



# MYEZO ENVIRONMENTAL MANAGEMENT SERVICES

*Environmental Stewardship*

ESKOM – INGULA – BASIC ASSESSMENT

BASIC ASSESSMENT REPORT IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (No.107 OF 1998) REGARDING THE ENVIRONMENTAL AUTHORISATION APPLICATION (BASIC ASSESSMENT PROCESS) FOR THE PROPOSED RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED IN THE FREE STATE PROVINCE, WITHIN THE THABO MOFUTSANYANA DISTRICT MUNICIPALITY, UNDER THE JURISDICTION OF PHUMELELA AND MALUTI A PHOFUNG LOCAL MUNICIPALITIES

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## ABBREVIATIONS

AIDS:	Acquired Immunodeficiency Syndrome
BAR:	Basic Assessment Report
BCEA:	Basic Conditions of Employment Act
BSc:	Bachelor of Science
BLSA:	Bird Life South Africa
C&I:	Control and Instrumentation
CBD:	Central Business District
CDF:	Conservation Development Framework
COVID-19:	Corona Virus (Disease) of 2019
CPA:	Catchment Protected Areas
CV:	Curriculum Vitae
CVB:	Channelled Valley Bottom
DARDLEA:	Mpumalanga Department of Rural Development, Land and Environmental Affairs
DEDET:	Mpumalanga Department of Economic Development, Environment and Tourism
DESTEA:	Department of Economic, Small business Development, Tourism and Environmental Affairs
DW&S:	Department of Water and Sanitation
E:	East
EAP:	Environmental Assessment Practitioner
EIS:	Ecological Importance and Sensitivity
ELM:	Emalahleni Local Municipality
EMP:	Environmental Management Plan
EMPr:	Environmental Management Programme report
FS:	Free State
GIS:	Geographic Information System
GN:	Government Notice
GPS:	Global Positioning System
HIV:	Human Immunodeficiency Virus
I&APs:	Interested and Affected Parties
IDP:	Integrated Development Plan
IFC:	International Finance Corporation
INR:	Ingula Nature Reserve

IPSS:	Ingula Pumped Storage Scheme
Km:	Kilometre
MAP:	Maluti A Phofung Local Municipality
Myezo:	Myezo Environmental Management Services (Pty) (Ltd)
NEMA:	National Environmental Management Act (Act No. 107 of 1998)
NEMWA:	National Environmental Management Waste Act (Act No. 59 of 2008)
NEMBA:	National Environmental Management Biodiversity Act (Act No. 10 of 2004)
NEMPAA:	National Environmental Management Protected Areas Act (Act No. 57 of 2003)
NGO:	Non-Governmental Organization
NWA:	National Water Act (NWA) (Act No. 36 of 1998)
OHSA:	Occupational Health and Safety Act
PES:	Present Ecological State
PLM:	Phumelela Local Municipality
PPE:	Personal Protective Equipment
PNA:	Priority Natural Areas
PTY:	Private Company
PV:	Photo Voltaic
R:	Regulation
REC:	Recommended Ecological Classification
RoD:	Record of Decision
S:	South
SA:	South Africa
SAHRA:	South African Heritage Resources Agency
SANBI:	South African National Biodiversity Institute
SANS:	South African National Standards
SABAP:	Southern African Bird Atlas Project
SDF:	Spatial Development Framework
SoER:	State of Environmental Report
STD:	Sexually Transmitted Disease
STI:	Sexually Transmitted Infection
SHP:	Shapefile Format
TCBA:	Terrestrial Critical Biodiversity Area
ToR:	Terms of Reference

UNEP:	United Nations Environment Programme
VHF:	Very High Frequency
VPA:	Viewshed Protected Area
WHO:	World Health Organisation
WUL:	Water Use Licence

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MANAGEMENT ACT (No.107 OF 1998) REGARDING THE ENVIRONMENTAL  
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DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED IN THE FREE  
STATE PROVINCE, WITHIN THE THABO MOFUTSANYANA DISTRICT  
MUNICIPALITY, UNDER THE JURISDICTION OF PHUMELELA AND MALUTI A  
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**BASIC ASSESSMENT REPORT COMPILED IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (No.107 OF 1998) REGARDING THE ENVIRONMENTAL AUTHORISATION APPLICATION FOR THE PROPOSED RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED IN THE FREE STATE PROVINCE, WITHIN THE THABO MOFUTSANYANA DISTRICT MUNICIPALITY, UNDER THE JURISDICTION OF PHUMELELA AND MALUTI A PHOFUNG LOCAL MUNICIPALITIES**

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**BASIC ASSESSMENT REPORT COMPILED IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (No.107 OF 1998) REGARDING THE ENVIRONMENTAL AUTHORISATION APPLICATION FOR THE PROPOSED RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED IN THE FREE STATE PROVINCE, WITHIN THE THABO MOFUTSANYANA DISTRICT MUNICIPALITY, UNDER THE JURISDICTION OF PHUMELELA AND MALUTI A PHOFUNG LOCAL MUNICIPALITIES**

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<b>Revision</b>	<b>Nature of Amendment</b>	<b>Compiled By</b>	<b>Approved by</b>	<b>Date of Amendment</b>
This document (Ver2)	Update of the BAR report of 30 September 2020 (Rev 1, which was issued for a 30-day public review on 08 October 2020	Babalwa Fatyi	Director	14 December 2020

## Section I Basic Assessment Process

Report submission outline

Please note that the outline below acts as a guide on the sequence of the submitted report:

### Part A : This Basic Assessment Report (BAR)

- i. Basic Assessment Report with associated stakeholder engagement outcomes (Volume 1 of 4)
- ii. Stakeholder engagement process (Volume 2 of 4)

### Part B : A stand-alone report)

- iii. Environmental Management Programme Report (Volume 3 of 4)
- iv. Specialist Studies(Volume 4 of 4)
  - Biodiversity Study (Volume 4 of 4)
  - Socio-Economic study (Volume 4 of 4)
  - Heritage Impact Assessment and Palaeontological Impact Assessment

In addition to the above broad report submission structure, this section provides the intrinsic detailed structure within the report, in terms of how various sections are divided and what information is provided under those various sections. The Basic Assessment activities described in this Report, are both based on the Environmental Impact Assessment Regulations of 2014 with Amendments, on 07 April 2017, and the National Environmental Management Act, 1998 (NEMA)(Act No. 107 of 1998).The BAR report is structured in accordance with the guidelines provided in Table 1 of Appendix 1 Checklist of the NEMA (Act No. 107 of 1998). The only exception is that the (a) values or roman numeral values provided under the guidelines, have been translated in section numbers. For example, Roman numeric Section I has been changed to Section 1. Furthermore, sub-sections within the major sections of the report have also been assigned matching numerical values. It must be noted, however, that the descriptions of the different section and associated sub-sections of the report structure, are not different from the guidelines provided in Appendix 1 Checklist. The report maintains the required structure, as per the guidelines and the table below provides those details.

**Table 1.1-1: Section III of the Appendix Checklist as presented in the Basic Assessment Report**

Appendix 1 Checklist	Description of Appendix 1 for Bar Report	Sections where this is Addressed in the Bar
<b>Section 3</b>		
	Basic assessment process	Section I Details of the BAR and how it was compiled and reporting structure.
2.	Objectives of the Basic Assessment Process	Section II: Objectives of the BAR Process
3.	Scope of Basic Assessment and Respective Content	Section III The content of the BAR as indicated in Section II

Appendix 1 Checklist Section 3	Description of Appendix 1 for Bar Report	Sections where this is Addressed in the Bar
		and respective contributors into the report (Eskom, Engineers, Myezo team, Specialists and Stakeholders).
	Details of –	Section 1: Report Preparation
	The EAP who prepared the report	1.1: Environmental Assessment Practitioner
	The expertise of the EAP, including a curriculum vitae	1.2: Environmental Assessment Practitioner Expertise and CV.
b)	The location of the activity, including:	Section 2: Project Activity Location
	i). The 21digit Surveyor General code of each cadastral land parcel;	2.1: Cadastral Land Parcel
	ii). Where available, the physical address and farm name;	2.2.: Project Location Details
	iii). Where the required information in items(i) and (ii) is not available, the co-ordinates of the boundary of the property or properties;	2.3. Project Co-ordinates and Maps
c)	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale. or, if it is—	Section 3: Infrastructural Plans and Designs
	i). A linear activity, a description, and co-ordinates of the corridor in which the proposed activity or activities is to be undertaken; or	3.1. Location of Activity Corridor
	ii). On land where the property has not been defined, the co-ordinates within which the activity is to be undertaken;	3.2. The Co-ordinates Within Which the Activity Is to Be Undertaken
d)	A description of the scope of the proposed activity, including—	Section 4: Scope of Proposed Project Activities
	i). All listed and specified activities triggered and being applied for; and	4.1. Triggered Activities being Applied for
	ii). A description of the activities to be undertaken including associated structures and infrastructure	4.2. Description of Activities and Associated Structures and Infrastructure
e)	A description of the policy and legislative context within which the development is proposed including—	Section 5: Policy and Legislative Framework
	i). An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and	5.1: Policy and Legislative Framework Applicable to Development
	ii). How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools, frameworks, and instruments	5.2. How the Project Development Complies with the Legislative and Policy Context.
f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Section 6. Motivation for the Need and Desirability for the Proposed Development
g)	A motivation for the preferred site, activity, and technology alternative;	Section 7: Motivation for the Preferred Site and Activities



Appendix 1 Checklist Section 3	Description of Appendix 1 for Bar Report	Sections where this is Addressed in the Bar
h)	A full description of the process followed to reach the proposed preferred alternative within the site, including —	Section 8: Description of the Process of Followed to reach the Proposed Development Option
	i). Details of all the alternatives considered;	8.1: Details of Alternatives Considered
	ii). Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	8.2. Public Participation Process
	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;	8.3. Issues Raised by Interested and Affected Parties
	iv). The environmental attributes associated with the alternatives focusing on the geographical (8.4-1), Physical, biological, social, economic, heritage and cultural aspects;	8.4. Environmental Attributes 8.4-1. Geographical Setting 8.4-2. Physical Setting 8.4-3. Biological Setting 8.4-4. Social Setting 8.4-5. Economic Setting 8.4-6. Heritage Aspects 8.4-7. Cultural Aspects
	v). The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts—	8.5. Impacts and Risks Identified for Alternatives
	(aa) Can be reversed;	8.5-1. Extent of Reversal of Impacts
	(bb) May cause irreplaceable loss of resources; and	8.5-2. Extent of Irreplaceable Resource Loss
	(cc) Can be avoided, managed, or mitigated;	8.5-3. Mitigation, Avoidance and Management of Impacts and Risks.
	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;	8.6. Methodology for Determining and Ranking Impacts Associated with Alternatives
	vii). Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	8.7. Positive and negative impacts that the proposed activity and alternatives will have on the environment and community
	viii). The possible mitigation measures that could be applied and level of residual risk;	8.8. Possible mitigation Measures that Could be Applied and Level of Residual risk
	ix). The outcome of the site selection matrix;	8.9. Outcomes of Site Selection Matrix
	x). If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	8.10. Motivation for not considering site location alternatives
	xi). A concluding statement indicating	8.11. Concluding Statement Indicating Preferred Alternatives, Including Preferred Location of the Activity

Appendix 1 Checklist Section 3	Description of Appendix 1 for Bar Report	Sections where this is Addressed in the Bar
i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including—	Section 9: Full description of the Process Undertaken to Identify, Assess and Rank the Impacts the Activity will Impose on the Environment
	i). A description of all environmental issues and risks that were identified during the environmental impact assessment process; and	9.1. Description of All Environmental Issues and Risks That Were Identified
	ii). An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	9.2. Assessment of the Significance of Each Issue/Risk & Indicator of The Extent to Which It Can Be Mitigated
j)	An assessment of each identified potentially significant impact and risk, including—	Section 10: Assessment of Each Identified Potentially Significant Impact and Risk Including the Following
	i). Cumulative impacts;	10.1. Cumulative Impacts
	ii). The nature, significance and consequences of the impact and risk;	10.2. Nature, Significance and Consequence Impacts and Risks
	iii). The extent and duration of the impact and risk;	10.3. Extent and Duration of Impacts and Risks
	iv). The probability of the impact and risk occurring;	10.4. Probability of Impacts and Risks Occurring
	v). The degree to which the impact and risk can be reversed;	10.5. Extent of Reversal of Impacts and Risks
	vi). The degree to which the impact and risk may cause irreplaceable loss of resources; and	10.6. Extent of Loss Associated with Risks and Impacts
	vii). The degree to which the impact and risk can be avoided, managed, or mitigated;	10.7. Mitigation, Avoidance and Management of Impacts and Risks
k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section 11: Summary of Findings and Impact Management Measures Identified in Any Specialist Reports
l)	An environmental impact statement which contains—	Section 12: Environmental Impact Statement
	i). A summary of the key findings of the environmental impact assessment;	12.1. Summary of Key Findings of Environmental Impact Assessment.
	ii). A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and	12.2. Map Showing Project Development and Measures on Sensitive Areas
	iii). A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	12.3. Summary of Impacts and Risks
m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the	Section 13: Impact Management Measures from Specialists Reports Based on the Assessment

Appendix 1 Checklist Section 3	Description of Appendix 1 for Bar Report	Sections where this is Addressed in the Bar
	recording of the proposed impact management outcomes for the development for inclusion in the EMPr	
n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	Section 14: Any Aspects Conditional to Assessment Findings to be included as Conditions for authorisations
o)	Any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 15: Assumptions, Uncertainties and Knowledge Gaps Relating to Assessment and Mitigation Measures
p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 16: Reasoned opinion or conditions as to whether the proposed activity should or should not be authorised
q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalized.	Section 17: Project Duration and Environmental Authorisation Required
r)	An undertaking under oath or affirmation by the EAP in relation to — i). The correctness of the information provided in the reports. ii). The inclusion of comments and inputs from stakeholders and I&APs iii). The inclusion of inputs and recommendations from the specialist reports where relevant; and iv). Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Section 18: Environmental Assessment Practitioner (EAP) Oath Undertaking
s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Section 19: Financial Provision for Rehabilitation and Closure Management of Negative impacts
t)	Any specific information that may be required by the competent authority; and	Section 20: Specific Information that may be required by the Competent Authority
u)	Any other matters required in terms of section 24(4) (a) and (b) of the Act.	Section 21: Any Other Matters in Terms of Section 24(4)(a) of the Act

## Section II Objective of the Basic Assessment Process

The objective of the basic assessment process is to, through a consultative process—

- a) Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- b) Identify the alternatives considered, including the activity, location, and technology alternatives;
- c) Describe the need and desirability of the proposed alternatives;
- d) Through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
  - (i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - (ii) 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; and
- e) Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
  - (i) Identify and motivate a preferred site, activity and technology alternative.
  - (ii) Identify suitable measures to avoid, manage or mitigate identified impacts; and
  - (iii) Identify residual risks that need to be managed and monitored.

## EXECUTIVE SUMMARY

This report outlines the environmental impact assessment (EIA) (basic assessment) process which was undertaken by Myezo Environmental Management Services (Pty) Ltd on behalf of Eskom Holdings, for the relocation of the dwellers at Ingula Pumped Storage Scheme. This basic assessment process culminated into the development of this basic assessment report (BAR) which has been undertaken in terms of the National Environmental Management Act (No.107 of 1998), as amended. This relocation exercise was triggered by the Ingula Pumped Storage Scheme environmental authorisation process, which called for trade-offs concerning to land that was disturbed by the scheme.

The Ingula Pumped Storage Scheme is located about 23 km north east of Van Reenen. The Ingula Project consists of two catchment areas namely: The Free State Upper Catchment and the Kwa Zulu Natal Lower Catchment.

Eskom Holdings SOC Limited (Eskom) constructed Ingula Pumped Storage Scheme as part of their New Build Programme and the Power station was commissioned in 2016. As part of the conditions to the environmental authorisation issued in terms of NEMA for the scheme, Eskom was requested to purchase adjacent farms consisting of sensitive wetlands and grasslands to compensate for the residual impacts on wetlands and ecosystems that would be lost during the construction of the power station.

Subsequently, Eskom engaged all the landowners whose land comprised of the sensitive wetland ecosystems on which the project is situated and ultimately purchased these farms. Over 8000 hectares of land was purchased around the Ingula Pumped Storage Scheme. In 2018, the purchased land was declared a nature reserve in terms of the National Environmental Management: Protected Areas Act (No. 57 of 2003).

Following the progression of developments and the proclamation of Ingula Nature Reserve, Eskom engaged all landowners whose land was within the sensitive wetland ecosystems, which are characteristic of the Ingula Nature Reserve and ultimately purchased these farms. However, some of the dwellers opted to stay on the property, within Ingula Nature Reserve, but on a less sensitive area. During the latter half of 2016, studies were undertaken and the Wilger area was identified as the ideal area to relocate the remaining dwellers. Initially, a total of seven (7) families were engaged, however in March 2019, only six (6) families decided to stay as one of the families had confirmed that they will be relocating outside the nature reserve, therefore the project is making provisions for six (6) remaining families. Negotiations with these last six households have been concluded and these will be relocated to the Wilger Farm.

The relocation exercise will result in the dwellers having better infrastructure and improved standard of life, as compared to where they are currently settled and congruently, the nature reserve management commitments will be better observed, since there will be a controlled utilisation of ecosystem services within the nature reserve.

The relocation site is on the northern boundary of Ingula Nature Reserve. The relocation site is located approximately 10 km north of the Ingula Pumped Storage Scheme and on the north-north-western boundary of the Ingula Nature Reserve. The general co-ordinates of the project site are: latitude 28° 12' 9.999" S and longitude 29° 33' 5.744" E. The activities to be undertaken under this application trigger listed activities in terms of NEMA regulations Government Notice No (GN). R.983 are discussed under Table 4.1-1. These activities triggers activities listed under:

- Listing Notice 1 (GNR327 (previously R983), 08 December 2014) and Listing Notice 2 (GNR 325 (previously R984), 08 December 2014).
- Listing Notice 3 (GNR324 (previously R985), 08 December 2014).

According to the International Finance Corporation (IFC) Performance Standards, involuntary resettlement must be done in a way that does not disrupt livelihoods or decrease the quality of life of the affected parties. This consideration was the basis of the consultation and participation of the affected parties. The relocation project, sponsored by Eskom, will include construction works outlined below.

- Dwellings for the six families, each with an ablution block (one shower and toilet), rondawel and a kraal. The new dwelling facilities will exactly match their current situation with respect to the number and size of dwellings. The mud structures will be replaced with brick and mortar.
- Internal access roads.
- Storm-water Management
- Geo-hydrological and Geotechnical Assessments.
- Sewer and Water Reticulation.
- Potable Water Reticulation.
- Siting and drilling of boreholes for water use.
- Solar power and electrical reticulation for future energisation.
- Fencing.
- Septic tanks installation.

Legislative statutes and principles formed the corner-stone of the environmental study approach for this project. In terms of the NEMA, reasonable measures must be taken to avoid, manage and mitigate environmental impacts of triggered activities. The National Environmental Management: Protected Areas Act No. 57 of 2003 allows for development within nature reserves such as Ingula Nature Reserve provided that certain measures are put in place following authorization from a competent authority. Since the area is within a biodiversity area, the National Environmental Management: Biodiversity Act (No. 10 Of 2004) was also considered during the environmental studies. The National Environmental Management: Waste Act (No. 59 of 2008) is the guideline for waste management during the construction and operational phases. The National Water Act( No. 36 of 1998) provided principles for the protection of aquatic resources near the relocation site. National Heritage Resources Act (No. 25 of 1999) which states that any identified paleontological findings during the excavation works must be reported to the SAHRA immediately provided guidance on the strategies to be employed in the overall implementation of the project.

The Public Participation Process (PPP) approach adopted for the relocation project is in line with the processes stipulated in Regulation 40 to 44 of the NEMA: Environmental Impact Assessment Regulations, 2014: GN R326. The processes included placing of a notice in a local newspaper, engaging relevant departments / authorities and potential interested and affected parties. The public and stakeholder participation has been a continuous process from before the establishment of the pumped storage scheme and will continue up to until the relocation process is completed. IFC Performance Standards were also followed during the project by establishing prior and informed consent from the affected parties.

The project area is characterized by high altitude grasslands. Due to dolerite dykes junctures, the terrain has places where it forms terraces, ravines and benches. The climate in the region is generally mild with mild temperatures prevailing throughout the year except in winter, which is cold. The Ingula Highveld is commonly characterised by grey-like Highveld pseudo-podzolic soils. The soils are primarily non-differentiated fersiallitic soils that transform into brown Mediterranean soils as altitude increases towards the little Drakensburg escapement. Grassland habitat covers the greater part of the relocation site with a small portion being a ridge grassland habitat and a small stream (that feeds into Wilge River) passing through the middle of the site classified as a wetland habitat. Ingula Nature Reserve sits on a continental watershed with most water paths draining seasonally or annually to the west. The Ingula Nature Reserve has over 34 species of mammals with about a third being carnivorous animals and another third being antelope species such as the Oribi. Agriculture, mining and tourism, form the economic activities in the district and province.



The area has erodible soils as evidenced by dongas and land degradation around Ingula. As such, soil erosion is expected to be one of the major impacts needing avoidance and mitigation. Erosion control mechanisms will be installed before construction commences. Sensitive ecosystems such as wetlands are at risk of being disturbed and must be avoided and hence there has been re-allocation of land plots after biodiversity studies were undertaken to ensure identified sensitive areas were avoided in the allocation of the homestead and grazing plots.

Temporary employment opportunities are a major benefit for the local communities which will be given first preference. During the operational phase of the project, improved standard of living is expected to be a major benefit for the dwellers. However, the presence of a village in the nature reserve may pose a risk to nature conservation. Poaching, wetland degradation and deforestation may occur. These will be avoided by training the dwellers on environmental conservation and possibly employing some of them to be nature reserve security patrols.

Eskom Ingula Project is not mandated to act on most of the issues raised by affected stakeholders such as provision of clinics, as these are either provincial or local competencies

Nevertheless, most of the raised issues can be tabulated to the inter-governmental and stakeholder forums by Eskom on behalf of the beneficiaries, where that opportunity is available.

The matter of collaboration and co-operation between the key stakeholders has been indicated as part of the mitigation measures in the environmental management programme. Opportunities for intensifying the corporation between Eskom – Ingula Farm and key strategic partners in the management of the nature reserve such as Klein Drakensberg Trust Farm will be observed to ensure the long-term sustainability of the broader project.

Firewood can be availed to occupiers of this land, in a controlled structured manner, as part of the alien invasive control and management processes. The locals will be getting continual information pertaining to reserve management and aspects such as Fire management are handled within the ambit of Eskom policies and procedures, as well as requirements of fire control committees as per the Veld and Forest Fire Act (No 101 of 1998).

Specialist studies such as Biodiversity Study and Wetland Study (Appendix D1, Volume 4 of 4), indicate that it is better for both the environment and the dwellers, for this relocation process to be undertaken so that families can be resettled on the less sensitive part of the nature reserve. The Biodiversity Study by Vlok and van Wyk (2020) supported findings made by Mentis (2005) and Partridge (2002) that Ingula has erodible soils and that there is the

presence of wetland ecosystems. These two factors and the presence of a rich biodiversity are the most sensitive aspects of the project and will be avoided or mitigated by putting in place control measures before construction commences. Any paleontological discoveries findings or artefacts should be handled according to a chance find protocol that must be developed prior to construction activities. There were also identified archaeological sites in the form of burial sites and these will be fenced-off to avoid their disturbance during the construction activities (Appendix D-3, Volume 4 of 4)

The adaptive management concept will be adopted for handling grazing matters within the nature reserve, along with ensuring that the number of cattle is significantly to combat overgrazing and potential desertification.

Provided that the mitigation measures for the identified impacts are implemented, it is the professional opinion of the various project specialists, that the relocation project is necessary and must be granted authorization because the impacts that have been identified can be managed through the compliance with the EMP that has been developed for this project.

## Section III BAR Content

### 1 ENVIRONMENTAL ASSESSMENT PRACTITIONER

This section introduces the Environmental Assessment Practitioner (EAP) for the Ingula Relocation project. Ms. Babalwa Fatyi is the team leader and Environmental Assessment Practitioner responsible for this project BAR

#### 1.1 Environmental Assessment Practitioner Expertise and CV

Ms. Babalwa Fatyi is a registered environmental consultant with over 20 years' experience in undertaking environmental authorisation applications across various sectors and industries. She has led, project-managed over 50 environmental impact assessments and Basic Assessment Reports (BARs) and compiled more than 50 Environmental Management Plans (EMPs) and programmes. Babalwa Fatyi has experience directing and managing environmental sustainability projects current across various industries and sectors, including environmental management programmes and associated stakeholder engagements, including impact evaluation along with development of environmental management plans, in support of environmental authorisation applications. She has a broad range of experience in leading the implementation of environmental management plans on sites through development of implementation plans with clear set objectives and structures, roles and responsibilities, design of performance monitoring plans and designing communication and risk management plans throughout the project implementation phases.

As a qualified EAP, Babalwa has been instrumental in the co-ordination of the Public Participation Process (PPP) either as a lead stakeholder engagement specialist and or as an overseer of the process. Partaking her duties as public participation leader, her duties included engaging with Interested and Affected Parties (IAPs) to ensure that their issues and concerns regarding the proposed project activities are adequately captured, addressed, included in the environmental report. When engaging with specialists, her duties include designing of terms of references (ToRs) that are project specific and ensure that specialist studies reports findings and recommendations are included as part of the EIA report to be submitted to the Competent Authority for environmental authorisation.

Babalwa is a registered Professional Natural Scientist. Having graduated with BSc Degree Majoring in Zoology and Botany in 1997 at the University of Witwatersrand, she went on to pursue and complete her Master of Science at the same university, graduating with *cum laude* in 1999. The EAP CV attached in Appendix G2

## 1.2 Project Activity Location

The Ingula Pumped Storage Scheme is located about 23 km north-east of Van Reenen. It straddles the Little Drakensburg Escarpment which forms the border between the Free State and Kwa-Zulu Natal Provinces. It consists of two catchment areas namely, the Free State and Kwa-Zulu Natal Lower Catchment. The proposed sites for the relocation project are under the jurisdiction of the Phumelela Local Municipality and Maluti a Phofung Local Municipality, within Thabo Mofutsanyana District, Free State Province. The project relocation area is located approximately 10 km north of the Ingula Pumped Storage Scheme, about 42 km north-east east of Harrismith, 26 km north-east of Van Reenan and 4.5 km from the Little Drakensberg Escarpment. The project regional and local setting is provided in Figure 1.2-1 and 1.2-2, respectively.

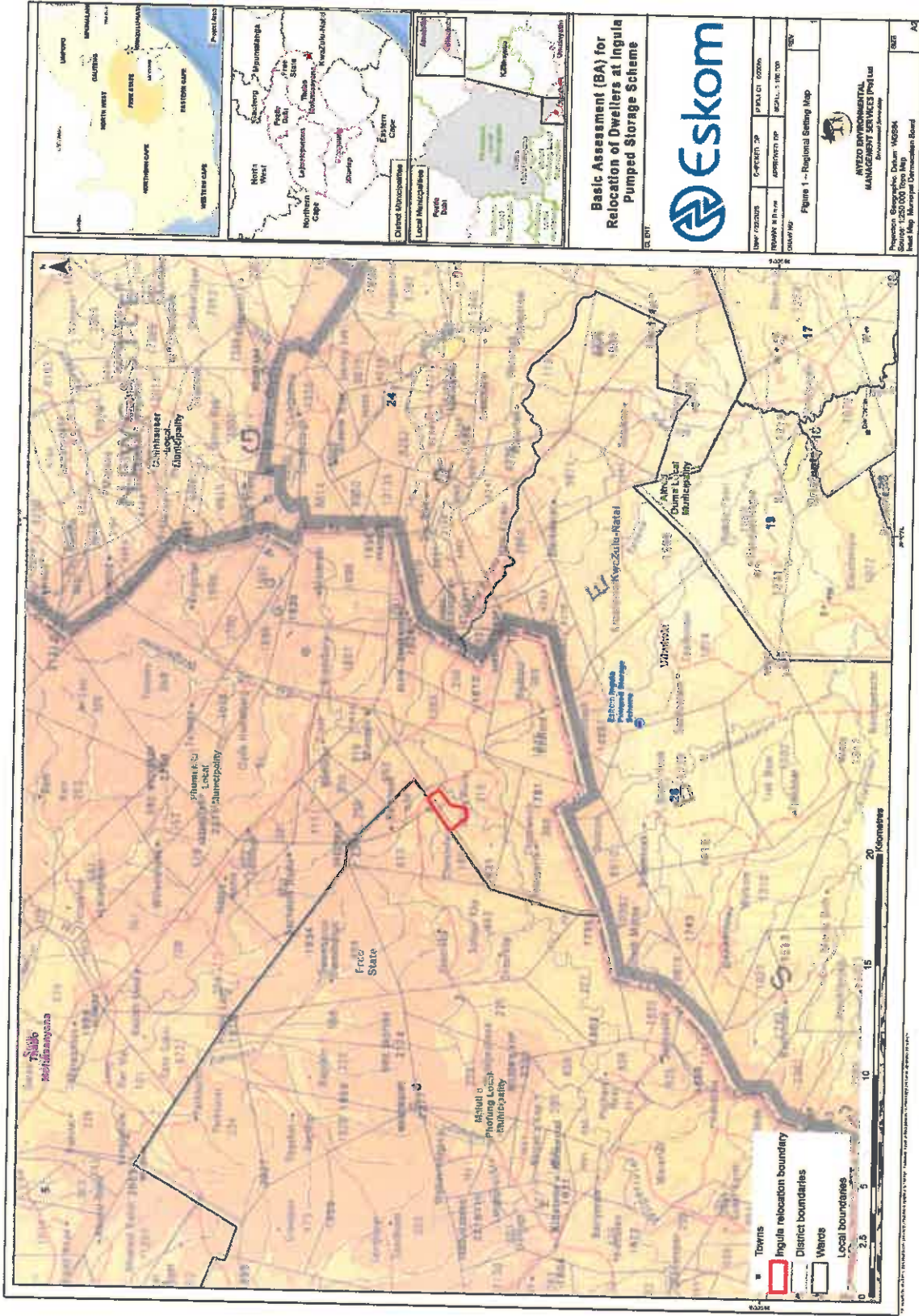


Figure 1.2-1: Regional Setting

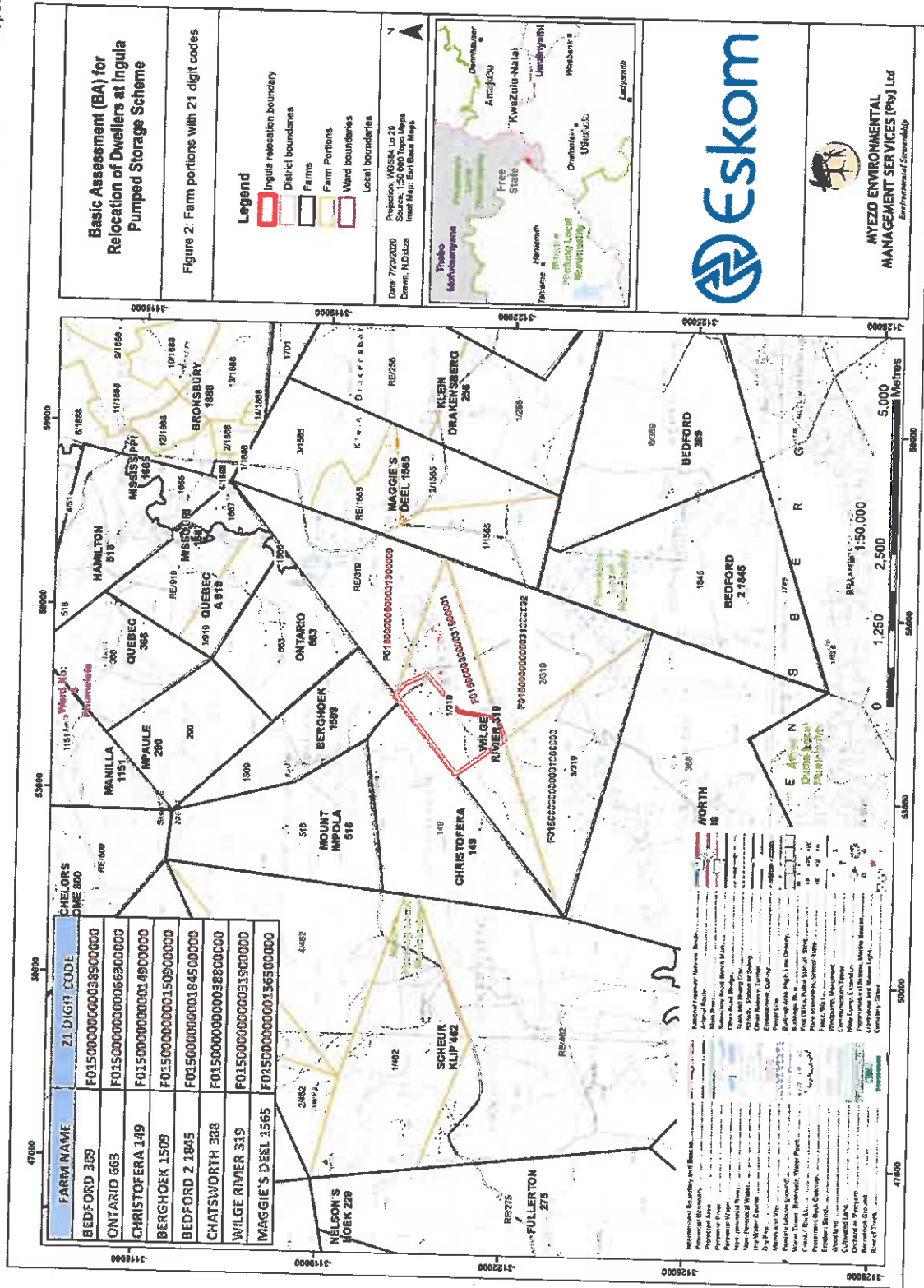


Figure 1.2-2: Local Setting



The relocation site is located approximately 10 km north of the Ingula Pumped Storage Scheme and on the north-north-western boundary of the Ingula Nature Reserve.

## **2 CADASTRAL LAND PARCEL**

This section gives information concerning land utilisation and ownership around the project area. The project site is within the Ingula Nature Reserve, which came about as a result of the Ingula Pumped Storage Scheme when Eskom Holdings initiated an EIA for the IPSS in early 1998, culminating in the then Minister of Environmental Affairs and Tourism authorising the scheme in December 2002. One of the recommendations of the specialist studies during the EIA, subsequently captured into the Record of Decision, was the need to purchase additional land surrounding the IPSS and to apply for the proclamation of the land associated with the IPSS as a Nature Reserve, to secure the biodiversity value of the site. The immediate boundaries are surrounded by farmlands such as Christofera and Ontario, and rivers that feed into the dams used by the Ingula Pumped Storage Scheme. The major river with several seasonal tributaries is the Wilge River. Ingula was declared a nature reserve in June 2018 in terms of the National Environmental Management Act: Protected Areas (No. 57 of 2003). As shown in Figure 1.2-1, the nature reserve is categorized into different utilization zones based on sensitivity. High intensity utilization zones are less sensitive whilst medium intensity utilization zones have moderate sensitivity and low intensity utilization zones have high sensitivity. As such, the area chosen for the relocation is a high utilization intensity zone with very low environmental sensitivity.





## 2.1 Project Location Details

The project location is in Free State Province in the Thabo Mofutsanyana District and in the Phumelela Local Municipality (FS195). The site is located approximately 10 km north of the Ingula Pumped Storage Scheme. The site is also about 42 km north-east-east of Harrismith, 26 km north-east of Van Reenen and 4.5 km from the Little Drakensberg escarpment, which forms the border between the Free State and Kwa Zulu-Natal Provinces. It is on the north-western boundary of the Ingula Nature Reserve, in the Free State Province.

## 2.2 Project Co-ordinates and Maps

The project site central co-ordinates are : latitude 28° 12' 9.999" S and longitude 29° 33' 5.744" E. Regional, local settings are indicated in Figure 1.2-1 and Figure 1.2-2, respectively. The location of this site in relation to the Ingula Nature Reserves and built-up areas is indicated in Figure 2.2-1.

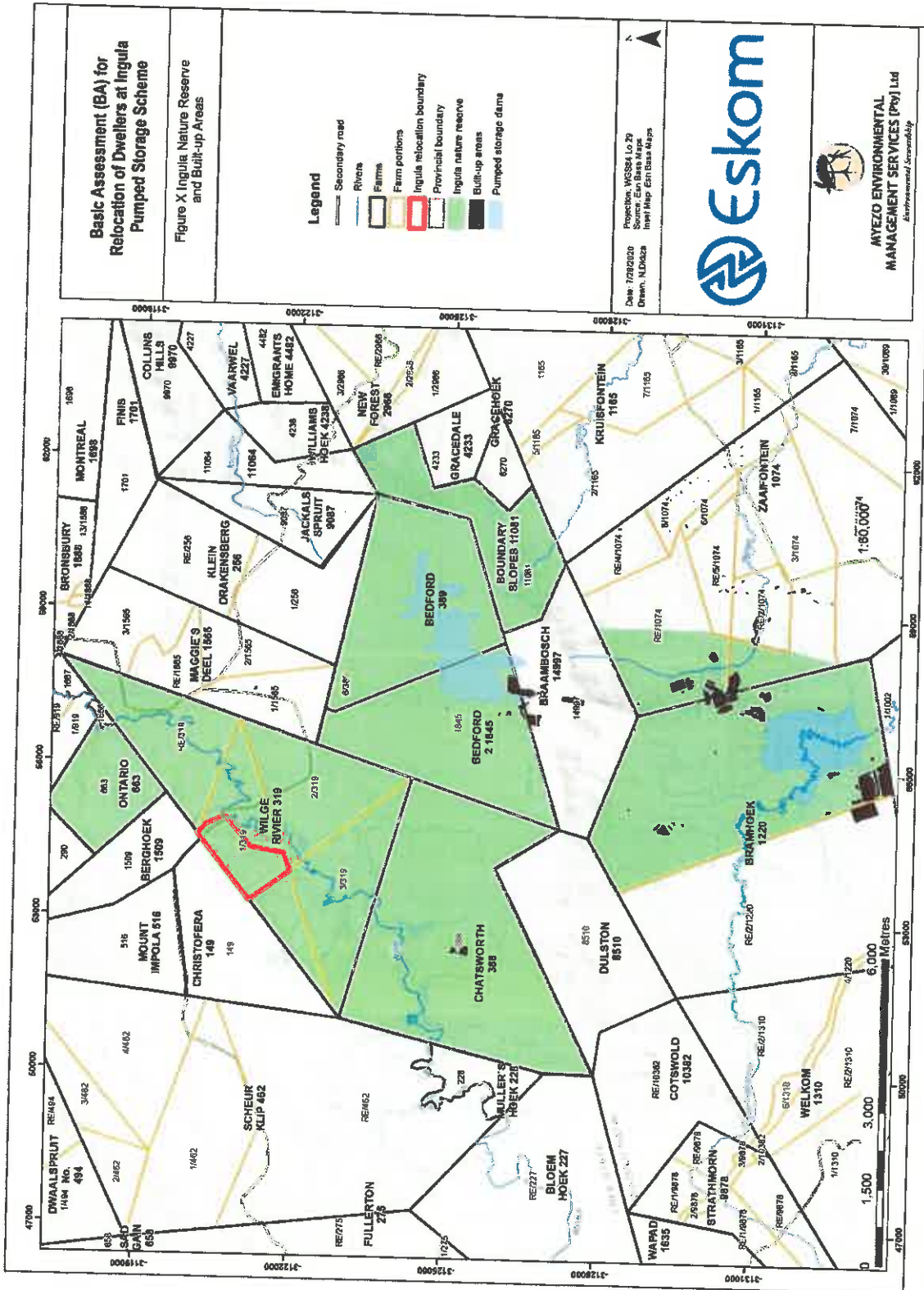


Figure 2.2-1: Relocation Area within the Ingula Nature Reserve

### **3 INFRASTRUCTURAL PLANS AND DESIGNS**

This section outlines the project location and proposed designs. The project area will consist of six homesteads for the six families. These will have facilities such as electrical, sewer and water supply designs which will be confined to the provisions of the site after approval from local municipality.

