh Pennywort	TG, WH, RH	LC	Herb
16.	<i>Cephalaria oblongata</i>		TG	LC	Herb
17.	<i>Chaetacanthus burchellii</i>	Fairy Stars	TG	LC	Herb
18.	<i>Clutia cordata</i>	Grassland Clutia	TG	LC	Herb
19.	<i>Conyza obscura</i>		TG	LC	Herb
20.	<i>Crassula obovata var. obovata</i>	Stonecrop	TG	LC	Herb
21.	<i>Cyperus dives</i>		WH, RH	LC	Sedge
22.	<i>Cyperus latifolius</i>		WH, RH	LC	Sedge
23.	<i>Cyperus solidus</i>		WH, RH	LC	Sedge
24.	<i>Cyperus textilis</i>		WH, RH	LC	Sedge
25.	<i>Delosperma sp.</i>		TG	LC	Herb
26.	<i>Dierama sp.</i>		TG	N/A	Herb
27.	<i>Diospyros lycioides</i>	Bluebush	TG	LC	Shrub, tree
28.	<i>Eleocharis sp.</i>		WH, RH	LC	Sedge
29.	<i>Eriospermum mackeenii</i>	Yellow Fluffy-Seed	TG	LC	Herb
30.	<i>Eucalyptus grandis</i>	Saligna Gum	TG	Exotic/Alien	Tree
31.	<i>Eucalyptus sp.</i>	Gum	TG	Exotic/Alien	Tree
32.	<i>Euclea crispa var. crispa</i>	Blue Guarri	TG	LC	Shrub, tree
33.	<i>Eulophia hians var. hians</i>		TG	LC	Herb
34.	<i>Euphorbia striata</i>	Milkweed	TG	LC	Herb
35.	<i>Felicia filifolia</i>	Fine-Leaved Felicia	TG	LC	Herb
36.	<i>Gazania krebsiana</i>	Common Gazania	TG	LC	Herb
37.	<i>Gerbera ambigua</i>	Pink And White Gerbera	TG	LC	Herb
38.	<i>Gerbera natalensis</i>		TG	LC	Herb
39.	<i>Gerbera piloselloides</i>		TG	LC	Herb
40.	<i>Gnidia nodiflora</i>		TG	LC	Herb
41.	<i>Gomphocarpus physocarpus</i>	Milkweed	WH, RH	LC	Herb
42.	<i>Gymnosporia buxifolia</i>	Common Spikethorn	TG	LC	Tree
43.	<i>Helichrysum allioides</i>		TG	LC	Herb
44.	<i>Helichrysum appendiculatum</i>	Sheep's Ears Everlasting	TG	LC	Herb
45.	<i>Helichrysum aureum var. Monocephalum</i>	Yellow Everlasting	TG	LC	Herb
46.	<i>Helichrysum cf. pannosum</i>		TG	Endangered	Herb
47.	<i>Helichrysum krebsianum</i>		TG	LC	Herb
48.	<i>Helichrysum nudifolium var. piloselloides</i>	Hottentot's Tea	TG	LC	Herb
49.	<i>Helichrysum odoratissimum</i>	Impepho (Z)	TG	LC	Herb
50.	<i>Hypericum aethiopicum</i>		TG	LC	Herb
51.	<i>Hypoxis argentea</i>	Small Yellow Star Flower	TG	LC	Herb
52.	<i>Hypoxis cf. hemerocallidea</i>	African Potato	TG	Declining	Herb
53.	<i>Hypoxis interjecta</i>	Yellow Star	TG	LC	Herb
54.	<i>Hypoxis multiceps</i>	White Star-Flower	TG	LC	Herb
55.	<i>Imperata cylindrica</i>		WH, RH	LC	Grass
56.	<i>Ipomoea crassipes</i>	Common Ipomoea	TG	LC	Herb

57.	<i>Juncus effusus</i>		RH	LC	Rush
58.	<i>Laggera crispata</i>		TG	LC	Herb
No	Latin Name*	Common Name	Location	Threat Status	Growth Form
59.	<i>Lantana camara</i>	Lantana	TG, TS, WH	Exotic/Alien	Shrub
60.	<i>Lantana rugosa</i>	Bird's Brandy	TG	LC	Shrub, herb
61.	<i>Leonotis leonorus</i>	Wild Dagga	TG	LC	Herb
62.	<i>Maesa alnifolia</i>	Dwarf Maesa	TG	LC	Shrub
63.	<i>Maesa lanceolata</i>	False-Assegai	TG, TS	LC	Tree
64.	<i>Moraea elliotii</i>	Blue Tulip	TG	LC	Herb
65.	<i>Morella serrate</i>	Lance-Leaf Waxberry	RH, WH	LC	Tree
66.	<i>Nemesia denticulate</i>	Wild Nemesia	TG	LC	Herb
67.	<i>Onopordum acanthium</i>	Scotch Thistle	WH	Exotic/Alien	Herb
68.	<i>Ornithogalum sp.</i>		TG	LC	Bulb, herb
69.	<i>Oxalis semiloba</i>	Common Sorrel	TG	LC	Herb
70.	<i>Pelargonium alchemilloides</i>	Pink Trailing Pelargonium	TG	LC	Herb
71.	<i>Plectranthus barbatus</i>	Abyssinian Coleus/Bearded Spurflower	TG	Exotic/Alien	Herb
72.	<i>Psidium guajava</i>	Guava	RH, WH	Exotic/Alien	Shrub, tree
73.	<i>Ricinus communis</i>	Castor Oil Bush	WH, RH, TG, TS	Exotic/Alien	Shrub, tree
74.	<i>Rubus cuneifolius</i>	Bramble	TG, TS, WH	Exotic/Alien	Shrub
75.	<i>Searsia dentata</i>	Nana-Berry	TG, TS	LC	Shrub
76.	<i>Searsia discolor</i>		TG, TS	LC	Shrub
77.	<i>Senecio cf. umgeniensis</i>		TG	Threatened	Herb
78.	<i>Senecio macrocephalus</i>	Mountain Senecio	TG	LC	Herb
79.	<i>Senecio madagascariensis</i>		TG	Exotic/Alien	Herb
80.	<i>Seriphium plumosum</i>		TG	LC	Herb
81.	<i>Sesbania puniceus</i>	Red Sesbania	WH, RH	Exotic/Alien	Shrub, tree
82.	<i>Solanum chrysotrichum</i>	Devil's Fig	TG	Exotic/Alien	Shrub, tree
83.	<i>Solanum incanum</i>	Prickle Pear	WH	Exotic/Alien	Herb
84.	<i>Spermacoce natalensis</i>		TG	LC	Herb
85.	<i>Tephrosia capensis</i>	Multi-Coloured Tephrosia	TG	LC	Herb
86.	<i>Teucrium kraussii</i>	Isihlungu (Z)	TG	LC	Herb
87.	<i>Thunbergia atriplicifolia</i>	Natal Primrose	TG	LC	Herb
88.	<i>Tragia meyeriana</i>	Imbabatane (Z)	TG	LC	Herb
89.	<i>Wahlenbergia grandiflora</i>	Giant Bell Flower	TG	LC	Herb
90.	<i>Zornia capensis</i>	Cartapilla Bean	TG	LC	Herb

ANNEXTURE B: Impact Significance Assessment Results

B1 Impact Significance Assessment Results for the Terrestrial Ecological Assessment

**B1-1 Construction Phase Terrestrial Ecological Impact Significance Assessment**

<b>CONSTRUCTION-PHASE ECOLOGICAL IMPACT SIGNIFICANCE ASSESSMENT: <i>Ecosystem conservation targets</i></b>								
<b>IMPACT SIGNIFICANCE: Realistic 'Standard mitigation' Scenario</b>								
No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
B1	Direct physical destruction of flora and fauna	Negative	Local	Moderately-High	Permanent	Definite	Moderately-High	Medium
B2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Definite	Moderate	Low
B3	Pollution of soil, water and vegetation	Negative	Local	Moderately-Low	Medium-term	Probable	Moderately-Low	Medium
B4	Nuisance factors (Noise, Vibrations, Light)	Negative	Local	Moderately-Low	Short-term	Highly Probable	Moderately-Low	Medium
<b>IMPACT SIGNIFICANCE: Realistic 'Best practical mitigation' Scenario</b>								
No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
B1	Direct physical destruction of flora and fauna	Negative	Local	Moderately-High	Permanent	Definite	Moderately-High	Medium
B2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Low
B3	Pollution of soil, water and vegetation	Negative	Site	Moderately-Low	Short-term	Unlikely	Low	Medium
B4	Nuisance factors (Noise, Vibrations, Light)	Negative	Site	Moderately-Low	Short-term	Possible	Low	Medium

**CONSTRUCTION-PHASE ECOLOGICAL IMPACT SIGNIFICANCE ASSESSMENT: *Ecological functioning & ecosystem service supply***

**IMPACT SIGNIFICANCE: Realistic 'Standard mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
B1	Direct physical destruction of flora and fauna	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Medium
B2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Low
B3	Pollution of soil, water and vegetation	Negative	Local	Moderately-Low	Long-term	Probable	Moderately-Low	Medium
B4	Nuisance factors (Noise, Vibrations, Light)	Negative	Local	Moderately-Low	Long-term	Highly Probable	Moderately-Low	Medium

**IMPACT SIGNIFICANCE: Realistic 'Best practical mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
B1	Direct physical destruction of flora and fauna	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Medium
B2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Low
B3	Pollution of soil, water and vegetation	Negative	Site	Moderately-Low	Long-term	Unlikely	Low	Medium
B4	Nuisance factors (Noise, Vibrations, Light)	Negative	Site	Moderately-Low	Long-term	Possible	Low	Medium

**CONSTRUCTION-PHASE ECOLOGICAL IMPACT SIGNIFICANCE ASSESSMENT: *Species of conservation concern***

**IMPACT SIGNIFICANCE: Realistic 'Standard mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
B1	Direct physical destruction of flora and fauna	Negative	Local	Moderately-High	Permanent	Highly Probable	Moderate	Medium
B2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Long-term	Highly Probable	Moderately-Low	Low
B3	Pollution of soil, water and vegetation	Negative	Local	Moderately-Low	Short-term	Probable	Low	Medium
B4	Nuisance factors (Noise, Vibrations, Light)	Negative	Local	Moderately-Low	Short-term	Possible	Low	Medium

**IMPACT SIGNIFICANCE: Realistic 'Best practical mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
B1	Direct physical destruction of flora and fauna	Negative	Surrounding Area	Moderately-High	Permanent	Unlikely	Low	Medium
B2	Degradation and fragmentation of habitat	Negative	Surrounding Area	Moderate	Long-term	Unlikely	Low	Low
B3	Pollution of soil, water and vegetation	Negative	Site	Moderately-Low	Short-term	Unlikely	Low	Medium
B4	Nuisance factors (Noise, Vibrations, Light)	Negative	Site	Low	Short-term	Unlikely	Low	Medium

## B 2 Operational Phase Terrestrial Ecological Impact Significance Assessment

OPERATIONAL-PHASE TERRESTRIAL ECOLOGICAL IMPACT SIGNIFICANCE ASSESSMENT: <i>Ecosystem conservation targets</i>								
IMPACT SIGNIFICANCE: Realistic 'Standard mitigation' Scenario								
No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
O1	Direct physical destruction of flora and fauna	Negative	Local	Moderately-High	Permanent	Definite	Moderately-High	Medium
O2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Definite	Moderate	Low
O3	Pollution of soil, water and vegetation	Negative	Local	Moderately-Low	Long-term	Probable	Moderately-Low	Medium
O4	Nuisance factors (Noise, Vibrations, Light)	Negative	Local	Moderately-Low	Long-term	Highly Probable	Moderately-Low	Medium
IMPACT SIGNIFICANCE: Realistic 'Best practical mitigation' Scenario								
No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
O1	Direct physical destruction of flora and fauna	Negative	Local	Moderately-High	Permanent	Definite	Moderately-High	Medium
O2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Low
O3	Pollution of soil, water and vegetation	Negative	Site	Moderately-Low	Long-term	Possible	Low	Medium
O4	Nuisance factors (Noise, Vibrations, Light)	Negative	Surrounding Area	Moderately-Low	Long-term	Probable	Low	Medium

**OPERATIONAL-PHASE TERRESTRIAL ECOLOGICAL IMPACT SIGNIFICANCE ASSESSMENT: *Ecological functioning & ecosystem service supply***

**IMPACT SIGNIFICANCE: Realistic 'Standard mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
O1	Direct physical destruction of flora and fauna	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Medium
O2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Low
O3	Pollution of soil, water and vegetation	Negative	Local	Moderately-Low	Long-term	Probable	Moderately-Low	Medium
O4	Nuisance factors (Noise, Vibrations, Light)	Negative	Local	Moderately-Low	Long-term	Highly Probable	Moderately-Low	Medium

**IMPACT SIGNIFICANCE: Realistic 'Best practical mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
O1	Direct physical destruction of flora and fauna	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Medium
O2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Permanent	Highly Probable	Moderate	Low
O3	Pollution of soil, water and vegetation	Negative	Site	Moderately-Low	Long-term	Possible	Low	Medium
O4	Nuisance factors (Noise, Vibrations, Light)	Negative	Surrounding Area	Moderately-Low	Long-term	Probable	Low	Medium



**OPERATIONAL-PHASE TERRESTRIA ECOLOGICAL IMPACT SIGNIFICANCE ASSESSMENT: *Species of conservation concern***

**IMPACT SIGNIFICANCE: Realistic 'Standard mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
O1	Direct physical destruction of flora and fauna	Negative	Local	Moderately-High	Permanent	Highly Probable	Moderate	Medium
O2	Degradation and fragmentation of habitat	Negative	Local	Moderate	Long-term	Highly Probable	Moderately-Low	Low
O3	Pollution of soil, water and vegetation	Negative	Local	Moderately-Low	Long-term	Probable	Moderately-Low	Medium
O4	Nuisance factors (Noise, Vibrations, Light)	Negative	Local	Moderately-Low	Long-term	Probable	Moderately-Low	Medium

**IMPACT SIGNIFICANCE: Realistic 'Best practical mitigation' Scenario**

No.	Nature of Impact	Status	Extent	Intensity	Duration	Probability	Impact Significance	Confidence
O1	Direct physical destruction of flora and fauna	Negative	Surrounding Area	Moderately-High	Permanent	Unlikely	Low	Medium
O2	Degradation and fragmentation of habitat	Negative	Surrounding Area	Moderate	Long-term	Unlikely	Low	Low
O3	Pollution of soil, water and vegetation	Negative	Site	Moderately-Low	Long-term	Unlikely	Low	Medium
O4	Nuisance factors (Noise, Vibrations, Light)	Negative	Site	Low	Long-term	Unlikely	Low	Medium

# **PALAEONTOLOGICAL IMPACT ASSESSMENT**

# Desktop Palaeontological Impact Assessment

## **PROPOSED EXTENSION OF MALANGENI FOREST IN LUSIKISIKI WARD 24 AND BHUKAZI NEW PLANTATIONS IN LUSIKISIKI WARD 12, INGQUZA HILL LOCAL MUNICIPALITY, OR TAMBO DISTRICT MUNICIPALITY IN THE EASTERN CAPE PROVINCE**

For:

**Ezendalo Environmental Consultants**

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By:

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Cell: 083 469 4696

21 February 2020

## **Executive Summary**

David Groenewald was appointed by Ezendalo Environmental Consultants to undertake a desktop Palaeontological Impact Assessment (PIA) to assess the impact on the palaeontological heritage by the proposed extension of Malangeni Forest Plantation and the establishment of the new Bhukazi Forest Plantation, both of which are situated close to Lusikisiki in the Ingquza Hill Local Municipality, OR Tambo District Municipality in The Eastern Cape Province.