#### **3.1 Location of Activity Corridor**

Not applicable to project as the relocation site is not within or related to any activity corridor. Durban provincial website (durban.gov.za) defines an activity corridor as, "An area of higher intensity urban use or land suitable for intensification, parallel to and on both sides of an activity spine and includes any associated higher order transportation routes such as railway lines and through roads."

#### **3.2 The Co-ordinates within which the Activity is to be Undertaken**

As shown on the satellite image below, the project activity will be established within the demarcated 131 hectares of land on the northern boundary of the Ingula Nature Reserve. The current location of the families in relation to the planned relocation site is indicated in and Figure 3.2-1. The co-ordinates of the delineated project area are presented in Figure 8.1-1 under the discussion of the considered alternatives or options for the relocation.

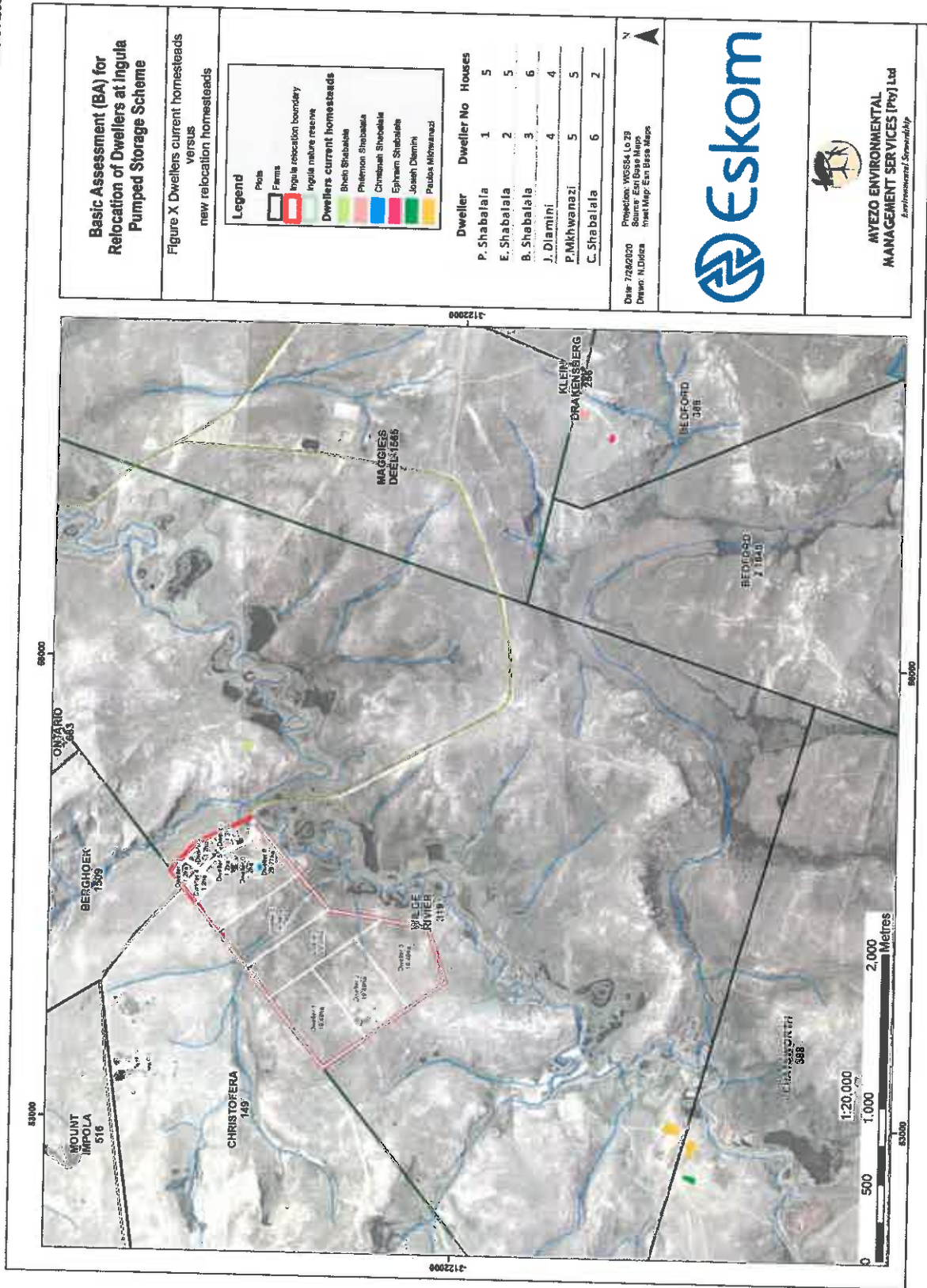


Figure 3.2-1: Satellite image showing the Project Site Inside Ingula Nature Reserve

#### 4 SCOPE OF THE PROPOSED PROJECT ACTIVITIES

The project entails relocation of six families, who will be built homesteads in a village structure setting (each homestead covering about 1.2 ha in extent) and will share a common grazing area (Option 1). Alternatively, for Option 2, each family will be allocated a plot that would be about 23 ha. The plots have since been re-arranged subsequent to the environmental investigations to avoid identified sensitive areas and as such the sizes might differ from the originally planned extent). and would accommodate the homestead, crop garden and grazing land. The main project activity can be classified as residential infrastructural development characterized by construction to cater for the relocation of six families. The construction activities include:

- Internal access roads
- Upgrades to the Main Access road (External)
- Stormwater management
- Geo-hydrological and Geotechnical investigations
- Sewer and Water reticulation
- Fencing
- Sewer treatment
- Potable water reticulation
- Siting and drilling of boreholes for water use
- Six dwellings each with an ablution block, rondawel and kraal
- Solar power and electrical reticulation for future energisation
- Decommissioning of the existing farmhouses and rehabilitation of the previously occupied dwellings

##### 4.1 Triggered Activities being Applied for

An assessment of the triggered activities was undertaken through the assessment of the activities that are proposed as indicated in Section 4 and the specific activities that would be undertaken during the execution of the project as outlined below. As part of the project planning and decision on position, various considerations were undertaken such as determination of the most feasible site for the location. These considerations entailed, the provision of architectural and civil design in compliance with the required legislation documents. The geological investigations are also part of the considerations to determine soil conditions and bearing capacities before the buildings can be built. This information is

indicated under the project description section and assessment of alternatives under Section 8.1.

The various activities which will be undertaken, which have an influence on the determination of whether certain listed activities would be triggered or not, are outlined below. The description of the applicability of these activities are discussed under each specified listing notice activity to ascertain if what is being planned and the associate thresholds do trigger the listed activities.

A detailed description of these activities and possible alternatives per activity are outlined in Section 4.2.

Table 4.1-1: Determination of Listed Activities

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	What does this law say	Describe each listed activity as per project description:
R-983 as amended in April 2017 (Listing Notice 1)	12 (ii) (a) (c)	<p>The development of—</p> <p>(i) dams or weirs, where the dam or the weir, including infrastructure and water surface area, exceeds 100 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs –</p> <p>(a) Within a watercourse;</p> <p>(b) In front of a development setback</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse</p>	<p>The proposed project involves the development of structures with a physical footprint of more than 100 100 square metres triggering (ii).</p> <p>No development will be undertaken within sensitive areas i.e watercourses and or 32 metres from the watercourse or within the floodlines. Also, residential plots will be situated more than 100 metres from the riverbeds. However, because the grazing areas which are part of the development are cutting across the streams and as such are regarded to be witing a water course. The actual houses will be outside of these threshold limits.</p>
R-983 as amended in April 2017 (Listing Notice 1)	27	<p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except 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</p>	<p>The development will cover an extent of about 21.7 hectares per family. This will require the clearance of an area of more than 1 hectare per family for homesteads. However, it is not expected that the clearance of vegetation will exceed the 20-hectare threshold.</p> <p>The proposed development is not being undertaken for a linear activity or in accordance to a maintenance plan, thus exclusions (i) and (ii) are not applicable.</p>

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	What does this law say	Describe each listed activity as per project description:
R983 as amended in April 2017 (Listing Notice 1)	28 (ii)	<p>management plan.</p> <p>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:</p> <p>(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</p> <p>excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</p>	<p>The relocation project entails relocation of dwellers into a residential area outside of the urban area (ii) and the land to be developed is more than 1 hectare in size on land that is within a nature reserve and had been previously used for game farming and agriculture.</p>



Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	What does this law say	Describe each listed activity as per project description:
R.985 as amended in April 2017 (Listing Notice 3)	12 b (l), (ii)	<p>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>b. Free State</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of Section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment, 2004;</p> <p>ii. Within critical biodiversity areas identified in bioregional plans;</p>	<p>The proposed development might involve the clearance of indigenous vegetation for an area of 300 square metres or more which is not in accordance with a maintenance management plan.</p> <p>Within the (b) Free State</p> <p>(i) Within areas that are identified as critically endangered in the National Spatial Biodiversity Assessment, 2004</p> <p>(ii) within critical biodiversity areas identified in bioregional plans.</p>
R.985 as amended in April 2017 (Listing Notice 3)	14 (ii) (a) (c) b.i (aa), (bb) (dd), (ff) (gg) (hh)	<p>The development of—</p> <p>(i) dams or weirs, where the dam or the weir, including infrastructure and water surface area, exceeds 100 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs –</p> <p>(a) Within a watercourse;</p>	<p>The construction of buildings exceeding 100 square metres in size: infrastructure or structures with a physical footprint of more than 100 square metres triggering (ii).</p> <p>There is no development to be undertaken within the watercourse and residential plots will be situated more than 100 metres from the riverbeds. However, it has been noted that the streams are cutting across the grazing areas that are part of the development, triggering (a) and (c).</p> <p>The proposed activities will be undertaken outside urban areas triggering (i), within Ingula Nature Reserve which is: (aa) a protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas</p>

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	What does this law say	Describe each listed activity as per project description:
		<p>(b) In front of a development setback</p> <p>(c) If no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse</p> <p>b. Free State</p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves; or</p> <p>hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p>	<p>dd) sensitive areas as identified in an EMF; or</p> <p>(ff) critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans identified in bioregional plans</p> <p>(gg) an area of core areas in biosphere reserves</p> <p>(hh) within 10 kilometres from any other protected area identified in terms of NEMPAA. Ingula Nature Reserve has been proclaimed in terms of NEMPAA.</p>

## 4.2 Description of Activities and Associated Structures and Infrastructure

This section

gives a description of the specific activities that will be taking place with the aim of establishing structures and infrastructure that form part of the dwellings and amenities for the families that will be relocated. Technological, site, operational and service provision alternatives are discussed in Section 8.

### 4.2.1 Buildings and Type of Houses

According to Eskom, 2020 report, houses will be constructed for each family using brick and mortar, to meet relevant standards and requirements. These will form some of the major components of the village. Each homestead will have a house, rondawel, internal access road, ablution block, sewer reticulation and kraal. The floor areas for each family's household will be as follows:

Table 4.2-1: Existing and new floor area for existing buildings per family (Eskom, 2020)

Family	Philemon Shabalala	Ephraim Shabalala	Bheki Shabalala	Josiah Dhlamini	Paulosi Mkhwanazi	Christina Shabalala
Existing floor areas	144 m <sup>2</sup>	150 m <sup>2</sup>	241 m <sup>2</sup>	275 m <sup>2</sup>	300 m <sup>2</sup>	72 m <sup>2</sup>
New floor area	233.02 m <sup>2</sup>	220.67 m <sup>2</sup>	296.47 m <sup>2</sup>	333.12 m <sup>2</sup>	395.26 m <sup>2</sup>	141.47 m <sup>2</sup>

Figure 3.2-1 indicates where the families are currently located versus where they are planned to be relocated.

There are six different types of housing that can be provided to each of the dwellers. Each type of house is either a two bedroom or three- bedroom house with the type and number of housing allocated to each dweller being predetermined with the family to be relocated and the infrastructure allocations per dweller are indicated in Table 4.2.2 below.

Table 4.2-2 : Infrastructure allocations

Infrastructure Type	Dweller 1	Dweller 2	Dweller 3	Dweller 4	Dweller 5	Dweller 6
Type A Sheet 1	-	-	-	1	-	-
Type A Sheet 11	-	-	-	1	1	-
Type B Sheet 2	-	-	-	-	1	-
Type B Sheet 15	1	1	1	-	1	1
Type C Sheet 3	1	-	4	1	1	-
Type C Sheet 12	3	4	1	1	1	1
Rondawel Type C	-	-	-	-	1	-
Rondawel Type F	1	1	1	1	1	1
Ablution Block	1	1	1	1	1	1
New Floor Area	233.02m <sup>2</sup>	220.67m <sup>2</sup>	296.47m <sup>2</sup>	333.12m <sup>2</sup>	395.26m <sup>2</sup>	141.47m <sup>2</sup>

#### 4.2.2 Water Supply

A borehole will be drilled to supply the dwellers with water. The pumped water will be kept in a storage tank before being sent to individual houses. The estimated daily water requirement is 38 m<sup>3</sup> but a design of 43 m<sup>3</sup> is advised to cater for population growth. The water provisions for the village will be done following the requirements of SANS and Guideline for Human Settlement Planning and Design. The following were considered as options for water supply for the village:

- Mechanical pumps (Hand, Wind, and Hydropower pumps)
- Petrol and Diesel pumps (Mechanical and Electrical)
- Electric Pumps (Wind electric pumps, PV)

The most practicable option is the wind pump due to the following motivation:

- Low maintenance
- No electric/ power requirement
- Delivers a maximum head of 150 m

#### Geohydrological investigations

The geotechnical investigation will be conducted in two (2) phases:

- Phase 1: Geo-hydrological investigations will be conducted on Option 1 and Option 2 sites. Boreholes will be assessed for quantity and quality of borehole yield against the required borehole yield. Only boreholes meeting the yield requirement will be left open for use as a water source. All other boreholes will be closed according to governing standards. The boreholes will be licenced in terms of NWA. All required borehole information and calculations for the borehole licensing is provided from the drilling data.
- Phase 2: From the presented geo-hydrological information, preferred sites will be selected. A co-ordinated image will assist with test plans and implementation.

#### 4.2.3 Sewage/Wastewater Reticulation

(Eskom, 2020)– septic tanks are going to be constructed for holding and natural treatment of wastewater and sewage.

Minimum and Maximum Sewer Loads are expected to be about 7980 and 14 250 m<sup>3</sup>.

The current design assumptions are outlined below.

- Maximum number of occupants per room in a dwelling = 2 people
- Minimum Design Load per Person = 70l/c/day

- Optimum Design per Dwelling Unit (2 bedroom) = 500l/day
- Optimum Design Load per Dwelling Unit (3 bedroom) = 750l/day i.e., equivalent to a Middle to Upper-Income Dwelling with 2 bedrooms

**Table 4.2-3: Sewer loads calculations to determine design requirements**

Dweller	No. of 2-Bedroom Dwellings	No. of 3-Bedroom Dwellings	Maximum No. of Occupants	Minimum Sewer Load (l/day)	Optimum Sewer Load (l/day)
Philemon Shabalala	5	0	20	1 400	2 500
Ephraim Shabalala	5	0	20	1 400	250
Christinah Shabalala	2	0	8	560	1 000
Bheki Shabalala	6	0	24	1 680	3 000
Paulos Mkhwanazi	4	1	22	1 540	2 750
Josiah Dlamini	2	2	20	1 400	2 500
<b>TOTAL</b>	<b>24</b>	<b>3</b>	<b>114</b>	<b>7 980</b>	<b>14 250</b>

(Eskom, 2020)

#### 4.2.4 Power / Electricity provision

Due to its remoteness and distance from the nearest grid line, the area has no power utilities but all houses will be fitted with electrical reticulations for future purposes should there be developments that allow for connecting to the national grid. In the meantime, solar will be installed.

#### 4.2.5 Access roads

There is a road that passes by the project site. Access roads will be constructed to connect to the houses to the main gravel road. The existing access point around the site are depicted in Figure 4.2-1.

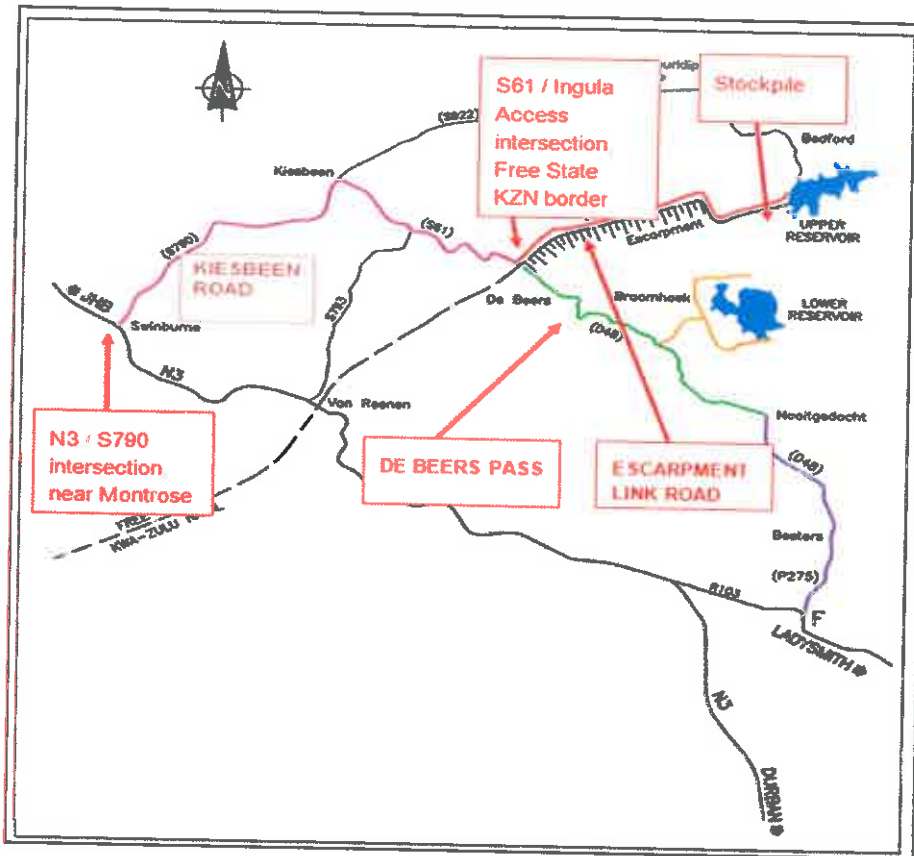


Figure 4.2-1: Access to the site

## 5 POLICY AND LEGISLATIVE FRAMEWORK

The NEMA is the main legislative framework governing this project. This legislation was complemented by the World Bank and IFC Performance Standards and Guidelines for best overall project sustainability performance.

### 5.1 Policy and Legislative Framework Applicable to Development

The table below gives a description of South African laws and legislation relevant to the proposed development.

This section, as such, is a key requirement to ensuring environmental protection and upholding of the principles of stewardship, during design, planning and implementation of any of the electrification programmes. It is important that the persons with environmental management responsibility have easy access to the legal requirements to guarantee compliance. Legal references can be used as source materials to provide text of regulatory or statutory language or provide interpretation of statutes or regulations. Such references are necessary to determine compliance requirements. Without adequate statutory and regulatory references, the parties who would be involved in the implementation of the project

would not know which statutes are applicable to the activities and how to comply with the legal requirements. It is thus important that the legal register be continuously updated:

- To have a conceptual and documented understanding of legal environmental conditions;
- To have a legal basis for undertaking developments that affect the environment;
- To ensure that all the persons with environmental management responsibility have easy access to the legal requirements; and
- To stay updated about current statutory requirements for the sectors in which the division operates

From time to time the legislation changes and new Acts, Regulations and or Guidelines are added. Section 4 provides a view of the legislation that was covered under this scope. This section does not deal with all environmental statutes, but rather focuses on those that have compliance implications for the project.

The Constitution provides the foundation for environmental regulation and policy. Section 24 of the Constitution makes provision for environmental protection for the benefit of present and future generations and the right to an environment that is not harmful to health and well-being. This can only be achieved through a reasonable legislative framework and other measures that prevent pollution and ecological degradation, promote conservation, secure ecologically sustainable development and the sustainable use of natural resources. The responsibility of ensuring a safe and healthy environment rests upon the State, reference can be made to the provisions of section 7(2) of the Constitution that reads "The State must respect, protect and fulfil the bill of rights". South Africa, specifically, the mandated Department of Environment, Forestry and Fisheries, fulfils these rights through the application of the NEMA and Specific Environmental Management Acts, among other tools. The National Environmental Management Act, 107 of 1998 (NEMA) provides an overarching framework for the issues relating to environmental management in South Africa. This framework includes the following key pieces of inter-related legislation:

- The National Environmental Management: Biodiversity Act (No. 10 of 2004)
- The National Environmental Management: Protected Areas Act (No. 57 of 2003)
- The National Environmental Management: Air Quality Act (No. 39 of 2004)
- The National Environmental Management: Waste Act (No. 59 of 2008)

The NEMA seeks to meet the Constitutional right to an environment that is not harmful to the health and well-being of South African citizens, the equitable distribution of natural

resources, sustainable development, environmental protection and the formulation of environmental management frameworks (EMFs).

NEMA's primary objective is to provide for co-operative governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith. Further to the above, the NEMA introduced a number of guiding principles into environmental legislation such as the life-cycle approach to waste management, producer responsibility, the precautionary principle, and the polluter pays principle, as well as 'duty of care' which places the onus on any person who causes significant pollution/degradation to the environment to institute measures to prevent pollution from occurring and to minimise and rectify the pollution or degradation where unavoidable. An additional principle, contained within the NEMA, is that of "Sustainable Development" which states that waste generation is to be avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner (the "Waste Hierarchy").

The NEMA introduced guiding principles into the South African environmental legislation, including the life-cycle approach to waste management, producer responsibility, the precautionary principle and the polluter pays principle. NEMA also places a duty of care on any person who causes significant pollution or degradation to the environment, requiring them to institute measures to prevent pollution from occurring, or to minimise and rectify the pollution or degradation to the environment, requiring them to institute measures to prevent pollution from occurring, or to minimise and rectify the pollution or degradation where it cannot reasonably be avoided.

The NEMA enables the Minister to identify activities which may not commence without prior authorisation from the Minister or Member of Executive Council (MEC) and may also identify geographical areas in which specified activities may not commence without prior authorisation. The Minister thus published GNR 983, 984 and 985 (2014) which indicates listed activities that may not commence prior to receipt of authorisation. Should the intended activity trigger a listed activity, the prospector will need to undertake one of the following three processes:

- GNR 983 listed activity trigger – undertake a Basic Assessment (BA) process.
- GNR 984 listed activity trigger – undertake a Scoping and Environmental impact Reporting (S&EiR) process; and



- GNR 985 listed activity trigger – undertake a BA process.
- The development of the norms and standards is the foundation of the regulatory system established in terms of Section 7(1) (c) of the NEM: WA.

Table 5.1-1: The Legislative and Policy Framework for the Ingula Relocation Project

Regulation or Guideline	Competent or Relevant Authority	Requirements of the legislation	Applicability in relation to the relocation at Ingula Nature Reserve	Applicable Sections
National Environmental Management Act No. 107 of 1998	Department of Environment, Forestry and Fisheries	Project activities require an Environmental Authorisation which will be applied for through this Basic Assessment. Chapter 1 Section 4(f) of the NEM Act requires that environmental and social impacts of project activities, both negative and positive, be assessed and evaluated and that decisions must be appropriate in relation to the assessment.	The project has put in place measures for environmental protection and nature conservation. Negative and positive project impacts have been described with mitigation or avoidance measures.	Chapter 1: Section 4(f)
National Environmental Management: Protected Areas Act No. 57 of 2003		Allows for development and economic activities within Nature Reserves provided that certain measures are put in place following authorisation from competent authority.	In 2018, Ingula Nature Reserve was declared a protected area and has been managed by Eskom as such.	Chapter 5: Section 51 Part 4 Section 41 Part 1
National Environmental Management: Biodiversity Act No. 10 of 2004	Department of Environment, Forestry and Fisheries	Allows for communities within the Nature Reserve to sustainably use resources within the park. Has provisions that allow co-management of a Nature Reserve with communities inside the reserve or other parties such as Eskom.	Biodiversity studies have been carried out by Dr Wynand Vlok in 2020.	Chapter 4: Section 52 Part 1
National Environmental Management: Waste Act No. 59 of 2008		Provision for the declaration of areas in need of protection if they harbor ecosystems that are deemed endangered or threatened.	Best practice waste reduction, reuse and recycling have been recommended.	Chapter 4: Section 17 Part 3 Section 21 Part 5
National Environmental Management: EIA Regulations of 2014		Waste management practices such as reduction, reusing and recycling. Storage, collection and transportation of waste.	Regulates requirements for projects that require Environmental Authorisation. Such requirements include public and stakeholder consultation and conducting of specialist studies.	Chapter 4: Section 19 Section 25

			<p>Environmental Authorisation Application. Activities such as public/stakeholder consultations and participation have been carried out.</p>	<p>Chapter 6, Section 41</p>
<p>National Water Act No. 36 of 1998</p>	<p>Department of Water and Sanitation</p>	<p>Protection of water resources from over-utilisation, pollution and degradation. Water use licensing.</p>	<p>Reasonable and effective measures will be put in place to avoid water pollution during construction.</p>	<p>Chapter 3, Section 19 Part 4</p>
<p>National Heritage Resources Act No. 25 of 1999</p>	<p>South African Heritage Resources Agency (SAHRA)</p>	<p>States that economic development must integrate the conservation of heritage resources. It also mandates the ceasing of all works and making a report to the SAHRA when any fossils are discovered.</p>	<p>Works must cease if any fossils are encountered during the construction activities.</p>	<p>Section 5, subsection 6</p>

The table below gives a summary of other principles and standards which the project has followed.

**Table 5.1-2: Policy and International Guidelines for the Ingula Relocation Project**

Policy/International Guidelines	Competent or Relevant Authority	Applicability in relation to the resettlement at Ingula Nature Reserve	How development complies with the legislation and policy context
IFC Performance Standards	World Bank / IFC	Benchmark for identification and management of environmental and social risk.	Refer to Table 5-3
National Biodiversity Strategy and Action Plan 2015-2025	Department of Environment, Forests and Fisheries	Measures put in place for biodiversity conservation, sustainable use of biodiversity and promotion of indigenous knowledge	Biodiversity studies carried out in 2020 by Wynand Vlok. Refer to Sections 8 and 9 for recommendations
Ramsar Convention		Protection and sustainable use of wetlands. South Africa is a signatory.	Extensive wetland studies carried out by Dr Mentis during the IPSS EIA covered the protection and management of all wetlands in Ingula Nature Reserve. Refer to sections 8 and 9
Convention on Biodiversity		Conservation of biological diversity and sustainable use of biological resources.	Biodiversity studies have been carried out by Dr Wynand Vlok. Refer to Sections 8 and 9

## 5.2 How the Project Development Complies with the Legislation and Policy Context

Refer to Column 4 of Table 5.1-2 above.

**Table 5.2-1: How the IFC Performance Standards were applied to the project**

IFC Standard	How it was (or will be) applied
1. Assessment and Management of Environmental and Social Risks and Impacts	<ul style="list-style-type: none"> <li>i. Effective community engagement through disclosure of project-related information</li> <li>ii. Proper management of environmental and social impacts through the EMPr</li> <li>iii. The proponent is capable of financing the costs of environmental and social risks. Proponent has already partnered with the Ingula Nature Reserve and Birdlife South Africa</li> </ul>
2. Labour and Working Conditions.	<ul style="list-style-type: none"> <li>i. The planning phase is being conducted with communication with relevant authorities to meet their requirements.</li> <li>ii. The construction phase will be done following the relevant labour laws and ethical practices.</li> <li>iii. For casual labour, preference shall be given to locals</li> </ul>
3. Resource Efficiency and Pollution Prevention	<ul style="list-style-type: none"> <li>i. Through the use of the EMPr, measures will be put in place to avoid and reduce pollution during the construction phase</li> <li>ii. The construction phase will be for homesteads and as such will not make use of heavy machinery over extended periods of time</li> <li>iii. Dust regulations will be observed</li> </ul>
4. Community Health, Safety, and Security	<ul style="list-style-type: none"> <li>i. During the construction phase, the area will be fenced and signs erected to protect the public from occupational risks</li> <li>ii. The planning and construction phases will be done with authorisations from competent authorities.</li> <li>iii. Recommendation of the biodiversity and social studies will be implemented (Volume 4)</li> </ul>
5. Land Acquisition and Involuntary Resettlement	<ul style="list-style-type: none"> <li>i. Land acquired from the six affected families being relocated was done on a willing buyer and willing seller basis using free, prior and informed consent</li> <li>ii. The families will be relocated to the new site and they agreed to the alternative and were fully compensated.</li> <li>iii. A livelihoods restoration programme will be done as part of the ecosystem's services within the nature reserve.</li> </ul>
6. Biodiversity Conservation and Sustainable Management of Living Natural Resources	<ul style="list-style-type: none"> <li>i. Project activities will be done with the knowledge and recommendations of the Ingula Nature Reserve administration.</li> <li>ii. Recommendations have been done for the project to limit use of any non-renewable or scarce natural resources.</li> </ul>
7. Indigenous Peoples 8. Cultural Heritage	<ul style="list-style-type: none"> <li>i. Project activities might temporarily disrupt or interfere with local cultural practices</li> <li>ii. Recommendations have been made for the project to limit use of natural resources that support the locals' livelihoods, if there are any identified. What is needed will be purchased from locals to promote local enterprises.</li> </ul>

## 6 MOTIVATION FOR THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT

Eskom is the sponsor of the proposed project, and the owner of the Ingula Nature Reserve (INR). The origins of the project can be traced back to 2002, when an EIA was conducted prior to the construction of the Ingula Pumped Storage Scheme (IPSS). One of the modules of that study recommended that Eskom engage all landowners whose land surrounding the IPSS and was comprised of the wetland ecosystem. The engagements ultimately resulted in Eskom purchasing the land, which was previously used for farming purposes by landowners and had farm tenants working on them. The recommendation is captured in the Record of Decision (RoD), Reference A24/16/3/124 of December 2002. In 2018, the IPSS and its associated land was declared as a nature reserve in terms of the National Environmental Management Protected Areas Act (No. 57 of 2003), resulting in the birth of the INR. The decision to purchase the land was in accordance with the Environmental Impact Assessment as approved by the Department of Environmental and Tourism at the time. Some of the above purchased land falls outside the required construction footprint of the Power Station and could be considered for the resettlement purposes.

Most of the landowners chose not to redeploy their farm workers elsewhere, when the farms were transferred to Eskom. Eskom was then obliged by agreement to engage on a resettlement programme for the farm tenants. Initially, the programme started with 22 families that were impacted; and 16 of whom have since opted to move to an area outside of the INR.

The remaining six families, who are the subject of the project for cultural reasons opted to remain within the INR but agreed to be moved from the highly environmental sensitive area they are currently located on, to a common low impact area. The affected six families have agreed and are in support of the pending move. This was also confirmed by the Community Representative on the project, Mr Mchunu in a telephone discussion of 6 August 2020. Based on material read, there is no alternative that can be considered to avoid relocation for the following reasons:

- Currently, the tenant houses are situated throughout the INR in highly sensitive environmental areas resulting in high environmental impacts. In addition, where their houses are currently situated, is remote to access roads.

- Since the households are currently scattered throughout the nature reserve, this makes it difficult and costly to provide basic services; as well as making it difficult to monitor whether their activities observe environmental good practices.
- The tenants, collaboratively, might be able to develop sustainable farming practices, in the new common area where they will be relocated to and this is critical for food security purposes.

The current location is subject to risks relating to environmental, lack of basic service infrastructure and safety challenges. The main objectives of the proposed project are to improve the families' living standards of life; and to reduce environmental impacts for them by providing a village, which will provide better quality dwellings, grazing land and social infrastructure. For the nature reserve, the benefit is that negative impacts will be reduced. The area on which these families are located is a paleontologically and ecologically sensitive area. The project requires that artificial flooding to maintain the wetland's ecosystem and this may affect the settlements. Relocation offers the families a chance to improve their lifestyles and livelihoods. The Ingula Power Project, with capacity to generate 1,332 Megawatts of power, is the largest pumped storage scheme in Africa. It will contribute towards meeting South Africa's growing energy demand being expected to reach 40,000 Megawatts by 2025. Failure to meet the demand may cripple industries and eventually the economy and negatively affect livelihoods. The project is therefore a necessity. Hence relocation ensures both primary and secondary benefits for the six families.

Additionally, involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social and environmental risks for unregistered right holders, legally or illegally occupying land at the time procured by Eskom. To mitigate these risks the resettlement plan is developed in line with South African legislation and the International Finance Corporation of the World Bank. The resettled families have to be in a state better than what they were before relocation. As such, this developmental project is not just aimed at building their dwellings but to make them better and provide other amenities such as solar power, sewer and tapped water. Due to the fact that the village development will be implemented in a nature reserve, ownership of the land will remain vested in Eskom and the families will not be handed title deeds for the properties; but will be responsible for their maintenance.

To give in detail more information on why it would be beneficial for the six families to be relocated from their current location, the following mini-sections 6.1-1, 6.1-2 and 6.1-3 were

adapted from the Ingula Conservation and Land Management report of 2019. It describes the risks relating to the current positions of the households that must be relocated; The pictorial view of the current dwelling status is shown in Photos 6.3-1, 6.3-2 and 6.3-3.

## **6.1 Risks Relating to Limited Access to Infrastructure**

### **6.1.1 Water**

Water is extracted by the dweller communities from wetland areas. This involves travelling over steep areas with resultant erosion on tracks. This is particularly visible around the Tshabalala households where family members draw water from the Bedford wetland located approximately in a 360 m distance, with an altitudinal change of 60m. This has resulted in serious erosion on the hill side.

### **6.1.2 Electricity**

No access to electricity.

### **6.1.3 Sewage**

No sewage systems are in place and the open veld is used instead of proper sanitation thus posing health risks

### **6.1.4 Road**

Direct distance to roads is high in some cases, making access to services such as the mobile clinic difficult. Dweller vehicles need to be taken across poor condition tracks to houses, causing damage to both the vehicle and landscape (erosion). In addition, during rainy season, the roads get inundated with water and are impassable. Alternate routes are then used leading to additional tracks. Erosion resulting from multiple tracks on the property lead to degradation of the natural environment and impacts on the wetlands.

## **6.2 Safety Risks**

### **6.2.1 Fire Management**

No fire safety practices are in place. Peaking prepares fire breaks around each house at significant cost and risk. There is no centralised point to store equipment and each family manages associated fire risk alone

### **6.2.2 House Safety**

Houses are prone to damage due to extreme weather conditions due to their construction from non-weather resistant material. There have been reports of structures collapsing.



### **6.2.3 Weather Conditions**

Communities are vulnerable to extreme weather conditions such as snow and flooding. Remote position of houses makes access and support during these periods difficult.

### **6.2.4 Security**

Isolated communities are prone to a security risk.

## **6.3 Environmental Risks**

### **6.3.1 Disturbance**

The presence of houses throughout ecological sensitive areas creates a disturbance in all areas to the detriment of critically endangered species such as the Wattled Crane and Oripi. Control of persons moving through sensitive areas is problematic

### **6.3.2 Wetland**

Continual reliance by people on wetlands as a resource will become unsustainable, and lead to undesired impacts on wetland health. The use of wetlands for both resources and as a waste disposal has a negative impact on natural ecosystems

### **6.3.3 Grazing**

Uncontrolled grazing leads to over-utilisation in certain areas and underutilisation in others. Animals also graze selectively in certain areas, limiting the development of habitats such as montane forests. This in turn reduces natural fire breaks and increases fire risk. The loss of natural habitat will also impact on natural diversity in contravention of the nature reserve objectives

### **6.3.4 Conservations Security**

The wide-spread nature of the current residential houses makes access control difficult, with a major implication on conservation and infrastructure security. Numerous incidents of poaching and other incidents such as unlawful grazing have been recorded on site, and illegal dog hunting often occurs.

### **6.3.5 Ablutions and Waste Management Processes**

No formal ablution facilities exist. Waste is dumped in proximity to houses or veld or burnt thereby resulting in air quality and fire risk implications.

### **6.3.6 Control of Damage Causing Animals**

Community's kraal animals will benefit to be in proximity to houses overnight. The wide distribution of houses makes these animals vulnerable to damage causing animals, and pressure is placed on natural populations of predators

### 6.3.7 Unplanned Fires

The area is prone to fires, in many cases being lit to stimulate grazing by unknown persons. The uncontrolled movement of people through the reserve also results in unplanned fires.

From the above ecological constraints pertaining to the management of the nature reserve and the social challenges the dwellers face where they are currently situated, it became apparent that there would be no other reasonable alternatives to relocation and the solutions that would be feasible in attaining the desired goals would entail reducing the impact on the sensitive part of the reserve and that will be achieved through this relocation process.

To determine the best relocation site within Ingula where the families have always been situated, biodiversity and wetland studies were carried out. These determined the sensitivity of the different areas within the nature reserve in terms of hydrology, archaeology and biodiversity. The site chosen on the northern boundary within the nature reserve had very low sensitivity and was determined to be the best for relocation.

Specialist studies such as Mentis (2005) observed how most parts of the nature reserve were highly eroded and requiring rehabilitation and preventive measures since the soils are erodible. Partridge (2002 & 2004) studies also noted sensitive biospheres in the Ingula area. These studies observed sensitive areas due to the presence of aquatic ecosystems, rare plant species, animal habitats and high bird activity areas as supported by Bird Life South Africa (2013). The result was an avoidance of such sensitive areas and the relocation site was chosen due to low sensitivity and high intensity utilisation capacity as mapped by Eskom. Biodiversity studies done in 2020 by Vlok and van Wyk supported the facts that the relocation site is a low sensitivity site from an ecological perspective.