The footprint area of the Malangeni Forest extension is underlain by sedimentary strata of the Late Carboniferous to early Permian Dwyka Group whereas that of the proposed new Bhukazi Forest plantation is underlain predominantly by sedimentary rocks of the early Permian Ecca Group, with extensive intrusions of Jurassic dolerite sills and dykes. Both areas have small patches underlain by more recent quaternary alluvial deposits, associated with the rivers adjacent to the development sites.

The sedimentary rocks of the Ecca Group are considered to have a High Palaeosensitivity whereas those of the Dwyka Group and Quaternary alluvium are considered to have a Moderate Palaeosensitivity. Due to the igneous character of dolerite, the areas underlain by dolerite are considered to have an Insignificant Palaeosensitivity.

The following recommendations are made:

1. The Environmental Assessment Practitioner and Environmental Control Officer need to be informed that there is a potential for fossils to be found during construction, and that a High Palaeosensitivity has been allocated to areas underlain by rocks of the Ecca Group and a Moderate Palaeosensitivity allocated to areas underlain by rocks of the Dwyka Group and Alluvium.
2. Further specialist palaeontological heritage studies and mitigation will be required should any excavations into fresh bedrock be done, pending the potential discovery or exposure of fossil remains during development. The most abundant fossils reported from the Dwyka and Ecca groups are trace fossils or plant fossils that will be seen on the bedding planes of laminated shales and siltstones. If fossils are

discovered, the procedures outlined in the Chance Find protocol need to be followed.

3. Where excavations will exceed 1.5m in the areas allocated a High Palaeosensitivity, a suitably qualified palaeontologist must do a Phase 1 PIA. Ideally this study must be done during the first week of the planned excavations since there is currently very little outcrop and a Phase 1 PIA at this stage will not be useful.
4. These recommendations as well as the recommended actions mentioned in the Chance Find Protocol (Appendix A) must be included in the EMPr of this project

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## 1. Introduction

David Groenewald was appointed by Ezendalo Environmental Consultants to undertake a desktop Palaeontological Impact Assessment (PIA) to assess the impact on the palaeontological heritage by the proposed extension of Malangeni Forest Plantation and the establishment of the new Bhukazi Forest Plantation. Both projects are situated close to Lusikisiki in the Ingquza Hill Local Municipality, OR Tambo District Municipality in The Eastern Cape Province. This report forms part of the Environmental Impact Assessment for the Malangeni extension of 433 hectares in Lusikisiki ward 24 and the new Bhukazi plantation of 194 hectares in Lusikisiki ward 12. The layout and locality of the areas investigated during this desktop study is indicated in Figure 1.1 below.

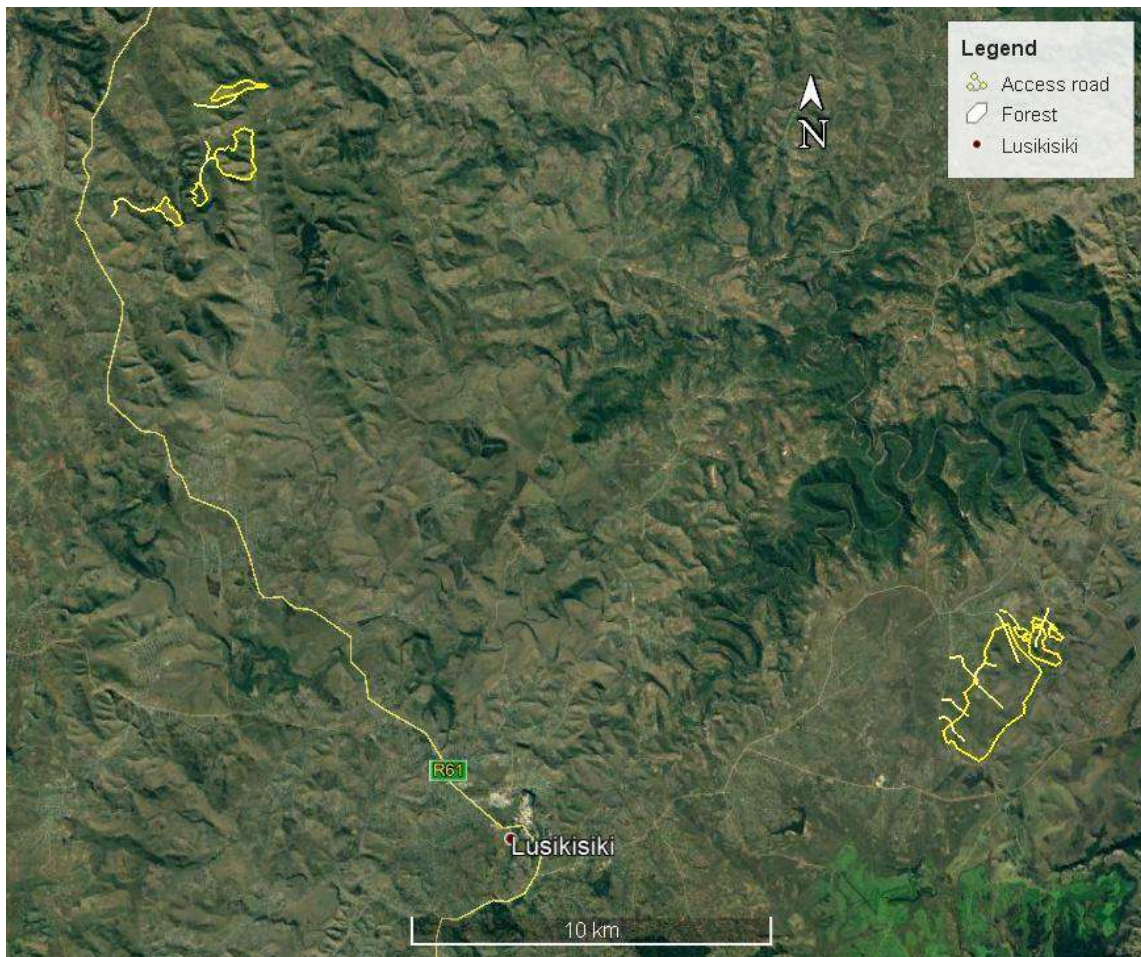


Figure 1.1 Satellite image showing the layout of the areas investigated during this study near the town Lusikisiki in the Eastern Cape Province. The plantations are outlined in yellow while access roads are shown in lighter yellow. Bhukazi is to the northwest of Lusikisiki whereas Bhukazi is situated to the east of the town.



## 1.1 Brief project description

The Planning and Development department of the Inquba Hill Local Municipality are looking at expanding the Malangeni Forest plantation by 433 ha and to establish the new 194ha Bhukazi Forest plantation. The Inquba Hill Local Municipality, previously known as Qaukeni, is an administrative area in the OR Tambo District of Eastern Cape in South Africa that is formed by two small towns, Lusikisiki and Flagstaff, under the O.R.Tambo District municipality. A total of 32 wards inform the municipality. The plantations are situated in the North Eastern region of the Eastern Cape, in Lusikisiki wards 24 and 12 respectively.

### 1.1.1 Malangeni Forest

The proposed Malangeni Forest extension is situated in an area with flat to gentle steep topography, whilst the sections adjacent to streams have a relatively steep incline. The area is

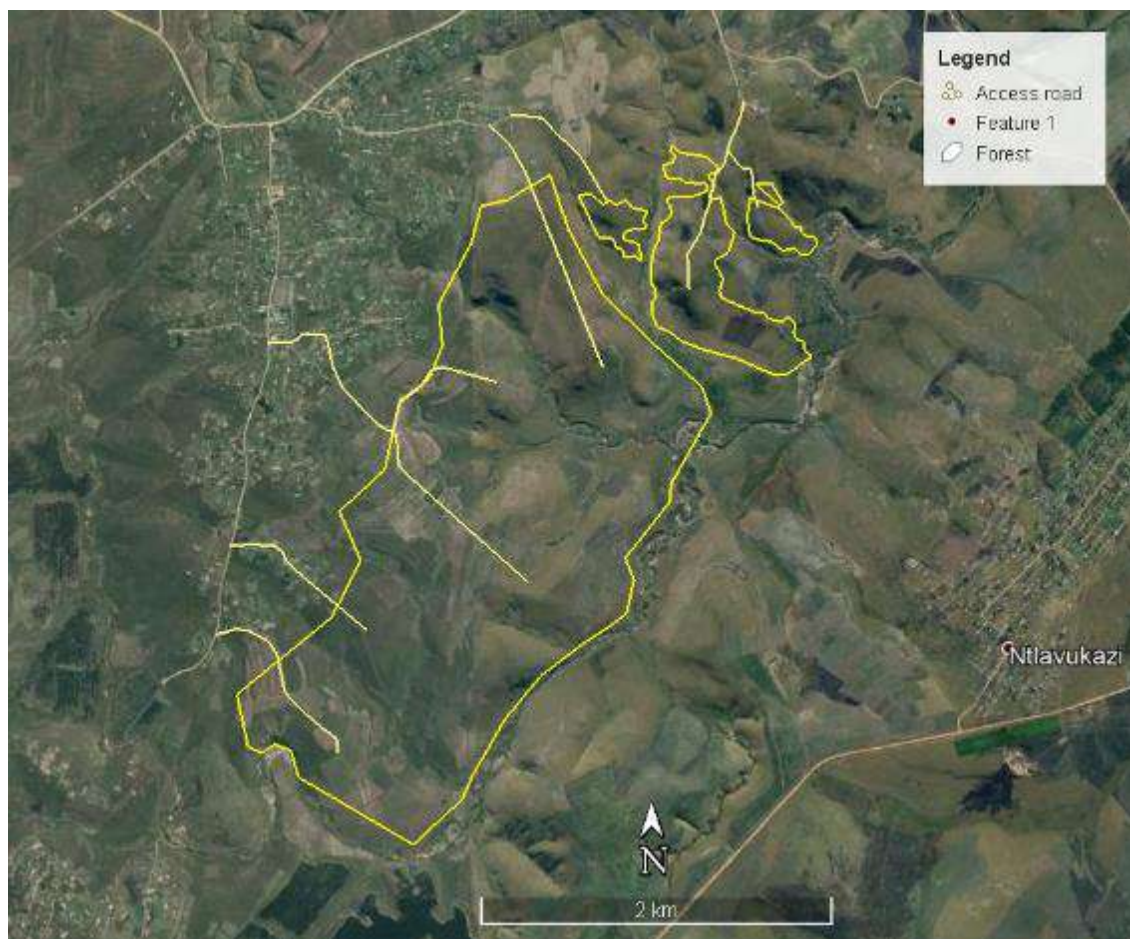


Figure 1.2 Layout of the proposed Malangeni Extension (433 ha) with access roads shown in lighter yellow and the proposed area for afforestation outlined in yellow.

predominantly covered by Drakensberg Foothill Moist Grassland (Grassland Biome) and the Eastern Valley Bushveld (Savanna Biome; Mucina & Rutherford 2006). The soil class falls under imperfectly drained soils that are often shallow with a plinthic horizon (S8) and Lithosols (shallow soils on hard or weathering rock; S13). The layout for the proposed extension is shown in figure 1.2.

### 1.1.2 Bhukazi Forest

The proposed new Bhukazi Forest is situated in an area of flat to gentle steep topography, with areas of relatively steep incline adjacent to streams and rivers. Vegetation cover is predominantly Drakensberg Foothill Moist Grassland (Gs 10 Grassland Biome) and the Eastern Valley Bushveld (SVs 6 Savanna Biome; Mucina & Rutherford 2006). The soil class falls under an association of Classes 13 and 16: Undifferentiated shallow soils and land classes (S21) and freely drained, structureless soils (S2). The layout for the proposed new forest is shown in figure 1.3 below.



Figure 1.3 Layout of the proposed new Bhukazi Forest (194 ha) with access roads shown in lighter yellow and the proposed area for afforestation outlined in yellow.

## 1.2 Terms of Reference

The Terms of Reference (ToR) for the study, as determined by Ezendalo Environmental Consultants, are as follows:

1. Undertake a desktop assessment of the palaeontological aspects of the area, which includes inter alia:
  - a. A description of the underlying geology and potential palaeontology on site in terms of relevant plans,
  - b. policies and legislation
  - c. An assessment of the palaeontological importance of rocks and stata present on site, and the significance of the impact of the proposed development and alternatives on the palaeontological aspects on site, including any cumulative impacts
2. Compile a Chance Find Protocol to accompany the Desktop PIA report.

## 1.3 Legislative requirements

This palaeontological assessment forms part of the Heritage Impact Assessment (HIA) and complies with the requirements of the South African National Heritage Resource Act No 25 of 1999 (Revised in 2017). In accordance with Section 35 and Section 38 of the South African Heritage Resources Act No 25 of 1999 (Heritage Resources Management), a HIA is required to assess any potential impacts to palaeontological heritage within the development footprint.

Categories of heritage resources recognised as part of the National Estate in Section 3 of the Heritage Resources Act, and which therefore fall under its protection, include, among others:

- geological sites of scientific or cultural importance;
- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens; and
- objects with the potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage.

The project sites are situated in an area of the eastern Karoo that is underlain by potentially fossiliferous sedimentary rocks of the Late Carboniferous to early Permian Dwyka and early Permian Ecca groups of the Karoo Supergroup. The associated and potential future activities e.g. site clearance and road construction, will potentially expose palaeontological resources and can adversely affect potential fossil heritage on the property by destroying or disturbing fossils.

According to Section 35 of the National Heritage Resources Act, which deals with archaeology, palaeontology and meteorites:

- (1) The protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority.
- (2) All archaeological objects, palaeontological material and meteorites are the property of the State.
- (3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
- (4) No person may, without a permit issued by the responsible heritage resources authority—
  - a. destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
  - b. destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
  - c. trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
  - d. bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

(5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may—

- a. serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
- b. carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
- c. if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and
- d. recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

#### 1.4 Aims and methodology

Following the SAHRA 2012 “Minimum Standards: Palaeontological Component of Heritage Impact Assessments”, the aims of the palaeontological impact assessment are:

- to identify exposed and subsurface rock formations that are considered to be palaeontologically significant;
- to assess the level of palaeontological significance of these formations;
- to comment on the impact of the development on these exposed and/or potential fossil resources; and
- to make recommendations as to how the developer should conserve or mitigate damage to these resources.

A desktop assessment of the study area was made using the appropriate 1:250 000 geological map, 3128 Umtata (Council for Geoscience 1979), in conjunction with satellite images on Google Earth and the photographs and information provided in the BID documentation for the project. Potential fossiliferous rock units (groups, formations etc.) were identified within the study area and the known fossil heritage within each rock unit was inventoried from the published scientific literature, previous palaeontological impact studies in the same region, the Karoo Fossil Database, and the author’s field experience. The aim of the desktop study is to assess the palaeontological potential of the region in terms of the type and extent of rock outcrop in the area.

The likely impact of the proposed development on local fossil heritage is determined based on the palaeontological sensitivity of the rock units concerned and the nature and scale of the development itself, most notably the extent of fresh bedrock excavation envisaged. The different sensitivity classes used are explained in Table 1 below.

Table 1.1 Palaeontological sensitivity classes

Sensitivity	Explanation
The following colour scheme is used for the indication of palaeontological sensitivity classes used for this report.	
<b>Very High Palaeosensitivity</b>	Development will most likely have a very significant impact on the palaeontological heritage of the region. Very high possibility that significant fossil assemblages will be present in all outcrops of the unit.
<b>High Palaeosensitivity</b>	High possibility that significant fossil assemblages will be present in most of the outcrop areas of the unit.
<b>Moderate Palaeosensitivity</b>	High possibility that fossils will be present in the outcrop areas of the unit or in associated sediments that underlie the unit. Fossils described in the literature are visible with the naked eye and development can have a significant impact on the palaeontological heritage of the area. Recording of fossils will contribute significantly to the present knowledge of the development of life in the geological record of the region.
<b>Low Palaeosensitivity</b>	Low possibility that fossils that are described in the literature will be visible to the naked eye or be recognized as fossils by untrained persons.
<b>Very Low Palaeosensitivity</b>	Very low possibility that significant fossils will be present in the bedrock of these geological units.

Based on the findings of the desktop study, the requirement for further specialist mitigation (Phase 1 or Phase 2 PIAs) is determined and specific recommendations for any mitigation required before or during the construction phase of the development are provided. Since adverse palaeontological impacts typically occur during the construction phase of a project, a Phase 1 PIA and Phase 2 mitigation by a professional palaeontologist – normally involving the recording and sampling of fossil material and associated geological information (e.g. sedimentological data) – may be required. Such mitigation would be implemented during a) the pre-construction phase (if important fossils are already exposed at or near the land surface) and/or b) during the construction phase (if fresh fossiliferous bedrock is being exposed by excavations). To carry out mitigation, the palaeontologist involved will need to apply for palaeontological collection permits from the relevant heritage management authorities, i.e. ECPHRA for the Eastern Cape (Contact details: Mr Sello Mokhanya; Email: smokhanya@ecphra.org.zaso).

It should be emphasized that, providing appropriate mitigation is carried out, the majority of developments involving bedrock excavation can make a positive contribution to our understanding of local palaeontological heritage.

#### 1.5 Assumptions and limitations

A palaeontological desktop study almost always requires some inference of the presence of buried fossil heritage within the study area based on relevant fossil data collected from similar or the same rock units elsewhere. In many cases such localities are widely separated. As such, several assumptions and limitations need to be taken into account when undertaking palaeontological specialist studies.

1. Variable accuracy of the geological maps underpinning desktop studies. The vast majority of the 1:250 000 geological series maps (Council for Geoscience, Pretoria) were predominantly based on aerial photographs, without ground-truthing. As such, only significant bedrock units and major areas of quaternary cover are shown and in most cases no indication of the level of bedrock outcrop, depth of cover or degree of weathering. The scale of the map also plays a part e.g. small and localized but highly

sensitive rock outcrops surrounded by larger unfossiliferous strata will not be indicated on the geological map due to the scale. All these factors may have an influence on the estimated significance of a development on the palaeontological heritage.

2. Palaeontological issues are generally poorly dealt within geological map explanation sheets.
3. Inadequate fossil heritage database. South Africa is a large country and, given how few professional palaeontologists there are, most development sites have never before been prospected for fossils.
4. Extensive relevant palaeontological “grey literature” in the form of unpublished university theses, impact studies and other internal reports (e.g. of mining companies, geological survey reports) is often not readily available for desktop studies. In the case of palaeontological studies, this can result in either: 1) an underestimation of the palaeontological significance of a given study area due to ignorance of significant recorded or unrecorded fossils preserved there, or 2) an overestimation of the palaeontological sensitivity of a study area, for example when originally rich fossil assemblages inferred from geological maps have in fact been destroyed by tectonism or weathering, or are buried beneath a thick mantle of unfossiliferous “drift” (soil, alluvium etc).



## 2. Geological context

The area of the Malangeni extension is underlain by sedimentary strata of the Late Carboniferous to early Permian Dwyka Group (Figure 2.1), whereas the area of the proposed new Bhukazi plantation is underlain predominantly by sedimentary rocks of the early Permian Ecca Group, with extensive intrusions of Jurassic dolerite sills and dykes (Figure 2.2). Both areas have small patches underlain by more recent quaternary alluvial deposits, associated with the rivers adjacent to the development sites. The areas are also covered by on average moderate to deep, clayey loam soils and natural vegetation.

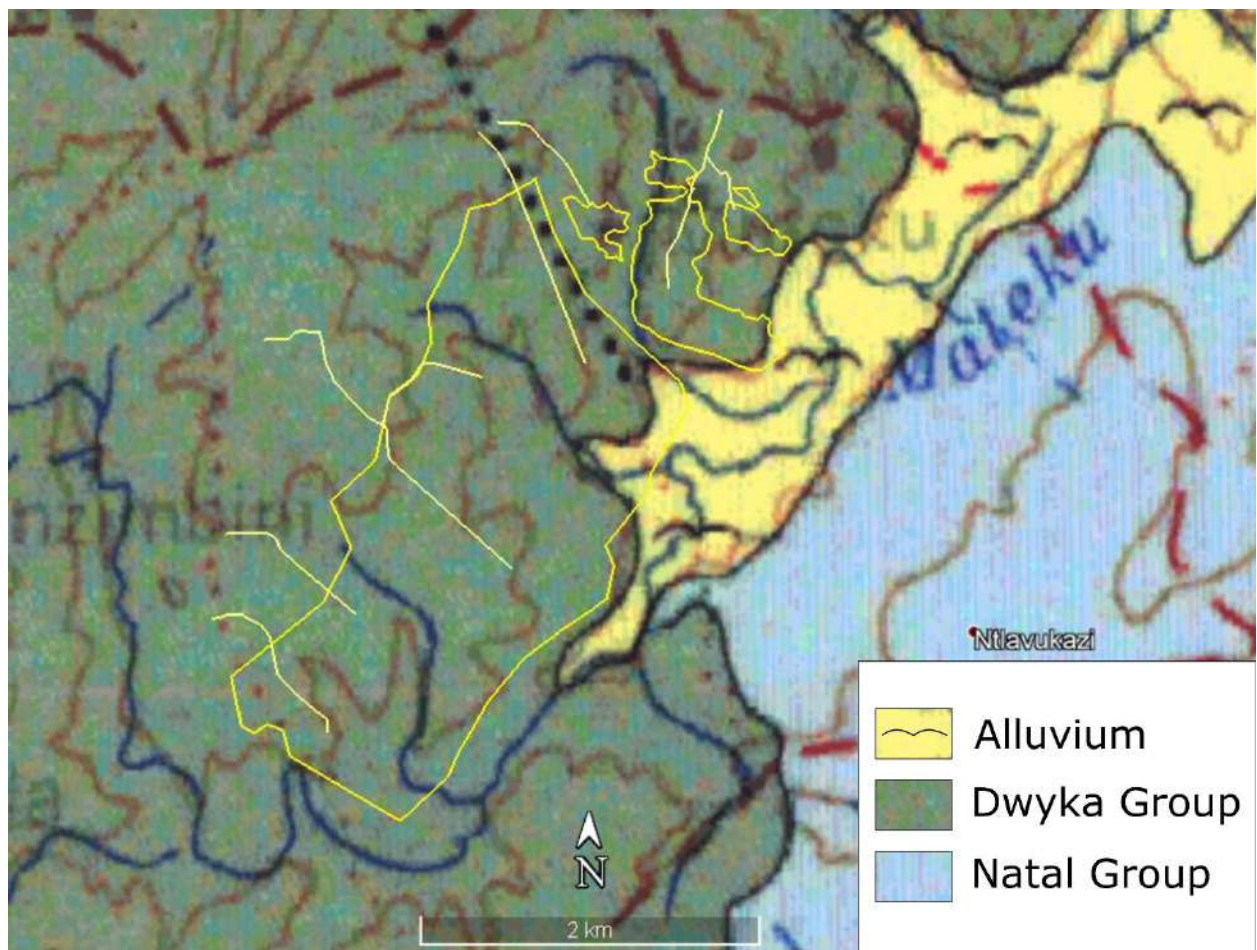


Figure 2.1 Extract from 1:250 000 Geological Map Sheet 3128 Umtata (Council for Geoscience 1979) showing the outline of the proposed Malangeni Forest Extension (Yellow polygons) and access roads (lighter yellow).

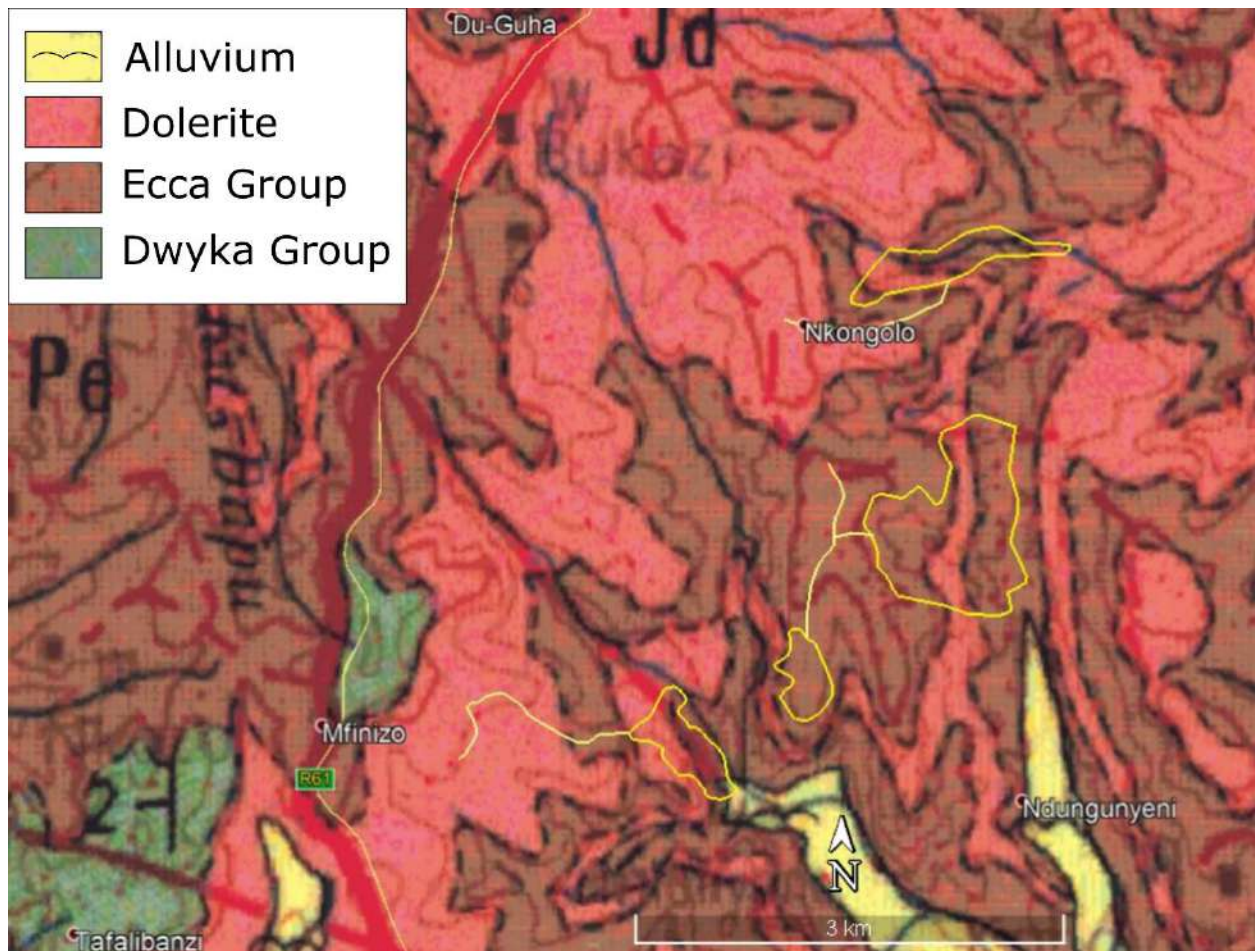


Figure 2.2 Extract from 1:250 000 Geological Map Sheet 3128 Umtata (Council for Geoscience 1979) showing the outline of the proposed new Bhukazi Forest (Yellow polygons) and access roads (lighter yellow).