**Photo 6.3-1: An example of the families' current houses**



**Photo 6.3-2: An example of what the new houses that will be built at the relocation will look like**



**Photo 6.3-3: The proposed relocation site at for the six families**

## **7 MOTIVATION FOR THE PREFERRED SITE AND ACTIVITIES**

The project does not have site alternatives for the reasons discussed in section 6 above. However, there are operational and technology alternatives discussed in Section 8.1. The displaced families had to be settled on a site not far from their original place where their culture, livelihoods, relations, practices and history are rooted. Secondly, they would still get easy access to their usual places such as social amenities, relatives, friends and markets amongst others. Thirdly, being settled in the same region which they have always stayed will not put them at the discomfort of adjusting to new places and new climates. Lastly, the closer they are to the Ingula Pumped Storage Scheme, the more they can enjoy project benefits such as Corporate Social Responsibility Programs and be given preference when there is need for employment. Other areas could have been considered but due to the abundance of fossil discoveries, wetlands, woodlands and grasslands, there were no feasible site alternatives available. The relocation site is the best and only site alternative. Recently there has been a lot of attention and biodiversity protection interests being made in the area being conserved by Eskom which greatly limited the choice for site alternatives. The relocation site ensures that they benefit from ecotourism and other nature conservation

activities as managed by Ingula Nature Reserve, Bird Life South Africa and the Middelpunt Wetland Trust.

## **8 DESCRIPTION OF PROCESS FOLLOWED TO REACH THE PROPOSAL DEVELOPMENT**

The origins of the necessity for relocation can be traced back to 2002, when an EIA was conducted prior to the construction of the Ingula Pumped Storage Scheme (IPSS). One of the modules of that study recommended that Eskom engage all landowners whose land surrounding the IPSS and was comprised of the wetland ecosystem. The need for relocating dwellers from the high ecological sensitivity areas where they were already facing challenges to low sensitivity areas was discussed and supported. The engagements ultimately resulted in Eskom purchasing the land, which was previously used for farming purposes by landowners and had farm tenants working on them. In 2018, the IPSS and its associated land was declared as a nature reserve in terms of the National Environmental Management Protected Areas Act (2003), resulting in the birth of the INR.

As aforementioned, involuntary resettlement in developmental projects have to be done in a way that does not give rise to negative socio-economic and environmental impacts that also result in detrimental mental and financial status of affected individuals. Following the World Bank's IFC Principles and South Africa's legislation, the site was chosen for its ability to provide ecosystem services to the families whilst minimising their impact on the environment. Public consultation was carried out with the affected families.

Specialist studies were undertaken to minimise the proposed development footprint on the natural environment. This also includes notifying the Department of Environmental Affairs and relevant competent authorities

### **8.1 Details of Alternatives Considered**

The whole area covered by Ingula Nature Reserve was assessed through the application of geographic information system tools, site surveys and specialist studies, which showed that there was one low ecological sensitivity site suitable for infrastructural development and outside the IPSS development footprint. Land with sensitive ecosystems such as wetlands and breeding grounds were avoided which left the relocation site as the only site alternative available with minimum negative impacts and maximum positive impacts. Being a residential village development project, technology alternatives considered were discussed in Section 4.2. The work is to be designed in accordance with SANS and other relevant design codes

and standards and it must be properly designed, safe and fit for human occupancy. According to the Ingula Conservation and Land Management, July 2019 report, the following factors supported the suitability of the selected site for relocation:

- Access to roads and other infrastructure – there is a gravel road passing through the relocation site.
- Community expectations and requirements – the families want to stay at Ingula Nature Reserve
- Soil Stability – geotechnical studies will be carried out to determine foundation types required at the relocation site.
- Available Grazing – site visits by biodiversity specialist, as supported by photos in Section 6 show that the area has grasslands suitable for livestock grazing and forage cropping.
- Current disturbance levels – according to Vlok (2020), the relocation site is not disturbance lowering the risk of worsening environmental issues. The survey, however, recommended special care to erosion control.
- Vegetation – Vlok (2020) observed no rare or endangered plant species which can be put at risk by construction work. The site is dominated by grasslands.
- Proximity to wetlands – except from a seasonal stream (which will be avoided) passing through the relocation site, there are no wetlands inside the polygon
- Distribution of endangered species - Vlok (2020) observed no rare or endangered animal species at the relocation site (Section 12).
- Available construction area – the site does not have steep slopes and this factor makes construction work uncomplicated. This also reduces the risks of erosion.

### **Operational Alternatives**

Within the relocation site, there are two alternatives for the orientation of housing units as shown below. Option 1 is to position the six families' houses on one site and divide the remainder of the land into six grazing lands. Option 2 is to divide the land into six plots and establish each family's house in their own plot.



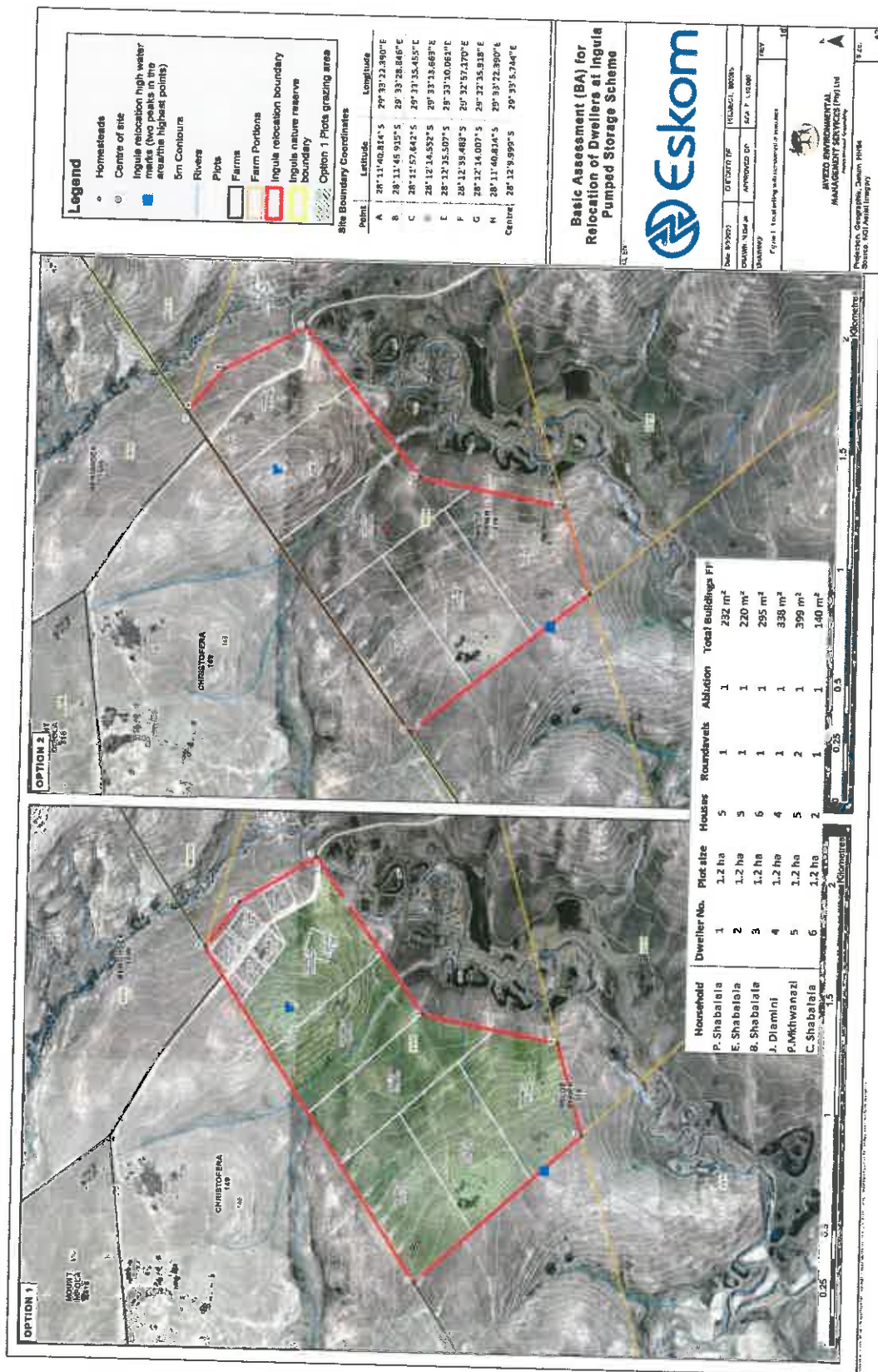


Figure 8.1-1: Local Setting with Considered Alternatives

As shown above in Figure 8.1-1, Option 1 involves partitioning the proposed site into six areas for grazing and cropping purposes, developing houses in one central section along the road. This allows for centralised infrastructure such as sewer and water whilst enabling easy and equal access to the road. Option 2 would segment the area into six portions and erecting dwellings on each section. Infrastructure supply will be considerably more intricate and both cost and environmental impacts will increase. Option 1 is the most preferred alternative from biophysical assessment and social perspective, even though there was one family preferring Option 2, which was perceived as more peaceful and will have limited social conflict issues. Nevertheless, it is also acknowledged that this Option 2 has its own security risks.

### **Construction alternatives**

#### **Building alternatives:**

- Mud houses – these are cheap to construct but are not strong and do not last long. Usually they need replacing in 10 years. They are difficult and risky to install grid-connected electricity.
- Brick and mortar – are more expensive than mud houses but they can last over 80 years with proper maintenance and are very strong. They are easy and safe to install grid or off grid electricity. This is the most preferred option.

#### **Roofing alternatives:**

- Grass thatch –thatch is inexpensive and acts as a natural temperature regulating mechanism for the houses. However, though possible to install electricity or solar on a thatch roof, it is difficult and not safe. Thatch roofs are prone to fires and need constant replacing every 2 to 5 years.
- Zinc or galvanized iron roof – this is very expensive. During rainfall or thunderstorms, they make a lot of noise which may disturb or irritate occupants. It needs replacing every five years. They can get damaged by expansion and contraction. They are maintenance-free and fireproof.
- Tiles –Tiles are generally beautiful and last for over 100 years. They are weather-proof and environmentally friendly. However, tiles are expensive to purchase and source and might break during hail.

Consideration will be between zinc or tiles.

#### **Contractor housing alternatives:**

- Site camp – the contractor can setup camp on the construction site.
- Housed at IPSS – the power station is about 5 km from the relocation site. Housing the contractor at the power station reduces the need for a contractor camp at the construction



site. In the EAP's opinion, a contractor camp may increase the severity of impacts such as soil erosion and waste management during the construction phase. However, housing their camp at Ingula Pumped Storage Scheme reduces the need for new waste management infrastructure, sewer collection and construction of temporary housing units. The construction site can also be guarded at night if construction is not done at night.

### **Technological Alternatives**

Borehole alternatives:

Nine pumping options were considered:

- Mechanical pumps - hand, wind, and hydropower pumps.
- Petrol and diesel pumps - mechanical and electrical. Expensive to maintain and produce emissions.
- Electric pumps - wind electric pumps, PV. high maintenance costs.

The most feasible option for the area is the wind pump due to:

- Low maintenance
- No electric/ power requirement
- Delivers a maximum head of 150 m
- No green-house gas emissions

Municipal water was not considered due to the distance between the relocation site and the nearest town. Van Reenan is 26 km away. Digging a 26 km water pipeline and installing lift pumps for only a few houses will have high economic and environmental costs that are difficult to recover.

Control and Instrumentation alternatives:

- Fully integrated and operational C&I system – easy to use but expensive and complex to maintain.
- Partial electro-mechanic design solution–high maintenance costs of actuators and screw gears.
- Mechanical design solution – most feasible due because it requires minimal user training and induction, has least complex system to maintain and lowest cost.

### **Service Provision Alternatives**

Sewage handling alternatives:

- Collection and/or treatment – expensive and has various risks such as spillage.
- Conservancy tank – This option presents temporary retention and requires regular collection and disposal

The conservancy tank was removed from the feasible alternatives due to the remoteness of the site. A conservancy tank will not function due to the lack of service provision in the area, and the distance to any formal disposal works. Use of this type of facility will lead to significant impacts due to overflowing systems and poor disposal practices.

There is no municipal collection and as such the village cannot be registered with the local municipality for sewer service. Nevertheless, this would not be economically feasible considering the few number of households.

- Even though an option of IPSS collection as considered, where the waste could be stored at a central point in the village and collected weekly or fortnightly and send to Ingula Pumped Storage Scheme where it would be managed, collectively with the power station's waste. This was not a feasible option as the power station is 5 km away.
- Packaged plant - only option that meets environmental standards.

A package plant could be sourced on what is available in the market and an option with an activated sludge system built within a single tank was considered. Typically this would be a batch reactor that will fill, aerate, settle and disinfect the effluent before discharge. The Contractor is to note that, if this is the selected option, the plant is to have a low power consumption and be preferably solar powered as there is no nearby infrastructure for the project and subsequently no permanent power supply.

#### **Preferred Option for Sewage supply**

- Septic tank with soak-away - preferred option but does not meet environmental standards of the area (Illustration 8-1).
- The septic tank with a soakaway is ideal for rural areas such as the projects location. The site is in an isolated area with no connection to a main sewer line. Therefore, this option would be the best option and is dependent on get a concession from the local municipality giving approval to use said system for the village.
- Each homestead will have its own septic tank and soakaway and must meet the following requirements:
  - The septic tank is to operate as a gravity system.
  - The system is to consist of a tank and a soakaway drain.

- Untreated wastewater from the house is to flow into the septic tank where solids separate from the liquids.
- Some solids such as soap scum or fat are to float to the top and form a scum layer.
- Heavier solids are to settle to the bottom of the tank as sludge.
- Self-forming bacteria in the tank is to reduce the amount of solid matter and provides some waste treatment.
- The remaining liquids are to flow out of the tank onto the soakaway.
- •The liquid is eventually taken up by plant root systems or added to the groundwater.
- There should be no power requirement unless a septic tank pump is required.
- The tanker will be sized based on the number of occupants of each household plus 20%.

This option will only be considered if permission for such a system is granted by DHWS. Geotechnical studies must also confirm that the soil is suitable for a septic tank and soakaway option. The management of this option will be undertaken in line with the conditions of authorisation from DHWS.

This is the preferred system for sewage management and is significantly better than most households in the district where “long drops” or the open veld is used.

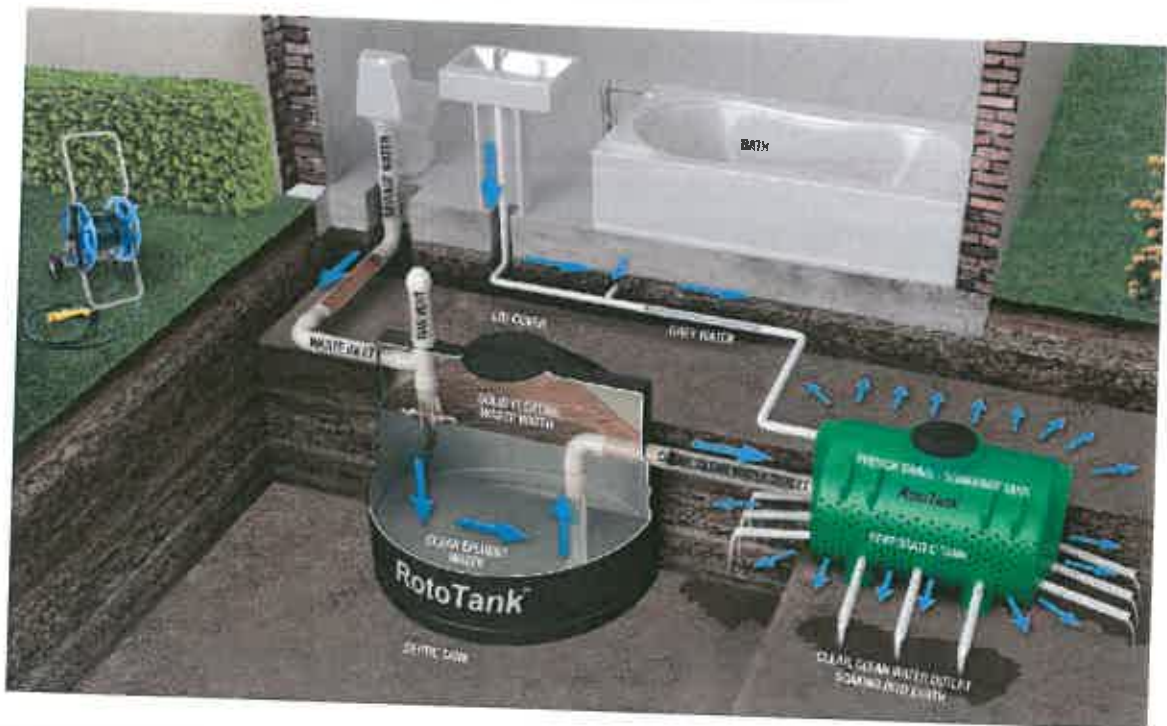


Illustration 8-1: Septic tank example

- Electricity provision alternative:
  - Solar and inverters – this option is the most feasible considering that the area is remote. This also ensures that the villagers do not have to incur electricity bills.
  - Grid connected electricity – possible option but is expensive considering that the area is not remote. The villagers may also face challenges paying electricity bills.

## 8.2 Basic Assessment and Public Participation Process

ESKOM SOC has appointed Myezo Environmental Management Services (Pty) Ltd, as the independent Environmental Assessment Practitioner (EAP), to undertake the Environmental Impact Assessment for the proposed Ingula Relocation Project. It should be noted that during this process there are various stakeholders who are key role players in the success of the process. These stakeholders are: The developer: who would be required to provide information pertaining to their development plans. This information is then processed and assessed for fatal flaws and risks by the environmental assessment practitioner. There is also a suite of technical experts who will be providing input into the environmental process by supplying technical information.

Their respective roles are:

- Determination of the most feasible site for the location
- The provision of architectural and civil design in compliance with the required legislation documents.
- Geological investigation to determine soil conditions and bearing capacities.
- The environmental assessment practitioner act as a facilitator to ensure that the information and project plans are scientifically analysed and that the best options are recommended.
- The IAPs are given an opportunity to process the information and provide their comments. Should there be fatal flaws, the developers respond to the comments and re-visit plans to ascertain how certain identified impacts can be best addressed.
- The other key role players are the competent authority, who are the decision makers in this process.

BAR is the environmental impact assessment process, applied to activities listed in Listing 1 and 3 of the EIA regulations, which are smaller scale activities, the impacts of which are generally known and can be easily managed. Typically, these activities are considered less likely to have significant environmental impacts and, therefore, do not require a full EIA process.

The environmental authorization process prescribed for listed activities under Listing Notices 7, 2 and 3 published in Government Gazette Numbers R983, R984 and R985 respectively, are

defined in the Environmental Impact Assessment (EJA) Regulations which were issued in terms of Section 24(5) of the National Environmental Management Act, 2008 (Act No. 7 of 1998) (NEMA).

The triggered listed activities for this project are as follows: Listed Activities: 12 (x), (xii), 27, and 28 (i) (under Listing Notice 1-GN R983, as amended in 2017 under GN R 327); 12b (i), (iii) under Listing Notice 3-GN R985, as amended in 2017 under GN R324) and therefore, basic assessment procedures will be followed for this application.

The BAR process for this project and the various roles played by different stakeholders is outlined in Chart 8.2-1.

## BASIC ASSESSMENT PROCESS FOLLOWED & ROLES PLAYED BY VARIOUS STAKEHOLDERS



Chart 8.2-1 : BAR Process

### 8.2.1 Public Participation

Volume 2 of this report details the public participation process that has been followed and it also provides supporting documents and appendices.

It is crucial that planning and decisions must take into account the interests, needs and values of interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge. The local indigenous knowledge was sourced and incorporated into the compilation of the environmental safeguarding requirements

A synopsis of the public participation process is provided in this BAR Section which must be read in conjunction with Volume 2 stand-alone report.

The PPP forms an integral part of the EIA process. It is a mechanism that aids to identify potential impacts of proposed projects on the biophysical and the human environments. Identified I&APs are given an opportunity to comment on the proposed project and make recommendations on mitigation requirements. The purpose of the PPP is to ensure that the issues, inputs and concerns of I&APs are taken into account during the decision-making process. This requires the identification of I&APs (including authorities, technical specialists and the public), communication of the process and findings to these I&APs and the facilitation of their input and comment on the process and environmental impacts, including issues and alternatives that are to be investigated. The Public Participation approach adopted in this process is in line with the processes stipulated in Regulation 39 to 44 of the NEMA. The following notification and communication methods were applied during the public participation:

#### Notification

The Public Participation approach adopted in this process is in line with the processes stipulated in Regulation 39 to 44 of the National Environmental Management Act, 1998 (Act 107 of 1998). The following notification and communication methods were applied during the public participation:

- Email communication.
- SMS communication.
- Door-to-door; and
- Telephone communication.

IAPs were notified of the proposed project informing them of the proposed project as well as affording them an opportunity to comment and raise concerns they might have regarding the project. Notification emails were sent to IAPs on 03 August 2020 and door-to-door notification was done on 17 August 2020. IAPs were granted a 30-day period to submit their comments

regarding the proposed project. Proof of notification emails is attached as Appendix 8.2-3 and acknowledgement of receipt register for door-to-door notification is attached as Appendix 8.2-5.

The following documents were shared with the IAPs during the notification process:

On 08 October 2020, a BAR was released for public review and that information is included under Volume 2 of 4.

### **Advertisements**

In fulfilment of the EIA Regulations, GNR 982 Section 42, a newspaper advertisement, notifying and inviting I&APs to participate in the proposed project, has been developed and this will be placed in Harrismith Gazette and Ladysmith Gazette at the beginning of the 30-day public review period opening at the beginning of October 2020. Nonetheless, drafts adverts were shared with IAPs during the notification period. Subsequent to site visit, it was identified that the use of English only, as a medium of communication, will hinder total participation of all groups, thus, adverts were translated to other major languages which are IsiZulu and Afrikaans. Copies of advertisements are attached as Appendix 8.2-11.

### **8.3 Issues raised by Interested and Affected Parties**

The PPP allowed for informed and responsible decision-making by all interested and affected parties. Due to the nature of the project, issues and responses are categorised in two sections namely:

- Historic Comments and Responses
- Comments received in the notification phase

#### **Historic Comments**

The project has been going for a long period, and engagement with community members date back to 2011. During this period, meetings were undertaken between Eskom and the dwellers to be relocated. During this period, the dwellers raised a number of concerns and these are crucial to this project as these also inform responses given during the notification phase. In addition, the EAP will also ensure that such comments are included in the Basic Assessment Report. Table 8.3-1 summarise the issues that were raised and responses given during the meetings that were held between Eskom and the dwellers.

According to the Ingula Land Conservation and Management (2019), Eskom appointed a fulltime social officer whose primary responsibility is to ensure effective relationships with adjoining communities. There were historically significant objections to any developments in the area by a



group of land owners such as the Scheurklip Conservancy, but these have subsequently stopped as the local community has become aware of the benefits and implications of the proposed developments.

Table 8.3-1: Historic Comments and Responses

No.	Issue/Comment	Raised by	Response	Raised at
	<b>Socio-Economic</b>			
	Sourcing of Labor			
	KB stated that the appointment of the civil contractor will be finalized within the next month and then all studies will be initiated.	Kritesh Bedessie (Eskom Representative)		Ingula Agri-village Meeting held on 21 May 2018.
	<b>Channels of communication/Handling of community grievances, Communication representation</b>			
	KB stated that all communicate and requests or concerns by families should be directed to him.	Kritesh Bedessie (Eskom Representative)		Ingula Agri-Village meeting held on 14 November 2017.
	Families will be communicated to on the outcome of each process with the development and construction of the village	Kritesh Bedessie (Eskom Representative)		Ingula Agri-Village meeting held on 14 November 2017.
	KB stated that the rules and conditions that will apply to the households for living within the agri-village will be formalised into the resettlement agreement once the layout and design of the homes and village is finalised.	Kritesh Bedessie (Eskom Representative)		Ingula Agri-Village meeting held on 06 March 2018.
	<b>Land</b>			
	Mr Ephraim Shabalala raised a concern regarding whether there will be sufficient grazing for their livestock.	Mr Ephraim Shabalala	KB stated that there will be ample grazing at or around the village, households will be allowed to undertake controlled grazing on Eskom owned land.	Ingula Agri-Village meeting held on 14 November 2017.
	One family (Bheki/Jane Shabalala) doesn't want to live within the village and stated that they would like to reside with the Solomon Dlamini household on the farm Maggies Deel.	Bheki Shabalala	KB explained that this is not possible as that farm is dedicated to the Solomon Dlamini family. KB stated that the family has until the end of April to state whether they will live within the village or relocate to a separate farm to be identified.	Ingula Agri-Village meeting held on 06 March 2018.
	KB asked whether there would be any families willing to be resettled outside the Eskom property whereby they would have separate title to their land they occupy.	Kritesh Bedessie	None of the families wanted to live on their own property and they prefer living within the village under Eskom's rules and terms.	Ingula Agri-Village meeting held on 06 March 2018.
	Ephraim Shabalala made a recommendation in that he stated that if the graves will be left at the old homesteads why can't Eskom then perhaps look at using his present location as a future graveyard.	Ephraim Shabalala	KB stated that the concerns and recommendation will be discussed with the project team at the next meeting.	Ingula Agri-Village meeting held on 21 May 2018.

No.	Issue/Comment	Raised by	Response	Raised at
	<p>Families were asked to decide as to how they would like to select their respective homesteads. KB suggested that we give each homestead a number and throw it into a hat and then ask the respective family heads to pick a number out of the hat. The number chosen will reflect their homestead.</p>	<p>Kritesh Bedessie (Eskom Representative)</p>	<p>The families were not in favour of this and suggested that they rather on their own decide whom they would like to reside next to.</p>	<p>Ingula Agri-Village meeting held on 06 March 2018</p>
	<p>KB stated that Eskom wanted to know the families' views with regards to Eskom's request whether if the families will make use of the graveyard at Bronsbury.</p>	<p>Kritesh Bedessie (Eskom Representative)</p>	<p>The families raised the following concerns: Bronsbury is too far and so what about the transport costs to and from the graveyard. The road conditions are difficult to get there. The size of the existing graveyard is too small.</p>	<p>Ingula Agri-Village Meeting held on 21 May 2018.</p>
<b>Water</b>				
	<p>Mr Ephraim Shabalala raised a concern regarding whether there will be sufficient water at the Agri-village</p>	<p>Mr Ephraim Shabalala</p>	<p>KB stated that there will be ample water at or around the village as presently there is sufficient water for animal consumption.</p>	<p>During the Ingula Agri-Village meeting held on 14 November 2017.</p>
	<p>A Contractor is in the process of being appointed to determine the availability of water.</p>	<p>Nhlanhla Ngema (Eskom Representative) Kritesh Bedessie (Eskom Representative)</p>	<p>KB stated that he will raise his concerns to the project team and will revert once he has had a response</p>	<p>Ingula Agri-Village meeting held on 06 March 2018.</p>
	<p>There was a concern raised about the low-level bridge as he stated that it floods during the raining season thus allowing no access. He wanted to know if there is no other area that Eskom can perhaps look at constructing the village at another location and he asked whether Eskom had a plan B should the need arise</p>	<p>Ephraim shabalala</p>	<p>KB stated that he will raise his concerns to the project team and will revert once he has had a response</p>	<p>Ingula Agri-Village meeting held on 21 May 2018.</p>
<b>Houses</b>				
	<p>The Mavuso household requested that the design of the roofs for the houses be flat instead of pitched</p>	<p>Mavuso</p>	<p>KB stated that the message was conveyed to the design team and they will take this into consideration when doing the</p>	<p>Ingula Agri-Village meeting held on 06 March 2018.</p>
	<p>The Mavuso Household requested that the rondavels' roofs also</p>	<p>Mavuso</p>	<p>KB stated that he conveyed</p>	<p>During the Ingula Agri-Village meeting held on</p>

No.	Issue/Comment	Raised by	Response	Raised at
	be lowered as they are presently too high		the request to the design team and they will take this into consideration when doing the designs.	06 March 2018.
	KB conveyed that the families must take note that they will be responsible for all the upkeep and maintenance of all the infrastructure once they have taken occupation of the village	Kritesh Bedessie (Eskom Representative)		During the Ingula Agri-Village meeting held on 06 March 2018.

### **Comments and Responses received in the Notification Phase**

This section of the report synthesizes the issues and concerns identified by interested and affected parties during the notification period of the public participation process. The details of the raised issues, comments and concerns are detailed in Table 8.3-2, the input has been collated from the written comments submitted by the landowners during door-to-door notification process. Comments were submitted in IsiZulu and these have been translated to English for purposes of reporting. Proof of comments submitted is attached as Appendix 8.2-15. No comments were submitted through emails and or verbal communication.

Table 8.3-2: Issues Raised and Comments Received during the Notification Phase

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
<p><b>Health and Education</b></p> <p>1. We travel long distances to get to the clinic, we would appreciate having one close by</p>	<p>Nonhlanhla Shabalala</p>	<p>There is limited land within the nature reserve for the development of such amenities. Eskom acknowledge the need for a health facility close to the reserve. The Social Survey Report (2005) indicate that there is a mobile clinic that services the area once a month, thus residents will have to make use of such services. In addition, when the relocation process is finalised, the dwellers will be situated close to the major roads and this might positively impact access to basic services such as clinics. However, Eskom will make efforts to pass the concern to the relevant and responsible authorities through existing inter-governmental and stakeholder forums.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	
<p>2. We walk a very long distance to get to the clinic and we have to pay money for the public transports</p>	<p>Thuleleni Shabalala</p>	<p>Addressed, refer to Response 1.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 7</p>
<p>3. May we please have a school and a clinic</p>	<p>Nesta Bessie Mkhwanazi</p>	<p>Addressed. Refer to Response 1.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 7 addresses the possibility of proximity to roads and other services</p>
<p>4. May we please have a school, clinic, electricity, and a community hall</p>	<p>G Dlamini</p>	<p>Regarding the issue of school, clinic and community, it should be noted that the provision of such amenities was not part either options signed for on the agreements between Eskom and the dwellers. The issue of limited land for development of amenities was discussed with the dwellers</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 8. Solar will be installed</p>

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
5. We need a school; our kids have to leave home at a very young age because there is no school around	Thuleleni Shabalala	before the signing of the agreements. Concerning electricity provision, the new houses at the relocation site will have solar power and also equipped for possible connection to the national grid in the future. Addressed. Refer to Response 1 and 4	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7 addresses the possibility of proximity to roads and other services
<b>Access Roads</b>				
6. The road is not of good standard, ambulances struggle to get to their place because of the roads.	Nonhlanhla Shabalala	The state of the road is applicable to the existing settlement setting. With the implementation of the project, the relocation site will be closer to the road which will also be upgraded during the construction of the new houses. During operational phase, the maintenance of the road will be cooperatively undertaken by Eskom and the residents, through community forums. Addressed. Refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
7. May we please have proper roads	Nesta Bessie Mkhwanazi	Addressed. Refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
8. The roads are not of good standard, cars cannot move, there are potholes and rivers, may we also have a bridge	Thuleleni Shabalala	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
9. There are no proper roads.	Fikile Martha Mdaki	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
10. May we please have proper road	G Dlamini	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	at relocation site Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
11. Please fix the road used by pedestrians because the rain season is around the corner, rivers will get full and it will be hard to use the route.	Nesta Bessie Mkhwanazi	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
12. The condition of the road is very bad, and it is not promising that the municipality will get it fixed	Siphamandla Mchunu	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
<b>Job Opportunities</b>				
13. Please hire people from around the community because they know how to control the veld fires	G Dlamini	There is a local forum, which is dedicated in addressing employment matters and ensure that job creation and opportunities are distributed in an equitable and fair manner During project implementation (construction), operational and decommissioning phases a commitment is made to prioritize the locals when allocating jobs and opportunities. This has been addressed, job opportunities will be made available and the locals will be given first priority. However, due to the current economic situation, job opportunities may be not be on a large scale.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10
14. Eskom said they will create job opportunities so that people can be able to survive, years have passed and there	Beauty Mavuso		Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10



Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
are still no jobs.		During the construction phase of the relocation project, there may be need for unskilled and semi-skilled labour and these will be sourced from the community. In addition, Eskom has noted the matter that creating job opportunities for the whole community might be impossible, thus, communities are encouraged to start small scale self-sustenance projects. Also refer to Response 13.		
15. We would appreciate it if Eskom can provide job opportunities for us and also take our children to tertiary.	G Dlamini	Issues of employment opportunities addressed in Response 13 and 14 above. Concerning sponsoring children's education, Eskom may assist the parents with employment or self-employment opportunities thereby empowering them to meet the financial needs of their children's academics. Residents are encouraged to take advantage of opportunities provided by bursary funds such as NSFAS. In addition, the agreement between Eskom and the dwellers was that a mentorship and training programme will be established, thus, residents are encouraged to maximize such opportunities once they arise. Addressed, refer to Response 13 14 and 15.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10
16. We need job opportunities.	Thuleleni Shabalala		Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10
17. We put our CVs in the UBuhle buyeza agricultural co-operative, we were not successful	G Dlamini	Communities are encouraged to start up their small businesses for self-sustenance. Eskom will therefore facilitate ways to secure grants from different funders, private and public, for the co-operatives. The main aim is to empower families to sustain a	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10 refer to how employment opportunities may be created

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
18. Eskom, may we please have jobs and electricity, we are dying of hunger.	Nesta Bessie Mkhwanazi	<p>profitable self-employment model such as market farming as well as curbing the need to seek employment.</p> <p>The issue of electricity will be addressed since solar power is going to be installed as part of the relocation developmental activities. In addition, there are plans to connect the dwellers to the grid in the future. Dwellers will be given first priority for employment opportunities that fit their skills, if any arise. Where possible, they will also be trained and equipped with new skills to meet the needs of certain vacancies that may arise such as nature reserve patrols. Residents should also make use of Eskom facilitated funded co-operatives and practice farming which will alleviate hunger.</p>	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 4, 7 and 10
<b>Deforestation</b>				
19. There were forests where we used to fetch firewood, now they are all gone.	Fikile Martha Mdaki	<p>Seeing that this area will be managed as a nature reserve, cutting of trees that are not supervised will not be allowed. Firewood can be availed in a controlled structured manner, as part of the alien invasive control and management processes. This means that cleared alien invasive species can be given to locals for use as firewood.</p>	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 refers to how solar will be installed and this will be used instead of firewood
<b>Veld Fires and Reserve Management</b>				
20. The livestock cannot be controllable because they did not use wire to separate the yards	Fikile Martha Mdaki	<p>Nature reserve is legislated to ensure free movement of wildlife and cattle will only graze under controlled conditions, therefore, grazing areas will be fenced. As a reminder of the current agreements and for</p>	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 describes how there will be plots for grazing and gardens

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
21. Ever since Mr Dijari left, the veld fires are not controlled. The grazing lands burn, and our livestock is left with no food and ends up dying.	Nesta Bessie Mkhwanazi	<p>background, it is also important to note that, as agreed with Eskom in the negotiations, any dweller wishing to increase their livestock beyond the agreed number must consult with the Plant Manager and be prepared to pay the R30 (subject to negotiation depending on environmental costs) per month per excess livestock. Adaptive management principles are adopted pertaining to grazing within the nature reserve. Entry point will be management and monitored to avoid overgrazing. Sensitive areas such as certain indicated floodplains will be off-limits for grazing.</p> <p>Eskom will manage and properly control any burning if required. It is acknowledged that the dwellers are keen to participate in veld fire control in the interest of protecting their properties and livestock, but this participation must be within the veld fire control committees and Eskom policies. Dwellers will be trained on smart farming and this includes livestock. Next year more bales will be cut early to provide assistance but importantly, firebreaks must be burnt and completed by prescribed timelines in alignment with regulatory framework and these cannot be individual's responsibilities.</p> <p>Even though there are no concerns here from the dwellers, Eskom is committed in working with the occupiers of land to ensure that they are aware of environmental compliance requirements such as the need to preserve wetlands and avoid</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4 describes how there will be plots for controlled grazing and gardens</p>
22. No environmental concern.	Siphamandla Mchunu		<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 10: Environmental Impacts Analysis</p>

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
		<p>them, and not to aggravate the already erodible soils as recommended by experts and within the key principles of adaptive management concept which is also adopted in handling grazing matters within the nature reserve.</p>		
<p>23. The grazing land gets burned, can we please be the ones who burn the veld because we are familiar with the place, we will be able to control it so that there is a portion that is left for our livestock.</p>	<p>G Dlamini</p>	<p>Fires are one of the reasons why Eskom wants to move them (this is addressed in the report briefly). Eskom has committed to train them in environmental management skills. Ingula Nature Reserve Management will determine where there is need for controlled burning to remove moribund as recommended by Dr Mentis.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4 describes how there will be plots for controlled grazing and gardens</p>
<p>24. The grazing lands have been burnt and our livestock has no food.</p>	<p>Beauty Mavuso</p>	<p>Refer to Response 21.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4 describes how there will be plots for controlled grazing and gardens</p>
<p><b>Safety</b></p>				
<p>25. We are not safe here at Eskom.</p>	<p>Beauty Mavuso</p>	<p>The motivation for the relocation is to ensure that the nature reserve is adequately managed, which is the reason why the dwellers are being moved from the most sensitive to the less sensitive part of the nature reserve, which also located on the edge to enable better access and control of nature reserve activities. There is as such limitations placed on what the dwellers can do because this is a nature reserve. However, safety aspects are at the forefront of Eskom's key priorities and the dwellers will be covered under those</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Sections 1, 2 and 3 describes the relocation site and its attributes</p>

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
26. Firefighting equipment should be close by so that we can be able to protect ourselves because the fires start at night.	Beauty Mavuso	<p>safety rules and protocols.</p> <p>It must be noted that the current scenario, whereby dwellers are scattered throughout the reserve; makes it difficult to manage these fires. Also, currently there is no centralised point to store fire equipment and each family manages associated fire risks alone. The planned relocation will ensure that there is an organized and structured manner to address fires.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	Section 6
<b>Dissatisfaction about Eskom</b>				
27. Eskom does nothing for us.	Beauty Mavuso	<p>Eskom considers dwellers for temporary and long-term employment opportunities that fit their skills. It is also important and crucial to note that Eskom has gone beyond the legal and IFC requirements to make sure that dwellers' standard of life improves. The current economic challenges also affect Eskom's capacity to provide much needed employment opportunities. Nevertheless, there are structures and forums which include affected local municipalities and ward representatives, where employment strategies are discussed and implemented, which the key adopted principle being prioritization of locals</p> <p>There were various challenges facing the implementation of the relocation such as economic hardships and the COVID-19 pandemic. The project will be underway soon. Also refer to Response 27</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	Sections 1, 2 and 3 describes the relocation benefits
28. Eskom does not help us with anything.	G Dlamini		<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	Sections 1, 2 and 3 describes the relocation benefits
<b>Socio-economic and Livelihoods</b>				

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
29. If successful, the project will enable people to get work, get skills and various business opportunities.	Siphamandla Mchunu	These are some of the identified positive impacts in the SEIA report. Refer to Section 14.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 10
30. May we please be provided with bigger yards so that we can be able to plough and also have our livestock inside the yards?	Nesta Bessie Mkhwanazi	Agreements have been signed in terms of how many hectares each household is getting; and how it can be used. With training in smart farming, the land sizes provided can be sustainable utilised. Refer to Response 20.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4
31. I have cows, goats, sheep, and horses.	Thuleleni Shabalala	There are limitations (Ingula Management Plan) in terms of how many and what animals any dweller can keep. To alleviate the impact of these restrictions, measures have been agreed to with the families. On the first limitation, families can get written approval from the Plant Manager to either modify or develop their houses in the future. Also, if they want to graze more livestock than is allowed, it must be negotiated and will be based on environmental consideration and cost. (Families would have to pay a monthly fee of R30 livestock unit per month.)	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4
32. I do not have any businesses; I survive on farming. I plant mealies, beans, potatoes then I sell so that I can survive. My livestock includes (Cows, goats, sheep, horses, and chickens) I also sell them so that I	Nesta Bessie Mkhwanazi	A livelihoods restoration plan will be implemented including skills develop training.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 5 and 16