### 2.1 Dwyka Group (Pd)

The Carboniferous to Permian aged Dwyka Group is the lowest stratigraphic unit of the Karoo Supergroup and has correlates from several basins throughout Gondwana (Visser 1989; Catuneanu 2004; Buatois *et al.* 2010). In the southeastern part of the Main Karoo Basin, the Dwyka Group reaches a thickness of up to 800m and is comprised primarily of dark-grey silt-dominated marine diamictites, deposited by either grounded or floating glaciers, with subordinate interbedded shales and siltstones (Visser 1989). The diamictites are generally deeply weathered and are characterised by a rich assemblage of dropstones that vary in size from millimetre scale to nearly a meter in diameter.

## 2.2 Ecca Group

In the Eastern Cape, including in the vicinity of Lusikisiki, the Ecca Group comprises a thick, monotonous succession of dark grey shales that have not yet been studied in detail and the group is not subdivided like elsewhere in the Karoo Basin (Johnson *et al.* 2006). The sequence of fine-grained sediments is interpreted as being deposited in a deep water, possibly marine, environment.

## 2.3 Karoo dolerite (Jd)

Numerous intrusive dolerite sills and dykes are present in the study area. These basic igneous intrusions are referred to the Karoo Dolerite Suite of Early Jurassic age (c. 183 Ma) and are associated with the crustal stretching and faulting that preceded the final break-up of Gondwana (Duncan *et al.* 2006). Country rocks close to the margins of these intrusions are often “baked” to form quartzites (sandstone) and hornfels (mudrocks). The igneous nature of the dolerites means they will have no direct palaeontological significance and they will therefore not be treated in any more detail.

## 2.4 Alluvium

Quaternary aged Alluvium, most likely comprising fine-grained sand and clay deposits with boulder beds at the base of river channels, is present along some of the valleys to the south of the proposed footprint of the Bhukazi Forest and along the eastern margin of the development footprint of the Malangeni Forest.

# 3. Palaeontological Heritage

## 3.1 Alluvium

Alluvial deposits are generally poorly studied in South Africa. Although few fossils are known from such deposits, it is possible that isolated quaternary-aged fossils might be exposed during excavations.

## 3.2 Jurassic Dolerite

Due to the igneous character of these rocks they do not contain fossils.

### 3.3 Ecca Group

Rocks of the Ecca Group host a wide variety of plant and ichnofossils, although most of the finds have been from other parts of the basin in the Vryheid and Whitehill formations of the Ecca Group. The most common macroplant fossils include impressions of horsetails and *Glossopteris* flora, with occasional sections of petrified wood. The ichnofauna of the Ecca Group is more variable than that of the underlying Dwyka Group, and includes arthropod trackways (*Umfolozia*), fish trails (*Undichna*) and invertebrate burrows and traces (e.g. *Siphonichnus*, *Spirodesmus*, *Cruziana*, *Skolithos*, *Chondrites*; Almond *et al.* 2009; Buatois *et al.* 2010).

### 3.4 Dwyka Group

Palaeontologically, the Dwyka Group has yielded a diverse ichnofauna that includes arthropod trackways (*Umfolozia*, *Maculichna* and *Diplicnites*) and resting traces (*Gluckstadtella*, *Kingella*), and fish trails (*Undichna isp.*). Most of the trace fossils from the Dwyka are known from a single quarry near Swart Umfolozi, KwaZulu-Natal with other localities in the southwestern part of the Main Karoo Basin, southern Namibia and from a core in the Free State Province (Almond *et al.* 2009; Buatois *et al.* 2010). At least four genera of silicified wood have been recovered from the Dwyka Group in Namibia, including *Megaporaxylon*, *Lobatoxylon*, *Kaokoxyton* and *Solenoxylon* (Bamford 2016)

## 4. Significance of impacts on palaeontological heritage

The predicted palaeontological impact of the development is based on the initial mapping assessment and literature reviews done during the desktop investigation, combined with the authors own experience. The development itself will entail the clearing of natural vegetation and excavations for the establishment and construction of infrastructure including access roads and stormwater drainage systems. The disturbance, damage or destruction of fossils preserved at or below the ground surface as a result of a development invariably represents a negative impact that is limited to the development footprint (Site). While such impacts are permanent and irreversible, they can normally be mitigated (although never fully rectified or reversed). If properly mitigated as per the below recommendations and mitigation measures in the Chance Find Protocol (Appendix A), the negative impact can be offset by the collection of new material and the improvement of our scientific understanding of the fossil heritage from the area. The

types impacts include direct, indirect/secondary and cumulative, since the clearing of the ground, future construction and development all potentially can have an impact on palaeontological heritage.

#### 4.1 Malangeni Forest

The Malangeni Forest extension is underlain almost entirely by rocks of the Dwyka Group, with a small portion along the southeastern margin underlain by Quaternary alluvium. These units are both known to be potentially fossiliferous, particularly the interbedded mudstone and siltstone horizons within the Dwyka Group, and are therefore allocated a Moderate Palaeosensitivity. However, as can be seen in the field photographs in the BID document and on the satellite imagery, there is almost no exposure of bedrock in the development footprint and the bedrock is covered by a veneer of soil and vegetation.

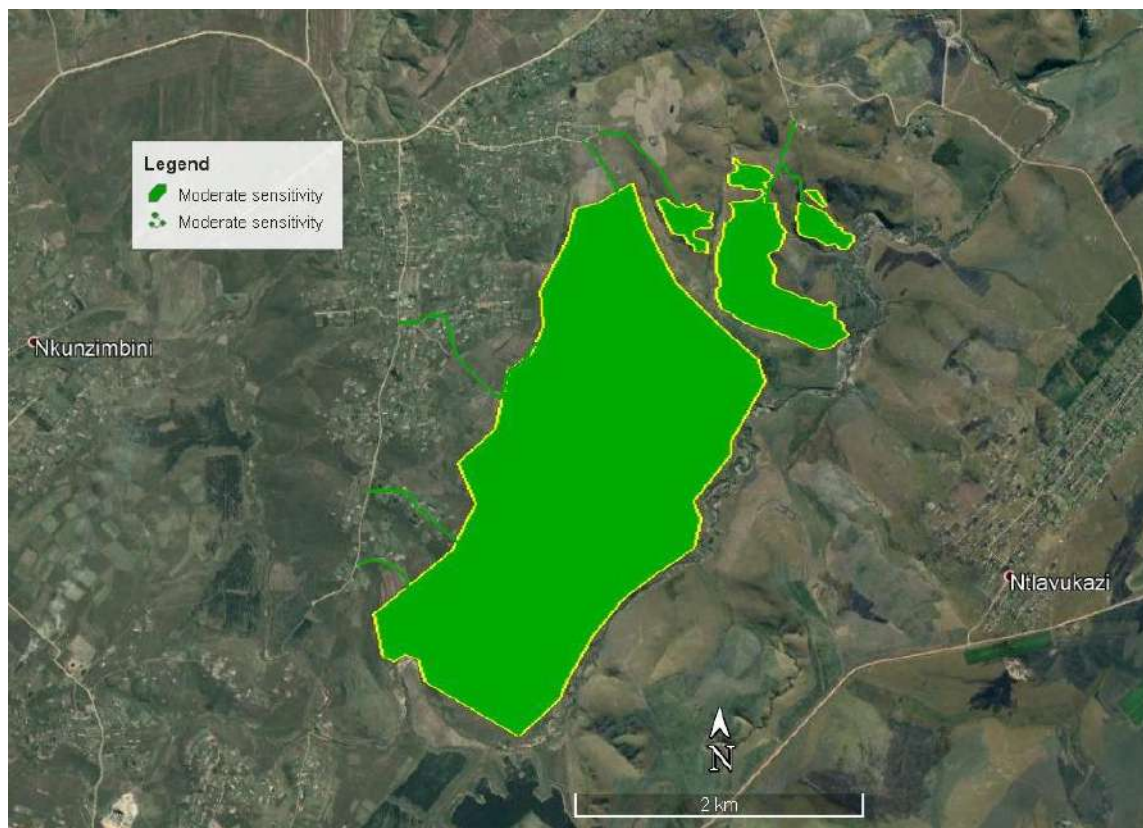


Figure 4.1 Palaeosensitivity of the Malangeni Forest extension

#### 4.2 Bhukazi Forest

The proposed new Bhukazi Forest plantation is underlain predominantly by mudrocks of the Eccra Group and Jurassic dolerite, with a small portion in the southern part of the footprint

underlain by Quaternary alluvium. The Ecca Group is considered to have a High Palaeosensitivity because of the diverse array of plant and ichnofossils that have been recorded there. Dolerite has an insignificant palantological sensitivity due to its igneous character. Quaternary alluvium is potentially fossiliferous, and is allocated a Moderate sensitivity. However, as can be seen in the field photographs in the BID document and on the satellite imagery, there is almost no exposure of bedrock in the development footprint and the bedrock is covered by a veneer of soil and vegetation.

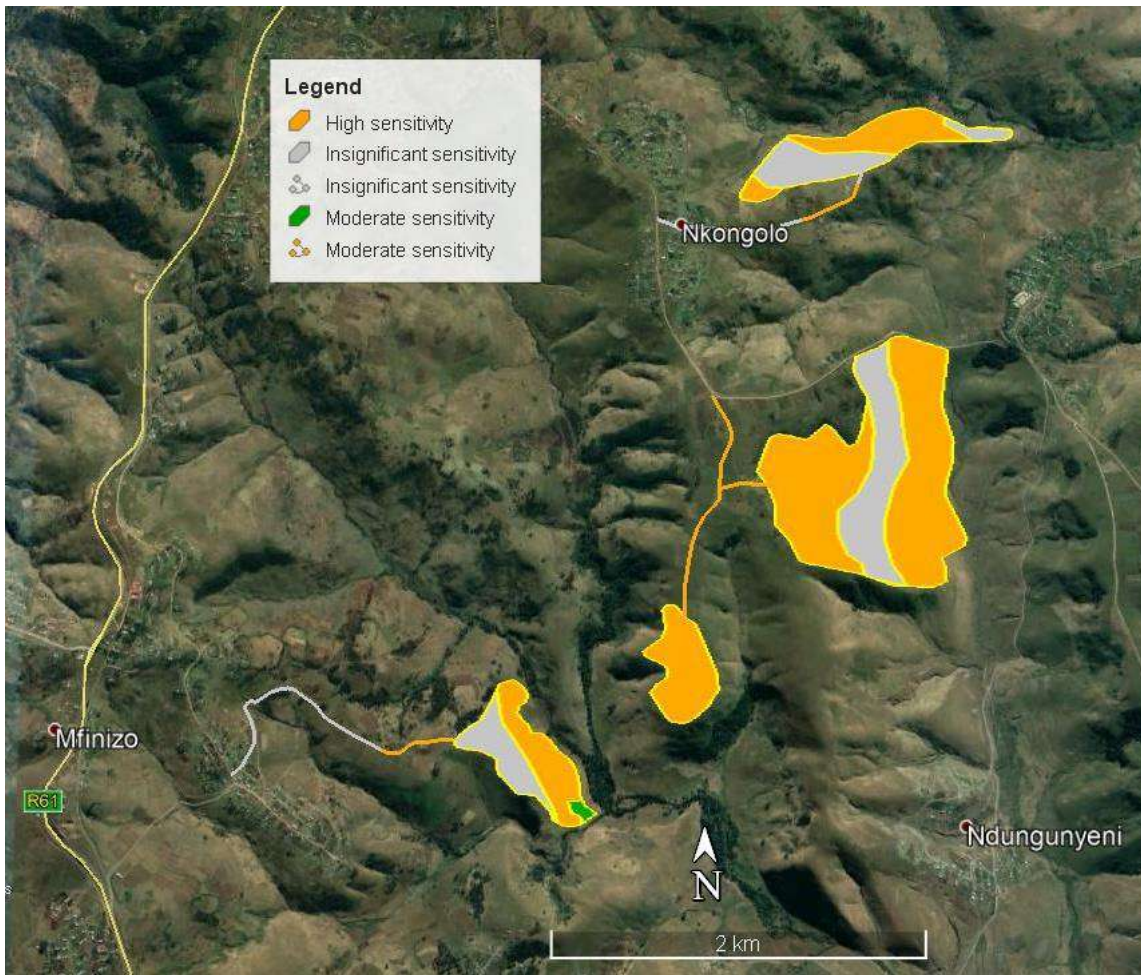


Figure 4.2 Palaeosensitivity of the Malangen Forest extension

Scientifically valuable fossils undoubtedly occur within rocks of the Dwyka and Ecca Groups and may also be present in the alluvial deposits. Considering that the development footprint is covered by on average moderate to deep soils with very little to no outcrop, it is strongly

recommended that, should any excavations be made into fresh bedrock, a Phase 1 PIA is commissioned during the first week of excavations.