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
can survive				
33. I survive on (mealie, beans, potatoes) I also have (Cows, goats, sheep) I sell pigs	G Dlamini	Addressed, refer to Response 32	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 (grazing and gardening), 5 and 16 (livelihoods)
<b>Project Implementation Recommendations</b>				
34. The material to be used when working should be kept in the community	Beauty Mavuso	Leftover material from construction is subject to recycling, reuse and approved disposal. Any re-allocation of such material should be done within safety regulations to ensure that it is safe for human usage and will not result in litigation risks.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 10
35. To cut the cost the project should consider building next to the old labour camp, next to the road for access to services.	Siphamandla Mchunu	Alternatives were considered where the community and reserve planners considered the area which is being recommended as favorable and options were agreed upon. The two options with respect to allocation or appropriation of land occupancy are now being considered along with a determination of the availability of water through ground water investigations are underway. The availability of water is a crucial factor which supersedes relocation costs when it comes to promotion of livelihoods and cost(s).	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 8.10
<b>Business Development</b>				
36. May we please have a tractor that will grind grass for the cows	G Dlamini	Addressed, please refer to Response 22.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
<b>Water Supply</b>				

Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
37. May we please have a windmill in every household.	G Dlamini	Windmills per household are part of the infrastructure to be provided for the relocation project.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
<b>Specific Project Alternatives</b>				
38. I prefer an alternative where I will be living alone but I'm concerned about the hectares, they seem to be small.	Thuleleni Shabalala	The agreements have already been signed and the dwellers were in agreement to what was offered in terms of plot sizes and settlement or layout plans. Refer to Response 39 as well.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7
39. I choose an alternative where I will be living alone so that I can be able to do my own thing and to avoid conflicts.	Nonhlanhla Shabalala	The environmental impacts of the two options will be evaluated with this input in mind.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7
<b>Enterprise and Skills Development</b>				
40. When the building commences, can we please have builders with certificates	G Dlamini	Locals will be given 1st preference depending on the availability of the skills categories and other qualifying criteria.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 8 and 10
<b>Communication</b>				
41. Communication through celiphones is hard since there is no network coverage here.	Fikile Martha Mdaki	Improvements in communication and or network coverage were not part of the agreed services to be offered by Eskom as this is a responsibility of the dwellers and their service providers. However, Eskom note this to be a very relevant concern.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
42. May we please have network towers.	G Dlamini	Addressed, please refer to Response 41	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	



Issue/Comment	Raised by	Response	Mode of Receipt	Section where Addressed in the Bar
<b>Current Relocation Buildings and Management of Outputs</b>				
43. The building of the houses commenced this year. We are not satisfied with the houses.	Beauty Mavuso	<p>The Mavuso Family was initially part of the relocation project but have opted to be built a house in Mawaneskop (tribal area), north of Ladysmith. Eskom is responsible for the building project, which commenced in July and currently in progress.</p> <p>Ms Mavuso is dissatisfied and wants two roundavels verses the one that is currently planned. Eskom Real Estate is to meet with the Mavuso Family to address the (rondavel) issue and provide detailed explanation of the guild lines that was applied for a like-for-like building agreement.</p>	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 1

**Issues raised as part of the BAR notification phase**

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<b>Health and Education</b>				
44. The proponent has noted that Klein Drankesberg Trust Farm forms an integral part of that wider nature reserve prospect.	Thamsanqa Nhlapo c/o Masibiya-Mavuso	The matter of collaboration and cooperation between the key stakeholders is welcome and has been indicated as part of the mitigation measures in the environmental management programme.	Comment submitted on the reply slip on 01 November 2020 via email, subsequent to the notification of stakeholders about the environmental authorization process.	Section 8 Section 10
45. The project must be commended on the goodwill gesture of relocating the	Thamsanqa Nhlapo c/o Masibiya-	Thank you for supporting the relocation project which will not only result in an improvement in	Comment submitted on the reply slip on 01 November 2020 via email, subsequent to the notification of stakeholders about the	Section 8 Section 10

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<p>current farm dwellers as outlined in the brief, to build them proper housing facilities with all the required livable amenities. Klein Drakensberg Trust Farm has 1 dweller (Mrs Masibiya-Mavuso) who over the year lived very closely with the current Ingula Farm dweller as good neighbors. It remains our wish that someday we could also afford "Masibiya" a similar kind of opportunity where her life and that of her children could be changed for better.</p>	<p>Mavuso</p>	<p>the lives of the dwellers but the community as a whole.</p>	<p>environmental authorization process.</p>	
<p>46. The Municipality would like to support the proposed project under the following conditions:</p> <ul style="list-style-type: none"> <li>i. That environmental issues that impact on the biophysical environment are taken care of</li> <li>ii. That artefacts of heritage or archaeological that are disturbed are mitigated</li> <li>iii. That significant long-term visual impact that would occur is within an area with similar development</li> </ul>	<p>Maluti-A-Phofung Municipality</p>	<ul style="list-style-type: none"> <li>i. Using industry best practices, IFC Performance Standards and recommendations by experienced specialists who carried out baseline studies in the project area, a thorough Environmental Management Programme was produced to avoid, minimise, mitigate and manage any issues on the biophysical environment, cultural heritage environment and the socio-economic</li> </ul>	<p>Comment submitted on 08 November 2020 via email subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 8 Section 10 Section 5</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
47. Kindly specify which sewage treatment alternative will be used and how it will be managed/handled	Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTE)	<p>ii. environment. Refer to (i)</p> <p>The project will involve the construction of standard and long-term structures. This will definitely have long-term visual impacts on the natural look of the environment. However, specialist studies done by specialists such as Mentis (2005) and Partridge (2006) showed that the selected area is a high utilisation zone and the least ecologically sensitive. Being on the northern boundary of the nature reserve, the extent to which the activities can negatively impact biodiversity within the nature reserve is minor.</p>	Comment submitted on 17 November 2020 through email (letter attached to the email) subsequent to the submission of documents to the authority for public review and commenting.	Section 4.2.3 Section 8.1

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
		<p>preferred.</p> <p>Two feasible options were thus evaluated, and these are the septic tanks with soakaways and the packaged plant. Diagrammatic presentations of the two options are attached as Appendix 1.1-1. Subsequent to the evaluation of the two options, it was discovered that the use of a Septic Tank with soakaway is ideal for this rural environment. This is the commonly used system in the area, which is more environmentally sound, and will protect the environment from the usual practice of using the open veld with its associated health risks. For each of the options, necessary permissions will be sought from the relevant regulatory authorities such as Department of Human Settlements, Water and Sanitation. Proper geotechnical studies will be undertaken prior to installation of these systems, to confirm the soil's suitability for the septic tank, with its associated soak away option.</p> <p>The second option is the packaged plant, where a batch reactor will fill, aerate, settle and disinfect the effluent before discharge. This plant was considered due to low power consumption and since it could be preferably solar powered since there is no nearby permanent power supply. Most significantly, the Department of Environment, Fisheries, Forestry</p>		

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
48. Upon reviewing, it was noted that there is a watercourse present on site, kindly revisit Listing Notice 1 and activity 14 (ii)(a)(c) b. i (aa) (bb) (dd) (ff) (gg) (hh) of Listing Notice 3, also check activity 19 of Listing Notice 1.		<p>(DEFF) Minister has just signed approval to have Ingula declared a Ramsar site which means it is a wetland of global importance. Therefore, the package plant will not work in this environment and will pose a risk to the wetland status.</p> <p>The preferred option is the Septic Tanks with a soakaway.</p> <p>No development will be undertaken within sensitive areas i.e., watercourses and or 32 metres from the watercourse or within the floodlines. Plots will be situated more than 100 metres from the riverbeds. Also, there is no development setback that applies. A map indicating the plot distances from the streams is attached as Appendix 2.1-1. However, it has been noted that the streams are cutting across the grazing areas that are part of the development. For this reason, Activity 12 (iii) (a) (c) of Listing Notice 1 and Activity 14 (ii)(a)(c) b. i (aa) (bb) (dd) (ff) (gg) (hh) of Listing Notice 3 will be included on the list of triggered activities being applied for. There is no anticipated dredging, excavation and removal of soil, sand, pebbles or rocks from the watercourse. Therefore, Activity 19 will not be triggered and will not be added to the list of activities being applied for. A detailed table summarising the activities, as listed within the listing notices and</p>	<p>Comment submitted on 17 November 2020 through email (letter attached to the email) subsequent to the submission of documents to the authority for public review and commenting.</p>	Section 4

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<p>49. Specify on how construction solid waste and domestic waste will be handled.</p>		<p>reasons for exclusion is attached as Appendix 2.1-2.</p> <p>At source, separation of waste will be practiced. Solid waste, in the form of rubble, generated during the construction phase will be used for erosion control within the nature reserve and any waste that is not suitable to be utilised for erosion control, will be disposed at a registered land fill site. Similarly, inert construction waste will be disposed at the nearest licenced/registered landfill site and scrap metal will be disposed of at the nearest licenced scrap metal recycling facility.</p> <p>Metal or plastic refuse bins, with lids, will be used to store domestic waste and will be collected to be disposed of at the nearest refuse disposal site. Organic solid waste will be composted. Waste management practices to be implemented during construction and operational phases is detailed under Section 15.4 of the Project Environmental Management Programme (Volume 3 of 4).</p>	<p>Comment submitted on 17 November 2020 through email (letter attached to the email) subsequent to the submission of documents to the authority for public review and commenting.</p>	<p>Section 8</p>
<p>50. Which option of the location is the preferred one and also confirm whether that one family that was preferring Option 2 is satisfied with the chosen option?</p>		<p>Subsequent to environmental and social assessments undertaken, Option 1 has been chosen as the preferred site. Engagements were done with the family that had an opinion of settling for Option 2 and the family indicated that they were satisfied with Option 1 as the preferred option. Confirmation that the matter of Option 2 was simply</p>	<p>Comment submitted on 17 November 2020 through email (letter attached to the email) subsequent to the submission of documents to the authority for public review and commenting.</p>	<p>Section 8</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
51. It has been noted that a borehole will be drilled on site, ensure that it is registered with the Department of Water and Sanitation.		<p>raised as a preference and not as a refusal to move to Option 1, was sought from the family and this is attached as Appendix 4.1-1.</p> <p>We have noted the comment and the proponent shall seek the required licences and or authorisations after water prospecting and establishment of borehole infrastructure.</p>	<p>Comment submitted on 17 November 2020 through email (letter attached to the email) subsequent to the submission of documents to the authority for public review and commenting.</p>	Section 6
<b>Job Opportunities</b>				
52. The community of Maluti-a-Phofung would benefit from this project both on health environment and job creation	Maluti-a-Phofung Municipality	<p>Your support for the project is appreciated and much needed. The door is always open for any comments and ideas at any phase of the project. Eskom's plans for improving the lives of the dwellers and communities can only be made possible with the support, communication and cooperation of the local municipalities. Definitely the environmental and social benefits of the project outweigh the impacts which will be reversed or mitigated.</p> <p>At all phases of the project, there will be open communication channels between Eskom and the community members which include Mrs Mavuso. As part of social impacts management, preference for employment opportunities will be given to community members and we recognise that Mrs Mavuso and her family are part of the community. Special interest will be paid to women and youths.</p>	<p>Comment submitted on 08 November 2020 via email subsequent to the notification of stakeholders about the environmental authorization process.</p>	Section 8 Section 10
53. It remains our wish that someday we could also afford "Masibiya" a similar kind of opportunity where her life and that of her children could be changed for better.	Thamsanqa Nhlapo c/o Mrs Masibiya-Mavuso	<p>At all phases of the project, there will be open communication channels between Eskom and the community members which include Mrs Mavuso. As part of social impacts management, preference for employment opportunities will be given to community members and we recognise that Mrs Mavuso and her family are part of the community. Special interest will be paid to women and youths.</p>	<p>Comment submitted on the reply slip on 01 November 2020 via email, subsequent to the notification of stakeholders about the environmental authorization process.</p>	Section 8 Section 10

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<b>Cultural Heritage Issues</b>				
54. The SAHRA APM unit notes that heritage specialist studies have been undertaken for the proposed development area in 2004, however, since the time the heritage studies were undertaken, changes to the surface are highly likely due to being degraded by weathering, therefore an updated assessment of heritage that reflects the current status of the environment is required	South African Heritage Resources Agency (SAHRA)	Heritage Specialists were commissioned and a Heritage Study, including Paleontology and Archaeological studies is being undertaken and will be uploaded to SAHRA portal by 10 December 2020.	Comment uploaded on SAHRA portal on 21 August 2020 subsequent to case opening on SAHRA website.	Section 8.4.6 Section 10 Section 11
55. SAHRA therefore request that a field-based Palaeontological Impact Assessment (PIA) and Archaeological Impact Assessment (AIA) be undertaken and attached to the case along with the 2004 heritage studies undertaken by Anderson and Anderson. The .kml file must also be attached to the case.	SAHRA	The Archaeology and Paleontology Reports undertaken in 2004 were uploaded to SAHRA website on 16 November 2020, and a kml / kmz file was uploaded on SAHRA portal on 18 November 2020.	Comment uploaded on SAHRA website on 27 October 2020 subsequent to the notification of stakeholders about the environmental authorization process.	Section 8.4.6 Section 10 Section 11
56. A comment dated 21/08/2020 was issued by the SAHRA which requested that a Heritage Impact Assessment be undertaken inclusive of a Palaeontological Impact Assessment and		Following a site visit by the Paleontologist and Archaeologist of 27 November 2020, the Heritage Impact Assessment Report was finalised and the Report was loaded on SAHRA portal on 10 December 2020.	Comment uploaded on SAHRA website on 02 December 2020 following the uploading of documents on SAHRA portal as was requested in previous comments.	Section 8.4.6 Section 10 Section 11



ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<p>Archaeological Impact Assessment be undertaken and attached to the case on SAHRIS. The comment also requested that .kml file be attached to the case. On the 19/10/2020 the draft BAR along with the appendices were attached to the case, but the requested heritage specialist report was not attached along with the submitted documents. The .kml file was not attached to the case. It was noted on page 166 of the draft BAR that that heritage specialist studies were undertaken for the Nature Reserve in 2004 and Palaeontological and Archaeological heritage resources were discovered and sent to SAHRA and the Ingula Cultural Center. The specialist studies undertaken in 2006 were uploaded to the case and the on the 16/11/2020, but the requested PIA and HIA report were not submitted. The .kml file that outlines the development footprint was also attached to the case on the 18/11/2020 which shows that the development area is very highly sensitive for palaeontological heritage resources as per the</p>				

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
SAHRA PalaeoSensitivity Map. The SAHRA still request that a field based Palaeontological Impact Assessment (PIA) and Archaeological Impact Assessment (AIA) be undertaken and attached to the case before further comments can be issued.				
<b>Socio economic and livelihoods</b>				
57. No alternative project at the moment. But will particularly be keen in engaging further on the breeding and sharing of land for game farming.	Thamsanqa Nhlapo c/o Masibiya-Mavuso	Specialist studies confirmed that the soils at Ingula are very erodible and this is being worsened by overgrazing. As such, livestock and game breeding will be regulated by Ingula Nature Reserve Management since the area has been classified as a protected area. However, there may be no need for dwellers and other community members to have excess animals since Eskom will give preference for employment to locals thereby creating a stable source of income. Tourism will also create more opportunities. There is also a general recommendation to train the nature reserve dwellers on the sustainable use and management of ecosystem resources which will benefit both the environment and the community members.	Comment submitted on the reply slip on 01 November 2020 via email, subsequent to the notification of stakeholders about the environmental authorization process.	Section 8.4.2 Section 10
<b>Project support</b>				
58. At this stage there are no	Thamsanqa Nhlapo c/o	Your support for the project is appreciated and much needed.	Comment submitted on the reply slip on 01 November 2020 via email, subsequent to	Section 8

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<p>objections to the project as we believe it aims to transform the lives of farm dwellers while preserving the nature and environmental resources.</p>	<p>Masibiya-Mavuso</p>	<p>The door is always open for any comments and ideas at any phase of the project. Eskom's plans for improving the lives of the dwellers and communities can only be made possible with the support, communication and cooperation of the local municipalities.</p>	<p>the notification of stakeholders about the environmental authorization process.</p>	

As part of the comments that were provided under public review for this BAR, SAHRA have since requested that a more recent archaeological study be undertaken to supplement the study which was conducted for the Ingula Pumped Storage development. This time schedule for such studies will be designed in agreement with DESTEA and SAHRA including the term of reference which would ensure protection of paleontological findings through use of site-specific protocols. The EMPr does make provision for archaeological, paleontological and heritage protection and management.

## **8.4 Environmental Attributes**

This section discusses the environmental attributes of the project location.

### **8.4.1 Geographical Setting**

#### **8.4.1.1 Terrain**

A pictorial view or visual view of the site environmental features is depicted under Figure 8.4-1.

The project site is mainly relatively undulating Savannah grassland of elevation gently rippling around between 1695 and 1730 m and with a small hill that reaches an elevation of 1749 m above sea level. The surrounding areas have a rolling terrain and some hills dotted across the plains. Birdlife South Africa describes the areas surrounding the project site as high altitude grasslands. Some of the surrounding areas have slopes composed of sandstone and shale. Due to dolerite dykes junctures, the terrain has places where it forms terraces, ravines and benches.

#### **8.4.1.2 Settlements**

The project site is located inside the Ingula Nature Reserve on the northern boundary. The general area surrounding this northern boundary are farms that have few buildings each. As such, the area has few houses dispersed over a large area. Most of the farms practice subsistence farming and livestock rearing.

#### **8.4.1.3 Infrastructure**

The area has gravel roads that are used for access to the main tarred road and highways such as the N3 and R102. Ingula Pumped Storage Scheme resulted in the construction of some tarred roads in the local area. Most farms in the area do not have electricity.

#### **8.4.1.4 Administrative**

The project location is under Free State Province in the Thabo Mofutsanyana District and in the Phumelela Local Municipality (FS195).

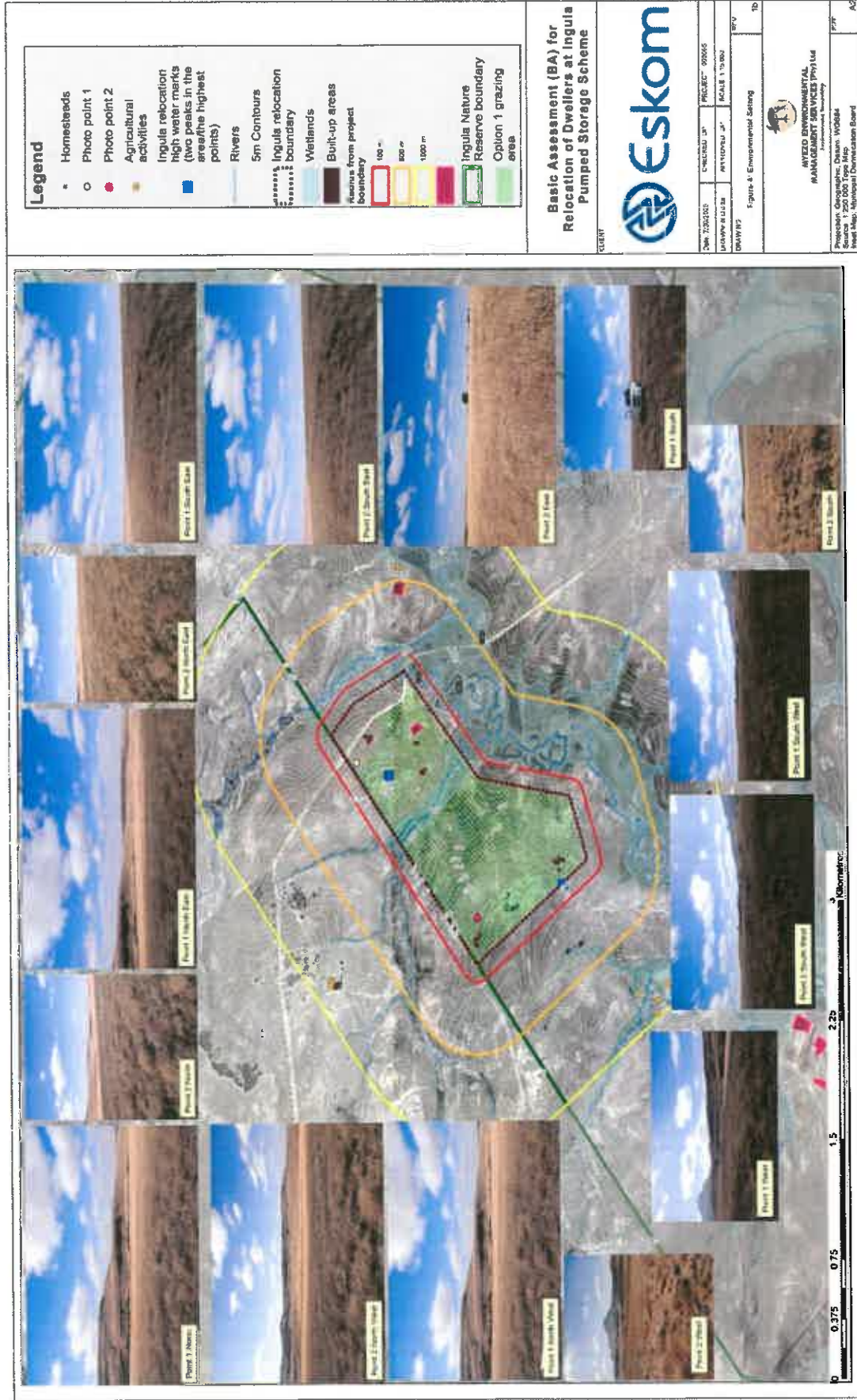


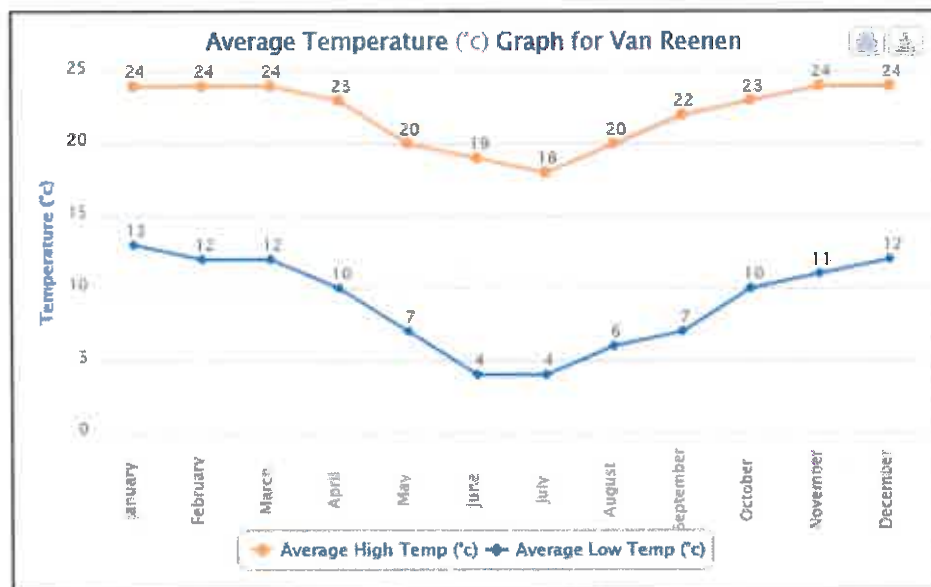
Figure 8.4-1: Environmental Features Pictorial View

## 8.4.2 Physical

### 8.4.2.1 Climate

The climate in the region is generally mild with mild temperatures prevailing throughout the year except in winter which is cold. The winters are mostly dry and rainfall falls mainly during the summer season. Annual average rainfall is 800 – 1000 mm with most of it falling between early November and early April. In winter, temperatures can go below zero but rarely beyond -4oC. The average temperature in winter is 6oC. Summer average temperatures vary around 21oC, peaking at 24oC. (Ingula Nature Reserve Management Plan, 2017)

According to the Ingula Nature Reserve Management Plan (2017) by Eskom Holdings, the area experiences summer rainfall, moderate summers and very cold winters. The cool summers can experience rainfall with possibility of thunderstorms whilst winters occasionally experience snowfall. (Figure 8.4-2 and 8.4-3).



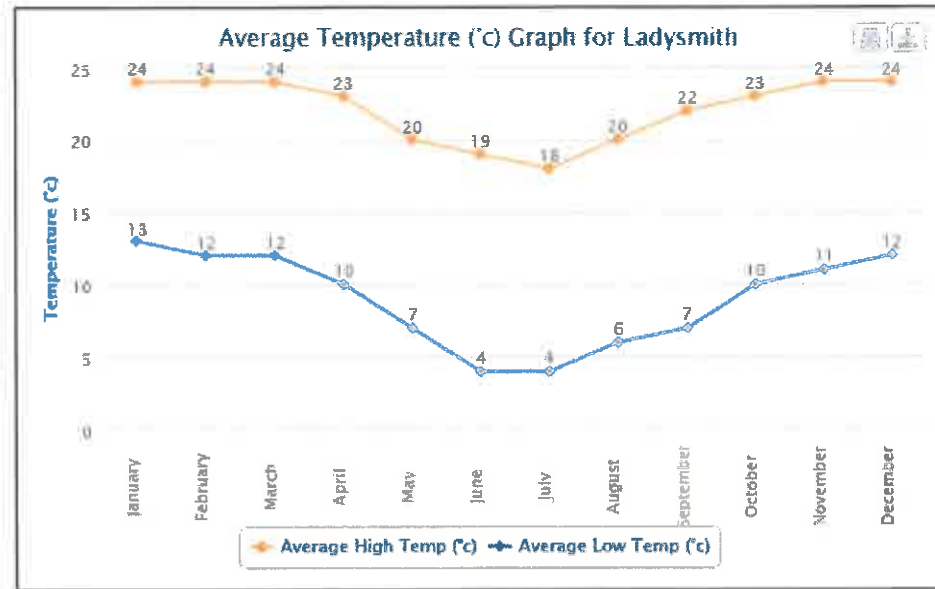
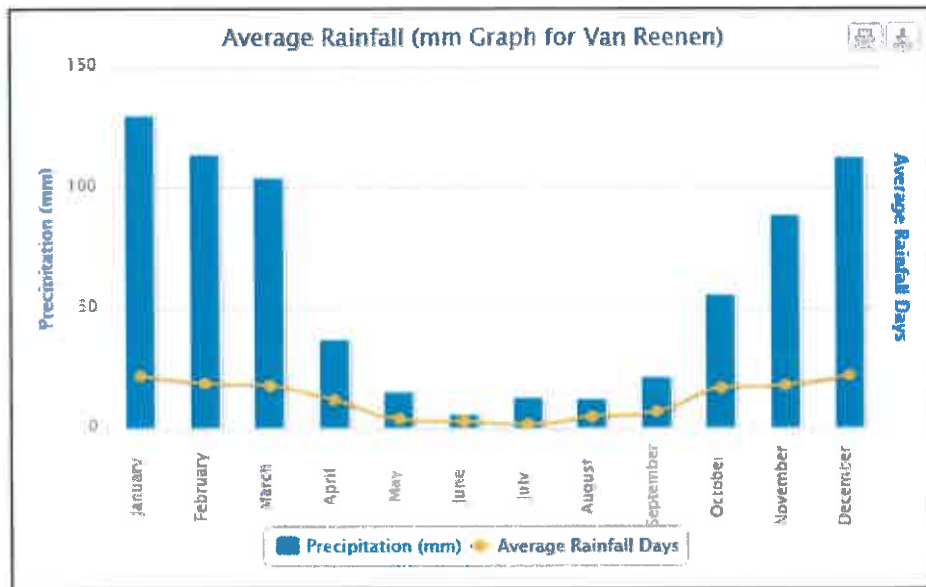


Figure 8.4-2: Average high and low temperatures at Van Reenen and Ladysmith (Ingula Management Plan, 2017)



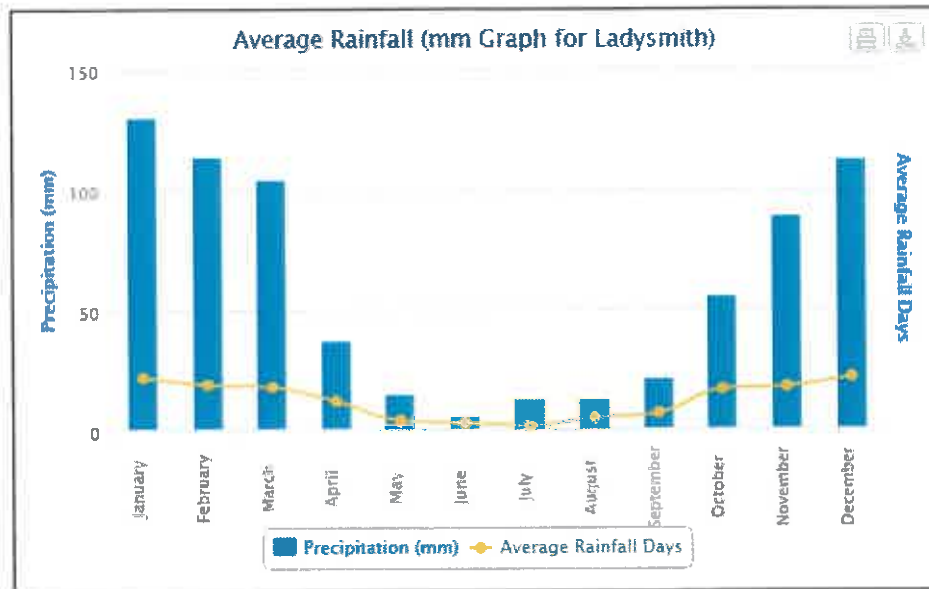


Figure 8.4-3: Average precipitation and rainfall days for Van Reenen and Ladysmith. (Eskom Holdings' Ingula Nature Reserve Management Plan, 2017)

#### 8.4.2.2 Soils and Geology

The Ingula Highveld is commonly characterised by grey-like Highveld pseudo-podzolic soils. The soils are primarily non-differentiated fersiallitic soils that transform into brown Mediterranean soils as altitude increases towards the little Drakensburg escapement. The geology is of the Normandien formation which is primarily sandstone of the Induan stratigraphic range. It is a Triassic-age rock formation. (geoscience.org.za, 2020)

Ingula Nature Reserve Management Plan (2017) describes the landscape as characterised by frequent dolerite kopjies and relatively thin soil mantles. Streams seem to have chiselled into the highly erodible sandstone down to 50 m resulting in the formation of small waterfalls and ravines along the Wilge River. The high erodibility of the soils is observed by Mentis and Partridge (2002), Mentis (2005) and by Vlok (2020) when a Biodiversity study was carried out.

#### 8.4.2.3 Hydrology

Ingula Nature Reserve sits on a continental watershed with most water paths draining seasonally or annually to the west. The Wilge River, a tributary to Orange River, passes close to the project site. In its upper sections, the Wilge River is fed by vast and widespread wetlands (Eskom, 2017). A study done by Maud and Partridge in 2004 for the Ingula Pumped Storage Scheme also covered the relocation site as it is inside the nature reserve. The study identified that the area has floodplains, hillslope seepage wetlands, pans and wetland channels. The experts pointed out that even though channelisation in areas with hill slopes was natural, it seemed to be accelerated by erosion which is common in the area.



The above-average erodibility of the soils in some of the areas is supported by a study by Partridge, Croswell and McCutcheon(2005) which indicated how erosion has an effect on the hydrology in the area such as how eroded soil result in siltation of wetlands. Erosion dongas have been formed by surface runoff erosion as water feeds into the wetlands.

In 2012, Terrell, Mahomed and Lorentz did a wetland study for Ingula Pumped Storage Scheme and noted that base flow to wetlands in the area is maintained by perennial groundwater moving through finger tributaries. The area has several wetlands which have outflow or discharge that is seasonal. The study noted how water collects in the drainage features such as erosion gullies, streams and valley slopes. Most wetlands flow in a westerly direction feeding into the Wilge River that passes through the relocation site. To some extent, water levels in the local streams and wetlands is determined by local vertical recharge which replenishes ground water.

Mentis (2005) did a management objective for regulated rivers for IPSS noted how the Wilge River has a main tributary, Bedfordspruit river. It was noted that most wetlands also reduce flooding of surrounding rivers. Hydrology in the Ingula Nature Reserve contributes greatly to habitat biodiversity. In support, Vlok (2020) describes how wetlands and riparian ecosystems are the most sensitive habitats for bird species.

#### **8.4.3 Biological**

According to Vlok (2020), open grassland habitat covers the greater part of the relocation site with a small portion being a ridge grassland habitat and a small stream (that feeds into Wilge River) passing through the middle of the site classified as a wetland habitat. The map is shown below. The stream passing through the relocation site is a sensitive ecosystem.



Figure 8.4-4: Map showing the stream that passes through the relocation site before feeding into Wilge River

#### 8.4.3.1 Flora

The project site is in an African savannah ecosystem that is characterised by tropical grasslands dominated by grasses and with small trees that are measily scattered. The vegetation is mainly grasses dominated by short to tall sour grasses constituting the bulk of species composition. Shrubs mainly occupy ravines, ground crevices and along rivers or streams. Examples of common grasses in the area include the *Themeda* and *Eragrostis* genus whilst *Leucosidea* is one of the common shrubs. The Ingula Nature Reserve Management Plan of 2017 also mentions numerous herb species such as *Helichrysum*, *Hypoxis*, *Ipomoea*, *Kohautia* *Vernonia* and *Berkheya*. Dominant grass species include different species of *Eragrostis*, *Aristida*, *Tristachya* and *Hyparrhenia*.

In 2004, a survey by Mentis mentioned how *Kniphofia ensifolia* subsp. *autumnalis* (classified as Vulnerable) and *Kniphofia typhoides* (classified as Near Threatened) were likely to be found in the nature reserve. A study done by Vlok in 2020 included a site visit where the species were not observed. The study noted that the area had fair to good condition vegetation cover with erosion contributing to the reduction in chances of better cover. Vlok

(2020) supports findings from Mentis (2004) that the nature reserve is abundant in floodplain grassland species such as *Harpochloa falx-Tristachya leucothrix* mixtures, *Tristachya leucothrix*, *Themeda triandra*, *Eragrostis capensis*, *Commelina africana*, *Helichrysum aureonitens* and *Helichrysum pilosellum*. Some of the species are common on floodplain grasslands only and not in the terrestrial grasslands. An example of these include *Helictotrichon turgidulum*. These grasslands form some of the habitat types for birds in the reserve which uses them as nesting grounds (Vlok, 2020).

#### 8.4.3.2 Fauna

The Nature Reserve has recorded 34 species of mammals with about a third being carnivorous animals and another third being antelope species such as the Oribi (*Ourebia ourebi*), Blesbok (*Damaliscus pygargus*), Grey Duiker (*Sylvicapra grimmia*), Common Reedbuck (*Redunca arundinum*) and Mountain Reedbuck (*Redunca fulvorufula*). Smaller mammals include the Aardvark (*Orycteropus afer*), Cape Springhare (*Pedetes capensis*), Serval (*Leptailurus serval*), porcupine (*Hystrix africaeaustralis*), striped polecat (*Ictonyx striatus*), otter (*Aonyx capensis*), vervet monkey (*Chlorocebus pygerythrus*), large grey mongoose (*Galerella pulverulenta*), yellow mongoose (*Cynictis penicillata*), black-backed jackal (*Canis mesomelas* or *Lupulella mesomelas*) and African wild cat (*Felis lybica cafra*) (Ingula Nature Reserve Management Plan: Eskom Holdings, 2017).

There is a presence of wetlands and over 55 butterfly species in the Ingula Nature Reserve. The area has a large number of birds that go beyond 306 species and some of them are endangered. Priority species of avifauna include Martial Eagle (*Polemaetus bellicosus*), Wattle Crane (*Bucconas carunculatus*), White-winged Flufftail (*Sarothrura ayresii*), Secretary Bird (*Sagittarius serpentarius*) and the Bearded Vulture (*Gypaetus barbatus*). Farther into the Nature Reserve are wetlands that are recognised and protected by the Ingula Partnership Trust as important habitats for over 300 bird species. Ingula Nature Reserve has the Southern Bald Ibis (*Geronticus calvus*) which is a Vulnerable endemic grassland species.

The recent study by Vlok (2020) identifies bird species such as African marsh Harrier (*Circus ranivorus*) and Flufftails (*Sarothrura* sp.) to be more common in sensitive ecosystems such as marshes, wetlands and riparian vegetation. Species such as the Eastern Long-billed Lark (*Certhilauda semitorquata*) prefer ridge-like grasslands for foraging purposes and nesting ground

Even though the SABAP (2020) provides evidence of how Ingula has 49% of bird species in the region, Vlok (2020) observed only 12% of the expected species in the relocation site. Of the 16 red listed species expected in the area, only 3 were observed during the survey.

#### 8.4.4 Social

The area, being a rural setting, have very low population density. Most families rely on horses for movement. Horses are also used for hunting and herding cattle.

According to Mfabana, the study area for the social study falls under Phumelela (PLM) and Maluti-a-Phofung (MAP) municipalities. The province has youths being 36% of the provincial population. The province has an HIV prevalence rate of 12.7% but the rate of AIDS related deaths has greatly declined due to the increase in government programmes such as prevention of Mother-to-Child Transmission, HIV Testing, rollout of antiretroviral therapy etc. Compared to other provinces of South Africa, the Free State has the lowest life expectancy at birth. The following information was extracted as is from the socio-economic study carried out by Mfabana (2020).

##### 8.4.4.1 Demographic and Household Data

Analysis of the demographic data focuses on population figures, gender breakdown and the age structure of the population; whilst analysis of HHs focuses on the total number and size of HHs, which is about the average number of people in a household. Information used is based on the 2016 Community Survey by Statistics South Africa. (Table 8.4-1)

**Table 8.4-1: Demographic and Household Data**

Key Indicator	Phumelela LM 8 209 km <sup>2</sup>	Maluti-a-Phofung LM 4 338 km <sup>2</sup>
<b>Demographics:</b>		
(a) Population	50 054	353 452
(b) Female	51%	54%
(c) Male	49%	46%
<b>Age Structure:</b>		
(a) 0-14 years	29%	31%
(b) Youth 15-34 years	39%	40%
(c) Adult 35-64 years	24%	21%
(d) 65+	8%	8%
<b>Total Households:</b>	<b>14 586</b>	<b>110 725</b>
(a) Formal Dwellings	10 157	84 978
(b) Informal Dwellings	2 707	15 058
(c) Traditional (Huts)	642	9 294
(d) Other	1 081	1 395
<b>Household Size</b>	<b>3,4</b>	<b>3,2</b>

Sources: Stats SA Community Survey 2016; 2018/2019 IDPs for PLM and MAP

In terms of geographical area, the PLM is the largest within the District Municipality; whilst the MAP has the highest population density within the District and the 3<sup>rd</sup> highest population

density in the FS. Both municipalities have a youthful population and more females than males. The implication of both factors is that future planning and creation of economic opportunities by the respective role players should take this into consideration.