## **5. Conclusions and recommendations**

The footprint areas of the proposed Malangeni Forest extension and new Bhukazi Forest plantation in wards 12 and 24 near Lusikisiki in the OR Tambo District, Eastern Cape, are underlain by potentially fossiliferous sedimentary rocks of the Dwyka and Ecca Groups and quaternary alluvium. Extensive intrusions of dolerite are present in the footprint area of the Bhukazi Forest.

The sedimentary rocks of the Ecca Group are considered to have a High Palaeosensitivity whereas those of the Dwyka Group and Quaternary alluvium are considered to have a Moderate Palaeosensitivity. Due to the igneous character of dolerite, the areas underlain by dolerite are considered to have an Insignificant Palaeosensitivity.

Considering that the entire development footprint is covered by moderate to deep soils, with very little to no outcrop of the underlying bedrock, a Phase 1 PIA should only be commissioned during the first week of construction i.e. once excavations into fresh bedrock have commenced, so that a qualified palaeontologist can inspect the fresh outcrops for fossils.

### **5.1 Recommendations:**

1. The Environmental Assessment Practitioner and Environmental Control Officer need to be informed that there is a potential for fossils to be found during construction, and that a High Palaeosensitivity has been allocated to areas underlain by rocks of the Ecca Group and a Moderate Palaeosensitivity allocated to areas underlain by rocks of the Dwyka Group and Alluvium.
2. Further specialist palaeontological heritage studies and mitigation will be required should any excavations into fresh bedrock be done, pending the potential discovery or exposure of fossil remains during development. The most abundant fossils reported from the Dwyka and Ecca groups are trace fossils or plant fossils that will be seen on the bedding planes of laminated shales and siltstones. If fossils are

- discovered, the procedures outlined in the Chance Find protocol need to be followed.
3. Where excavations will exceed 1.5m in the areas allocated a High Palaeosensitivity, a suitably qualified palaeontologist must do a Phase 1 PIA. Ideally this study must be done during the first week of the planned excavations since there is currently very little outcrop and a Phase 1 PIA at this stage will not be useful.
  4. These recommendations as well as the recommended actions mentioned in the Chance Find Protocol (Appendix A) must be included in the EMPr of this project

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## **7. Qualifications and experience of the author**

David Groenewald holds an BSc. honours degree in palaeontology from the University of the Witwatersrand and is currently pursuing a PhD in Palaeontology at the Evolutionary Studies Institute (ESI), University of the Witwatersrand. His research focus is on the mid- to late-Permian faunal communities present in the Beaufort Group rocks in the Free State and KwaZulu-Natal, and how those faunal communities changed through time, as well as refinement of the basin development model for the Main Karoo Basin during the mid- to late-Permian.

Growing up in the Eastern Free State near the town Clarens, David has had a keen interest in palaeontology from an early age and has carried out palaeontological research throughout South Africa and in the Luangwa Valley, Zambia. Since 2010, David has also assisted his father, Gideon Groenewald, with numerous palaeontological impact assessments for developments and conservation areas in the Eastern and Northern Cape, Mpumalanga, Free State, Limpopo, Northwest and Kwazulu-Natal and in 2014 was a co-compiler of the Palaeontological Technical Reports for the Free State, Gauteng, North West, Mpumalanga and Limpopo provinces for SAHRA.

## **8. Declaration of independence**

I, David P. Groenewald, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



David Groenewald

## Appendix A: Chance Find Protocol

**Province:** Eastern Cape, OR Tambo District Municipality

**Responsible Heritage Authority:** Eastern Cape Provincial Heritage Resources Agency (ECPHRA) -

Mr Sello Mokhanya, Email: smokhanya@ecphra.org.za.

**Rock units:** Ecca Group;

Dwyka Group

### **Potential fossils:**

Ecca Group: Numerous macroplant fossils of horsetails and *Glossopteris* flora

Rich diversity of invertebrate ichnofossils, arthropod trackways, fish trails and traces

Dwyka Group: Arthropod trackways and resting traces, fish trails.

### **Protocol to be followed by the ECO or designated person if fossils are discovered during clearing or excavation operations:**

1. Alert the site foreman and stop work in the immediate area. Safeguard the site using bunting tape/ fence etc.
2. Record the following information:
  - a. Accurate location information of material i.e. GPS location/ describe and mark on site map
  - b. Context i.e. position of fossil relative to rock units, depth below surface
  - c. Photographs of material *in situ* with a scale bar and from multiple angles. Contextual photographs showing the geology (rock layering etc.) are also important. Photographs of putative fossil material can be sent to the palaeontologist for preliminary assessment.
3. Alert the Heritage Management Authority and project palaeontologist (if appointed) who will advise on the necessary mitigation.

4. If required, a suitably qualified palaeontologist needs to be appointed as soon as possible by the developer. They will advise on mitigation measures and assist with obtaining the necessary permits.
5. Ensure the fossil(s) is/are safeguarded until the go ahead is given by the Heritage Management Authority for work to resume.
6. Liaise with the appointed palaeontologist for periodic inspections of the site.

**Functional responsibilities of the specialist palaeontologist:**

1. Assist with the application for the relevant permit and provide the developer with the necessary mitigation measures. Provide on-site training of the ECO and other environmental staff.
2. Record, describe and collect any significant fossil remains, together with relevant contextual data on the stratigraphy and sedimentology as well as taphonomy.
3. Adhere to best international practice for palaeontological fieldwork and Heritage Management Authority minimum standards.
4. Ensure that fossils are curated in an approved repository together with the relevant collection data.
5. Submit Palaeontological Mitigation report to the Heritage Resources Authority.
6. Submit annual permit reports to the relevant Heritage Resources Authority as per the permit conditions.

# HERITAGE IMPACT ASSESSMENT

**PHASE ONE HERITAGE IMPACT ASSESSMENT  
OF THE PROPOSED AFFORESTATION FOR  
MALANGENI EXTENSION OF 433 HECTARES,  
INGQUZA HILL LOCAL MUNICIPALITY, EASTERN  
CAPE PROVINCE.**



**ACTIVE HERITAGE cc.**

**For: EZENDALO ENVIRONMENTAL CONSULTANTS**

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3 February 2020

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Hons (Archaeology) University of Stellenbosch 1989

University of KwaZulu-Natal, Honorary Lecturer (School of Anthropology, Gender and Historical Studies).

Association of Southern African Professional Archaeologists member.

Frans received his MA (Archaeology) from the University of Stellenbosch and is presently a PhD candidate on social anthropology at Rhodes University. His PhD research topic deals with indigenous San perceptions and interactions with the rock art heritage of the Drakensberg.

Frans was employed as a junior research associate at the then University of Transkei, Botany Department in 1988-1990. Although attached to a Botany Department he conducted a palaeoecological study on the Iron Age of northern Transkei - this study formed the basis for his MA thesis in Archaeology. Frans left the University of Transkei to accept a junior lecturing position at the University of Stellenbosch in 1990. He taught mostly undergraduate courses on World Archaeology and research methodology during this period.

From 1991 – 2001 Frans was appointed as the head of the department of Historical Anthropology at the Natal Museum, Pietermaritzburg. His tasks included academic research and publication, display conceptualization, and curating the African ethnology collections of the Museum. He developed various displays at the Natal Museum on topics ranging from Zulu material culture, traditional healing, and indigenous classificatory systems. During this period Frans also developed a close association with the Departments of Fine Art, Psychology, and Cultural and Media Studies at the then University of Natal. He assisted many post-graduate students with projects relating

to the cultural heritage of South Africa. He also taught post-graduate courses on qualitative research methodology to honours students at the Psychology Department, University of Natal. During this period he served on the editorial boards of the *South African Journal of Field Archaeology* and *Natalia*.

Frans left the Natal Museum in 2001 when approached by a Swiss funding agency to assist an international NGO (Working Group for Indigenous Minorities) with the conceptualization of a San or Bushman museum near Cape Town. During this period he consulted extensively with various San groupings in South Africa, Namibia and Botswana. During this period he also made major research and conceptual contributions to the Kamberg and Didima Rock Art Centres in the Ukhahlamba Drakensberg World Heritage Site.

Between 2003 and 2007 Frans was employed as the Cultural Resource Specialist for the Maloti Drakensberg Transfrontier Project – a bilateral conservation project funded through the World Bank. This project involved the facilitation with various stakeholders in order to produce a cultural heritage conservation and development strategy for the adjacent parts of Lesotho and South Africa. Frans was the facilitator for numerous heritage surveys and assessments during this project. This vast area included more than 2000 heritage sites. Many of these sites had to be assessed and heritage management plans designed for them. He had a major input in the drafting of the new Cultural Resource Management Plan for the Ukhahlamba Drakensberg World Heritage site in 2007/2008. A highpoint of his career was the inclusion of Drakensberg San indigenous knowledge systems, with San collaboration, into the management plans of various rock art sites in this world heritage site. He also liaised with the tourism specialist with the drafting of a tourism business plan for the area.

During April 2008 Frans accepted employment at the environmental agency called Strategic Environmental Focus (SEF). His main task was to set-up and run the cultural heritage unit of this national company. During this period he also became an accredited heritage impact assessor and he is rated by both Amafa and the South African Heritage Resources Agency (SAHRA). He completed almost 50 heritage impact assessment reports nation-wide during an 18<sup>th</sup> month period.

Frans left SEF and started his own heritage consultancy called “Active Heritage cc” in July 2009. Although mostly active along the eastern seaboard his clients also include international companies such as Royal Dutch Shell through Golder Associates, and UNESCO. He has now completed almost 1000 heritage conservation and management reports for various clients since the inception of “Active Heritage cc”. Amongst these was a heritage study of the controversial fracking gas exploration of the Karoo Basin and various proposed mining developments in South Africa and proposed developments adjacent to various World Heritage sites. Apart from heritage impact assessments (HIA's) Frans also assist the National Heritage Council (NHC) through Haley Sharpe Southern Africa', with heritage site data capturing and analysis for the proposed National Liberation Route World Heritage Site and the national intangible heritage audit. In

addition, he is has done background research and conceptualization of the proposed Dinosaur Interpretative Centre at Golden Gate National Park and the proposed Khoi and San Interpretive Centre at Camdeboo, Eastern Cape Province. During 2009 he also produced the first draft dossier for the nomination of the Sehlabathebe National Park, Lesotho as a UNESCO inscribed World Heritage Site.

Frans was appointed as temporary lecturer in the department of Heritage and Tourism, UKZN in 2011. He is also a research affiliate at the School of Cultural and Media Studies in the same institution.

Frans's research interests include African Iron Age, paleoecology, rock art research, San ethnography, traditional healers in South Africa, and heritage conservation. Frans has produced more than forty publications on these topics in both popular and academic publications. He is frequently approached by local and international video and film productions in order to assist with research and conceptualization for programmes on African heritage and culture. He has also acted as presenter and specialist for local and international film productions on the rock art of southern Africa. Frans has a wide experience in the fields of museum and interpretive centre display and made a significant contribution to the conceptual planning of displays at the Natal Museum, Golden Horse Casino, Didima Rock Art Centre and !Khwatya San Heritage Centre. Frans is also the co-founder and active member of "African Antiqua" a small tour company who conducts archaeological and cultural tours world-wide. He is a Thetha accredited cultural tour guide and he has conducted more than 50 tours to heritage sites since 1992.

#### **Declaration of Consultants independence**

Frans Prins is an independent consultant to Ezendalo and has no business, financial, personal or other interest in the activity, application or appeal in respect of which he was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances whatsoever that compromise the objectivity of this specialist performing such work.



**Frans Prins**



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**LIST OF ABBREVIATIONS AND ACRONYMS**

EIA	Early Iron Age
ESA	Early Stone Age
HISTORIC PERIOD	Since the arrival of the white settlers - c. AD 1820 in this part of the country
IRON AGE	Early Iron Age AD 200 - AD 1000 Late Iron Age AD 1000 - AD 1830
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998 and associated regulations (2006)).
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999) and associated regulations (2000))
SAHRA	South African Heritage Resources Agency
STONE AGE	Early Stone Age 2 000 000 - 250 000 BP Middle Stone Age 250 000 - 25 000 BP Late Stone Age 30 000 - until c. AD 200

**EXECUTIVE SUMMARY**

A heritage survey of the proposed Afforestation for Malangeni Extension, Ingquza Hill Local Municipality, Eastern Cape Province identified one grave site on the footprint. There are no archaeological sites or any other heritage resources on or near the proposed development site. The greater area is also not part of any known cultural landscape. A buffer of 25m must be maintained around the identified grave site. Should the developers wish to remove or alter the grave then a Phase 2 Heritage Impact Assessment must be called for. An Amafa registered palaeontologist needs to conduct a desktop paleontological assessment of the area before development may proceed. Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999), which requires that operations that expose archaeological or historical remains as well as graves and fossil material should cease immediately, pending evaluation by the provincial heritage agency.