The PLM has no land area containing traditional authorities; whilst the MAP encompasses substantially the entire former homeland of Qwaqwa and has traditional systems of governance and applied within the municipal jurisdiction. 60% of HHs in the PLM are headed by males; whilst, 50.4 % of HHs in the MAP are headed by females. In both municipalities, the average size of HHs is three people per household. The veracity of the HH size statistics as it applies to the MAP is questionable, because this municipality is regarded as one of the very poorer municipalities in the FS with high levels of unemployment.

Only the MAP has provided statistics on tenure status, which is 4.8% of the households, live in rented dwellings; 83.6% of households own the dwellings, whilst 9.1% live rent-free.

#### 8.4.4.2 Social Indicators

The focus here will be a brief analysis of poverty levels, education and the existence of health facilities. It is very uncommon to get statistics on the Human Development Index and Gini Co-efficient at the municipal level; however, these figures have been indicated in the provincial section (Table 8.4-2)

**Table 8.4-2: Social Indicators**

Key Indicator	PLM	MAP
<b>Poverty:</b>		
Poverty Headcount	8,7%	8,1%
Intensity of Poverty	44,5%	40,8%
<b>Education:</b>		
Persons 20 years and have completed Grade 12	8 231	76 033
<b>Health Facilities:</b>		
Clinics	6	34
District Hospital	1	2
Regional Hospital	0	1
<b>Access to Basic Services:</b>		
Water (Piped)	94%	89%
Sanitation (Flush)	70.4%	36.6%
Electricity/Solar	79.8%	93.1%
Weekly Refuse Removal	65,1%	22,1%

Sources: Stats SA Community Survey 2016; FS Department of Health "TM District Health Plan 2018/19-2020/21; MAP IDP 2018/2019

For the PLM, both poverty statistics have increased from the 2011 figures, which were 8,5% and 41, 2% for poverty headcount and intensity of poverty respectively. This therefore means that levels of poverty in the PLM have not improved. On the other hand there has been a slight improvement in the MAP, where the 2011 figures were 7, 9% for poverty headcount; and, 41,4% for intensity of poverty.

It must be noted that both education (provincial mandate) and health (district and provincial mandate) are not municipal mandates and the statistics just point to the level of achievement with regards education; and the number and variety of health delivery platforms available. In the case of the PLM, it has been highlighted in the IDP, that according to the 2016 education statistics, more males (7 702) attended school than females (7 187); and, that this was the cases well in 2011.

#### 8.4.5 Economic

Due to the very low population density in the area, economic growth has been very stunted. The region is classified as very impoverished and has been identified as a presidential poverty node. Livestock farming is the main economic activity with people rearing cattle. Most farmers grow maize. Farms that are in the vicinity of the project area mainly practice subsistence farming and rarely for commercial purposes. However, the district is characterised by beautiful landscapes, plains, river valleys, ravines, wetlands and Drakensberg Mountains which boost tourism in the district and province. Tourism provides locals with opportunities to find employment as bird guides and hosts. Fruit farming in the district contributes to employment creation and exports. The proposed project site is labelled as a “high intensive utilisation” zone because it will be easily accessible to district services compared to where they are currently situated (Global Africa Network, 2017).

The following information was extracted as is from the socio-economic study carried out by Mfabana (2020).

The average annual growth rate of the FS was 1.6% between 2011 and 2017; and, the province's economy is estimated to have declined by 1.4% in 2018. According to the 2019/2020 report on the Overview of Provincial Revenue and Expenditure, the 2015/16 drought was the most significant challenge to the economic growth rate of the province between 2011 and 2017. There was however a recovery in 2017 due to the recovery of the agriculture industry, the growth in the mining industry; as well as a rise in commodity prices (agriculture and mining). Sectors that are dominant in the economy are:

- **Primary Industries:** Agriculture; and Mining.
- **Secondary Industries:** Manufacturing; Electricity; and Construction.
- **Tertiary Industries:** Trade; Transport; Finance; and Community Services.
- All Industries.

The formal sector and the private household industry are the biggest employers of those employed. Between Q4: 2019 and Q1: 2020, the number of employed people decreased in

five of the nine provinces, with the largest employment decrease recorded in the FS (down by 29 000). The table below provides a comparative picture of the official and expanded unemployment rates for both the country and the FS for 2020: Q1.

**Table 8.4-3: Official and Expanded Unemployment Rates**

	Official Unemployment Rate <sup>1</sup>	Expanded Unemployment Rate <sup>2</sup>
FS	38.4%	44.5%
SA	30.1%	39.7%

Source: Statistics South Africa, QLFS, Quarter 1, 2020.

During this period, the official unemployment rate in the Country increased in seven of the nine provinces; with the FS recording the second largest increase (3.4% after the North West at 4.4%). With regards expanded unemployment rate, all the provinces recorded increases, with the largest recorded in the FS (2.2%).

#### 8.4.6 Heritage

The district has rock paintings believed to be from the San people (Hollman, 2002). The Free State province has got most of the best ancient rock paintings depicting the San's hunting and gathering lifestyle. The area currently has Basotho people who are identified by their clan names such as Bafokeng, Makgolokoe and Bakuena. Some of this ethnic group are in Lesotho which is very close to the project area. An archaeological survey for the Ingula area done by Anderson and Anderson (2004) mentions fossils and rock art discovered in the area. Areas where these were found were inundated by the Bedford dam.

During the 2020 survey, no Stone Age sites were recorded, this however does not rule out the possibility of any Stone Age findings during the construction phase. There were also no paleontological finds in the form of fossils.

The dense vegetation cover made it almost impossible for smaller Stone Age artefacts and fragments to be discovered. However, a possible Later Iron Age Cattle Kraal was recorded during the field survey. No middens or any other associated Iron Age findings were made in association with this kraal making its context very difficult to be known and its existence to be interpreted. This cattle kraal is given a LOW Significance rating.

<sup>1</sup>Official Unemployment Rate measures the number of people actively looking for a job as a percentage of the labour force.

<sup>2</sup>Expanded Unemployment Rate includes people who have stopped looking for work





**Photo 8.4-1: View of some cow dung within the proposed site**


The field survey noted the existence of marked and unmarked recent graves. Some of the graves are isolated and some are at clustered in one place.


<b>Burial Site No1</b>	
<b>Coordinates :</b> -28.198024 29.552555	
<b>Number of Burials :</b> 1	
<b>Description: Marked grave</b>  The grave is a stand-alone grave on the western boundary of the proposed development site. The grave is marked by stones.	
<b>Significance :</b> High	


<b>Burial Site No2</b>	
<b>Coordinates :</b> -28.199188, 29.555609	
<b>Number of Burials :</b> About 8	
<b>Description: Marked grave</b>  This is a possible family burial ground with burials marked with stones. The graves are about 8 in number. Close to the homesteads on the proposed grazing lands for Option 1	




Significance : <b>High</b>	
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<b>Burial Site No3</b>	
<b>Coordinates :</b> -28.199184, 29.555546	
<b>Number of Burials :</b> 1	
<b>Description: Marked grave</b>  This is a stand – alone marked grave	
<b>Significance: High</b>	

<b>Burial Site No4</b>	
<b>Coordinates :</b> -28.200506, 29.555350	
<b>Number of Burials:</b> Number not clearly determined as markings are not clear, possibly 3 graves	
<b>Description: Marked grave</b>  The grave markings are scattered everywhere therefore making it difficult to determine the number of graves present.	
<b>Significance : High</b>	

<b>Burial Site No5</b>	
<b>Coordinates :</b> -28.207381, 29.549929	
<b>Number of Burials :</b> Number not determined	
<b>Description: Marked grave</b>  The grave markings are scattered everywhere therefore making it difficult to determine the number of graves present.	
<b>Significance: High</b>	

<b>Burial Site No6</b>	
<b>Coordinates :</b> -28.206528, 29.547589	
<b>Number of Burials :</b> Possible Burial (1)	
<p><b>Description: Half marked possible grave</b></p> <p>This possible burial though it has no clear markings it has a head stone with some numbers scribed on it.</p>	
<b>Significance :</b> High (if it is indeed a burial)	

The position of the discovered burial sites is presented in Figure 8.4-5

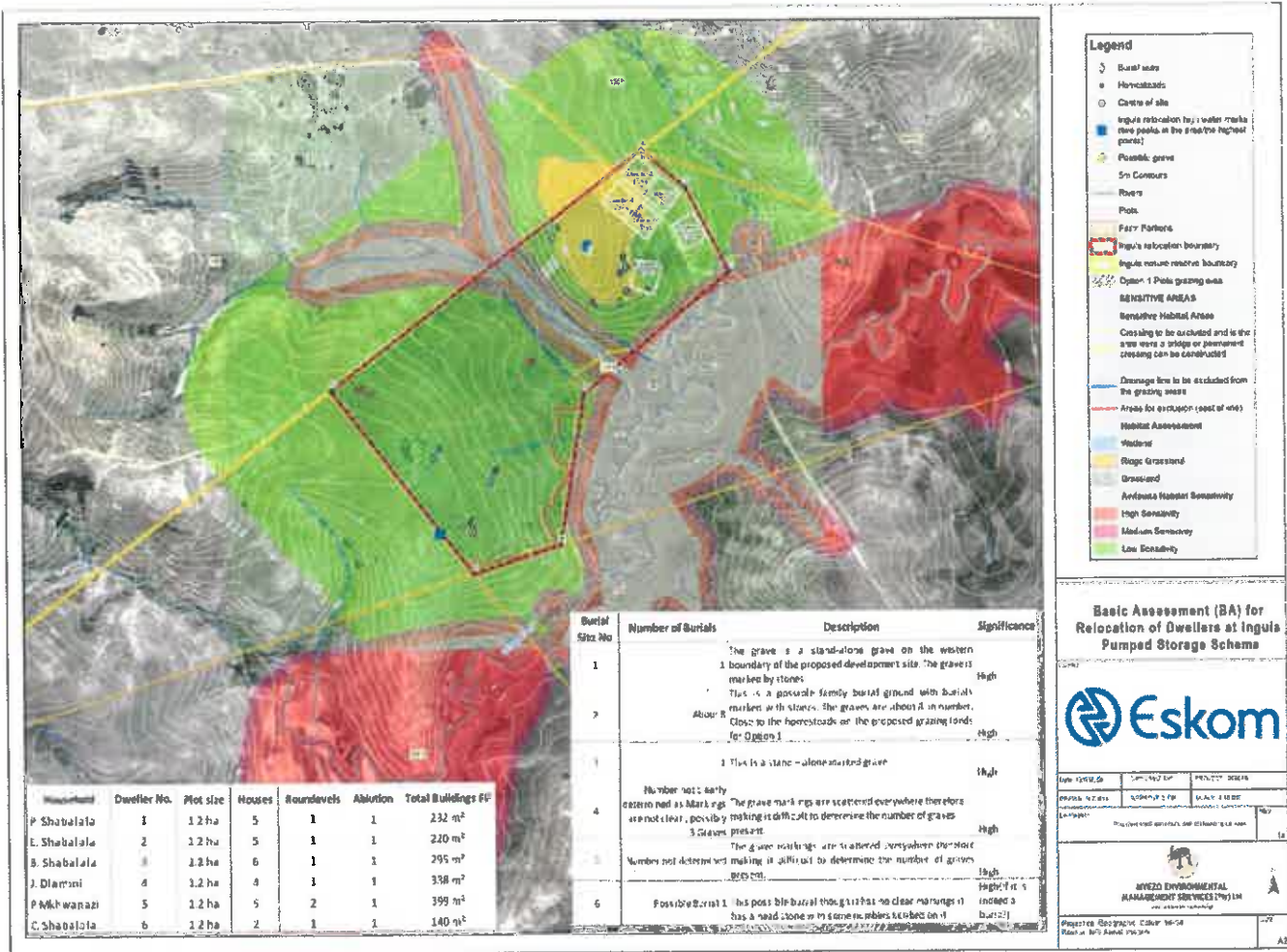


Figure 8.4-5: Location of burial sites

### 8.4.7 Cultural Aspects

According to Mohale (2020), the majority of the people in the project area, who are of the Basotho origin speak Sesotho which is one of the official 11 languages of South Africa. They are believed to be an ethnic group started in the 19<sup>th</sup> century by King Moshoeshe I. Their culture is depicted in the Basotho Cultural Village which is next to the Harrismith town. The Basotho people wear clothing that indicates the type of lifestyle they live. For example, herd men are synonymous with long gumboots and the Basotho cloth. These protect them from the mountain terrain and waterlogged areas as they tend to their livestock. The women normally wear bright coloured long dresses with a traditional wrap that can be used to carry children. They are also known for special clothing which include the young women's beaded waist wrap called a *thethana* and the young men's loincloth called a *tshea*, all worn during an initiation ceremony. The Basotho people who are in the project area are known for herding cattle and hunting on horseback (Mohale, 2020).

## 8.5 Impacts and Risks Identified for Alternatives

Studies carried out for the Ingula Pumped Storage Scheme by Mentis (2005), Terrell et al (2012), Partridge and Maud and other specialists determined that the chosen 131-hectare relocation site was the least ecologically sensitive in the nature reserve. Due to this, no other relocation site alternatives could be considered possible since the six families decided to stay at Ingula. However, within the proposed 131-hectare relocation site, there are two options being considered for the orientation of households. Option 1 is to bundle the six families' houses on one site and divide the remainder of the land into six grazing lands. Option 2 is to divide the land into six plots and establish each family's house in their own plot. Therefore, impacts outlined in Section 9.2 will be common impacts for both household orientation options. Immediately after the mutual impacts, the additional impacts specific to Option 2 have been added and assessed.



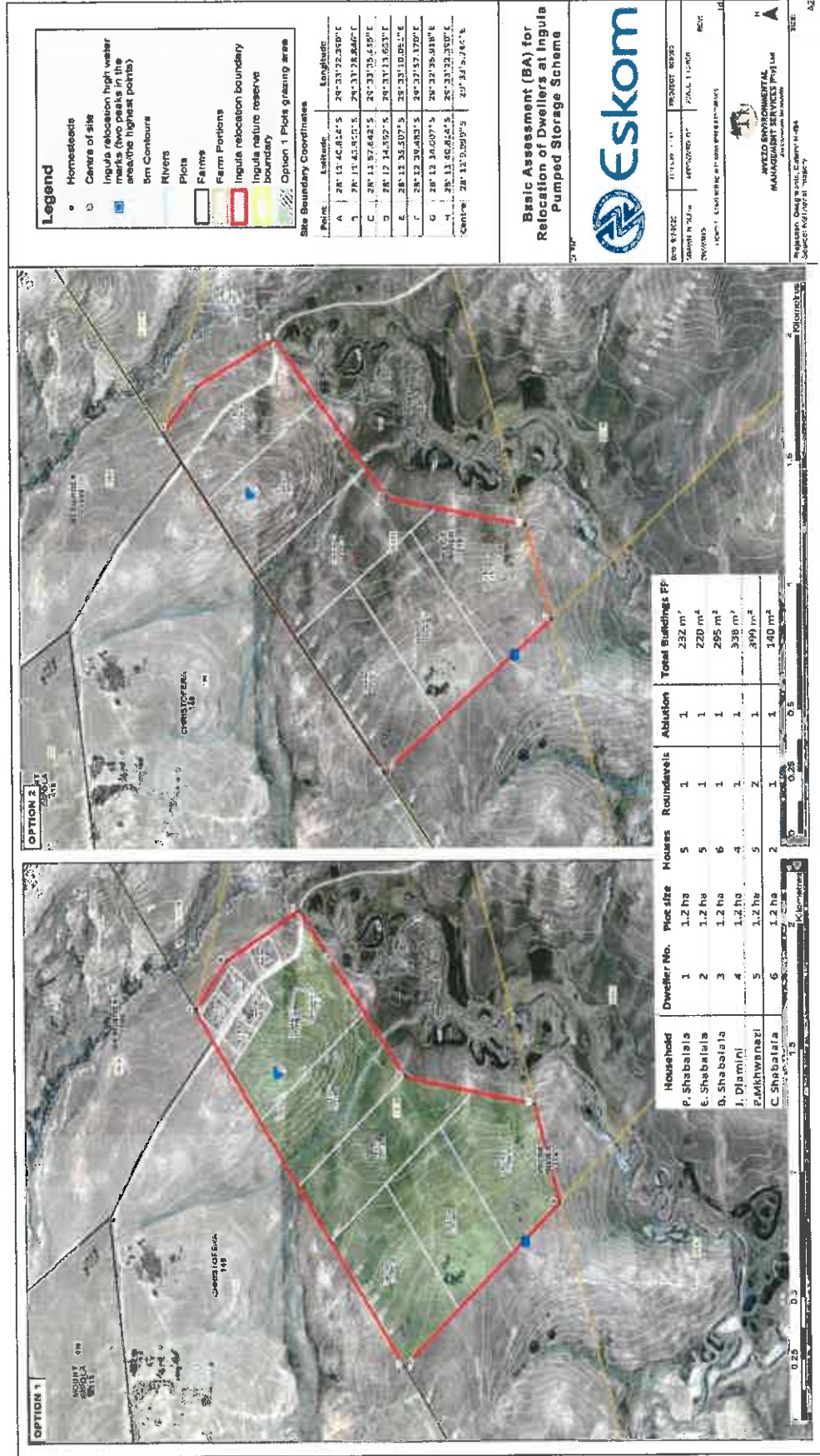


Figure 8.5-1: Satellite image of orientation alternatives within the relocation site

Since the project has no alternative sites, the impacts described in this document are for the orientation options shown in Figure 8-5. Section 9.2 provides detailed impacts and risks.

### 8.5.1 Extent of Reversal of Impacts

Project has no site alternatives but has two household orientation options which are assessed in Section 9.2. The assessment is for impacts common to both options and impacts unique to Option 2.

### 8.5.2 Extent of Irreplaceable Resource Loss

Project has no site alternatives. Section 9.2 presents assessment of impacts common to both options and impacts unique to Option 2.

### 8.5.3 Mitigation, Avoidance and Management of Impacts and Risks

Table 8-6 provides summary of major impacts expected for both Options 1 and 2. Refer Section 9.2 for a comprehensive assessment of all impacts common to both options and impacts unique to Option 2.

**Table 8.5-1: Impact Mitigation, Avoidance and Management of Major Impacts and Risks**

Impact	Extent of Reversal	Extent of Resource Loss	Mitigation Management	Duration
<b>Impacts for both Option 1 and 2</b>				
Vegetation and Biodiversity: Vegetation loss Endangered species Habitat loss	Reversible	Very minimal resource loss. No loss of non-renewable resources	Unnecessary vegetation clearing to be avoided. Site has no endangered species (Vlok, 2020). Site has no identified habitats.	Short-term
Soil Resources: Erosion and runoff Soil Extraction Soil Compaction	Reversible	Runoff causes loss of topsoil rich in organic matter, microbes and seeds.	According to Cauldwell's (2012) specialist report, soil erosion can be managed through use of control mechanisms before commencing construction (Vlok, 2020). It can be avoided by increasing grass cover especially on slopes.	Medium-term
Water Resources: Water Use Contamination by oil spills Siltation and sedimentation	Reversible at high costs	No resource loss though the water will negatively affect aquatic life.	Can be avoided by controlling erosion (Terrell et al, 2012) or through use of turbidity barriers and bunding to prevent spillage. Use of stabilised earth walls. Conservation of riparian vegetation (Mentis, 2004) which acts as barriers and protects the river	Short-term
Air Quality: Dust particulate Emissions by machinery	Reversible over time	No resource loss though the polluted air contributes to global warming	Can be managed. Machinery will be used for very short periods. No unnecessary use of heavy machinery, Machinery can make use of emissions trapping devices.	Short-term
Noise and Vibration	Reversible	No resource loss	Can be managed. Machinery will be used for a very short period.	Short-term
Construction safety: Risk of injuries Public safety	Irreversible	No resource loss	Can be avoided and managed. Use of personal protection equipment. Use of warning signs	Short-term

Impact	Extent of Reversal	Extent of Resource Loss	Mitigation Management	Duration
			and fencing of high-risk areas	
Waste Management	Reversible	No resource loss	Proper waste management practices will be followed. Waste must not be dumped illegally. Recycling and reusing will be followed where possible.	Short-term
Improved standard of life Access to ecosystem services	Permanent	Natural resource loss if access to ecosystem services not managed.	Houses will be built using proper standard and solar power will be installed. There will be tapped water. Dwellers will be taught on sustainable use of ecosystem services.	Long-term
<b>Impacts unique to Option 2 Avoidance only possible by choosing Option 1</b>				
Construction of access roads from main road to households;	Irreversible considering that roads take years to naturally rehabilitate or can be rehabilitated in a short space of time at very high cost	Considerable cumulative resource loss of topsoil and vegetation	Using Google Earth and SHP files provided by Eskom to plot distance, the farthest plot is approximately one kilometer from the road. There will be no avoidance but slight mitigation by restricting road to a certain width (Newman, et al, 2012).	Long-term
More vegetation clearing	Reversible if minimal	Minimal resource loss	The establishment of more and longer access roads and earthworks for laying pipes will be unavoidable and will result in more clearing of grass. Minimisation is possible through restricting trench width.	Long-term
Increased scale of soil erosion	Irreversible in the sense that this type of soil is prone to erosion and takes time and high cost to rehabilitate	Loss of topsoil	With more roads and earthworks, rehabilitation will be possible but very costly.	Long-term
More excavation works to lay pipes for sewer and water	Irreversible	Possible loss of top oil	Avoidable by choosing Option 1.	Long-term
Less community safety and security compared to Option 1	Irreversible	Possible loss of property	Option 1 has households close to each other hence more secure.	Long-term
More privacy for each household	Irreversible	None	Situating each household on their separate plot offers more family privacy and less room for conflicts (Mfabana, 2020)	Long-term
Disturbance of large areas of land due to uncontrolled land use spacing within the nature reserve.	Irreversible	Extensive resource loss	Option 1, by removing people from being scattered across the nature reserve and placing them in one area, which is less sensitive, and managing the impacts caused by dwelling in a manageable manner	Long term

The Option 1 is a preferred option due to the fact it best meets the objectives of relocation which is to minimise disturbance within the nature reserve by concentrating activities to the less sensitive part of the nature reserve. To have a village type dwelling where people are in one place as presented by Option 1, provides less pressure on the nature reserve than

having people distributed across. The Option 1 makes it easy to provide services such as water supply and sewage management. Table 8.1-11 also presents the motivation for having Option 1 as the preferred alternative.

Option 2 will have more intense cumulative impact due to uncontrolled people's actions in widely distributed areas which make control of activities and management within the nature reserve more challenging.

### 8.6 Methodology for Determining and Ranking Impacts with Alternative

Refer to Section 9.0 for the Methodology use for Impact ranking for the project site.

### 8.7 Positive and Negative Impacts that the Proposal Activity and Alternatives will have on the Environment and Community

**Table 8.7-1: Impacts that the proposed project activities will have on the environment and community. All the aspects outlined below favour Option 1 relocation method, where the village is designed in one area.**

Aspect/components	Impacts
Geographical	<i>Positive:</i> Infrastructural development. New settlements. Increase in community size <i>Easily attainable when Option 1 is selected.</i>
Physical	<i>Positive:</i> Construction of permanent soil erosion control mechanisms <i>Negative:</i> Soil erosion. Minimum vegetation clearing. Temporary noise and dust nuisance. Temporary air pollution.
Biological	<i>Negative:</i> Habitat disturbance. Vegetation clearing with vegetation loss.
Social	<i>Positive:</i> Increased social interaction. Knowledge transfer. Better amenities. Option 1 more favorable to attain this.
Economic	<i>Positive:</i> Temporary employment creation. Skills transfer. Improved livelihoods.
Heritage	<i>Positive:</i> (Option1) Preservation of any identified heritage resources. <i>Negative:</i> None
Services	<i>Positive:</i> (Option 1)- Provision of services centralized and design and installation more economically reasonable
Health and safety	<i>Negative:</i> Exposure to risks due to isolated households. This is more a risk for Option 2.
Cultural	<i>Positive:</i> (Option 1) Culture sharing. Preservation of cultural practices. <i>Negative:</i> None

### 8.8 Positive Mitigation Measures that could be Applied and Level of Residual Risk

The project will make use of several mitigation measures to avoid and manage environmental impacts. Since the project is of small scale with construction not expected to go beyond 6 months, there are no major or residual impacts expected. Below are the mitigation measures that will be followed to avoid, minimize and manage the following possible residual impacts.

#### **Objective: Soil erosion control and dust minimisation**



**Mechanically Stabilised Earth Walls** – these will be constructed to avoid soil erosion and prevent runoff of top soil into a nearby stream.

**Minimal vegetation clearing** – this will reduce the risk of soil erosion. Riparian vegetation will be avoided at all costs as this has high biodiversity and act as buffers preventing runoff of soil into streams. Hence, they prevent siltation and sedimentation.

**Soil stockpiling** – where vegetation is cleared over a very large area, the top soil can be stockpiled since it is a seed bank. Such soil can be used to cover cleared land when the project ends.

**Turbidity Barriers** – these will be used to prevent soil erosion and migration of contaminants into ground water or water table.

**Objective: Pollution minimization and control**

**Storage Designs** – cement will be stored where it is not blown away by wind causing dust. If there is storage of oil, a bunding of 150% volume will be used to prevent spillage that may contaminate water and soil.

**Minimal Construction Vehicle Usage** – the project will have very light usage of heavy construction vehicles. As such there will be unlikely chances of air pollution, noise, vibration and soil compaction. Where construction vehicles are used, they will have devices fitted to reduce air emissions and should be well serviced to reduce noise.

**Project Duration and Timing** – the project can be done before or after the rain season to avoid the chances of contaminants such as oil being carried and transported by water. The project will take as short a period as possible to minimize the duration of impacts such as noise.

**Objective: Waste minimization**

**Waste Management** – the project will have no production of chemical or hazardous wastes, but if any, the contractor shall hold relevant material safety data sheets on site if contractor camps are used, domestic waste from such will be stored and moved to a licenced waste recycling or dumping site. No waste dumping shall occur on site. The construction activities will have very minimal waste such as broken bricks and concrete, both which can be re-used for constructing septic tanks or filling dongas. Putrefiable waste must be kept in scavenger proof containers.

**Objective: Labour and occupational safety**

**Casual labour** – where there is need for casual labour, this will be sought from surrounding communities. The affected families can be offered the roles for casual labour if they wish.

### **8.9 Outcome of Site Selection Matrix**

The purpose of the project was to relocate six families from a sensitive ecosystem to a site where they can carry on with their daily lives without making them worse-off. Since the families chose to remain at Ingula, they had to be relocated to a less sensitive site and specialist studies by experts such as Partridge (2002 and 2004) showed sensitive areas in the nature reserve resulting in the selection of the proposed site as the only feasible choice. The site selection consideration is discussed in Section 6 and Section 7.

### **8.10 Motivation for not Considering Site Location Alternatives**

During the site selection process in the Nature Reserve, a study was undertaken and the map below shows the selected project site being in a less sensitive area with the least vegetation intensity. GIS studies done to complement specialist studies by experts such as Mentis (2004) and Vlok (2020), produced a map showing the relocation site as a high utilisation intensity zone. This means the area has high capacity to be exploited for invasive activities such as construction due to the absence (or low presence) of sensitive species, ecosystems and habitats. Low utilization intensity zones are difficult to exploit due to the presence of sensitive species, ecosystems and habitats. The map below shows the current zonation in Ingula Nature Reserve where the relocation site (red) is shown in a high intensity utilisation area.

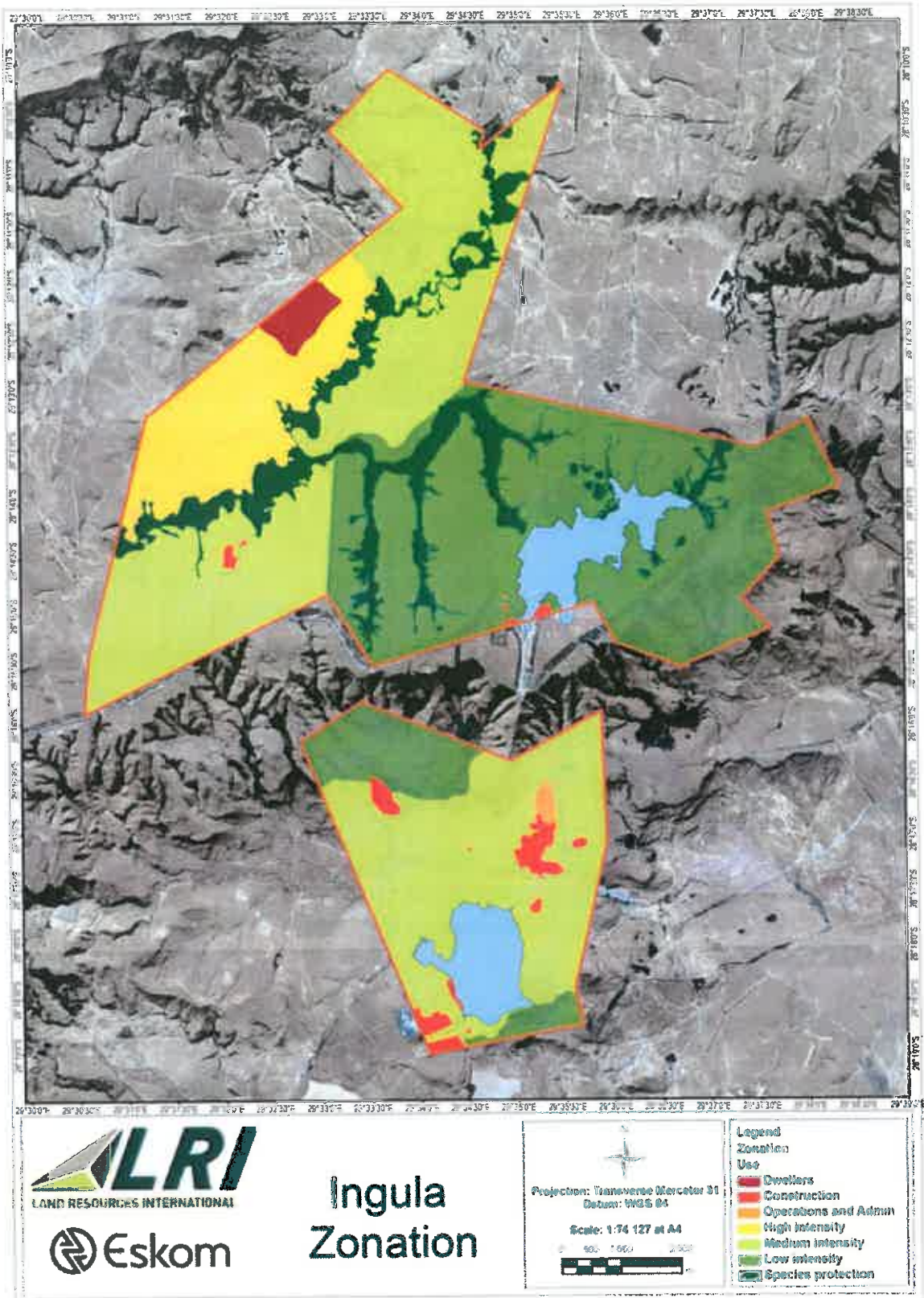


Figure 8.10-1: Imagery Map of Land Utilisation Intensity for Ingula Nature Reserve

### 8.11 Concluding Statement Indicating Preferred Location of the Activity

The identified project site had no site alternatives due to the nature of the surrounding areas. Most of the land is taken up by farms and the Ingula Nature Reserve which is a protected area. Considering that the families are being resettled from a wetland to the northern boundary of the Nature Reserve, this solution maximizes positive impacts and minimizes negative impacts. The resettlement location is not far from the areas they are used to and is still close to the Ingula Pumped Storage Scheme. Where they are currently settled, the families are keen to relocate and already experience several socio-economic impacts making their livelihoods difficult.

As aforementioned, there are two options for the orientation of the houses within the selected site. Option 1 is to situate the houses close together whilst Option B is to separate the houses into different plots within the same 131-hectare project site. Option 1 is the preferred option as indicated in Table 8.11-1 below.

**Table 8.11-1: Comparison of Orientation Options 1 and 2**

Design Criteria	House Orientation Options		Most Preferred Option
	Option 1	Option 2	
Internal Access Roads	<ol style="list-style-type: none"> <li>1. Dwellings positioned within close proximity of one another.</li> <li>2. Terrain is flat; therefore there is minimal cut and fill.</li> <li>3. Fewer river crossings indicated in this area.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dwellings spaced further apart, therefore the length of internal access roads is much greater.</li> <li>2. Terrain is hilly, subsequently increase in cut and fill volumes.</li> <li>3. Due to increased road lengths &amp; surface terrain, the number of river crossings and culverts are increased.</li> <li>4. A major stream crossing which will require an upgrade and registration with Department of Water Affairs</li> </ol>	Option 1
Stormwater Management	<ol style="list-style-type: none"> <li>1. Dwellings are positioned within close proximity; therefore stormwater management requirements are manageable &amp; practical.</li> </ol>	<ol style="list-style-type: none"> <li>1. Due to increased road lengths &amp; surface area, there are increased stormwater management requirements.</li> </ol>	Option 1
Geotechnical Investigations	<ol style="list-style-type: none"> <li>1. Dwellings are positioned within close proximity of one another; therefore GI is required across a smaller area.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dwellings are positioned far apart; therefore entire area of 131 ha is to be tested.</li> </ol>	Option 1
Sewer & Water Reticulation	<ol style="list-style-type: none"> <li>1. Dwellings are positioned within close proximity of one another; therefore reticulation is required across a smaller area.</li> <li>2. Terrain is flat and therefore a gravity system is possible.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dwellings are positioned far apart; therefore extent of reticulation is increased.</li> <li>2. Terrain is hilly and there is an increased possibility for the need of a rising main option and pumps for the sewer &amp;</li> </ol>	Option 1

		water reticulation respectively.	
Fencing	1. Dwellings are positioned within close proximity of one another; therefore, fencing is required across a smaller area.	1. Dwellings are positioned far apart; therefore, extent of fencing is increased.	Option 1
Sewage handling	1. Septic tanks are going to be constructed for holding a wastewater and sewage	1. Septic tanks are going to be constructed for holding wastewater and sewage	Option 1

## 9 FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS THE ACTIVITY WILL IMPOSE ON THE ENVIRONMENT

An Impact Assessment Methodology for Assessing the Impact Significance of proposed activities is outlined below. The assessment of possible impacts during the project life cycle stages was done through the establishment of a standardised and internationally recognised methodology to assess the significance of the potential environmental impacts of the proposed development. The significance of the impacts was determined through the following:

- For each impact, the SEVERITY (size or degree), DURATION (time scale) and EXTENT (spatial scale) are used to determine the CONSEQUENCE of the impact.
- The section below outlines the assessment methodologies utilised in the study.

In order to identify and assess impacts, a site surveillance was undertaken to support desktop studies, specialist studies, Geographic Systems Information and through the use of tools and standards provided by NEMA, IFC and UNEP.

**Nature of Impact** – describes the impact. It shows how the impacts arise. For example, “emissions by machinery” describes the production of air pollutants from vehicles that use fossil fuels.

**Magnitude** – describes the degree to which the impact’s effects affect the environment. It is the severity of the impact rated as minimal, moderate, severe or extremely severe.

**Extent** – this is the geographical radius of the impact's influence described as localised or widespread. For example, air pollution is widespread as the contaminants are carried by air across large areas whilst vegetation clearing is limited to one site which is described as localised.

**Probability** – this is the likelihood or risk of the impact occurring. It is described as unlikely, likely or highly likely. Impacts such as soil erosion where there is no vegetation clearing are unlikely whilst they are highly likely where vegetation is cleared.

**Duration** – this is the time for which the impact continues to have an effect on the environment or local communities. The impact is rated as short-term, medium-term or long-term. Some impacts such as noise can have a duration of one day whilst some such as spillage of chemicals into water last until the chemical is biodegraded.

**Significance** – describes the importance of the impact depending on the consequences and secondary effects arising. Rated as insignificant, significant or highly significant.

**Reversibility** – describes whether the impact can be reversed or not. It is rated as reversible or irreversible. Impacts such as vegetation clearing can be reversed whilst those such as loss of human life are irreversible.

**METHODOLOGY FOR RATING AND DETERMINING IMPACTS**

<b>IMPACT STATUS</b>		
<b>Positive</b> –impacts that are beneficial to the environment or community or economy		
<b>Negative</b> –these are impacts that are detrimental to the environment, community or economy		
<b>SEVERITY</b>		
How severe does the aspects impact on the resource quality i.e. flow regime, water quality, geomorphology, biota, habitat?		
<b>Scale</b>	<b>Positive/Beneficial</b>	<b>Negative/Detrimental</b>
1	Insignificant	Non-harmful
2	Slightly significant	Potentially harmful
3	Significant	Slightly harmful
4	Very significant	Harmful
5	Extremely beneficial	Extremely harmful
<b>IMPACT PROBABILITY</b>		
<b>Probable</b> – impact or benefit is most likely to occur		
<b>Improbable</b> – impact of benefit is most unlikely to occur		
<b>Definite</b> – impact or benefit will occur		
<b>REVERSIBILITY</b>		
<b>Reversible</b> – benefits are for a short time and will eventually return to initial state. Negative impacts are short lived and affected aspects can be restored back to original state.		
<b>Irreversible</b> - defines impacts that are permanent and cannot be restored back to original state.		
<b>SPATIAL SCALE</b>		
Defines how big the area that the aspect is impacting on?		
<b>Scale</b>	<b>Description</b>	
1	Restricted to a portion of project site	
2	Entire project site	
3	Within village and surrounding communities	
4	Impacting beyond provinces	
5	Transboundary	
<b>DURATION</b>		
Rates how long the impact or benefits lasts		
<b>Scale</b>	<b>Description</b>	

1	One month to a year
2	One year to five years
3	Five to ten years
4	Ten to thirty years
5	Permanent or over 30 years
<b>Calculations;</b>	
Consequence = Severity + Spatial Scale + Duration	
Significance/Risk = Consequence x Likelihood	
Likelihood/Probability of occurrence = Frequency of Activity + Frequency of Incident	

Once the significance of an impact has been determined, the CONFIDENCE in the assessment of the significance rating is ascertained using the rating systems outlined below.

**DEFINITION OF CONFIDENCE RATINGS**

CONFIDENCE RATINGS*	CRITERIA
<b>High</b>	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact. Greater than 70% sure of impact prediction
<b>Medium</b>	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact. Between 35% and 70% sure of impact prediction.
<b>Low</b>	Limited useful information on and understanding of the environmental factors potentially influencing this impact. Less than 35% sure of impact prediction.

The level of confidence in the prediction is based on specialist knowledge of that particular field and the reliability of data used to make the prediction.

FREQUENCY OF THE ACTIVITY		
How often do you do the specific activity?		
Annually or less	1	
6-monthly	2	
Monthly	3	
Weekly	4	
Daily	5	

FREQUENCY OF THE INCIDENT/IMPACT		
How often does the activity impact on the resource quality?		
Almost never / almost impossible / >20%		1
Very seldom / highly unlikely / >40%		2
Infrequent / unlikely / seldom / >60%		3
Often / regularly / likely / possible / >80%		4
Daily / highly likely / definitely / >100%		5
Remote and difficult to observe		4
Covered		5

#### DEFINITION OF LOSS OF RESOURCES

LOSS OF RESOURCES	CRITERIA
Low	Where the activity results in a loss of a particular resource but where the natural, cultural and social functions and processes are not affected.
Medium	Where the loss of a resource occurs, but natural, cultural and social functions and processes continue, albeit in a modified way.
High	Where the activity results in an irreplaceable loss of a resource.

The degree to which the impact can be mitigated or enhanced is shown below.

#### DEGREE TO WHICH IMPACT CAN BE MITIGATED

DEGREE TO WHICH IMPACT CAN BE MITIGATED	CRITERIA
None	No change in impact after mitigation.
Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
Low	Where the significance rating drops by one level, after mitigation.
Medium	Where the significance rating drops by two to three levels, after mitigation.
High	Where the significance rating drops by more than three levels, after mitigation.



**SIGNIFICANCE RATING**

RATING	CLASS	MANAGEMENT DESCRIPTION
1 – 55	(L) Low	Acceptable as is or consider requirement for mitigation. Impact to easily mitigated.
56 – 169	(M) Moderate Risk	Risk and impact are notably and require mitigation measures on a higher level, which costs more and require specialist input.
170 – 300	(H) High Risk	Impacts by the activity are such that they impose a long-term threat on a large scale. Mitigation measure will have to be more stringent and require dedicated monitoring and enforcement.

**9.1 Description of all Environmental Issues and Risks that were Identified**

Below are the impacts and risks for the project site in question regardless of the village orientation options since these do not result in a change in the location or site of the project site. It is important to note that most of these impacts are localised in nature and not widespread.

A preliminary background research was done to obtain an overview of the project context from an environmental, legal, policy and administrative, as well as institutional context. The baseline environmental assessment studies of the receiving environment that are likely to be affected were conducted. Impacts were identified through use of collected data from the literature review of the municipality and its related documents such as the State of the Environment Report (SoER), IDP, SDF, communication with the municipality officials, consultation with the authorities from the Competent Authority offices, research of information from SANBI and Windeed and professional expertise. Once the impacts were identified, they were assessed for significance, using the criteria and methodology provided in Section 9.0. The first stage of impact assessment was identification of environmental activities, aspects and impacts. This was supported by the identification of receptors and

resources, which allowed for an understanding of the impact pathway and an assessment of the sensitivity to change.

## **9.2 Assessment of the Significance of each Issue/Risk and Indicator of the Extent to which it can be mitigated**

The significance of the impact was then assessed by rating each variable according to defined criteria. The purpose of the rating was to develop a clear understanding of influences and processes associated with each impact.

Impact management objectives were then determined from previous knowledge of the EAP whilst undertaking similar studies, input from project team, I&APs and stakeholders, existing documents and reports. The significance of the impact also determined the impact management objectives to be utilised e.g. whether the impact will require on-going monitoring or if mitigation measures could be implemented to reduce the impact within a specific period of time. Existing regulations, guidelines and standards with regards to the different activities/impacts to be undertaken were also utilized to determine impact management objectives.

Potential issues of concerns gathered during engagement of stakeholders were assessed further by specialists, to identify the key aspects and the impacts resulting from those aspects. Stakeholders were given an opportunity to raise any concerns they might have about the project as well as suggested solutions. In instances where it was clear that such an interactive and iterative process had been followed in the development of a preferred alternative, it was then appropriate to terminate the assessment of other alternatives, excluding the no-go alternative that have been considered and assessed in such a process during the course of the assessment.

The table below gives a description of the assessment of the significance of each issue/risk and indicator of the extent to which it can be mitigated. However, even though there are impacts listed, the project is a small-scale construction project. Such projects are associated with short-term impacts with a very small footprint on the environment. In the table below, the last column's terms are defined as follows: quantitative refers to the impacts being measurable by amount or size, qualitative refers to the impacts being measurable by characteristics, measurable refers to the ability to quantify amount, size or characteristic of the impact, avoidable refers to the possibility of the impact being avoided and manageable refers to the ability to reduce an impact's effects on the environment. Assessment of Impact

Significance and Indicator of the extent to which it can be mitigated, for the project construction and operational phase is presented in Table 9.2-1 and 9.2-2, respectively.

**Table 9.2-1: Assessment of Impact Significance and Indicator of the extent to which it can be mitigated, for the project construction phase**

Impact	Significance	Extent	Mitigation Measures	Indication of the extent to which risk can be managed
<b>Households Orientation Option 1 and 2 shared impacts</b>				
Vegetation and Biodiversity: Vegetation loss Endangered species Habitat loss	Significant	Localised	Site has no endangered species. Site has no identified habitats. Cleared and fire safe places must be designated by site manager.	Quantitative. Measurable. Manageable. Area already has low vegetation
Soil Resources: Erosion and runoff Soil Compaction Contamination by oil spills	Significant	Localised	Can be avoided. Avoid unnecessary vegetation clearing. Use of riprap barriers.	Qualitative. Measurable. Avoidable.
Water Resources: Sustainable Water Use Contamination by oil spills Siltation and sedimentation	Significant	Widespread	Can be avoided. Use of turbidity barriers and bunding to prevent spillage. Use of stabilised earth walls. Conservation of riparian vegetation which acts as barriers and protects the river	Qualitative. Measurable. Avoidable.
Air Quality: Dust particulate Emissions by machinery	Significant	Widespread	Can be managed. Machinery will be used for very short periods. No unnecessary use of heavy machinery, Machinery can make use of emissions trapping devices.	Qualitative. Measurable. Avoidable and manageable.
Noise and Vibration	Significant	Localised	Can be managed. Machinery will be used for a very short period.	Qualitative. Measurable. Manageable.
Construction safety: Risk of injuries Public safety	Significant	Localised	Can be avoided and managed. Use of personal protection equipment. Use of warning signs and fencing of high-risk areas. First Aid kit on site.	Quantitative. Measurable. Avoidable.
Waste Management	Insignificant	Localised	Proper waste management practices to be followed. Waste must not be dumped illegally. Recycling and reusing will be followed where possible.	Quantitative. Measurable. Manageable.

**Table 9.2-2: Assessment of impact significance and indicator of the extent to which it can be mitigated, for the project Operational Phase**

Impact	Significance	Extent	Mitigation Measures	Indication of the extent to which risk can be managed
Ecosystem Resource Depletion	Significant	Localised	The affected people to be relocated consist of small families who rely on both agriculture and ecosystem services hence there won't be pressure on natural resources.	Qualitative. Measurable. Manageable.
Soil Resources: Erosion and runoff	Significant	Localised	Can be avoided. Practice conservation farming.	Qualitative. Measurable. Avoidable and manageable.
Water Resources: Sustainable Water Use. Contamination by	Significant	Widespread	Water to be used sustainably. Small families in rural areas rarely have high water demand. Water pollution by	Qualitative. Measurable. Avoidable and

agrochemicals			agrochemicals can be avoided by avoiding riverbank cultivation. Conservation of riparian vegetation which acts as barriers and protects the river	manageable.
Deforestation	Significant	Localised	Area already has very few trees. Proponent can donate indigenous tree seedlings to be planted and groomed by the villagers at their homesteads. Use of solar will avoid dependence on firewood.	Quantitative. Measurable. Avoidable and manageable.
Sewage and Wastewater Production	Significant	Localised	A septic tank will be constructed. All wastewater will be directed here for biodegradation.	Qualitative. Measurable. Manageable.
Solid Domestic Waste Production	Significant	Localised	Rural households produce little non-biodegradable waste. Most plastic and paper waste are reused. Proper rubbish pits will be constructed.	Quantitative. Measurable. Avoidable.

## 10 ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK INCLUDING THE FOLLOWING:

10.1 This section describes the assessment of identified project impacts and risks such as soil erosion and wetland damage. It also outlines benefits and how they can be maximized. The assessment includes:

- Cumulative Impacts
- Nature, Significance and Consequence, Impacts and Risks
- Extent and Duration of Impacts and Risks
- Probability of Impacts and Risks Occurring
- Extent of Reversal of Impacts and Risks
- Extent of Losses Associated with Risks and Impacts
- Mitigation, Avoidance and Management of Impacts and Risks

Tables 10.1-1 to 10.2-2 detail the identified impacts for various development phases and provides assessment of these according to the defined criteria provided in Section 9.

Table 10.1-1: Construction Phase Shared Impacts for Household Orientation Options 1 and 2

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
1. Installation of measures and devices to avoid environmental damage prior to construction. According to Vlok (2020) and Mentis (2005), Ingula has erodible soils in most areas.	<p>i). Protection and preservation of nature reserve resources will result from measures implemented before and during construction to avoid and minimise environmental damage</p> <p><i>Impact Status: Positive</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>	Probable 4 + 4 = 8	Irreversible and long-term since permanent devices will be made use of	5 Extremely beneficial	13 x 8 = 104	3 + 5 = 8	Medium	Low	14 x 8 = 112  Moderate benefit
<p>Mitigation/Enhancement Measures:</p> <p>(a) Environmental management devices such as erosion control mechanically stabilised walls will be permanently installed using environmentally friendly materials such as stones, boulders and concrete.</p> <p>(b) Erosion control mechanisms will be installed before construction begin (Vlok, 2020).</p>									
<p>Cumulative Impacts:</p> <p>Prior to implementing prevention and preservation measures, the risk of several negative impacts becoming severe due to detrimental activities from the past and the construction phase is high. For example, Mentis (2002) and Vlok (2020) both concur to the presence of soil erosion which can be worsened by project activities if nothing is done. Installing the preventive measures reduces the likelihood and severity of cumulative impacts such as soil erosion from livestock movement being worsened by movement of construction workers and vehicles.</p>									
2. Preparation of roads for use during construction	<p>i). The existing gravel road will have minor upgrades and access roads into the proposed construction site. This provides a chance for better community infrastructure that already</p>	Probable 3 + 4 = 7	Irreversible. Properly constructed roads take time to deteriorate	3 Significant	7 x 7 = 49	3 + 1 = 4	Medium	Low	8 x 7 = 56  Small benefit (Low)

					<p>exists such as roads and bridges, even though the benefit may be short to medium term.</p> <p><i>Impact Status: Positive</i>  <i>Degree to which the impact can cause loss to natural resources: Low</i>  <i>Degree to which the impact can be mitigated: -High</i>  <i>Confidence rating: Medium</i></p>						
<p>Mitigation/Enhancement:                  (a) Access roads used during construction will be upgraded as they will be used by construction vehicles bringing materials and water. They must be upgraded in a way that ensures that they stay longer with minimal chances of flooding which may affect the environment adversely.</p>											
<p>Cumulative Impacts:</p>											
<p>Upgrading of roads reduces the likelihood of community members using unmarked roads or trails in the nature reserve which may contribute to aggravation of existing impacts such as soil erosion and wetland degradation. Currently, wetlands are threatened by unsustainable use by community members. Degradation can be worsened by sedimentation due to sedimentation driven by soil erosion.</p>											
<p>3. Recruitment of casual and temporary labour for construction and mental work.</p>	<p>i). Temporary employment creation for locals when there is need for casual or temporary labour during construction will benefit locals especially youths for the project duration. This also results in a reduction in petty crimes such as theft or vandalism.</p>	<p>Probable  <math>2 + 4 = 6</math></p>	<p>Medium-term.                  The project will run for a maximum of 6 months</p>	<p>4                  Great</p>	<p><math>8 \times 6 = 48</math></p>	<p><math>3 + 1 = 4</math></p>	<p>Medium</p>	<p>Low</p>	<p><math>9 \times 6 = 54</math></p>	<p>Small benefit (Low)</p>	
<p><i>Impact Status: Positive</i>  <i>Degree to which the impact can cause loss to natural resources: Low</i>  <i>Degree to which the impact can be mitigated: -High</i>  <i>Confidence rating: High</i></p>											

	<p><b>Mitigation/Enhancement Measures:</b></p> <p>(a) Preference for casual labour will be given to locals or the affected families. This creates temporary employment and they will have invested emotionally into their properties.</p> <p>(b) Employees will undergo police clearance and certified to have no criminal records (Mfabana, 2020).</p> <p>(c) Employee records will be kept</p> <p>(d) Contractor must comply with labour legislation and standards (Mfabana, 2020).</p> <p><b>Cumulative impacts:</b></p> <p>According to sanews.co.za (2020), the rate of petty crime such as theft in the province is 82.9%. The presence of construction equipment and materials can contribute to the extend and frequency of petty crime rate in the area. Equipment and material can tempt thieves. However, by employing locals, the chances of petty crimes are reduced for two reasons. First, locals know each other can easily spot strangers who are not part of the construction team. Secondly, by employing youths, their chances of engaging in petty crimes are reduced.</p>								
<p>4. Construction of housing units, sewer and water reticulation systems.</p>	<p>i). Construction skills transfer to the locals during the construction work. According to Mfabana (2020), this provides on the job training to pass new skills that may enable casual workers to have better chances of employment elsewhere.</p> <p><i>Impact Status: Positive</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>	<p>Probable 5 + 4 = 9</p>	<p>Irreversible. These skills stay with them for life. It makes them eligible for future casual labour at Ingula</p>	<p>4 Great</p>	<p>8 x 9 = 72</p>	<p>3 + 1 = 4</p>	<p>Low</p>	<p>None</p>	<p>9 x 9 = 81 Moderate benefit</p>
	<p><b>Mitigation/Enhancement Measures:</b></p> <p>(a) During the construction phase, the affected families can be offered casual jobs if there is need. This gives them a chance to earn and purchase electrical appliances such as stoves and reduce reliance on firewood.</p> <p>(b) Contractor is to liaise with local communities through accepted channels or forums (Mfabana, 2020).</p> <p><b>Cumulative impacts:</b></p> <p>According to Mfabana (2020), the province already experiences high unemployment rates with the last statistic indicating it at 34.7%. Even though the chances of any negative cumulative impacts such as unemployment and petty crimes continuing after project ends are low, transfer of skills will reduce unemployment rates even after the project construction phase.</p> <p>ii). With the construction of</p>								
	<p>Probable</p>	<p>Irreversible.</p>	<p>4</p>	<p>3 + 1 = 4</p>	<p>8 x 7 = 56</p>	<p>Medium</p>	<p>Low</p>	<p>9 x 7 = 63</p>	

	<p>new, standard buildings, there is community infrastructure development.</p> <p><i>Impact Status: Positive</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated:-High</i> <i>Confidence rating: High</i></p>	<p>2 + 5 = 7</p>	<p>Permanent structures are being established.</p>	<p>Great</p>				<p>Moderate benefit</p>	
<p><b>Mitigation/Enhancement Measures:</b> There will be construction of community infrastructure such as water storage tanks and upgrading of nearby road to support the village.</p>									
<p><b>Cumulative impacts:</b> The dwellers are experiencing socio-economic challenges which will worsen if they are relocated without proper standards being followed. If proper infrastructure is not constructed, the relocated families may be worse off than before and this may result in aggravation of existing environmental and social impacts such as soil erosion and poverty. Even though the cumulative impacts are likely to be medium, they can be eliminated with the establishment of proper structures in a site that is less ecologically sensitive.</p>									
<p>5. Establishment of contractor camps (Mfabana, 2020).</p>	<p>i). Economic development can occur when construction activities promote local markets when procuring materials and other needs such as food. Even if the project is for a short period of time, the positive impacts can stay longer. For example kiosks established for construction workers can continue to operate and serve the community once contractor leaves.</p> <p><i>Impact status: Positive</i> <i>Degree to which the impact can cause loss to natural resources: Low</i></p>	<p>2 + 4 = 6</p>	<p>Reversible. Project is only for a short period.</p>	<p>4 Great</p>	<p>7 x 6 = 42</p>	<p>1 + 2 = 3</p>	<p>Low</p>	<p>None</p>	<p>10 x 6 = 60 Moderate benefit</p>



<p><i>Degree to which the impact can be mitigated: High</i> <i>Confidence rating: Medium</i></p>									
<p>Mitigation/Enhancement Measures: Mfabana (2020); (a) A local person can run a kiosk within the lay down or campsite. (b) The kiosk can continue to run and serve the community. (c) In line with Eskom's policy on BBBEE, the contractors and sub-contractors should be required to purchase an agreed to quota of materials, goods and services from local businesses. (d) Set aside a safe space at the construction site to allow an agreed upon small number (2-3) of locals to operate food stalls, within agreed upon working hours. (e) Construction workers must not be allowed to sell any goods as this may suffocate the locals' business.</p>									
<p>Cumulative impacts: According to treasury.gov.za, economic growth was 0.7% as of 2019 and had not translated to employment creation and economic empowerment for the locals. Construction activities can leave the local communities worse off than before and worsen the mentioned negative socio-economic impacts from other non-project activities such as economic growth without tangible benefits. In this case, due to construction workers' ability to afford better services and goods, they may avoid local markets. If not mitigated, this can worsen poverty and dampen economic growth in the area. If mitigated, the opposite becomes possible.</p>									
<p>ii). Siting of contractor camps can result in soil erosion and production of waste. Workers may disregard local cultural norms and result in conflicts with locals.</p> <p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: High</i> <i>Confidence rating: High</i></p>	<p>2 + 4 = 6</p>	<p>Reversible. Relations can be restored but at unnecessary costs and may also take time.</p>	<p>2 Potentially harmful</p>	<p>6 x 6 = 36</p>	<p>2 + 2 = 4</p>	<p>Medium</p>	<p>Low</p>	<p>3 x 6 = 18</p>	<p>Low risk</p>
<p>Mitigation/Enhancement Measures: Mfabana (2020); (a) The contractor to establish a demarcated lay down or site camp area; and, provide electricity; sanitation facilities; and, portable water for domestic consumption. (b) Construction workers' movements will be monitored and they must observe locals norms and traditions. The contractors can be housed at Ingula Pumped Storage Scheme where there will use existing facilities such as ablation and waste management.</p>									
<p>Cumulative impacts:</p>									

<p>Soil erosion is occurring in the project area due to other non-project activities such as the movement of people and livestock. Establishment of contractor camps can contribute to this adverse impact if not mitigated. Depletion of natural resources happens due to soil erosion and overgrazing; it can be worsened by production of waste at the contractor camp. Managing the establishment of contractor camp will reduce such cumulative impacts from medium to low.</p>									
<p>6. Land clearing for establishing building foundations and trenches for piping</p>	<p>i). Clearing of vegetation and plant debris will impact on the current vegetation as mentioned by Vlok (2020).  <i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated:-High</i> <i>Confidence rating: High</i></p>	<p>Probable 3 + 5 = 8</p>	<p>Irreversible. Area will be covered by houses permanently.</p>	<p>3 Slightly harmful</p>	<p>5 x 8 = 40</p>	<p>1 + 1 = 2</p>	<p>Medium</p>	<p>None</p>	<p>2 x 8 = 16  Low risk</p>
<p>Mitigation/Enhancement Measures: (a) Reduces the ecological footprint and severity of the construction activities by clearing only the areas that is required for development. Vlok (2020) mentions that the area does not have rare or endangered plant species.</p>									
<p>Cumulative impacts: Vegetation clearing contributes to soil erosion which already exists due to movement of livestock and people. Vegetation clearing contributes to habitat destruction that already exists due to depletion of aquatic resources as mentioned by Mentis (2006). Cumulative impacts would be medium without mitigation as vegetation clearing would contribute to both soil erosion and habitat destruction. With mitigation measures such as avoiding unnecessary vegetation clearing and avoiding habitats, cumulative impacts become low.</p>									
<p>ii). Land degradation due to vegetation clearing and digging activities during construction of foundations and trenches. Soil erosion has remained a problem as evidence by observations by Mentis (2002) and recently by Vlok (2020). <i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i></p>	<p>Improbable 1 + 3 = 4</p>	<p>Reversible. Mitigation measures can be applied after construction.</p>	<p>2 Potentially harmful</p>	<p>4 x 4 = 16</p>	<p>1 + 1 = 2</p>	<p>Medium</p>	<p>None</p>	<p>3 x 4 = 12  Low risk</p>	

<p>Degree to which the impact can be mitigated:--High Confidence rating: High</p>												
<p>Mitigation/Enhancement Measures:</p>												
<p>(a) Unnecessary land clearing will be avoided due to the possibility of easily degrading the land which has erodible soils as mentioned by Mentis &amp; Partridge (2002).</p>												
<p>(b) Reforestation with fruit trees can be done after construction. This results in more residual benefits such as habitat creation for avifauna.</p>												
<p>Cumulative impacts:</p>												
<p>Land degradation due to construction activities and vegetation clearing can worsen land degradation which exists currently due to high soil erosion, overgrazing and vehicle off-roading. Cumulative impacts can be greatly downgraded from medium to none if reforestation is done as it results in benefits such as soil preservation.</p>												
<p>iii) Habitat destruction due to vegetation clearing. Vlok (2020) states that the relocation site has a stream and grasslands both which are bird habitats. These habitats may be destroyed or disturbed during construction.</p>	<p>Irreversible. Habitats can be avoided.</p>	<p>3</p>	<p>Slightly harmful</p>	<p>5 x 3 = 15</p>	<p>1 + 1 = 2</p>	<p>Medium</p>	<p>None</p>	<p>4 x 2 = 8</p>	<p>Low risk</p>			
<p>Impact Status: Negative</p>												
<p>Degree to which the impact can cause loss to natural resources: Medium</p>												
<p>Degree to which the impact can be mitigated:--High</p>												
<p>Confidence rating: High</p>												
<p>Mitigation/Enhancement Measures:</p>												
<p>(a) Vlok (2020) discovered no bird habitats on the site.</p>												
<p>(b) Vlok (2020) recommended that the stream passing through the relocation site be avoided at all costs during construction.</p>												
<p>(c) If bird nests are discovered during construction, they must be moved with guidance from Bird Life South Africa.</p>												
<p>Cumulative impacts:</p>												
<p>Overgrazing in the nature reserve and soil erosion are non-construction factors causing habitat destruction. Adding vegetation clearing results in an increase in the number of factors aggravating habitat destruction. However, if properly mitigated, the cumulative impacts become none.</p>												
<p>iv). Soil erosion and loss of top soil due to vegetation clearing and digging</p>	<p>Irreversible. Erosion is long-term</p>	<p>3</p>	<p>Slightly harmful</p>	<p>8 x 7 = 56</p>	<p>1 + 1 = 2</p>	<p>Medium</p>	<p>Low</p>	<p>5 x 7 = 35</p>	<p>Low risk</p>			

<p>activities. In 2002, Partridge describes Ingula soils as erodible. This is supported by Vlok in 2020 where a survey done observed how existing erosion is high in the area.</p> <p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated:--High</i> <i>Confidence rating: High</i></p>	<p>unless intervention methods are used.</p>									
<p>Mitigation/Enhancement Measures:</p>										
<p>(a) During the digging of foundations, the top soil will be used to rehabilitate gulleys. According to a specialist study by Professor McCutcheon (2005), nearby areas are prone to gully erosion which can be controlled by using remnant vegetation and grazing control.</p>										
<p>(b) This was supported by Vlok (2020) where use of control gabions is mentioned as effective.</p>										
<p>Cumulative impacts:</p>										
<p>Viewed alone, soil erosion is high in the area due to overgrazing, uncontrolled burning, movement of people and livestock, and off-roading. Adding to these causes by construction activities such as vegetation clearing and digging of foundations increases the cumulative effect. Even if viewed alone, erosion from construction activities will still be severe due to the high erodibility of the soils as indicated by Mentis (2005). By mitigating, reducing and avoiding soil erosion, cumulative impacts become low.</p>										
<p>v). Alien invasive species can be unintentionally spread across the nature reserve during movement of workers and vehicles. Vlok (2020) mentions <i>Salix babylonica</i> and a few alien invasive (<i>Acacia mearnsii</i>) on the hills to the north.</p> <p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i></p>	<p>Reversible. Mitigation and restoration can be done.</p>	<p>4 Harmful</p>	<p>6 x 7 = 42</p>	<p>2 + 1 = 3</p>	<p>Medium</p>	<p>Low</p>	<p>3 x 7 = 21 Low risk</p>			

<p><i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>								
<p>Mitigation/Enhancement Measures: (a) If any alien invasive species are found, they must be disposed of with guidance from the nature reserve team. The Alien Invader Control recommendations by Mentis (2002) recommends cutting down the invasive plants, then destroy with a chipper before burning or applying eco-friendly herbicides. (b) Invasive species can be cut and burnt.</p>								
<p>Cumulative impacts: According to specialist studies by Mentis (2006), some parts of the reserve have the alien invasive species which contribute to habitat destruction and the reduction of ecosystem services. They do so by hindering growth and establishment of indigenous plant species. Even though Vlok (2020) observed no alien invasive plants on the project site, they can be introduced and spread by uncontrolled movement of workers during the construction phase. At the moment, the spread of alien invasive species due to movement of animals and livestock seems to be very low or non-existent. Thus the cumulative effect due to movement of workers will likely be medium prior to mitigation and low afterwards.</p>								
<p>vi).impact on archaeological resources which can be unintentionally disturbed or destroyed during excavation works</p>	<p>Probable 4+5 =9</p>	<p>Irreversible.</p>	<p>4 Potentially harmful</p>	<p>12*9 =108</p>	<p>4+4 = 8</p>	<p>Medium</p>	<p>Low</p>	<p>9*8= 72 Medium risk</p>
<p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>								
<p>Mitigation/Enhancement Measures: (a) If any artefacts are found during excavation or digging, an archaeologist must be notified and works temporarily ceased. (b) Artefacts can be sent to the Ingula culture centre but the chance find protocol must be followed.. Impact severity Medium according to the 2020 archaeological study and the mitigation is feasible and fairly easy. (c) the identified graves (Figure 8.4-5) should be preserved in-situ and a 50 m buffer be maintained as far as practically possible or alternatively relocated according to existing legislation.</p>								
<p>Cumulative impacts: Loss of sites of significant national heritage. By minimising the likelihood of the disturbance of artefacts, cumulative impacts can be reduced from medium to none. Currently, there are no known activities causing disturbance of paleontological resources hence the likelihood of cumulative impacts is very low prior to mitigation.</p>								

<p>7. Movement of vehicles, workers, bricklaying and concrete mixing</p>	<p>i).Riverine and riparian ecosystems may be disturbed. A small stream which is a tributary to the Wilge River, passes through the relocation as noted by Vlok (2020). It must not be disturbed since it provides a habitat to several bird species such as the African marsh Harrier and the Flufftail.</p>	<p>Probable 5 + 2 = 7</p>	<p>Reversible. It can be avoided and the current status enhanced after construction.</p>	<p>3 Slightly harmful</p>	<p>7 x 7 = 49</p>	<p>3 + 1 = 4</p>	<p>High</p>	<p>Low</p>	<p>5 x 7 = 35 Low risk</p>
<p>Mitigation/Enhancement Measures: (a) Vlok (2020) recommends that access to the stream or river be restricted or denied for both workers and dwellers. (b) Construction will be done at least 32 m away from the nearby stream. (c) The current riparian system can be enhanced by planting new indigenous plant species in the section of the river near the proposed site.</p>									
<p>Cumulative impacts: According to the Wetland Report by Mentis (2006), depletion of aquatic ecosystems is already occurring due to high soil erosion in the area. Use of wetlands by locals has also contributed to degradation of wetlands. This depletion can be worsened by movement of construction workers and machinery on river banks and in streams. Avoidance and mitigation measures that there are no cumulative impacts occurring due to construction activities.</p>									
<p>ii). Dust may be generated by the movement of vehicles and machinery. Dust poses a risk to both workers and the nearby community by causing irritation to eyes and the respiratory system.</p>	<p>Probable 5 + 4 = 9</p>	<p>Reversible. Can be controlled and dust settles after construction.</p>	<p>2 Potentially harmful</p>	<p>7 x 9 = 63</p>	<p>1 + 1 = 2</p>	<p>Low</p>	<p>None</p>	<p>5 x 9 = 45 Low risk</p>	<p>Impact Status: Negative</p>

	<p>Degree to which the impact can cause loss to natural resources: <i>Low</i> Degree to which the impact can be mitigated: <i>-High</i> Confidence rating: <i>High</i></p>								
<p>8. Use and movement of construction machinery and vehicles that have combustion engines</p>	<p>Mitigation/Enhancement Measures: (a) Unnecessary vegetation clearing must be avoided since it acts as soil cover. (b) Water can be sprayed during windy days. This reduces the severity of the impact. (c) The EMP for IPSS construction by Mentis (2008) suggested use of portable dust sensor to monitor for dust and apply suppression irrigation as effective control measures</p> <p>Cumulative impacts: Currently, the area has no observed dust generation issues. Even though the soils are erodible, the particles are large Maud &amp; Partridge (2004) and not easily blown away by the wind. Any chances of dust are slim and probably due to movement of livestock. As a result, construction activities will result in low cumulative effect which can be mitigated. However, if viewed alone, dust generation from construction activities can be high if unmitigated.</p> <p>i). Greenhouse gas emissions by construction combustion engines that use fossil fuels such as diesel contribute to global warming and air pollution. <i>Impact Status: Negative</i> Degree to which the impact can cause loss to natural resources: <i>Low</i> Degree to which the impact can be mitigated: <i>-High</i> Confidence rating: <i>High</i></p> <p>Mitigation/Enhancement: (a) Use of machinery will be minimum to moderate since it is a small project hence moderate severity. (b) Well-serviced machinery must be used. (c) Mfabana (2020) recommends that contractor is required to exercise and enforce all necessary care and measure to preclude exposure of personnel, labour and nearby residents to potential health hazards and environmental pollutants</p> <p>Cumulative impacts: Even though global warming due to greenhouse gas emissions is a universal challenge fuelling negative climate change, the project area is a rural area in pristine</p>	<p>Probable 5 + 4 = 9</p>	<p>Reversible. Carbon is assimilated by vegetation. Impact can be minimised.</p>	<p>3 Slightly harmful</p>	<p>7 x 9 = 63</p>	<p>3 + 1 = 4</p>	<p>Low</p>	<p>Low</p>	<p>5 x 9 = 45 Low risk</p>

<p>conditions with insignificant activities that may emit greenhouse gases. Unmonitored use of construction vehicles and machinery can contribute to greenhouse gas emissions being emitted nationally and globally (and not locally), at a rate faster than how they can be sequestered. Even though mitigation measures are desired and to be followed, the cumulative effect remains low.</p>	<p>ii). Vibration from movement of vehicles and use of machinery can cause panic among underground animals. The Ingula Nature Reserve Management Plan (2017) mentions that the reserve has underground animals such as the Rough-haired Golden Mole. Noise can damage workers' eardrums. Noise can cause stress response in wild animals (Wright et al, 2007).</p>	<p>Reversible. There are no sensitive receptors nearby</p>	<p>1 Non-harmful</p>	<p>3 x 9 = 27</p>	<p>1 + 1 = 2</p>	<p>Low</p>	<p>None</p>	<p>2 x 9 = 18 Low risk</p>	
<p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: High</i> <i>Confidence rating: High</i></p>	<p>Mitigation/Enhancement:</p>								
<p>(a) Well serviced machinery and vehicles must be used in order to reduce noise and vibration levels.</p>	<p>(b) Vehicle and machinery use will be minimum to moderate hence the severity.</p>								
<p>(c) Mentis (2008) recommends use of noise protection devices such as earplugs.</p>	<p>Cumulative impacts:</p>								
<p>Except for the occasional movement of vehicles once in a while, there are no known existing factors causing vibration or disturbance of underground animals. Hence cumulative impacts will be low and none with mitigation.</p>									
<p>9. Movement of construction workers on the site and in the vicinity of the</p>	<p>i). Disturbance of rare and endangered plant species during movement of workers and machinery.</p>	<p>Probable 5 + 1 = 6</p>	<p>Reversible. Endangered plants can be avoided or replanted.</p>	<p>3 Slightly harmful</p>	<p>6 x 6 = 36</p>	<p>2 + 1 = 3</p>	<p>Medium</p>	<p>None</p>	<p>4 x 6 = 24 Low risk</p>





<p>can be mitigated:-High Confidence rating: High</p>	<p>Mitigation/Enhancement Measures: (a) As recommended by Vlok and Mentis (2007), erosion control must be done prior to construction. Partridge's (2002) specialist report states that wetland damage occurs due to erosion but can be avoided through erosion control.</p>	<p>Cumulative impacts: According to the Wetland Report by Mentis (2006), the depletion of wetlands is prevalent due to eroded soil being washed into wetlands and movement of people and livestock. Viewed alone, the degradation is medium. This depletion can be worsened by movement of construction workers and machinery on river banks, streams and wetlands. Again if viewed alone, degradation due to construction activities will be medium and high if viewed cumulatively. However, after mitigation, cumulative are expected to be low.</p>	<p>ii). Injuries can occur during construction such as back injuries due to improper lifting of heavy material, broken bones, cuts and illnesses due to exposure to toxic chemicals or material.</p>	<p>Probable 5 + 4 = 9</p>	<p>Irreversible. Some human injuries can result in disability or loss of life.</p>	<p>2 Potentially harmful</p>	<p>4 x 9 = 36</p>	<p>1 + 1 = 2</p>	<p>Low</p>	<p>None</p>	<p>3 x 9 = 27 Low risk</p>
<p>Impact Status: Negative Degree to which the impact can cause loss to natural resources: Low Degree to which the impact can be mitigated:-High Confidence rating: High</p>	<p>Mitigation/Enhancement Measures: (a) All workers will use PPE and be made aware of construction safety. (b) Daily and weekly safety briefings will be conducted to reduce incidences of injury. (c) There will be a first aid kit on site and at least one worker with first aid knowledge. (d) Cordon-off construction site and strictly control entry to authorised personnel only and they should be required to wear protective gear.</p>	<p>Cumulative impacts: With the exception of existing conditions such as old injuries and chronic conditions, there are expected to be no injuries occurring prior to construction. Injuries due to construction work can contribute to the deterioration of existing health conditions such as previous injuries and chronic conditions like hypertension. This may even result in death. With mitigation measures such as employing medically fit employees for heavy labour, cumulative impacts are expected to be non-existent.</p>	<p>iii). Due to high unemployment levels in the local and</p>	<p>2 + 3 = 5</p>	<p>Reversible to some extent.</p>	<p>3 Slightly</p>	<p>7 x 5 = 35</p>	<p>2 + 2 = 4</p>	<p>Medium</p>	<p>Low</p>	<p>5 x 5 = 25</p>

	<p>district municipalities and the province as a whole, the employment and economic opportunities presented by the proposed project during the construction phase will lead to an influx of job seekers leading to increased incidents of crime, sexually transmitted diseases (STDs) etc. (Mfabana, 2020).</p> <p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -Medium</i> <i>Confidence rating: High</i></p>		<p>However, the spread of STIs can be exponential and difficult to trace.</p>	harmful					Low risk	
<p>Mitigation/Enhancement Measures: (a) The contractor to ensure that all employees have undergone the police screening process mentioned in the Scope of Work. (b) Allowing non-locals to go home during weekends reduces incidences of health impacts. (c) A code of conduct for project workers that establishes rules between the project, its workers and the local community.</p>										
<p>Cumulative impacts: A study by Francis (2018) observed that rate of STIs in rural areas is high in South Africa. Construction activities and the increased movement of people can provide an opportunity for criminal elements and prostitutes to move towards the projects area until construction ends. This will contribute to an increase in spread of STIs which is already high. With mitigation, the cumulative effect is expected to be low.</p>										
<p>iv). The community can be at risk of injury from the construction activities. For example there will be increased vehicle movement which may result in collisions or people being hit by vehicles.</p>		<p>Probable 5 + 2 = 7</p>	<p>Irreversible. Some injuries become permanent</p>	<p>2 Potentially harmful</p>	<p>6 x 7 = 42</p>	<p>3 + 1 = 4</p>	<p>Low</p>	<p>None</p>	<p>3 x 4 = 12 Low risk</p>	

	<p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>										
	<p>Mitigation/Enhancement Measures: (a) Local communities will be made aware of activities and associated risks and dangers. (b) The construction area will make use of warning signs. (c) Pits or excavations will be fenced and relevant warning signs erected.</p>										
	<p>Cumulative impacts: Incidences of traffic related injuries and accidents are low in rural areas due to the low traffic activity. As such, there are expected to be low to no cumulative impacts resulting from the construction activities. Even when viewed alone, accidents and injuries occurring to the community members will be low due to their distance from project site and generally a low population in the rural area.</p>										
<p>11. Resource extraction contractor builders.</p>	<p>i). Construction workers can end up making use of natural resources such as firewood or poaching wildlife for meat. Construction material such as water and river sand may end up being extracted from the Wilge River.</p>	<p>Probable 5 + 3 = 8</p>	<p>Reversible. Project is small in nature.</p>	<p>3 Slightly harmful</p>	<p>6 x 8 = 48</p>	<p>2 + 1 = 3</p>	<p>Medium</p>	<p>None</p>	<p>4 x 8 = 32 Low risk</p>		
	<p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Medium</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>										
	<p>Mitigation/Enhancement Measures: (a) Materials for construction will be acquired outside of the nature reserve. (b) Workers will not make use of any resources from the nature reserve.</p>										

<p>(c) Penalties will be imposed on contractors if workers make unauthorised use of nature reserve resources.</p>							
<p>Cumulative impacts: Natural resources are already strained in the area due to issues identified by specialist studies such as erosion, overgrazing and burning of vegetation. Extraction of natural resources can result in creation of factors that contribute to adverse impacts. Extraction of pit sand from the nature reserve can result in aggravation of soil erosion or sedimentation. Poaching of wildlife by construction workers may drive to extinction rate and endangered faunal species, especially some birds.</p>							
12. Waste products from bricklaying and oil spills	<p>i). Construction activities produce waste such as concrete rubble and bits of broken bricks. These disturb the natural look of the environment when left lying around haphazardly.</p> <p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated:--High</i> <i>Confidence rating: High</i></p>	<p>Probable 4 + 4 = 8</p>	<p>Reversible. Waste rubble can be used for other purposes.</p>	<p>2 Potentially harmful</p>	<p>5 x 8 = 40</p>	<p>1 + 2 = 3 Medium</p>	<p>Low 3 x 8 = 24 Low risk</p>
<p>Mitigation/Enhancement Measures: (a) Concrete rubble must be used to fill in gullies or reused during construction of soakaways and septic tanks. (b) Most construction waste such as rubble, damaged bricks and stones pose little threat to the environment hence the low impact severity.</p>							
<p>Cumulative impacts: Currently, the natural look of the environment is at risk of distortion by soil erosion and overgrazing. Leaving construction waste lying around can aggravate the risk of distorting the aesthetic value of the land. Mitigation reduces the cumulative impact to low from medium.</p>							
ii). Water resources can be depleted through water extraction and pollution by oil spills. Water quality plays an important role in the health of ecosystems as mentioned by Terrell et al (2012). Presence of contaminants such as oil can reduce the levels of dissolved oxygen in	<p>Probable 2 + 3 = 5</p>	<p>Reversible. Naturally reversible over time. Impact can be avoided.</p>	<p>2 Potentially harmful</p>	<p>4 x 5 = 20</p>	<p>1 + 1 = 2 High</p>	<p>Low 3 x 5 = 15 Low risk</p>	