## 1 BACKGROUND INFORMATION ON THE PROJECT

**Table 1. Background information**

Consultant:	Frans Prins (Active Heritage cc) for Ezendalo Environmental Consultants
Type of development:	Proposed afforestation of 433 hectares of the Malangeni Extension and expansion of existing project. Large tracks of indigenous vegetation (ca. 20 hectares) will be cleared for the listed activity.
Rezoning or subdivision:	Rezoning
Terms of reference	To carry out a Phase One Heritage Impact Assessment
Legislative requirements:	The Heritage Impact Assessment was carried out in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and following the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

### 1.1. Details of the area surveyed:

Ingquza Hill Local Municipality, previously known as Qaukeni, is an administrative area in the OR Tambo District of Eastern Cape in South Africa. Ingquza Hill Local Municipality is formed by two small towns which are Lusikisiki and Flagstaff. The local municipality is called after a living heritage and historical site known as Ingquza Hill a geological feature that formed the centre point of the Mphondo Revolt of the 1960's (Fig 8). The OR Tambo District Municipality is informed by 32 Wards. Malangeni is located in the North Eastern region of the Eastern Cape Province near Lusikisiki and is situated in Ward no 24. It is roughly situated between Lusikisiki in the west and the Mkambathi Nature reserve in the east (Figs 1 & 2). The Malangeni Project area covers an area of 433 hectares (Figs 3 & 4). The GPS coordinates for Malangeni are: 31° 19' 10.343'' S 29° 43' 28.889'' E

## **2 BACKGROUND TO ARCHAEOLOGICAL HISTORY OF AREA**

The archaeological history of the Province of the Eastern Cape Province dates back to about 2 million years and possibly older, which marks the beginning of the Stone Age. The Stone Age in the Eastern Cape Province was extensively researched by archaeologists attached to the Albany Museum in Grahamstown, the University of Stellenbosch, the then University of Transkei (UNITRA) and Fort Hare University. The Stone Age period has been divided into three periods namely: Early Stone Age (ESA) dating between 2 million years ago to about 200 000 years ago, Middle Stone Age (MSA) dating between 200 000 years ago to about 30 000 years ago, and the Later Stone Age (LSA) which dates from 30 000 to about 2 000 year ago. The Stone Age period ends around approximately 2 000 years ago when Bantu speaking Age farmers from the north arrived in southern Africa. The Iron Age is also divided into three periods, namely: Early Iron Age (EIA) dating between AD 200 and AD 900, Middle Iron Age (MIA) dating between AD 900 and AD 1300, Late Iron Age (LIA) dating between AD 1 300 and 1 820.

### **2.1 Stone Age**

#### **2.1.1 Early Stone Age (ESA)**

The ESA is considered as the beginning of the stone tool technology. It dates back to over 2 million years ago until 200 000 years ago. This period is characterised by the Oldowan and Acheulean industries. The Oldowan Industry, dating to approximately between over 2 million years and 1.7 million years predates the later Acheulean. The Oldowan Industry consists of very simple, crudely made core tools from which flakes are struck a couple of times. To date, there is no consensus amongst archaeologists as to which hominid species manufactured these artefacts. The Acheulean Industry lasted from about 1.7 million years until 200 thousand years ago. Acheulean tools were more specialized tools than those of the earlier industry. They were shaped intentionally to carry out specific tasks such as hacking and bashing to remove limbs from animals and marrow from bone. These duties were performed using the large sharp pointed artefacts known as hand axes. Cleavers, with their sharp, flat cutting edges were used to carry out more heavy duty butchering activities (Esterhuysen, 2007). The ESA technology lasted for a very long time, from early to middle Pleistocene and thus seems to have been sufficient to meet the needs of early hominids and their ancestors. Although not identified on the footprint, ESA tools occurrence have been reported in other sites in the Transkei (Derricourt 1977: Feely 1987). However, Sangoan period sites have been recorded in the greater Port Edward area to the immediate north of the project area.

Sangoan period sites are seen to be a late expression of the Early Stone Age and may date back to about 300 000 years ago (Mitchell 2002). It is possible that more systematic surveys will also locate Sangoan period sites to the south of the Umtavuna River. Apart from stone artefacts, the ESA sites in the Transkei have produced very little as regards other archaeological remains. This has made it difficult to make inferences pointing to economical dynamics of the ESA people in this part of the world (Mazel 1989).

### **2.1.2 Middle Stone Age (MSA)**

The MSA dates to between 200 000 and 30 000 years ago, coinciding with the emergence of anatomically modern humans. The MSA technology is therefore believed to have been manufactured by fully modern humans known as *Homo sapiens* who emerged around 250 000 years ago. While some of the sites belonging to this time period occur in similar contexts as those of ESA, most of the MSA sites are located in rock shelters. Palaeoenvironmental data suggest that the distribution of MSA sites in the high lying Drakensberg and surrounding areas was influenced by the climate conditions, specifically the amount and duration of snow (Carter, 1976). In general, the MSA stone tools are smaller than those of the ESA. Although some MSA tools are made from prepared cores, the majority of MSA flakes are rather irregular and are probably waste material from knapping exercises. A variety of MSA tools include blades, flakes, scrapers and pointed tools that may have been hafted onto shafts or handles and used as spearheads. Between 70 000 and 60 000 years ago new tool types appear known as segments and trapezoids. These tool types are referred to as backed tools from the method of preparation. Residue analyses on the backed tools from South African MSA sites including those in KZN indicate that these tools were certainly used as spear heads and perhaps even arrow points (Wadley, 2007). Derricourt (1977) reported a few MSA sites in the Transkei but none of these occur in the immediate vicinity of the project area.

### **2.1.3 Late Stone Age (LSA)**

Compared to the earlier MSA and ESA, more is known about the LSA which dates from around 30 000 to 2 000 (possibly later) years ago. This is because LSA sites are more recent than ESA and MSA sites and therefore achieve better preservation of a greater variety of organic archaeological material. The Later Stone Age is usually associated with the San (Bushmen) or their direct ancestors. The tools during this period were even smaller and more diverse than those of the preceding Middle Stone Age period. LSA

tool technology is observed to display rapid stylistic change compared to the slower pace in the MSA. The rapidity is more evident during the last 10 000 years. The LSA tool sequence includes informal small blade tradition from about 22 000 – 12 000 years ago, a scraper and adze-rich industry between 12 000 – 8 000 years ago, a backed tool and small scraper industry between 8 000 – 4 000 years and ending with a variable set of other industries thereafter (Wadley, 2007). Adzes are thought to be wood working tools and may have also been used to make digging sticks and handles for tools. Scrapers are tools that are thought to have been used to prepare hides for clothing and manufacture of other leather items. Backed tools may have been used for cutting as well as tips for arrows. It was also during Later Stone Age times that the bow and arrow was introduced into southern Africa – perhaps around 20 000 years ago. Because of the extensive use of the bow and arrow and the use of traps and snares, Later Stone Age people were far more efficient in exploiting their natural environment than Middle Stone Age people. Up until 2 000 years ago Later Stone Age people dominated the southern African landscape. However, shortly after 2 000 years ago the first Khoi herders and Bantu-speaking agro pastoralists immigrated into southern Africa from the north. This led to major demographic changes in the population distribution of the subcontinent. San hunter-gatherers were either assimilated or moved off to more marginal environments such as the Kalahari Desert or some mountain ranges unsuitable for small-scale subsistence farming and herding. The San in the coastal areas of the study area were the first to have been displaced by incoming African agro pastoralists. However, some independent groups continue to practice their hunter gatherer lifestyle in the foothills of the Drakensberg until the period of white colonisation around the 1840's (Wright & Mazel, 2007). Also dating to the LSA period is the impressive Rock Art found on cave walls and rock faces. Rock Art can be in the form of rock paintings or rock engravings. The Eastern Province is renowned for the prolific San rock painting sites concentrated in the southern Drakensberg and adjacent areas. Rock art sites do occur outside the Drakensberg including the Mpondoland coastal zone that also covers the project area (Feely 1987). The Umtavuna Nature Reserve, to the immediate north of the project area, and the Mkambati Nature Reserve, to the east of the project area, contains various rock painting sites. However, these sites have not been afforded similar research attention as those sites occurring in the Drakensberg.

## **2.2 Iron Age**

### **2.2.1 Early Iron Age (EIA)**

Unlike the Stone Age people whose life styles were arguably egalitarian, Iron Age people led quite complex life styles. Their way of life of greater dependence on agriculture necessitated more sedentary settlements. They cultivated crops and kept domestic animals such as cattle, sheep, goats and dogs. Pottery production is also an important feature of Iron Age communities. Iron smelting was practised quite significantly by Iron Age society as they had to produce iron implements for agricultural use. Although Iron Age people occasionally hunted and gathered wild plants and shellfish, the bulk of their diet consisted of the crops they cultivated as well as the meat of the animals they kept. EIA villages were relatively large settlements strategically located in valleys beside rivers to take advantage of the fertile alluvial soils for growing crops (Maggs, 1989. Huffman 2007). The EIA sites in the Eastern Cape Province dates back between AD 600 to AD 900. Based on extensive research on EIA sites in the eastern seaboard they can be divided along the following typological criteria and time lines according to ceramic styles (Maggs, 1989; Huffman 2007):

- \_ Msuluzi (AD 500-700);
- \_ Ndongondwane (AD 700 – 800);
- \_ Ntshekane (AD 800 – 900).

Jim Feely found seven EIA sites within the greater Bizana and Lusikisiki areas to the immediate during archaeological surveys conducted in the 1980's. However, all of these are located adjacent to the Mzintlava and Mzimvubu rivers below the 800m contour. As such none of them occur in the immediate vicinity of the identified study areas.

### **2.2.2 Late Iron Age (LIA)**

The LIA is not only distinguished from the EIA by greater regional diversity of pottery styles but is also marked by extensive stone wall settlements. However, in this part of the world, stone walls were not common as the Nguni people used thatch and wood to build their houses (Derricourt 1977). This explains the failure to obtain sites from the aerial photograph investigation of the study area. LIA sites in the Transkei occur adjacent to the major rivers in low lying river valleys but also along ridge crests above the 800m contour. The LIA in the project area can be ascribed to the Mpondo people or their immediate ancestors (Feely 1987). Trade played a major role in the economy of LIA societies. Goods were traded locally and over long distances. The main trade goods included metal, salt, grain, cattle and thatch. This led to the establishment of



economically driven centres and the growth of trade wealth. Keeping of domestic animals, metal work and the cultivation of crops continued with a change in the organisation of economic activities (Maggs, 1989; Huffman 2007). Jim Feely found nine LIA sites in the greater Bizana and Lusikisiki areas during archaeological surveys in the 1980's. None of these sites, however, are situated on the project area..

### **2.3 Historic Period**

Oral tradition is the basis of the evidence of historical events that took place before written history could be recorded. This kind of evidence becomes even more reliable in cases where archaeology could be utilised to back up the oral records. Sources of evidence for socio political organization during the mid-eighteenth to early nineteenth century in the study area and the Transkei suggest that the people here existed in numerous small-scale political units of different sizes, population numbers and political structures (Feely 1987; Wright & Hamilton, 1989). This period was largely characterised by rage and instability as political skirmishes broke due to the thirst for power and resources between chiefdoms. During the 2nd half of the eighteenth century, stronger chiefdoms and paramountcies emerged. However, these were not fully grown states as there was no proper formal central political body established. This changed in the 1780's when a shift towards a more centralized political state occurred in parts of northern KwaZulu-Natal. The Zulu kingdom, established by King Shaka however became the most powerful in KwaZulu-Natal in the early years of the 19th century and had a marked influence on the local Mpondo chiefdom of the project area then ruled by chief Faku (Feely 1987).

The people of the greater Lusikisiki area are descendants of Nguni clans that migrated across the Umtamvuna River in the 1700s. They speak a dialect of Xhosa known as Pondo and the people themselves are called the amaPondo. In those early years, the amaPondo lived in small clans ruled by chieftains assisted by clan elders and councillors - who were usually members of the extended royal family. The affairs of the clans were regulated by customary law. Sons of chieftains other than the direct heir to the chieftaincy were free to start their own clans with reasonably loose bonds of loyalty to their fathers' clans. Lineages tended to die out after three or four generations. That, coupled with the fact that most amaPondo history is based on oral tradition, has made tracing lineages difficult. Interference, in terms of the arbitrary appointment of traditional leaders by both the British colonial government during the 1800s and the Nationalist government during the 20th Century, has complicated matters further.

According to local oral tradition, Sibiside is said to be the common patriarch of a number of Nguni communities (Soga 1905). He had three sons, Njanya, Dlamini and Mkhize. Njanya fathered twins, Mpondo and Mpondomise. Mpondo established his own clan, known as the amaMpondo. Mpondomise's descendants are known as the amaMpondomise. AmaPondo succession follows ancient traditions based on primogeniture (a woman may not succeed to the throne) and the number and importance of a king's wives. Upon marriage to a king each wife is assigned status by being allocated a 'house'. The two most important houses are the great house (*indlunkulu*) and the right hand house. Additional wives, known as *iqadi*, are regarded as support for these two houses. There may be as many *amaqadi* houses as there are wives married to a king. However, among the *amaqadi*, there is also a great house (*iqadi lendlunkulu*) and a right hand house (*iqadi lekunene*). The first born son of the great house succeeds his father. The first born son of the right hand house may establish a separate "tribe". Such a community would be semi-independent of but not of equal status to the great house. The son of *iqadi* to the great house succeeds his father if there is no male issue in the great house. In other words, the first born son of the right hand house does not automatically succeed if there is no son born to the great house. If there is no male issue in the right hand house, the son of *iqadi* of the right hand house succeeds to chieftaincy of the right hand house.

The wife whose *lobola* is derived from contributions made by the community assumes the highest status and is known as the great wife (*undlunkulu*). When there are twins from the great house, such as Mpondo and Mpondomise, or there is a dispute among the sons of a great house, prioritising the rights of inheritance becomes a matter of the father's preference. In naming his heir, the father takes into account the preferences of his tribal elders and the community at large. Mpondo's father chose him as his heir. Mpondo's direct lineage includes Sihula, Santsabe, Mkhondwane, Sukude, Hlambangobubende, Siqelekazi, Hlamandana, Tahle, Msiza, Ncindise, and Cabe. Cabe fathered five sons, Qiya, Cwera, and Gangatha, from the great house, and Gwaru and Njilo from the right hand house. Although, as the eldest, Qiya was the rightful heir and successor to his father, Gangatha was favoured by his father and the people at large. A fight ensued between Qiya and Gangatha, resulting in Qiya being forced to retreat across the Mthatha River, leaving Gangatha to ascend the throne. After Gangatha, the amaMpondo were led, successively, by Bhala, Chithwayo, Ndayeni, Tahle, Nyawuza, Ngqungqushe, and Faku.