	<p>wetland water.</p> <p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>								
	<p><b>Mitigation/Enhancement Measures:</b></p> <p>(a) Water for construction activities will be extracted from sources indicated by the Ingula Nature Reserve management.</p> <p>(b) Vehicle servicing will not be done onsite to reduce risk of oil spills.</p> <p>(c) The recommendation by the BAR specialists is to transport water from the nearby dam.</p>								
	<p><b>Cumulative impacts:</b></p> <p>Aquatic resources currently face a risk from soil erosion and sedimentation which when viewed separately is medium. Introduction of contaminants into water resources negatively contributes to this risk bringing cumulative impacts to high. With mitigation, this is reduced to low since measures will also deal with existing environmental issues.</p>								

Table 10.1-2: Construction Impacts Restricted to Households Orientation Option 2 Only

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability	
1. Construction of a 1-kilometre access road and earthworks for laying sewer and water pipes	<p>i). Construction of longer access roads. The furthest plot will be about 1 kilometre from the main dust road according to calculations done using Google Earth Pro and SHP files provided by proponent. Construction of longer access roads imply more secondary impacts on the environment vegetation clearing and soil erosion.</p> <p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>	Definite 3 + 4 = 7	Permanent. Road will be used for life.	4 Harmful	11 x 7 = 77	2 + 5 = 7	High	Medium	9 x 7 = 63  Moderate risk	
<p>Mitigation / Enhancement Measures:</p> <p>(a) The access road must be constructed within specified widths and made according to local municipality standards. (b) Mitigation measures for this impact are very limited. Selecting Option 1 in favour of 2 is the only avoidance measure.</p> <p>Cumulative impacts: Option 2 will have more intense cumulative impacts. Currently, erosion is high due to livestock and overgrazing. Vegetation clearing for Option 2 results in a high soil erosion resulting in high cumulative impacts. Habitat destruction and aquatic resources is currently moderate due to soil erosion but the cumulative effect will be high if combined with clearing of vegetation and accelerated erosion due to movement of workers and construction vehicles.</p>										
<p>ii). More vegetation clearing. It may be impossible for the 1-kilometre road to make use of natural clearings only.</p>										
			Probable 4 + 5 = 9	Permanent. Space used by road must be kept free of	4 Harmful	11 x 9 = 99	2 + 5 = 7	High	Medium  Moderate risk	11 x 9 = 99  Moderate risk

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>		vegetation.						
<p>Mitigation / Enhancement Measures: (a) The road must be restricted to the stipulated standard widths.</p>									
<p>Cumulative impacts: Vegetation clearing in the area is high due to uncontrolled burning and overgrazing. The 1-kilometre road will increase the cumulative impact of vegetation clearing which will be medium after mitigation.</p>									
2. Digging trenches	<p>i). Digging of trenches for laying sewage and water pipes with some over one kilometre long because the distance between the farthest two dwellings is about a kilometre. This digging results in more vegetation clearing and higher chances of soil erosion.</p> <p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating:</i></p>	<p>Probable 2 + 4 = 6</p>	<p>Reversible at high cost</p>	<p>5 Disastrous since area is prone to erosion</p>	<p>12 x 6 = 84</p>	<p>2 + 5 = 7</p>	<p>High</p>	<p>Medium</p>	<p>10 x 6 = 60 Moderate risk</p>
<p>Mitigation / Enhancement Measures: (a) Trenches will have to be restricted to accommodate pipe widths.</p>									



Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	(b) Vegetation maybe replanted but only grasses are suitable since other vegetation with deep roots may damage pipes. All these complexities result in high impact severity.								
	<p>Cumulative impacts: As mentioned above, vegetation clearing is high in the area due to overgrazing, off-road trails and veld fires. Digging of trenches increases vegetation clearing and soil erosion making it hard for reforestation to occur thereby the high cumulative impact.</p> <p>ii). Increased severity and extend of soil erosion due to the longer access road and digging of trenches.</p> <p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated:-High</i> <i>Confidence rating: High</i></p>	4 + 4 = 8	Reversible and long-term at a very high cost. Results in other impacts such as river siltation and wetland damage.	5 Disastrous since spatial scale would have increased	13 x 8 = 104	3 + 5 = 8	High	Low	8 x 6 = 48 Low risk
	<p>Mitigation / Enhancement Measures: (a) Soil erosion control mechanism such as use of mechanically stabilised walls and roadside storm drains must be installed to reduce washing away of eroded soil into rivers and wetlands as recommended by Vlok (2020).</p> <p>Cumulative impacts: Without mitigation, cumulative impacts are expected to be high. Soil erosion is high in the area due to the nature of soil, overgrazing, off-road trails and veld fires. Digging of trenches and the increased construction activities on the 1-kilometre long space of land increases soil erosion thereby the high cumulative impact but reduced with the implementation of mitigation measures.</p>								

Table 10.1-3: Operational Phase Impacts for Household Orientation Options 1 and 2

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
1. Proximity of the dwellers to Ingula Nature Reserve and the Pumped Storage Scheme	<p>i). Due to proximity to the Ingula Pumped Storage Scheme, the dwellers will have increased chances of employment whenever there is need for temporary or permanent labour which fits their skills. This is a beneficial in the quality and standard of life of the dwellers</p> <p><i>Impact status: Positive</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated:-High</i> <i>Confidence rating: High</i></p> <p>Mitigation / Enhancement Measures: (a) The dwellers will be considered when there is need for casual or long-term labour at the power station. (b) They can also be trained and offered employment as tourism guides or game rangers for the nature reserve.</p> <p>Cumulative impacts: Being settled inside the nature reserve, the presence of unemployed dwellers can result in contribution to existing adverse impacts such as farming practices that cause soil erosion, land degradation and unsustainable harvesting of natural resources. Cumulative impacts would be very high as evidenced by where they are currently settled. However, with mitigation measures, cumulative impacts would be low.</p>	<p>Probable 3 + 4 = 7</p>	<p>Medium term to Permanent due to presence of Nature Reserve and the Pumped Storage Scheme</p>	<p>5 Extremely beneficial</p>	<p>13 x 7 = 91</p>	<p>3 + 5 = 8</p>	<p>High</p>	<p>Medium</p>	<p>14 x 10 = 140  Moderate benefit</p>
	<p>ii). Access to Ingula Nature Reserve ecosystem services by the dwellers will allow them to enjoy natural resources such as natural herbs used as remedies for ailments.</p>	<p>Definite 5 + 5 = 10</p>	<p>Permanent due to the permanent settlements</p>	<p>4 Great</p>	<p>12 x 10 = 120</p>	<p>3 + 5 = 8</p>	<p>High</p>	<p>Low</p>	<p>13 x 10 = 130  Moderate benefit</p>



Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>There are plans to construct sewer and water reticulation and solar power for the six households.</p>								
	<p>Cumulative impacts: According to Mfabana (2020), the district experiences unemployment which results in poor standards of living. If sub-standard houses are constructed, their quality of life may remain poor or deteriorate further. Such cumulative impacts are quite significant and can be low with mitigation.</p>	<p>iv).Afforestation and nature conservancy can be carried out in the nature reserve due to the presence of dwellers. If done continuously over the years, this can result in more bird habitats and better capacity for the nature reserve to provide ecosystem services to the dwellers. According to Mentis (2002), the reserve has erodible soils in some areas and afforestation will assist in reducing erosion.</p>	<p>Medium term. Can be permanent with mitigation</p>	<p>5 Extremely beneficial</p>	<p>11 x 6 = 66</p>	<p>3 + 3 = 6</p>	<p>High</p>	<p>Low</p>	<p>12 x 6 = 72 Moderate benefit</p>
	<p>Mitigation / Enhancement Measures: (a) Naturally, dwellers may feel obliged to protect their land and surrounding areas and these values will be encouraged through structured awareness and empowerment programmes for building livelihoods and a sense of community within the nature reserve management requirements. (b) Dwellers will be encouraged and given incentives for tree planting. Fruit trees can provide extra food and other services such as shade and microclimates.</p>								
	<p>Cumulative impacts: In the understandable drive to sustain livelihoods, nature conservation is currently worsening prompting the need for relocation. Viewed alone, the impact is high. With the</p>								

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>relocation, the cumulative impact can be high as the dwellers will be causing detriment to a new area through Impacts such as depletion of natural resources and disturbance of aquatic resources in the unguided drive to seek a better survival. Firewood harvesting for domestic use or for sale can significantly contribute to deforestation. Vegetation clearing and soil erosion become cumulative impacts which can be low after mitigation.</p>	<p>Definite 5 + 5 = 10</p>	<p>Permanent. Use of solar is a long-term solution.</p>	<p>4 Great</p>	<p>11 x 10 = 110</p>	<p>2 + 5 = 7</p>	<p>High</p>	<p>Low</p>	<p>12 x 10 = 120 Moderate benefit</p>
	<p><i>Impact status: Positive</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated:-High</i> <i>Confidence rating: High</i></p>								
	<p>Mitigation / Enhancement Measures:</p>								
	<p>(a) The houses will be using solar energy for cooking, lighting and other related activities.</p>								
	<p>(b) The significant reduction in use of firewood and fossil fuel results in cumulative impacts such as reduction in indoor air pollution.</p>								
	<p>Cumulative impacts:</p>								
	<p>Due to the current use of firewood by the dwellers, there is vegetation clearing, deforestation, desertification, soil erosion and indoor air pollution which contributes to the further deterioration of existing chronic medical conditions such as asthma. Evidently, the cumulative effect is high when viewed alone and remains high prior to mitigation. With mitigation, the cumulative impacts are expected to be low.</p>								
	<p>vi). By using solar, there will be less deforestation and significantly reduced chances of wood poaching in the nature reserve.</p>	<p>Probable 5 + 4 = 9</p>	<p>Permanent. Home solar systems can last ten years and be upgraded or houses</p>	<p>5 Extremely beneficial</p>	<p>13 x 9 = 117</p>	<p>3 + 5 = 8</p>	<p>High</p>	<p>Medium</p>	<p>14 x 9 = 126 Moderate benefit</p>
	<p><i>Impact status: Positive</i> <i>Degree to which the impact can</i></p>								

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>cause loss to natural resources: Low Degree to which the impact can be mitigated:-High Confidence rating: High</p>		connected to national grid.						
	<p>Mitigation / Enhancement Measures: (a) The families will have all their homes installed with solar power systems. This will avoid the need for firewood hence significant reduction in deforestation. (b) In the future, the houses may be connected to the national grid.</p>								
	<p>Cumulative impacts: Due to the current use of firewood by the dwellers, there is vegetation clearing, soil erosion and indoor air pollution which contributes to the further deterioration of existing chronic medical conditions such as asthma. The cumulative effect is high when viewed alone and remains high prior to mitigation. With mitigation, the cumulative impacts are expected to be low.</p>								
	<p>vii). Preservation of cultural and archaeological resources in the area due to the presence of a cultural centre capable of archiving information and artefacts. This will benefit the scientific community and local heritage. This way, reliable information can be passed down generations and students.</p>	<p>Probable 5 + 5 = 10</p>	<p>Permanent due to the establishment of a culture centre</p>	<p>5 Extremely beneficial</p>	<p>14 x 10 = 140</p>	<p>4 + 5 = 9</p>	<p>Low</p>	<p>Low</p>	<p>15 x 10 = 150 Moderate benefit</p>
	<p>Impact Status: Positive Degree to which the impact can cause loss to natural resources: Low Degree to which the impact can be mitigated:-High Confidence rating: High</p>								
	<p>Mitigation / Enhancement Measures:</p>								

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>(a) A culture centre was established where some cultural and archaeological resources are put on exhibit. This allows the dwellers an opportunity to have their culture being documented, preserved and communicated to the world through the centre.</p> <p>(b) Visits to the centre may generate income for the community and nature reserve.</p>								
	<p>Cumulative impacts: Unintentional destruction of artefacts. This can add to the factors that may cause conflicts with local communities such as competition for natural resources with construction workers. By minimising the likelihood of the disturbance of artefacts, cumulative impacts can be reduced from medium to none. Currently, there are no known activities causing disturbance of paleontological resources hence the likelihood of cumulative impacts is very low prior to mitigation.</p> <p>ix). Tourism development due to protected status of the nature reserve and biodiversity conservation will benefit local communities by creating employment and contributing to the economy.</p> <p><i>Impact Status: Positive</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>	<p>Probable 4 + 4 = 8</p>	<p>Permanent if the reserve and culture centre is well maintained</p>	<p>5 Extremely beneficial</p>	<p>13 x 8 = 104</p>	<p>3 + 5 = 8</p>	<p>Medium</p>	<p>Low</p>	<p>15 x 10 = 150  Moderate benefit</p>
	<p>Mitigation / Enhancement Measures: (a) In developing more tourism products, requirements for environmental authorisation must be considered and adhered to. (b) The nature reserve can be advertised on the domestic and international market</p>								
<p>2. Water and</p>	<p>i). Movement of dwellers and their</p>	<p>Probable</p>	<p>Irreversible.</p>	<p>4</p>	<p>12 x 9 = 108</p>	<p>3 + 5 = 8</p>	<p>High</p>	<p>Low</p>	<p>5 x 9 = 45</p>

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
plant extraction from the wetland	livestock or water extraction in the nature reserve may cause wetland resource depletion due to soil erosion.  <i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i>	Probable 5 + 4 = 9	Wetlands are complex ecosystems that are hard and costly to rehabilitate	Harmful					Low risk
<p>Mitigation / Enhancement Measures:                      (a) Dwellers to be educated on sustainable and responsible use of ecosystem services.                      (b) The wetland study for Ingula done by Mentis (2006) recommended off-site mitigation and avoidance measures such as erosion control to avoid and minimise depletion of wetlands.</p>									
<p>Cumulative impacts:                      According to the Wetland Report by Mentis (2006), the depletion of wetlands is prevalent due to eroded soil being washed into wetlands and movement of people and livestock. Viewed alone, the degradation is medium. This depletion can be worsened by movement of dwellers and their livestock on river banks, streams and wetlands. Again if viewed alone, degradation due to construction activities will be medium and high if viewed cumulatively. However, after mitigation, cumulative are expected to be low.</p>									
3. Cultivation of land for cropping	Intensive subsistence cropping by the dwellers can damage the ecosystem. This can result in the reduction in quality of nature reserve and put tourism at risk.  <i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i>	Probable 1 + 4 = 5	Long-term. If casual or permanent employment opportunities do not arise.	4 Harmful	12 x 5 = 60	3 + 5 = 8	High	Low	10 x 4 = 40 Low risk



Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	Degree to which the impact can be mitigated:-High Confidence rating: High								
	Mitigation / Enhancement Measures: (a) Area of land that can be farmed to be restricted. (b) Regular, casual employment opportunities can reduce dependence on farming. (c) Dwellers can be educated on how to do conservation farming.								
	Cumulative impacts: The nature reserve's ecosystem is under pressure from soil erosion, uncontrolled burning and overgrazing. Intensive subsistence cropping can contribute to erosion which is already occurring in the nature reserve. Soil loss and land degradation can follow and fuel sedimentation and degradation of aquatic resources putting more negative pressure on the reserve's ecosystems. Obviously, the cumulative effect will be high if unmitigated.								
4. Burning of grasslands to remove moribund and increase pasture quality	i). High risk of uncontrolled fire due to burning programmes by the dwellers. Uncontrolled fire can destroy habitats and threaten biodiversity.  Impact Status: Negative Degree to which the impact can cause loss to natural resources: High Degree to which the impact can be mitigated:-High Confidence rating: High	Probable 1 + 4 = 5	Reversible. Fire damage to the environment can naturally resolve in 2 seasons	4 Harmful	9 x 5 = 45	3 + 2 = 5	Medium	Low	7 x 5 = 35  Low risk
	Mitigation / Enhancement Measures: (a) According to Mentis' (2006) Burning and Grazing Regime report for Eskom; In terms of Section 17 of the National Veld and Forest Fires Act, there is need to maintain a system of firebreaks to enable the management of controlled burns and to effectively fight wildfires. Controlled burning by nature reserve management.								
	Cumulative impacts: According to Mentis (2006), uncontrolled burning is already occurring in the reserve. If the practice continues after relocation, undisturbed areas of the reserve will be disturbed resulting in medium cumulative effects.								
	ii). Burning programmes can	1 + 4 = 5	Long-term.	5	11 x 5 = 55	3 + 3 = 6	High	low	7 x 5 = 35

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	threaten biodiversity and rare plant and animal species.  <i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: High</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i>		Biodiversity and rare plant species loss due to fires takes time to recover.	Disastrous					Low risk
	<p>Mitigation / Enhancement Measures: (According to Mentis' (2006)) (a) Burning and Grazing Regime report for Eskom specifies that burning should be undertaken in such a way that it maintains spatial and temporal heterogeneity within the landscape. (b) It must be undertaken with due consideration to the biodiversity conservation requirements of the nature reserve and the need to protect rare and endangered species. (c) Burning and fire management must be undertaken in a safe manner that is legally compliant with the National Veld and Forest Fire Act (No.101 of 1998).</p> <p>Cumulative impacts: Biodiversity is already under threat due to habitat destruction, overgrazing, uncontrolled burning programmes and unsustainable use of wetlands. Viewed alone, the cumulative effect is high and will be worsened by continued or sustained burning of the veld in an uncontrolled manner. Unmistakably, cumulative impacts would be high prior to mitigation and very low after mitigation.</p>								
5. Increased access and movement of people in the nature reserve	i). Poaching of wild animals and unsustainable harvesting of natural resources due to increased access into the nature reserve can impact negatively on biodiversity and threaten plant and animal species abundance.  <i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources:</i>	Probable 5 + 3 = 8	Long-term to permanent. The effects of poaching are usually noticeable when it's too late	5 Disastrous	13 x 8 = 104	3 + 5 = 8	High	Low	3 x 2 = 6  Low risk



Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance after Mitigation or Enhancement Consequence x Probability
	<p>of extension. The cumulative impacts are therefore high and severe before mitigation. They will be low after mitigation.</p>	<p>Probable 4 + 3 = 7</p>	<p>3 Medium-term. Permanent if intervention is not done in time.</p>	<p>3 Slightly harmful</p>	<p>9 x 7 = 63</p>	<p>2 + 4 = 6</p>	<p>High</p>	<p>Low</p>	<p>4 x 7 = 28 Low risk</p>
	<p>iii). Whilst the dwellers must have access to natural resources, unsustainable harvesting of tree barks for traditional uses such as medicine can leave permanent damage on plant species straining their capacity to reproduce and increase in population numbers.</p>								
	<p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>								
	<p>Mitigation / Enhancement Measures:</p>								
	<p>(a) Settlers can be encouraged to make use of nearest clinics when not feeling well.</p>								
	<p>(b) Bark or root harvesting from rare and endangered plant species must be avoided.</p>								
	<p>(c) Identified trees or plants that are used as natural remedies must be introduced into planting programmes to increase their numbers.</p>								
	<p>(d) Harvesting of tree barks or herbs for sale must be prohibited</p>								
	<p>Cumulative impacts:</p>								
	<p>Whilst rare / endangered plant species can be threatened by factors such as veld fires and habitat destruction, poaching is also a major factor which can speed up the possibility of extension. The cumulative impacts are therefore high and severe before mitigation. They will be low after mitigation. Unsustainable harvesting can unintentionally spread to rare and endangered plant species, increasing the cumulative effect.</p>								
6. Livestock grazing	<p>i). Overgrazing can increase soil erosion which worsens problems such as siltation and wetland damage. According to Vlok</p>	<p>Probable 5 + 4 = 9</p>	<p>5 Long-term. Soils are highly erodible hence high</p>	<p>5 Disastrous</p>	<p>12 x 9 = 108</p>	<p>2 + 5 = 7</p>	<p>High</p>	<p>Low</p>	<p>9 x 9 = 81 Moderate risk</p>

Activity Factor	Possible Impacts and Impact Status	Impact Probability: Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>(2020), the nature reserve has erosion problems.</p> <p><i>Impact Status: Negative</i> Degree to which the impact can cause loss to natural resources: Low Degree to which the impact can be mitigated: -High Confidence rating: High</p>		<p>impact severity and high costs of rehabilitation.</p>						
<p>Mitigation / Enhancement Measures:</p> <p>a) Livestock numbers will be limited and there will be penalties for overgrazing. According to Mentis' (2006) Burning and Grazing Regime report for Eskom; Dwellers must not exceed the carrying capacity of the veld. They must burn regularly (every year to every two years, depending on grazing pressure and conditions) to remove old, moribund material. They should rest the veld regularly (every year to every four years, depending on the grazing system, and VCA).</p> <p>b) The adaptive management concept will be adopted for handling grazing matters within the nature reserve.</p>									
<p>Cumulative impacts:</p> <p>Overgrazing by livestock is currently occurring due to overstocking as observed by specialist studies by Mentis (2002, 2004 and 2006) and Vlok (2020). Sustained overstocking exponentially increases overgrazing. The cumulative effect will be high and can be significantly lowered with mitigation.</p>									
7. Crop farming	<p>i). Through annual land preparation for cropping, there can be unintentional spread of alien plant species. This threatens biodiversity and results in reduced ecosystem services.</p> <p><i>Impact Status: Negative</i> Degree to which the impact can cause loss to natural resources: Low Degree to which the impact can be</p>	<p>Probable 1 + 3 = 4</p>	<p>Medium-term. Alien invasive species can be easily controlled if intervention done in time</p>	<p>4 Harmful</p>	<p>10 x 4 = 40</p>	<p>3 + 3 = 6</p>	<p>Medium</p>	<p>Low</p>	<p>6 x 2 = 12  Low risk</p>

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; <i>Consequence x Probability</i>	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement <i>Consequence x Probability</i>
	<p><i>mitigated:-High Confidence rating: High</i></p> <p>Mitigation / Enhancement Measures:                      (a) Some alien species can be composted which destroys the seed and produces organic fertilisers.                      (b) Dwellers will be taught to identify and get rid of alien plant species on their properties.</p> <p>Cumulative impacts:                      According to specialist studies by Mentis (2006), some parts of the reserve have the alien invasive species which contribute to habitat destruction and the reduction of ecosystem services. They do so by hindering growth and establishment of indigenous plant species. Even though Vlok (2020) observed no alien invasive plants on the project site, they can be introduced and spread by uncontrolled movement of dwellers during farming activities. At the moment, the spread of alien invasive species due to movement of animals and livestock seems to be very low or non-existent. Thus the cumulative effect due to farming activities will likely be medium prior to mitigation and low afterwards.</p>	<p>ii). Introduction of new alien invasive species can occur unintentionally when dwellers farm or bring in new plant species for decorative or cropping purposes.</p> <p><i>Impact Status: Negative Degree to which the impact can cause loss to natural resources: Low</i></p> <p><i>Degree to which the impact can be mitigated:-High Confidence rating: High</i></p>	<p>Short term if intervention done properly and in time.</p>	<p>4 Harmful</p>	<p>10 x 4 = 40</p>	<p>3 + 3 = 6</p>	<p>Medium</p>	<p>Low</p>	<p>8 x 4 = 32 Low risk</p>
	<p>Mitigation / Enhancement Measures:                      (a) Dwellers must be discouraged from transplanting or sowing plant seeds from any place unless it's a crop or fruit seed.</p> <p>Cumulative impacts:                      According to specialist studies by Mentis (2006), some parts of the reserve have the alien invasive species which contribute to habitat destruction and the reduction of ecosystem services. They do so by hindering growth and establishment of indigenous plant species. Even though Vlok (2020) observed no alien invasive plants on the project site, they can be introduced and spread unintentionally when dwellers bring in new plants for ornamental purposes. Thus the cumulative effect due to this will be medium prior to mitigation and low afterwards.</p>	<p>iii). Water resources contamination</p>	<p>Probable</p>	<p>3 Long-term.</p>	<p>10 x 5 = 50</p>	<p>2 + 5 = 7</p>	<p>High</p>	<p>None</p>	<p>5 x 5 = 25</p>

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>by agrochemicals can threaten aquatic and riparian ecosystems. It also results in algal blooms.</p> <p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>	<p>1 + 4 = 5</p>	<p>Most agrochemicals have a long half-life and effects of eutrophication by fertilisers take time to reverse.</p>	<p>Slightly harmful</p>					<p>Low risk</p>
	<p>Mitigation / Enhancement Measures: (b) Encourage use of organic fertilisers. (c) Conservation of riparian vegetation to be maintained. (d) Use of agrochemicals must be done at least 40 m from the river or 60 m if there is a slope.</p>								
	<p>Cumulative impacts: Aquatic resources currently face a risk from soil erosion and sedimentation which when viewed separately is medium. Introduction of contaminants into water resources negatively contributes to this risk bringing cumulative impacts to high. With mitigation, this is reduced to low since measures will also deal with existing environmental issues.</p>								
	<p>iv). Soil resources Degradation due to land preparation can worsen already existing soil erosion identified by studies done by Vlok (2020) and Mentis (2005).</p>	<p>Probable Probable 1 + 5 = 6</p>	<p>Permanent. Soil resources take years to form.</p>	<p>3 Slightly harmful</p>	<p>9 x 6 = 54</p>	<p>1 + 5 = 6</p>	<p>Medium</p>	<p>Low</p>	<p>7 x 6 = 42 Low risk</p>
	<p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>								

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>Mitigation / Enhancement Measures:</p> <p>(a) Conservation farming will be taught and encouraged.</p> <p>(b) Cutting of trees as firewood will be discouraged and villagers will have access to the wood that is generated as part of the alien invasive control and management processes</p> <p>(c) Permanent erosion mechanisms will be maintained</p> <p>Cumulative impacts:</p> <p>Soil resources degradation due to farming activities and vegetation clearing can worsen land degradation which exists currently due to high soil erosion, overgrazing and vehicle offloading. Cumulative impacts can be greatly downgraded from medium to low if reforestation is done as it results in benefits such as soil preservation.</p> <p>v). Siltation of rivers can occur due to washing away of soil loosen during land preparation. Silted rivers can dry up and this puts biodiversity at risk.</p> <p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Medium</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>	<p>Probable 1 + 4 = 5</p>	<p>Reversible but long-term. Expensive and complex to rehabilitate.</p>	<p>3 Slightly harmful</p>	<p>11 x 5 = 55</p>	<p>3 + 5 = 8</p>	<p>High</p>	<p>Low</p>	<p>6 x 5 = 30 Low risk</p>
<p>8. Waste from village</p>	<p>Mitigation / Enhancement Measures:</p> <p>(a) River bank cultivation will be prohibited and cutting down of riparian vegetation will be discouraged.</p> <p>(b) Vlok (2020) recommends that rivers and streams be avoided at all costs during construction and land tilling.</p> <p>Cumulative impacts:</p> <p>According to the Wetland Report by Mentis (2006), depletion of aquatic ecosystems is already occurring due to high soil erosion in the area. This depletion can be worsened by riverbank cultivation and introduction of agro-chemicals into aquatic resources. Avoidance and mitigation ensure that there are low to no cumulative impacts.</p> <p>i). Sewage and solid waste production pose a risk to human health and causes algal blooms in rivers if untreated.</p>	<p>Probable 5 + 4 = 9</p>	<p>Reversible. Sewage waste is biodegradable</p>	<p>3 Slightly harmful</p>	<p>10 x 9 = 90</p>	<p>2 + 5 = 7</p>	<p>Medium</p>	<p>None</p>	<p>5 x 9 = 45 Low risk</p>



Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p> <p>Mitigation / Enhancement Measures: (a) Sewage will be treated naturally in conservancy tanks or biogas can be incorporated. (b) Organic solid waste will be composted.</p>								
	<p>Cumulative impacts: Sewage and waste production can result in algal blooms which threatens aquatic biodiversity. Currently, aquatic biodiversity is at risk from sedimentation and siltation being fuelled by soil erosion. Algal blooms add to the problem.</p>								
9. Livestock rearing	<p>i). Spread of disease from wildlife to livestock can result in the dwellers losing some of their domestic animals resulting in an economic loss. Wildlife is generally resistant to diseases and can be carriers.</p> <p><i>Impact Status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p> <p>Mitigation / Enhancement Measures: (a) Grazing areas will be fenced off, where applicable, to avoid livestock wandering into the nature reserve and to control the access to sensitive areas.</p>	<p>Probable 5 + 3 = 8</p>	<p>Irreversible. Usually diseases from wild animals are hard to treat</p>	<p>4 Harmful</p>	<p>12 x 8 = 96</p>	<p>3 + 5 = 8</p>	<p>Low</p>	<p>Low</p>	<p>6 x 8 = 48 Low risk</p>

Activity Factor	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	(b) Regular livestock dipping and feeding with vitamin supplements can reduce the vulnerability of domestic animals to diseases. (c) Resistant livestock breeds can be encouraged on agreement with the land owners. (d) The adaptive management concept will be adopted for handling grazing matters within the nature reserve.								
	Cumulative impacts: At the moment, there are no known factors threatening or negatively affecting livestock farming. As such cumulative impacts are expected to be low to none.								

Table 10.1-4: Operational Impacts Restricted to Households Orientation Option 2 Only

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
1. Village option 2 setup	More privacy for each household since they will have more space to themselves and a distance from the nearby homes.  Impact status: Positive Degree to which the impact can cause loss to natural resources: Low Degree to which the impact can be mitigated: -High Confidence rating: High	Probable 5 + 5 = 10	Permanent.	5 Extremely beneficial	12 x 10 = 120	2 + 5 = 7	None	None	13 x 10 = 130  Moderate benefit
	Mitigation / Enhancement Measures: (a) This is a positive that may come from the separation of households. (b) The chances of conflicts between families will be low. (c) However rural families value Ubuntu and base their relationships on trust and respect.								
	Cumulative impacts:								

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
2. Maintenance of sewer and water works	<p>From having more privacy, no cumulative impacts are expected.</p> <p>High infrastructure maintenance costs may arise. With a longer network of water and sewer pipes arise the chances of burst pipes. Burst sewage can pose risk to human health.</p> <p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: High</i> <i>Confidence rating: High</i></p>	<p>Improbable 1 + 1 = 2</p>	<p>Reversible. Burst pipes can be replaced at a cost</p>	<p>4 Great</p>	<p>7 x 2 = 14</p>	<p>1 + 2 = 3</p>	<p>Medium</p>	<p>Low</p>	<p>5 x 2 = 10 Low risk</p>
	<p>Mitigation / Enhancement Measures:                      (a) Good quality pipes will be used and these must be strong and large enough to handle volume, flow and pressure                      (b) Orientation Option 1 makes it easy to have a centralised management control.                      (c) .Septic tanks will be managed according to the DHWS requirements and applicable municipal by laws.</p> <p>Cumulative impacts:                      Infrastructural maintenance may result in disturbance of soil and land during digging of water and sewer pipes. This increases the number of factors causing and worsening soil erosion, land degradation and siltation of water bodies due to eroded soil being washed into rivers and wetlands.</p>								

Table 10.1-5: Decommissioning Phase

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
Demolition of houses and infrastructure.	<p>i). Demolition of brick-and-mortar structures produces noise and vibrations that can disturb both nearby communities and wildlife.</p> <p>Impact status: Negative</p> <p>Degree to which the impact can cause loss to natural resources: Low</p> <p>Degree to which the impact can be mitigated: -High</p> <p>Confidence rating: High</p>	<p>Probable</p> <p>1 + 1 = 2</p>	<p>Reversible. The effects are short-term and leave no permanent damage.</p>	<p>2</p> <p>Potentially harmful</p>	<p>6 x 2 = 12</p>	<p>2 + 2 = 4</p>	<p>Low</p>	<p>Negligible</p>	<p>5 x 2 = 10</p> <p>Low risk</p>
	<p>Mitigation and Enhancement Measures:</p> <p>(a) Silent demolition methods such as the use of soundless chemical demolition agents can be used.</p> <p>(b) If mechanical methods are to be used, demolition will be done as quickly as possible</p> <p>(c) The houses can be renovated to be used as a tourist housing instead of demolishing them.</p>								
	<p>Cumulative Impacts:</p> <p>Demolition of infrastructure can add to existing noise pollution from vehicle patrols amongst others even though this cumulative impact is considered negligible.</p>								
	<p>ii). Occupational, physical injuries such as bone fractures can occur during demolition work due to workers standing close to falling rubble or machinery. Such injuries can result in permanent disabilities or death.</p> <p>Impact status: Negative</p> <p>Degree to which the impact can cause loss to natural resources: Low</p> <p>Degree to which the impact can be mitigated: -High</p> <p>Confidence rating: High</p>	<p>Probable</p> <p>1 + 4 = 5</p>	<p>Irreversible.</p> <p>Sometimes injuries result in permanent disability or death</p>	<p>3</p> <p>Slightly harmful</p>	<p>7 x 5 = 35</p>	<p>2 + 2 = 4</p>	<p>Medium</p>	<p>Low</p>	<p>6 x 5 = 30</p> <p>Low risk</p>

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance to prior mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p>Mitigation and Enhancement Measures:</p> <p>(a) Workers will wear PPE at all times must observe occupational safety rules.</p> <p>(b) A first aid kit must be on site.</p> <p>(c) A safety officer will be present at all times to monitor demolition work and safety.</p> <p>(d) During demolition, a minimum safe distance must be maintained from the building.</p> <p>Cumulative impacts:</p> <p>With the exception of existing conditions such as old injuries and chronic conditions, there are expected to be no injuries occurring prior to demolition. Injuries due to demolition work can contribute to the deterioration of existing health conditions such as previous injuries and chronic conditions like hypertension. This may even result in death. With mitigation measures such as employing medically fit employees for heavy or risky labour, cumulative impacts are expected to be non-existent.</p>								
	<p>iii). Demolition produces a lot of dust emissions that can pose a risk to human health by causing respiratory problems when inhaled and irritating eyes.</p> <p><i>Impacts status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p>	<p>Probable 4 + 4 = 8</p>	<p>Reversible. Short time exposure to dust can heal in a matter of day. However, it may cause long-term worsening of pre-existing conditions such as asthma.</p>	<p>1 Non harmful</p>	<p>5 x 8 = 40</p>	<p>2 + 2 = 4</p>	<p>None</p>	<p>None</p>	<p>4 x 8 = 32 Low risk</p>
	<p>Mitigation and Enhancement Measures:</p> <p>(a) Workers must wear respiratory protection and eye goggles during demolition work.</p> <p>(b) Water can be sprayed around the building prior to demolition</p> <p>Cumulative impacts:</p> <p>Currently, there are no known factors causing dust in the area therefore cumulative impacts are highly unlikely and less severe if they occur.</p>								
1. Production of demolition waste	<p>Demolition waste such as rubble, electrical wiring, roofing, wood and metal can pose a risk to the environment as some of it is not biodegradable and can distort the natural aesthetics.</p>	<p>Probable 5 + 2 = 7</p>	<p>Reversible. Most demolition waste can be recycled</p>	<p>2 Potentially harmful</p>	<p>5 x 7 = 35</p>	<p>1 + 2 = 3</p>	<p>Medium</p>	<p>Low</p>	<p>4 x 7 = 28 Low risk</p>

Activity	Possible Impacts and Impact Status	Impact Probability; Activity Frequency + Impact Frequency	Reversibility	Severity	Significance prior to mitigation; Consequence x Probability	Spatial Scale + Duration	Cumulative Impacts Prior to Mitigation	Cumulative Impacts after Mitigation	Significance Rating after Mitigation or Enhancement Consequence x Probability
	<p><i>Impact status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p> <p>Mitigation and Enhancement Measures:                      (a) Demolition waste can be recycled or reused. Some of the material can be sold.                      (b) Where recycling or reuse is not possible, the material can be collected and dumped at approved landfills                      (c) Rubble can be used to fill dongas as an effective method for erosion mitigation.</p> <p>Cumulative impacts:                      Currently, the natural look of the environment is at risk of distortion by soil erosion and overgrazing. Leaving demolition waste lying around can aggravate the risk of distorting the aesthetic value of the land, threatening the tourism potential of the area. Mitigation reduces the cumulative impact to low from medium. The rubble may provide residual benefits such as the filling of dongas to control erosion.</p>								
2. Concrete slabs and foundations that remain after demolition.	<p>When demolition is complete, concrete slabs and foundations that remain can distort the natural look of the environment.</p> <p><i>Impacts status: Negative</i> <i>Degree to which the impact can cause loss to natural resources: Low</i> <i>Degree to which the impact can be mitigated: -High</i> <i>Confidence rating: High</i></p> <p>Mitigation and Enhancement Measures:                      (a) Concrete foundations can be dug out and removed.                      (b) The holes that remain after digging can be used for tree planting.</p> <p>Cumulative impacts:                      Currently, the natural look of the environment is at risk of distortion by soil erosion and overgrazing. Leaving stripped foundations uncovered can aggravate the risk of distorting the aesthetic value of the land, threatening the tourism potential of the area. Mitigation reduces the cumulative impact to low from medium. The rubble may</p>	<p>Probable 1 + 4 = 5</p>	<p>Reversible. Slabs and concrete foundations can take many years before they can be naturally disintegrated.</p>	<p>2 Potentially harmful</p>	<p>5 x 5 = 25</p>	<p>1 + 2 = 3</p>	<p>Medium</p>	<p>Low</p>	<p>4 x 5 = 20 Low risk</p>



## 11 SUMMARY OF FINDINGS AND IMPACT MANAGEMENT MEASURES IDENTIFIED IN ANY SPECIALIST REPORTS

This Basic Assessment Process provides an indication of likely/potential environmental impacts based on the assessment criteria, the public consultation process, and maps of the site and nature of the receiving environment. The construction impacts are directly interrelated within the project. It is therefore important that the applicant, ensure continual monitoring to ensure environmental protection. It is also essential that the EMP and Operational Management Plan be updated in order to reflect actual impacts, biophysical environment and the changing institutional and legal environment as appropriate. During the IPSS project between 2002 and 2007, several specialist studies (in Table 11-1) were done to assess the baseline status, identify existing issues and predict project environmental impacts. Recently, Vlok (2020) and Mfabana (2020) carried out biodiversity and socio-economic studies, respectively. The purpose of these studies was to assess any changes in the baseline setting to determine any changes in natural-occurring existing environmental components. This assists in establishing trends and to determine if there have been any changes that can affect how decisions will be made.

This Environmental Impact Statement describes the project, the expected environmental conditions of the site, and assesses the likely effects of the proposed project on the environment. The Environmental Impact Statement also includes an assessment of likely cumulative effects of the project in combination with other past, present or reasonably foreseeable projects, as required. It describes the effects for normal conditions and as a result of accidents and malfunctions.

Findings and impact management measures identified in the relevant specialist reports have been incorporated into the previous section. However, below is the summary for specialist findings.

### 11.1 Summary of impact management measures identified by specialists

Table 11.1-1: Summary of impact management measures identified by specialists

Specialist	Issues	Management	Nature of Report (Volume 4 of 4: Specialist Reports)
Anderson & Anderson (2004)	Paleontological discoveries were made in the Nature Reserve and documented. These are very important and rare resources which must be preserved and documented. They are not renewable and take millions of years to form	Artefacts were removed and sent to SAHRA. Some were sent to Ingula Cultural Centre.	Archaeological Study



Specialist	Issues	Management	Nature of Report (Volume 4 of 4: Specialist Reports)
	hence the importance. If more are discovered, a specialist must be informed, and diligence taken that these resources are not disturbed.		
Muroyi (2020) and Fourie (2020)	There are identified burial sites There are no fossil finds	Burial sites to be fenced off and 30-50 m radius be maintained	Chance find protocol (Appendix E of the Heritage Impact assessment report) Heritage impact assessment and Palaeontological impact assessment report
Cauldwell, <i>et al</i> (2012)	The veld condition was assessed to ascertain how it can be improved. Burning regimes were recommended to remove moribund so that new plants can germinate and flourish undisturbed.	Controlled burning to remove moribund.	Veld Condition Assessment
Mentis (2006) - reference material	Alien invasive species threatening biodiversity were noted in some parts of the nature reserve. These may spread and threaten biodiversity, tourism and ecosystem services in the reserve.	Mechanical chipping and burning	Alien Invader Control
Mentis (2006)- Reference material	Wetland depletion due to erosion can occur since the soils are erodible. Erosion threaten rivers. Wetland and river ecosystem damage threatens biodiversity such as bird species. Sedimentation reduces wetland productivity.	Offsite erosion avoidance to avoid an minimise depletion of wetlands	Wetland Study
Mfabana (2020)	During construction, there is risk of occupational injuries. Employment laws can be broken. Dwellers may cause environmental challenges in the nature reserve when they start staying in the relocation site.	Workers must be trained on occupational safety. Legislative standards must be followed during construction. Dwellers must be trained on environmental conservation when they start staying at the relocation site.	Socio-economic Study
Partridge (2002)	Wetland damage due to soil erosion can occur. Erosion occurs due to the high erodibility of soils in some parts of the reserve. This can be accelerated by human activities and livestock,	Proper erosion control reduces wetland damage due to sediment.	Wetland Study
Vlok and van Wyk (2020)	There is risk of acceleration of soil erosion. There is threat of endangered species and sensitive zones being disturbed. Vlok recommended Household Orientation Option 1 as the most feasible from an ecological perspective.	Erosion must be controlled before construction commences. Sensitive zones must be avoided during construction and operational phases.	Biodiversity Survey

## 12 ENVIRONMENTAL IMPACT STATEMENT

This section gives a summary of the key findings of the impact assessment studies and the development and mitigation process to be adopted on or near sensitive ecosystems.

## 12.1 Summary of Key Findings of Environmental Impact Assessment

The project site located at the north-western boundary of the Ingula Nature Reserve, is for the establishment of the village for the six families being relocated from a sensitive ecological site. The ecological site is close to Eskom's Ingula Pumped Storage Scheme who purchased the land and are part of the trust that manages Ingula Nature Reserve and promotes conservation within it. Therefore, the relocation is meant to preserve the ecologically sensitive site and provide the six families with better land for resettlement where they can continue farming and improve their livelihoods with solar installed and stored/piped water provided. Several environmental issues are of major concern and must be avoided or mitigated prior to commencing construction or during construction and operational phases of the project.

Such issues identified by Vlok (2020) and Partridge (2002) include soil erosion and possible wetland degradation. Even though the two studies are 18 years apart, there is a trend that shows that the issues continue to exist, despite little to no human interference. The mitigation measures can be effective as also supported from the outcomes of the studies done between 2002 and 2007 which determined that the proposed relocation site is the least ecologically sensitive and with possible negative impacts that can be avoided or mitigated.

The Impact Assessment concluded that the social benefits include a better lifestyle for the families and the availability of ecosystem services. This is particularly more beneficial if Option 1 is selected.

The families will have better housing facilities and renewable energy. The land capability is good and supports a wide variety of crops. Availability of tapped water ensures the possibility of more farming options that include market gardening. This greatly offers a chance to improve livelihoods (Mfabana, 2020). The project will have some negative impacts such as soil erosion, possible water contamination and stream siltation if mitigation measures are not well executed., irrespective of the selected option. Special attention has to be given to protection of sensitive ecosystems, as supported by at least three specialist studies who noticed these issues (Volume 4 of 4). All the negative impacts can either be avoided or managed in such a way that the severity is greatly reduced. With proponent involvement, this project is set to become an example of how developmental projects and involuntary resettlement can positively impact communities. Option 1 remains the preferred option when viewing the impacts and evaluating the alignment of the option with the intended project objectives which are to remove uncontrolled pressure on the utilisation

zones of the nature reserve. The village type settlement will have more governance to enhance the nature reserve management plans and protocols than Option 2.

## **12.2 Map Showing Project Development and Measures on Sensitive Areas**

The relocation site has a stream that traverses the site. This stream feeds into Wilge River and must be avoided. During initial land allocations, this part of the land was allocated as a grazing site and a decision has subsequently be taken to exclude this portion from the allocations in response to the biodiversity study findings. Figure 12.1-1 shows the identified sensitive areas in relation to the initially planned allocated areas. Figure 12.2-2 indicates the re-allocation of plots to the families after the sensitive areas had been discovered as part of the biodiversity study. Engineering designs for the infrastructure are yet to be finalised and ecological considerations will form part of the design options. Figure 12.2-3 also shows the sensitive habitats that were identified. Figure 12.2-4 is a close-up of the sensitive areas to the east of the project site and shows the seeps and steep slopes. Figure 12.2-5 is a habitat assessment map.

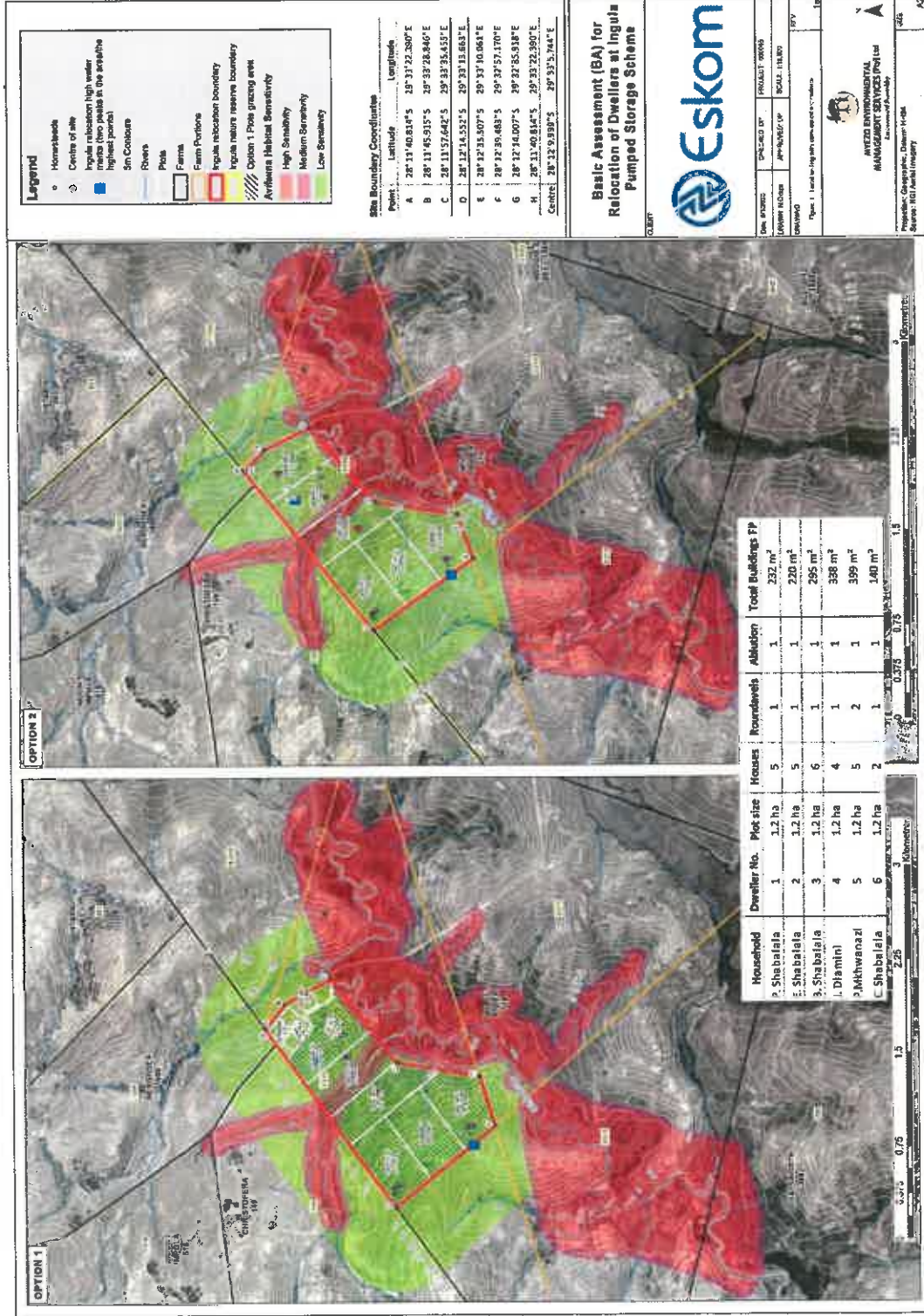


Figure 12.2-1: Sensitive Areas





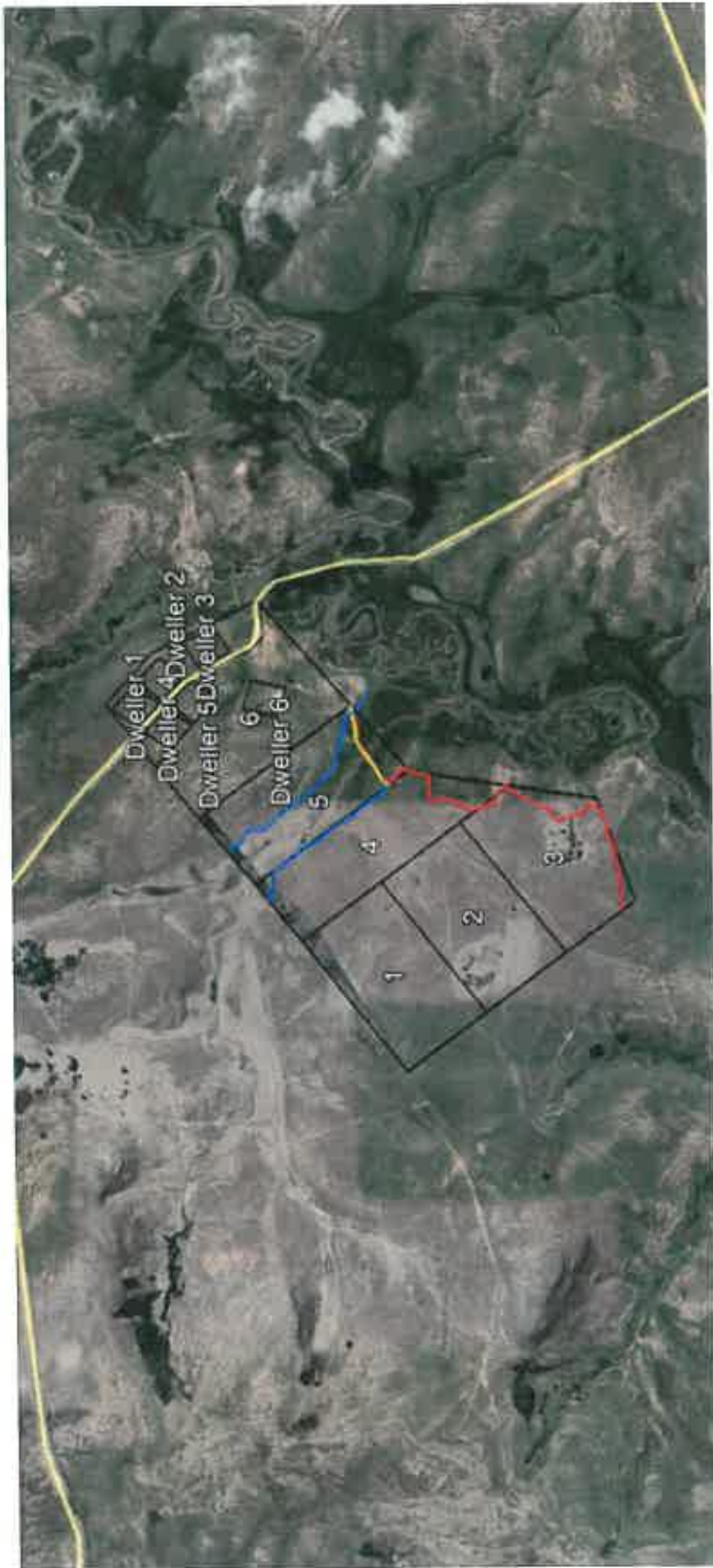


Figure 12.2-3: The sensitive habitat areas identified – red line represent the areas for exclusion (to the east), the yellow line (with the red line next to it) is the crossing to be excluded and is the area where a bridge or permanent crossing can be constructed, blue lines are the drainage lines to be excluded from the grazing areas.





Figure 12.2-4: Close-up of the exclusions to the east, including the seeps and steep slopes.



Figure 12.2-5: Habitat Assessment Map



### 12.3 Summary of Impacts and Risks

Below are the project impacts and risks identified. This includes both positive and negative impacts for both the construction and operational phases. The project does not have alternatives.

#### Construction Phase Impact

- |                  |   |  |
|------------------|---|--|
| <b>Positive:</b> | <b>i. Temporary employment creation</b>                       | <b>iii. Market for local communities to provide goods, labour and other services</b> |
|                  | <b>ii. Skills and knowledge transfer to locals</b>            |  |
| <b>Negative:</b> | <b>i. Vegetation loss</b>                                     | <b>ii. Soil erosion</b>  |
|                  | <b>iii. Siltation and sedimentation of nearby stream</b>      | <b>iv. Soil and water contamination by oil spills</b>                                |
|                  | <b>v. Soil compaction</b>                                     | <b>vi. Dust particulate production</b>   |
|                  | <b>vii. Greenhouse gas emissions by construction vehicles</b> | <b>viii. air emissions by construction vehicles</b>                                  |
|                  | <b>ix. Waste management</b>                                   | <b>x. Occupational and community safety</b>  |
|                  | <b>xi. Noise and vibration</b>                                |  |

#### Operational Phase Impacts

- |                  |   |  |
|------------------|---|--|
| <b>Positive;</b> | <b>i. Nature conservation</b>   | <b>ii Reduction of uncontrolled pressure on the nature reserve</b> |
| <b>Negative;</b> | <b>i. Natural resource depletion</b>                                  | <b>ii. Soil resources degradation</b>                              |
|                  | <b>iii. Production of wastewater, sewage and solid domestic waste</b> | <b>iv. Water resources contamination</b>                           |

### 13 IMPACT MANAGEMENT MEASURES FROM SPECIALIST REPORTS BASED ON THE ASSESSMENT

The following impact management measures are from the specialist reports (Volume 4 of 4). Even though most of them were done for the Ingula Pumped Storage Scheme which resulted in the relocation option, the recommendations apply to the relocation project as the studies covered the whole nature reserve which houses the relocation site.

#### 13.1 Biodiversity

Recommendations were extracted as is from a biodiversity survey done by Vlok (2020):

- Main concern for the habitat and vegetation is high erodibility of soils in the area. The site is undulating – the slopes are increasing the erosion potential. Current erosion in

areas severe and this needs rehabilitation. Trampling, grazing and poorly maintained roads are the main problems contributing to the erosion. It is recommended that the southern area adjacent to the flood plain and river excluded from the allocated land since there is a number of seep and springs that will be susceptible to erosion.

- From an ecological perspective, it is recommended that the new buildings are constructed near the road (Option 1). The remainder of the property to the west can be divided for grazing. It is recommended that the drainage line is excluded from the grazing allocation. A clear strategy must be in place for grazing in the reserve and a single- entry point must be avoided as this will increase erosion potential. Adaptive management approach is preferred.
- It is recommended that no access to the river must be given from the property. Off-channel watering points must be supply in the reserve to prevent drinking and trampling of the flood plain and river zones
- Recommend construction of a permanent crossing over the wetland. In addition, the road crossing the wetland must be cordoned off to prevent sheep and cattle entering the wetland for grazing and drinking
- It is highly recommended that a follow up avifaunal survey be conducted during the summer months prior to any construction or operational phase due to the limited time and season of this site survey.
- Due to the high possibility of nesting sites for one of the threatened bird species (African marsh Harrier - *Circus ranivorus*), it is recommended that the indicated high sensitivity area should not only be protected but also be classified as a no-go zone.
- It is recommended that the highly sensitive area be fenced off and indicated as a no-go area. This is recommended due to agricultural activities in specific the grazing of livestock and development of croplands that will have a high impact on the wetland areas and critical habitat area (Highly Sensitive Areas) for the said species. The exclusions are linked to the potential trampling when grazing and crop development can damage existing and future nesting sites of threatened bird species.

### 13.2 Wetland Study

The wetland study for the Ingula Nature Reserve carried out in 2006 for the pumped storage scheme basically made two recommendations. First was the removal and relocation of rare wetland plant species if work on a wetland is unavoidable. The second recommendation was an opportunity for improvement of the status of wetlands in the reserve. This would be done through permanent erosion control mechanisms and the use of water diversion berms and culvert crossing to reduce impact of roads on wetlands. Terrell et al (2012) recommends the following:

- Water quality in wetlands and other sensitive aquatic ecosystems must be monitored quarterly.
- Monitor the subsurface water hydrometry in the mainstem and tributaries of the wetland as well as the hillslope seepage to confirm the contributions of surface, near-surface and groundwater discharge to the mainstem wetland.

### **13.3 Bird Life South Africa (BLSA)**

BLSA monitors bird and insect activities inside the Ingula Nature Reserve. According to the 2012-13 reports, there were no major environmental issues noted during the construction activities. The current project, being on a much smaller scale, is likely to have no negative impacts in avifauna.

### **13.4 Social Economic Study**

Recommendations and impact management measures by the Socio-Economic Specialist Report (Mfabana, 2020) are as follows:

- The contractor to establish a demarcated laydown or site camp area; and provide electricity; sanitation facilities; and portable water for domestic consumption.
- Records of employees of the contractor and sub-contractors to be kept; and, that all such employees will have undergo police clearance and certified to have no criminal records.
- Contractor to establish temporary health and safety facilities on site (i.e., medical and fire-fighting facilities).
- Contractor to comply with some of the labour related legislation like the OHSA and the BCEA.
- Other health and safety related issues to be complied with refer to control and management of waste, pollution, dust, noise levels and emissions.
- Should the need arise; the Contractor is to liaise with local communities through accepted channels or forums.
- The contractor is required to exercise and enforce all necessary care and measure to preclude exposure of personnel, labour and nearby residents to potential health hazards and environmental pollutants.
- Terms and conditions of the Labour Relations Act in terms of the appropriate age of employment should apply. Also, the terms and conditions of the BCEA and OSHA should be observed; as well as ensuring that proper personal protective equipment is supplied and that fair wages and salaries in line with industry norms are paid.
- The rules to be established and enforced by the Contractor and Sub-contractors regarding the health and safety of employees should include plans of action regarding COVID-19 safeguards in line with the Construction Industry Guidelines.

- Reference letters acknowledging the training provided should be given to workers at the end of their contracts.
- Hiring policy that gives priority to local residents especially for unskilled labour.
- The contractor to ensure that all employees have undergone the police screening process mentioned in the Scope of Work.
- Allowing non-locals to go home during weekends to reduce incidences of sexually transmitted diseases.
- Raise awareness amongst workers about local traditions, practices, norms and values; and, if possible, a code of conduct should be developed for the construction workers, which will state the types of behaviours and conduct that is allowed.
- Ensure that the local community, through appropriate relevant structures communicate their expectations of construction workers' behaviour with them.
- Option 1 is the preferred development option.

### 13.5 Heritage impact study

No significant Stone Age material or ceramics occurs in the study area. There is however a stone wall structure attributed to the Iron Age recorded within the study area. No further mitigation is recommended in terms of the archaeological component for Section 35 for the proposed development to proceed.

- Regular Archaeological Watching Briefs are recommended during the construction phase of the proposed development
- Due to the subsurface nature of archaeological remains in the Nature reserve and the fact that graves can occur anywhere on the landscape. it is recommended that a chance find procedure/protocol be development and implemented for the project
- In terms of the built environment of the area (Section 34), no standing structures older than 60 years occur within the study area.
- In terms of Section 36 of the National Heritage Resources Act, the eastern side of the site contains a significant number of burial sites while two more sites occur on the western boundary of the site. Ideally the graves should be preserved in-situ or alternatively relocated according to existing legislation.
  - If the developer chooses to preserve them in future;
    - ✓ If the developer chooses to preserve the graves, they should be fenced off and a small access gate the put in order to allow relatives of the deceased access to the graves.
    - ✓ The development should observe a 50 m buffer around the graves in order to avoid disturbing them

- If the developer chooses to relocate the graves, the following should be observed;
  - ✓ A qualified archaeologist should be contracted to apply for a human burial exhumation permit from SAHRA.
  - ✓ The relocation procedure will then be guided by the conditions of the SAHRA permit.

#### **14 ANY ASPECTS CONDITIONAL TO ASSESSMENT FINDINGS TO BE INCLUDED AS CONDITIONS FOR AUTHORISATIONS**

Biodiversity Study (Vlok, 2020):

- Vlok (2020) recommended that no access to the river must be given from the property.

Social Specialist (Mfabana):

- A Skills Audit of the members of the directly affected families and affected local community should be conducted to establish the available local skills base, facilitate recruitment during the implementation phases of the project and establish training requirements.
- A meaningful consultation with the affected stakeholders be held, which will result in an agreed agenda for activities that can be implemented as part of the restoration of livelihood programme.
- The update of the socio-economic data on the six-dweller families; and the livestock they own.

Wetland Study (Terrell *et al*, 2012):

- Quarterly monitoring of the stream and wetlands.

Heritage impact study (Muroyi, 2020)

It is the reasoned opinion of (Muroyi, 2020), that SAHRA should exercise its discretion and offer the proposed development a conditional approval. This is based on the fact that no other significant heritage resources were noted in the proposed development footprint apart from the graves of the proposed development.

Palaeontological Study (Fourie, 2020)

- Mitigation may be needed if fossils are found during construction. Overburden and interburden must be surveyed for fossils.

- The Environmental Control Officer must familiarise him- or herself with the formation present and its fossils.
- The development may go ahead with caution. The ECO must survey for fossils before and or after clearing, blasting or excavating and keep a photographic record.
- For a chance find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation.
- It is recommended there must be an involvement of a palaeontologist for pre-construction training of the ECO.

Environmental Assessment Practitioner (2020):

- There must be an Environmental Control Officer on site to monitor for environmental quality for the duration of the construction phase.
- Measures must be put in place to curb naturally existing environmental issues such as soil erosion and possible degradation of riverine ecosystem.

## **15 ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS RELATING TO ASSESSMENT AND MITIGATION MEASURES**

The assessment was based on the assumption that all information provided by proponent and affected parties during the public participation process is correct. It is also the EAP's assumption that information on such gathered in specialist reports such as the biodiversity study (Vlok, 2020) is correct and gathered professionally. Using all information gathered during specialist studies and site visits, enough evidence is available to predict possible impacts and avert them. It must also be noted that in the process of converting spatial data to final output drawings, several steps were followed and these may affect the accuracy of delineated areas even though due diligence was done to preserve accuracy.

Data presented in this BAR may not explain all possible conditions that may exist given the limited nature of the enquiry. It is unlikely that more surveys would alter the outcome of the aquatic study.

## **16 REASONED OPINION OR CONDITIONS AS TO WHETHER THE PROPOSED ACTIVITY SHOULD BE AUTHORISED**

Given available specialist studies (Volume 4 of 4, Appendix D) and impact analysis done, it is the opinion of the EAP that any potential negative impacts arising from the relocation project can be avoided or mitigated adequately with proper planning and rehabilitation. In

fact, this relocation project is based on the need to improve the site itself and the current area where the dwellers are settled. Generally, there will be improvements to fauna, flora, habitats and areas being grazed by animals. Option 1 is recommended as the preferred relocation option.

The proposed project should be authorised given that the mitigation measures and suggestions contained in this report are followed. These best practices ensure that project benefits are reaped whilst negative impacts are avoided and managed at minimal costs. Ultimately, the relocation exercise is good for both the dwellers and the environment. Once resettled, the six families will have better livelihoods and assets of greater value. Relocating them to a less sensitive site within Ingula can result in better conservation of nature by avoiding sparsely distributed settlements which might pose governance risks. Having a village type settlement also ensure that the provisions of services is much more controlled and managed and maintained.

Should the families remain settled where they are, their livelihoods may deteriorate as the environment continue to face challenges such as soil erosion and land degradation. Conservation of faunal species of special interest in the nature reserve may be difficult if the settlement within the nature reserve is not structured. With crippled access to roads and basic services, their lifestyles may also deteriorate. It is the EAP's professional opinion that the relocation be carried out.

According to the Social Specialist (Mfabana, 2020) the implementation of the proposed project, if implemented according to design will exceed the expectation of the principles regarding involuntary resettlements of the Development Finance Institutions like the IFC, World Bank etc. For the first time, the six-dweller families will be exposed to basic services and decent housing; and, this will change their quality of lives forever. Also, the project will ensure that the families have food security through training in sustainable farming techniques thus improving their livelihoods, rather than the current subsistence farming practices which are practiced. The implementation of the proposed project will also contribute to ensuring that government's developmental commitments are gradually being fulfilled, that is in terms of the National Development Plan; as well as commitments made toward achieving targets for the UN SDGs." Given all the reasons stated above and from an ecological and socio-economic perspective, the EAP highly recommends this project.

## 17 PROJECT DURATION AND ENVIRONMENTAL AUTHORISATION REQUIRED

The project is expected to take an average of six months. An Environmental Authorisation is required for the project to begin. The project will include operational aspects and Eskom will conduct regular maintenance according to the plan which they will develop for this project. The project implementation schedule is included as Table 17-1. The environmental authorisation should be valid indefinitely since this is about relocation of families and their homes will be passed as heritage from one generation to the next.

Table 17-1: Summary of the project schedule

Ingula Relocation Construction Project – Key Milestones		Eskom	
SR Name	Start Date	End Date	
<b>1</b>	<b>Engineering Process</b>	<b>Aug-19</b>	<b>Aug-20</b>
	Concept		
	Initial Design Review (IDR)		
	End Of Phase (EOP)		
	Works Info (WIIP)		
<b>2</b>	<b>Procurement / Tender</b>	<b>Sep-20</b>	<b>Jan-21</b>
	Cost estimate		
	Develop NEC		
	Tender		
	Evaluation		
	Tender Committee		
	Award Contract		
<b>3</b>	<b>Execution</b>	<b>Feb-21</b>	<b>Feb-22</b>
	Site Establishment		
	Geohydro		
	Design		
	Construction		
	Handover		



## **18 ENVIRONMENTAL ASSESSMENT PRACTITIONER OATH UNDERTAKING**

I, **Babalwa Fatyi**, confirm and assure that the information provided in this report is to the best of my knowledge accurate at the time of report production. I also affirm that comments and inputs from interested and affected contained in this report are correct and where summarised, no information was tampered with. Inclusion of comments and reports by specialist in this report where relevant, was done with exactness. I confirm that inform provided to the interested and affected parties concerning this project was correct and simple.

---

**Signature**

---

**Date**

## **19 FINANCIAL PROVISION FOR REHABILITATION AND CLOSURE MANAGEMENT OF NEGATIVE IMPACTS**

Due to the project being a relocation and resettlement of farmers in rural areas, there are no provisions for rehabilitation and closure. The village has a lifespan of at least 50 years which will be extended with regular maintenance of the houses by owners. Since the dwellers will be located inside land owned by Eskom, it is important to note that the proponent (Eskom) who will be responsible for rehabilitation and closure, should it come to that, is financially and technically capable of doing so.

The rehabilitation after construction activities will be provided through the construction and operational costs.

## **20 SPECIFIC INFORMATION THAT MAY BE REQUIRED BY THE COMPETENT AUTHORITY**

Being a residential development project in a nature reserve, the project needs to follow the mitigation and avoidance measures mentioned in this report in addition to the nature reserve management plan, where applicable. Monthly monitoring reports with respect to environmental management are proposed and these details are provided in the EMPr (Volume 3 of this report) T

It is the view of the EAP that the developer should co-operate with the competent authority should authorisation be granted to ensure a holistic approach to environmental protection and ensuring that the intended and inadvertent project benefits are maximised whilst minimising the negative effects.

## **21 ANY OTHER MATTERS IN TERMS OF SECTION 24 (4) (A) AND (B) OF THE ACT**

Section 24 (4) a and b of the National Environmental Management Act states that:

Before any regulations are prescribed under this section or any other law that contemplates the assessment of the potential environmental impact of activities. And notwithstanding such other law—

- (a) A Minister must submit a draft of such regulations to the Committee;
- (b) The Committee must within 30 days of the receipt of such draft regulations—
  - (i) Determine whether the draft regulations would bring about a duplication of effort by persons initiating activities contemplated in subsection (1) in the investigation and assessment of the potential impacts of activities that require authorisation or permission from more than one organ of state: and
  - (ii) Approve the draft regulations unless they would bring about such a duplication of effort: or
  - (iii) Specify amendments to be made to such draft regulations in order to avoid such a duplication of effort:

The project does not have any identified activities requiring authorisation from more than one organ of state that may result in duplication of effort or amendments.

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**ESKOM – INGULA – BASIC ASSESSMENT  
BASIC ASSESSMENT UNDERTAKE FOR THE RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME  
LOCATED WITHIN THE BOARDERS OF FREE STATE AND KWAZULU NATAL PROVINCES**

**Document Name: EIB – BAR Proposal**

**Date: 14 December 2020**

**Document Status: Ver 1**

**Myezo Ref: EIB 2020/01**



**MYEZO ENVIRONMENTAL  
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1	Electronic	Mr. Reggie Chippe	Eskom SOC Limited	ChippeRN@eskom.cp.za	01 (Draft)		01 October 2020

Appendix 3.1-1: Surveyor General 21 Digit Codes

Appendix A: Site Plan – Layout Plan (Figure showing positions of allocations and stands)

Appendix B: Photographs (Pictorial View 1 Images)

Appendix C: Facility Illustration(s) (See pictures which act as an example of how the houses will look like)

Appendix D: Specialist Reports – see Volume 4 of 4

Appendix E: Comments and Response Report Table

Appendix F: EMPr – see Volume 3 of 4

Appendix G: Other Information

Appendix G1: Declaration by EAP

Appendix G2: CV for EAP

Appendix G3: Declaration by Applicant

Appendix G4: CV for Applicant Representative:

Appendix H (Volume 2 of 4): Public Participation Process Appendices

Appendix 8.2-1: I&AP Register

Appendix 8.2-2: Background Information Document (BID)

Appendix 8.2-3: Notification Letters

Appendix 8.2.3-1: Notification about Project Commencement

Appendix 8.2.3-2: Notification about BAR Availability for Public Review

Appendix 8.2-4: Email Communication

Appendix 8.2-5: Acknowledgement of Receipt of Notification Register

Appendix 8.2-6: Response Sheet

Appendix 8.2-7: Acknowledgment of Layout Plans

Appendix 8.2-8: Eskom and Dwellers Meeting Minutes

Appendix 8.2-9: Eskom and DESTEA Communication

Appendix 8.2-10: Proof of Publication of Newspaper Adverts

Appendix 8.2-11: Pictorial Record of Site Notice Erection



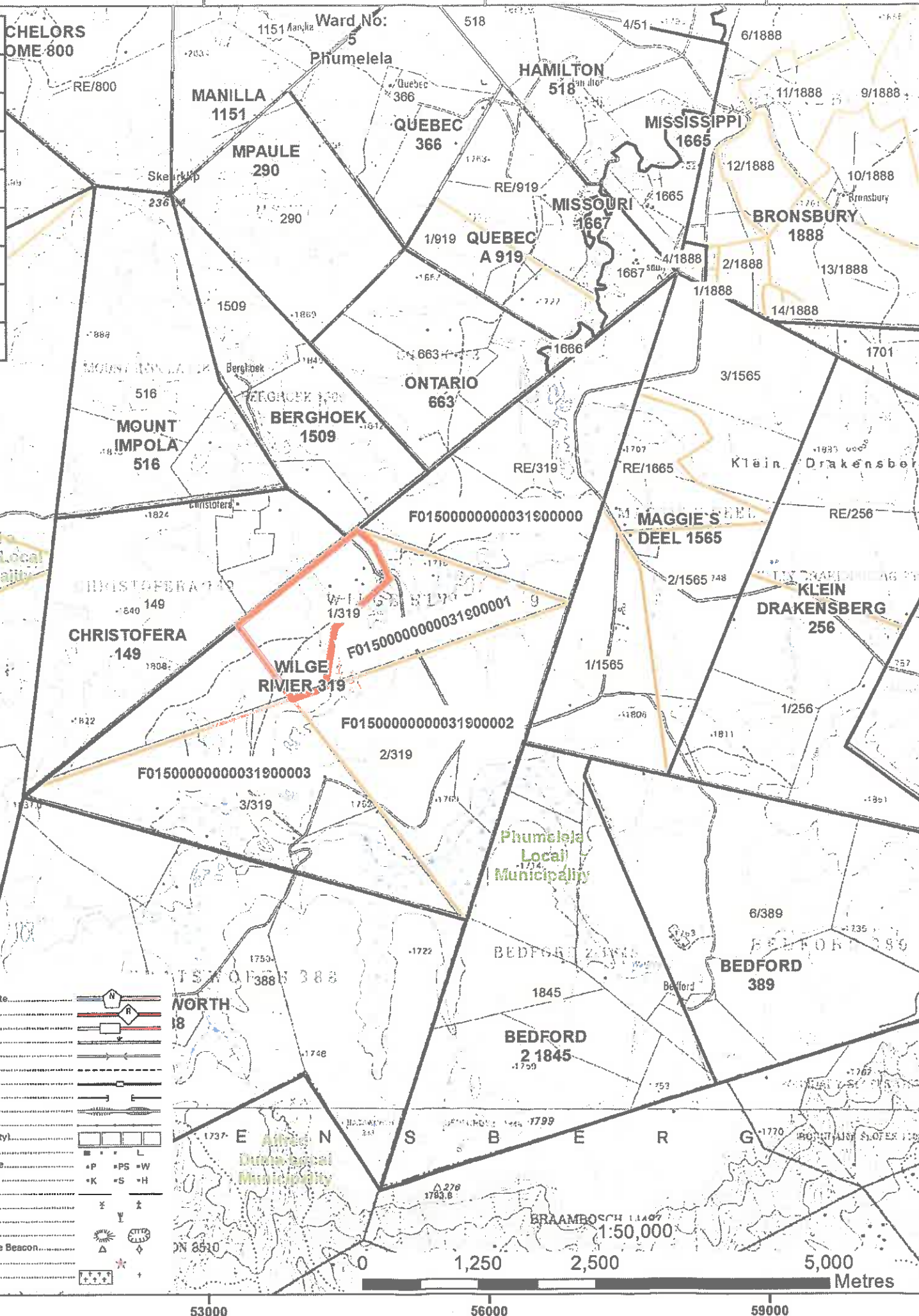
- Appendix 8.2-12: Proof of Registration with SAHRA
- Appendix 8.2-13: EAP & CA Proof of Communication
- Appendix 8.2-14: I&AP Comments Submitted during Notification Period
- Appendix 8.2-15: Submission Letters for Draft Documents Placement
- Appendix 8.2-16: Public Review and Commenting Period Email Notification
- Appendix 8.2-17: Acknowledgement of Receipt for Public Review Register
- Appendix 8.2-18: Reminder Regarding the Availability of Draft Documents
- Appendix 8.2-18-1: Email Reminders
- Appendix 8.2-18-2: SMS Reminders
- Appendix 8.2-19: Email Notification to I&APs
- Appendix 8.2-20: I&AP Comments Submitted during Public Review Period
- Appendix 8.2-21: SAHRA Comments
- Appendix 8.2-21-1: Comments submitted during the Public Review Period
- Appendix 8.2-21-2: SAHRA Confirmation Regarding the Uploaded Documents
- Appendix 8.2-22: Proof of Application Form Submission
- Appendix 8.2-23: Proof of Draft BAR Submission to CA
- Appendix 8.2-24: CA Comments and Responses
- Appendix 8.2-24-1: CA Comments
- Appendix 8.2-24-2: CA Responses

**Appendix 3.1-1: Surveyor General 21 Digit**



**Appendix 3.1-1-2: Dweller Coordinates**

FARM NAME	21 DIGIT CODE
BEDFORD 389	F01500000000038900000
ONTARIO 663	F01500000000066300000
CHRISTOFERA 149	F01500000000014900000
BERGHOEK 1509	F015000000000150900000
BEDFORD 2 1845	F015000000000184500000
CHATSWORTH 388	F01500000000038800000
WILGE RIVIER 319	F01500000000031900000
MAGGIE'S DEEL 1565	F015000000000156500000



### Basic Assessment (BA) for Relocation of Dwellers at Ingula Pumped Storage Scheme

Figure 2: Farm portions with 21 digit codes

#### Legend

- Ingula relocation boundary
- District boundaries
- Farms
- Farm Portions
- Ward boundaries
- Local boundaries

Date: 7/23/2020  
 Drawn: N.Didiza  
 Projection: WGS84 Lo 29  
 Source: 1:50 000 Topo Maps  
 Inset Map: Esri Base Maps



- |  |  |   |  |
|--|--|---|--|
| International Boundary and Beacon.....   |  | National Freeway; National Route.....       |  |
| Provincial Boundary.....                 |  | Arterial Route.....                         |  |
| Protected Area.....                      |  | Main Road.....                              |  |
| Perennial River.....                     |  | Secondary Road; Bench Mark.....             |  |
| Perennial Water.....                     |  | Other Road; Bridge.....                     |  |
| Non-perennial River.....                 |  | Track and Hiking Trail.....                 |  |
| Non-Perennial Water.....                 |  | Railway; Station or Siding.....             |  |
| Dry Water Course.....                    |  | Other Railway; Tunnel.....                  |  |
| Dry Pan.....                             |  | Embankment; Cutting.....                    |  |
| Marsh and Vlei.....                      |  | Power Line.....                             |  |
| Pipeline (above ground).....             |  | Built-up Area (High, Low Density).....      |  |
| Water Tower; Reservoir; Water Point..... |  | Buildings; Ruin.....                        |  |
| Coastal Rocks.....                       |  | Post Office; Police Station; Store.....     |  |
| Prominent Rock Outcrop.....              |  | Place of Worship; School; Hotel.....        |  |
| Erosion; Sand.....                       |  | Fence; Wall.....                            |  |
| Woodland.....                            |  | Windpump; Monument.....                     |  |
| Cultivated Land.....                     |  | Communication Tower.....                    |  |
| Orchard or Vineyard.....                 |  | Mine Dump; Excavation.....                  |  |
| Recreation Ground.....                   |  | Trigonometrical Station; Marine Beacon..... |  |
| Row of Trees.....                        |  | Lighthouse and Marine Light.....            |  |
|  |  | Cemetery; Grave.....                        |  |



**MYEZO ENVIRONMENTAL MANAGEMENT SERVICES [Pty] Ltd**  
 Environmental Stewardship





## **ESKOM - INGULA - BASIC ASSESSMENT PROCESS**

### **DWELLER COORDINATES FOR THE PROPOSED RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED IN THE FREE STATE PROVINCE, WITHIN THE THABO MOFUTSANYANA DISTRICT MUNICIPALITY, UNDER THE JURISDICTION OF PHUMELELA AND MALUTI A PHOFUNG LOCAL MUNICIPALITIES**

**Document Name: EIB – PROJI – Dweller Coordinates**

**Date: September 2020**

**Myezo Ref: EIB 2020/01**

#### **Coordinates and Extent of the Relocation Boundary**

**Total Area for Dwellings: 72 