Faku (1824-1867) is considered the most significant ruler in the history of amaPondo. He successfully defended his people against Shaka, king of amaZulu, in the Mfecane wars (1824-1828). In the process, he crossed to the west of the Mzimvubu River and established his Great Place at Qaukeni near the Mngazi River. He then expanded the amaPondo's sphere of influence by accommodating refugees from the Mfecane – including the amaBhaca, amaXesibe, and amaCwera. Faku also consolidated under his authority several neighbouring communities such as the imiZizi, amaNgutyana, and amaTshangase. In other words, he was the first of the amaPondo leaders to rule a community of some considerable size – and to integrate diverse cultures into a single society.

Acknowledged by then as King Faku and having completed the consolidation of his peoples, he returned to Qaukeni near Mngazi, leaving Ndamase, his eldest son, to rule on his behalf the regions adjacent to the Mzimvubu River. Ndamase set up his Great Place at Nyandeni. Ndamase was from the right hand house. Tradition has it that he once killed a lion whose skin he was expected to hand over to Mqikela, his much younger brother from the great house. Ndamase refused, triggering a fight between his own supporters and those of Mqikela. The ensuing tensions between the brothers made it expedient for Faku to offer Ndamase leadership of a region a fair distance away from his own Great Place and, therefore, from his younger son and heir. Here oral history gives us two versions of Ndamase's status. One is that Ndamase was to remain forever subordinate to the great house. Another is that, when he crossed the Mzimvubu River he subjugated the communities he found there. When Faku visited Ndamase, he instructed that all skins of animals killed be taken to Nyandeni, instead of Qaukeni. This was interpreted as a sign that Faku had handed over kingship to Ndamase. Whatever the truth of these stories, the disagreements between Ndamase and his brother effectively divided the amaPondo, a situation that the British colonial powers exploited to their own advantage.

By the closing decades of the 18th century, South Africa had fallen into two broad regions: west and east. Colonial settlement dominated the west, including the winter rainfall region around the Cape of Good Hope, the coastal hinterland northward toward the present-day border with Namibia, and the dry lands of the interior. Trekboers took increasingly more land from the Khoekhoe and from remnant hunter-gatherer communities, who were killed, were forced into marginal areas, or became labourers

tied to the farms of their new overlords. Indigenous farmers controlled both the coastal and valley lowlands and the Highveld of the interior in the east, where summer rainfall and good grazing made mixed farming economies possible. A large group of British settlers arrived in the Eastern Cape in 1820; this, together with a high European birth rate and wasteful land usage, produced an acute land shortage, which was alleviated only when the British acquired more land through massive military intervention against Africans on the eastern frontier. Until the 1840s the British vision of the colony did not include African citizens (referred to pejoratively by the British as “Kaffirs”), so, as Africans lost their land, they were expelled across the Great Fish River, the unilaterally proclaimed eastern border of the colony.

The first step in this process included attacks in 1811–12 by the British army on the Xhosa groups, the Gqunukhwebe and Ndlambe. An attack by the Rharhabe-Xhosa on Graham’s Town in 1819 provided the pretext for the annexation of more African territory, to the Keiskamma River. Various Rharhabe-Xhosa groups were driven from their lands throughout the early 1830s. They counterattacked in December 1834, and Governor Benjamin D’Urban ordered a major invasion the following year, during which thousands of Rharhabe-Xhosa died. The British crossed the Great Kei River and ravaged territory of the Gcaleka-Xhosa as well; the Gcaleka chief, Hintsa, invited to hold discussions with British military officials, was held hostage and died trying to escape. The British colonial secretary, Lord Glenelg, who disapproved of D’Urban’s policy, halted the seizure of all African land east of the Great Kei. D’Urban’s initial attempt to rule conquered Africans with European magistrates and soldiers was overturned by Glenelg; instead, for a time, Africans east of the Keiskamma retained their autonomy and dealt with the colony through diplomatic agents. However, after further fighting with the Rharhabe-Xhosa on the eastern frontier in 1846, Governor Colonel Harry Smith finally annexed, over the next two years, not only the region between the Great Fish and the Great Kei rivers (establishing British Kaffraria) but also a large area between the Orange and Vaal rivers, thus establishing the Orange River Sovereignty. These moves provoked further warfare in 1851–53 with the Xhosa (joined once more by many Khoe), with a few British politicians ineffectively trying to influence events.

The Mpondo people, under Faku (and west of the Kei), had never clashed with the British and the British treated the Mpondo as an independent nation. However, the Boers who trekked into Natal (now KwaZulu-Natal) to escape British rule in first the Western and then the Eastern Cape, found themselves under British sovereignty again. They sought

new farms in MPondo territory and Faku turned to the British to help him resist the Boer intrusion.

As the first of the amaPondo kings to rule a united nation, Faku was deemed by his own people and the British to have the authority to sign the Maitland Treaty of 1844. The treaty confirmed his claim to the land of the MPondo (from the Drakensberg Mountains in the west to the coast). It also guaranteed him protection from annexation of that land by the British. In addition, the colonial government promised to stand by him should he need to defend his own territory and gave him cattle valued at seventy-five pounds. In return, he committed the MPondo to avoiding conflict with the Cape Colony, handing over any criminal elements who tried to hide on his land, returning any stolen cattle to their rightful owners, protecting the whites living legitimately on his land as well as traders passing through his territory, maintaining peace amongst the various clans under his sovereignty, and supporting the Cape government with his forces if requested. Between 1811 and 1858 colonial aggression deprived Africans of most of their land between the Sundays and Great Kei rivers and produced poverty and despair. From the mid-1850s British magistrates held political power in British Kaffraria, destroying the power of the Xhosa chiefs. Following a severe lung sickness epidemic among their cattle in 1854–56, the Xhosa killed many of their remaining cattle and in 1857–58 grew few crops in response to a millenarian prophecy that this would cause their ancestors to rise from the dead and destroy the whites. Many thousands of Xhosa starved to death, and large numbers of survivors were driven into the Cape Colony to work. British Kaffraria fused with the Cape Colony in 1865, and thousands of Africans newly defined as Fingo resettled east of the Great Kei, thereby creating Fingoland.

After Faku died in 1867, Mqikela refused to co-operate with the government. Accordingly, the Cape government curtailed his powers, dividing Pondoland, as it had become known, into two and threatening to elevate Nqwiliso, the son and successor to Ndamase, to paramountcy. In 1878, in order to ensure that he did indeed get the paramountcy, Nqwiliso sold land at Port St. Johns to the British for one thousand pounds. The British wanted the land to secure the port for their ships. On his accession to power Nqwiliso made it clear that, while recognising Mqikela's house as the Great House of the amaPondo, he intended to follow in Ndamase's footsteps and owe allegiance to no one, and maintain his position as an independent chief. That meant he would suffer no interference from Mqikela. In this declaration he was supported by the Government. Once again, dissent among the MPondo gave the colonial power an

opportunity to further erode traditional leadership. Colonial officialdom either ignored traditional authorities completely or allowed them to, at best, play a marginal role in governing their communities.

The Transkei, as the Fingoland region comprising the hilly country between the Cape and Natal became known, grew to be a large African reserve that expanded when those parts that were still independent were annexed in the 1880s and '90s. Pondoland lost its independence in 1894 (Kepe & Kotsebeza 2012).

### **3 BACKGROUND INFORMATION OF THE SURVEY**

#### **3.1 Methodology**

A desktop study was conducted of the archaeological databases housed in the KwaZulu-Natal Museum. The SAHRIS website was consulted for previous heritage surveys and heritage site data covering the project area. In addition, the available archaeological and heritage literature covering the greater Lusikisiki areas was consulted. Aerial photographs covering the area were scrutinised for potential Iron Age and historical period structures and grave sites. A ground survey, following standard and accepted archaeological procedures, was conducted on the 25 January 2020. Particular attention was focused on the occurrence of potential grave sites and other heritage resources on the footprint.

##### **3.1.1 Background to the area surveyed**

The proposed development site is situated in a communal area dominated by small-scale subsistence farming. The Mphondo, a Xhosa-speaking people, lives in the area and has been the owners of the land for at least four centuries. Their immediate ancestors were encountered in the area by Portuguese shipwreck survivors along the coastline since at least the sixteenth century. Although there is evidence for resettlement and the alteration of traditional settlement patterns to the immediate west of the project area the traditional dispersed settlement pattern is still observable in some areas adjacent to the Malangeni Afforestation Project. This local settlement structure has been referred to in

anthropological literature as the 'dispersed Nguni settlement structure' (Sansom 1974). Essentially it is the indigenous settlement structure that occurred along the eastern seaboard of South Africa (Transkei and KwaZulu-Natal) prior to colonialism and so-called betterment schemes of the Apartheid-era (MacAllister 1988). Some local Mphondo homesteads still express the indigenous spatial patterning referred to as the 'Central Cattle Pattern' (Huffman 2007). The 'Central Cattle Pattern' has been a core expression of African world-views relating to the central notion of 'wives for cattle' and associated social structure. It has been a feature of indigenous African spatial patterning for almost 1 600 years (Huffman 2007) and is discernible at most Iron Age sites in the sub-continent south of the Zambezi.

### **3.2 Heritage Survey Results**

The available data bases and literature do not suggest that any heritage features or sites of the following categories occur on the proposed development area. The results of the desktop survey was also confirmed by the actual ground survey.

- Archaeological Sites
- Historical Sites
- Living Heritage Sites
- Sites or areas with oral traditions attached to it.
- Cultural landscapes

A couple of Cultural Resource Management Projects have been conducted in the greater Lisikisiki area during the last 10 years (For instance see Van Schalkwyk 2010; Bezuidenhout & Kock 2014; Smith et al 2015). However, none of these covered the actual footprint. In addition, it is well worth mentioning that the well-known Ingquza Hill heritage site and associated graves (Fig 8) is situated more than 5 km to the north west of the project area and will not be affected by the proposed development.

#### **3.2.1 Grave Site**

Graves are associated with most rural homesteads in the greater Lusikisi area. Various graves have also been observed to the immediate west of the project area. However, only one grave site, consisting of three individual graves (Figs 11 -13), was located on the actual footprint. These graves are well demarcated and marked with concrete blocks and stone. They are situated some distance from the road on a ridge overlooking the

valley at S 31° 18' 58.54" E 29° 43' 18.93" (Figs 5 & 6). The grave site is younger than 60 years old and is not regarded as a historical feature. However, more recent graves do have 'living heritage' values. Relatives of the deceased still live in the area and visit the grave site from time to time. It is therefore advisable to leave the graves intact and rather enforce a buffer zone around them. The consultant therefore recommends that a buffer zone of at least 25m should be maintained around the grave site. It is also recommended that the developers place a fence around the graves with a sturdy entrance gate in order to ensure that no damage are inflicted on the graves. The developers should liaise closely with the relatives of the deceased should the grave site be threatened in any way.

However, should it not be possible to enforce a buffer zone around the grave then the developers may call for a Second Phase Heritage Impact Assessment of the grave site. This second phase will entail an investigation regarding the feasibility of grave exhumation and relocation. It must be emphasised, however, that this is an expensive and time consuming exercise as it will entail thorough community consultation (Appendix 1).

### **3.3 Restrictions encountered during the survey**

#### **3.3.1 Visibility**

Visibility was good.

#### **3.3.2 Disturbance**

No disturbance of any potential heritage features was noted.

### **3.4 Details of equipment used in the survey**

GPS: Garmin Etrek

Digital cameras: Canon Powershot A460

All readings were taken using the GPS. Accuracy was to a level of 5 m.



## **4 DESCRIPTION OF SITES AND MATERIAL OBSERVED**

### **4.1 Locational data**

Province: Eastern Cape

Closest Towns: Lusikisiki and Flaggstaf

Municipality: Ingquza Hill Local Municipality

#### ***4.1.1 Stakeholder Consultation***

The consultant spoke to various local residents encountered along the road during the ground survey. None of them had knowledge of any heritage sites and additional graves within the project area.

#### ***4.1.2 Desktop Paleontology Assessment***

The updated fossil sensitivity map, as provided by the SAHRIS website, shows that the project area is of moderate paleontological sensitivity (Fig 7). According to SAHRA policy the implication is that a comprehensive paleontological desktop study will be required before the proposed development may proceed. This study will have to be conducted by an accredited palaeontologist.

## 5 STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)

### 5.1 Field Rating

The grave site on the footprint has been rated as locally significant (Table 2). Apart from the graves there are no heritage sites or features of any significance (Table 3).

**Table 2. Field rating and recommended grading of sites (SAHRA 2005)**

Level	Details	Action
National (Grade I)	The site is considered to be of National Significance	Nominated to be declared by SAHRA
Provincial (Grade II)	This site is considered to be of Provincial significance	Nominated to be declared by Provincial Heritage Authority
Local Grade IIIA	This site is considered to be of HIGH significance locally	The site should be retained as a heritage site
Local Grade IIIB	This site is considered to be of HIGH significance locally	The site should be mitigated, and part retained as a heritage site
Generally Protected A	High to medium significance	Mitigation necessary before destruction
Generally Protected B	Medium significance	The site needs to be recorded before destruction
Generally Protected C	Low significance	No further recording is required before destruction

**Table 3. Evaluation and statement of significance.**

Significance criteria in terms of Section 3(3) of the NHRA		
	<b>Significance</b>	<b>Rating</b>
1.	<b>Historic and political significance</b> - The importance of the cultural heritage in the community or pattern of South Africa's history.	None.
2.	<b>Scientific significance</b> – Possession of uncommon, rare or endangered aspects of South Africa's cultural heritage.	None.
3.	<b>Research/scientific significance</b> – Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage.	None.
4.	<b>Scientific significance</b> – Importance in demonstrating the principal characteristics of a particular class of South Africa's cultural places/objects.	None.
5.	<b>Aesthetic significance</b> – Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.	None.
6.	<b>Scientific significance</b> – Importance in demonstrating a high degree of creative or technical achievement at a particular period.	None.
7.	<b>Social significance</b> – Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.	None.
8.	<b>Historic significance</b> – Strong or special association with the life and work of a person, group or organization of importance in the history of South Africa.	None.
9.	The significance of the site relating to the history of slavery in South Africa.	None.

## 6 RECOMMENDATIONS

- The identified grave site may not be disturbed, altered or removed under any conditions. It is recommended that the developers maintain a buffer zone of at least 25m around the grave site.
- It is also recommended that the developers erect a fence with a sturdy gate around the grave site prior to any development.
- Should the developers have a need to remove the graves then a Second Phase Heritage Impact Assessment must be called for.
- A desktop paleontological study by a qualified palaeontologist will be required before development may proceed.
- It is important to take note of the National Heritage Act that requires that any exposing of graves and archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.

## 7 MAPS AND FIGURES



**Figure 1. Topographical map showing the location of the project area.**



**Figure 2. Google Earth Map showing the location of the project area relative to Lusikisiki.**

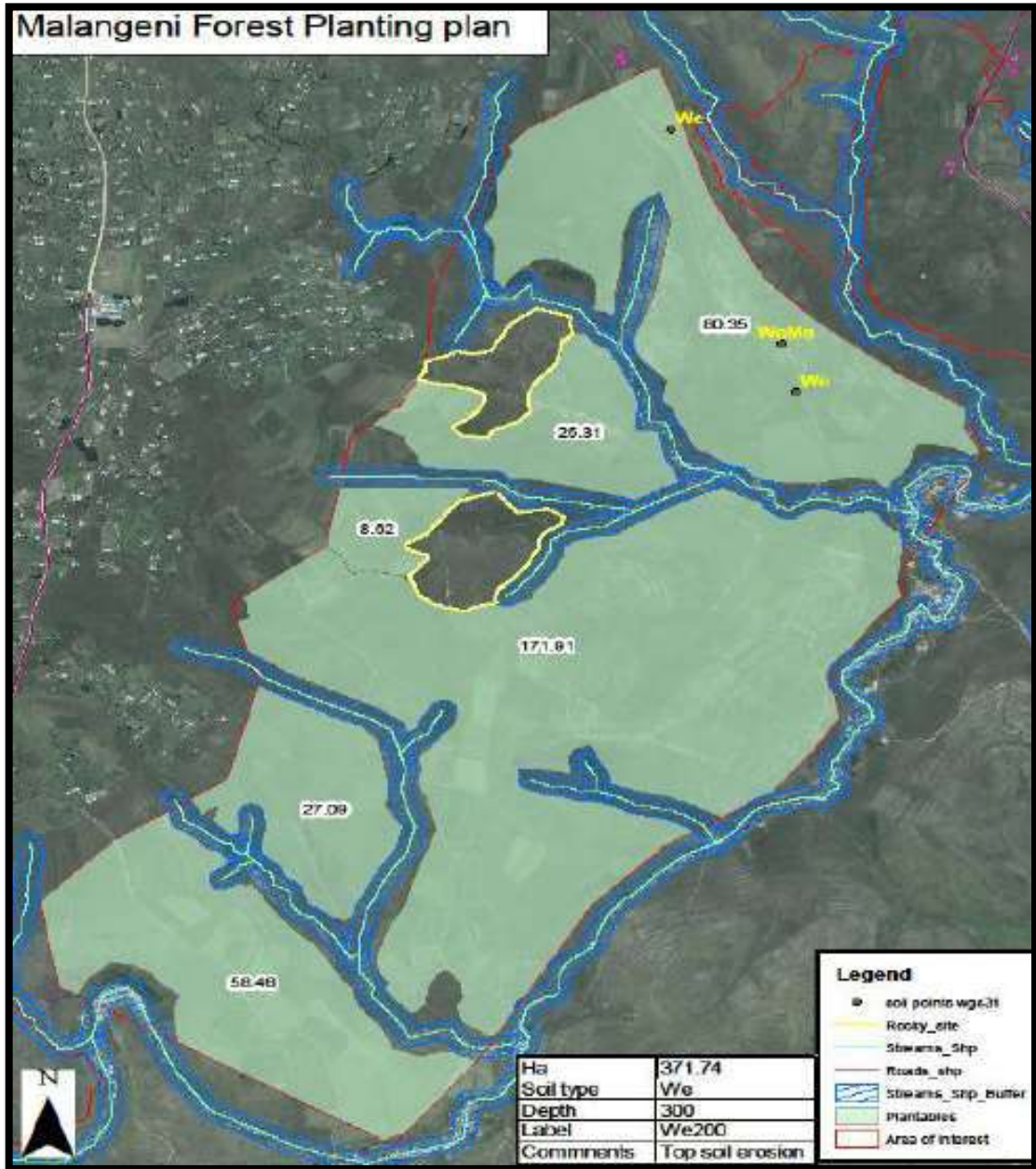


Figure 3. Malangeni Forest Planting Plan Map 1 (Source: Ezendalo)

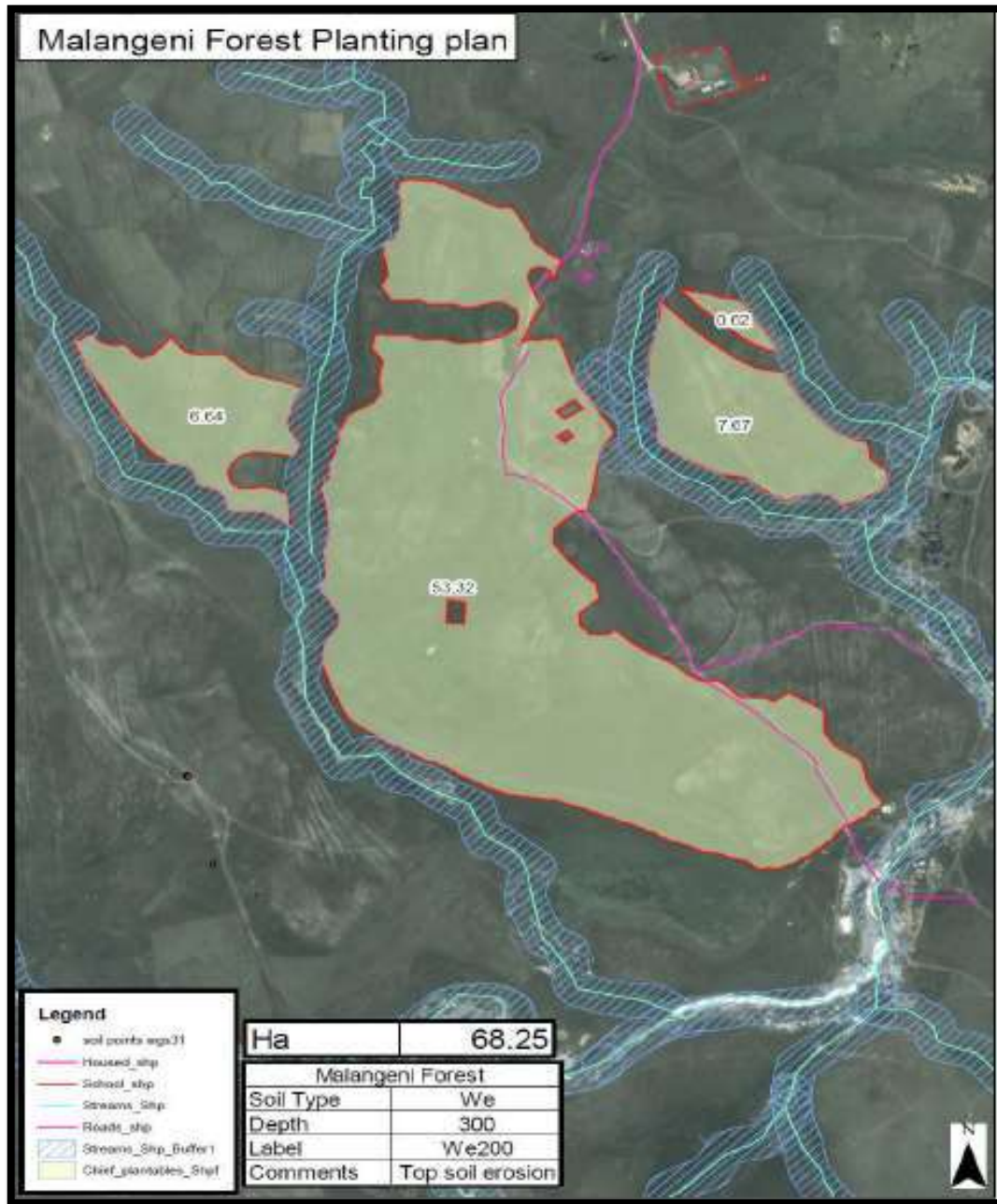
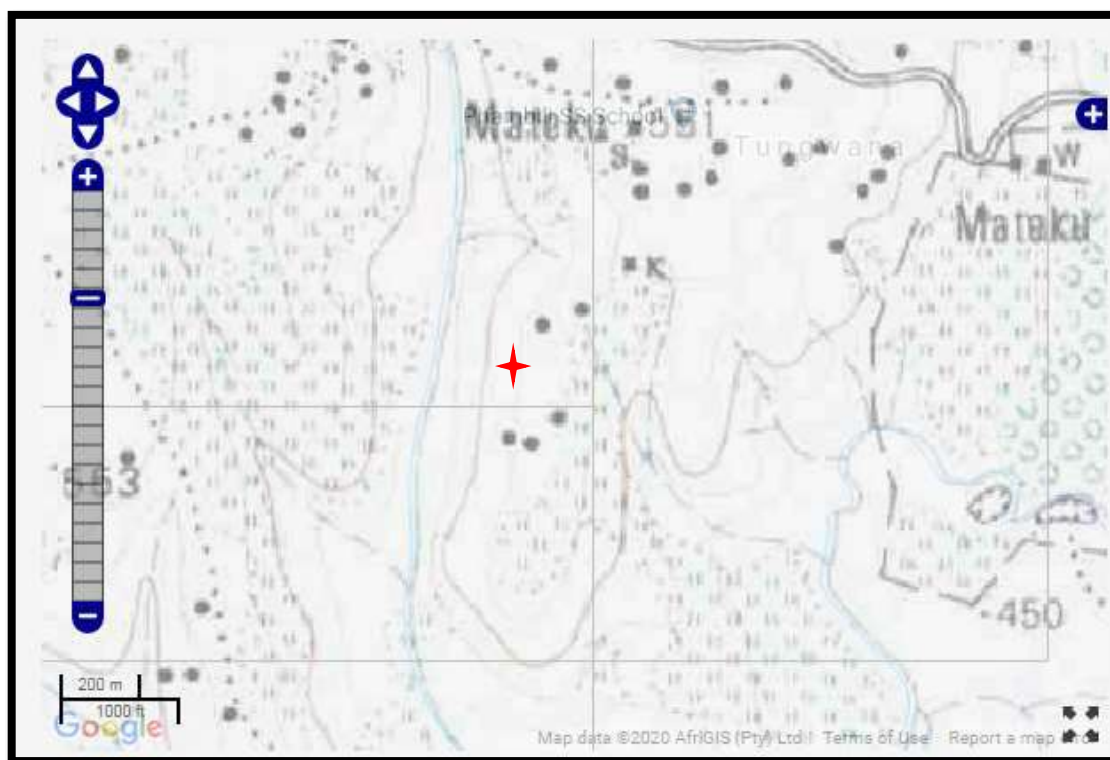


Figure 4. Malangeni Forest Planting Plan Map 2 (Source: Ezendalo)



**Figure 5. Google Earth Imagery showing the location of the identified grave site in the project area.**



**Figure 6. 1:50 000 Topographical Map showing the location of the grave site (red star) in the project area.**





**Figure 7. Fossil Sensitivity Map of the project area: The proposed development sites are indicated by the red polygon. The green background colour indicate that the area has a moderate fossil sensitivity. A paleontological desktop assessment will be required by an accredited paleontologist (Source: SAHRIS website).**



***Figure 8. Ingquza Hill: a living heritage site and scene of the Mpondoland revolt of the 1960's. This important site occurs more than 5km to the north of the project area and will not be affected by the proposed development at Malangeni.***



***Figure 9. View over the project area facing west. No archaeological sites occur in the project area.***



***Figure 10. View over the project area facing north. No archaeological sites occur in the project area.***



**Figure 11. All the existing homesteads in the greater Malangeni area appears to be younger than 60 years old.**



**Figure 12. Grave site at Malangeni.**



**Figure 13. No headstones are visible. However, the grave site appears to be younger than 60 years old.**



**Figure 14. The grave site consists of at least three individual graves.**

## 8 REFERENCES

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## APPENDIX 1 RELOCATION OF GRAVES

Burial grounds and graves older than 60 years are dealt with in Article 36 of the NHR Act, No. 25 of 1999. The Human Tissues Act (Act No. 65 of 1983) protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and reburial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

Below follows a broad summary of how to deal with graves in the event that they are identified within the footprint, or within 25m, of the proposed development.

- If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. They need permits, such as those relating to health and safety, and have their own requirements that must be adhered to.
- If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by provincial heritage legislation.

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is required by provincial heritage legislation.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a required by provincial heritage legislation.
- Once the 60 days has passed and all the information from the family members

have been received, a permit can be requested from SAHRA. This is a required by provincial heritage legislation.

- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave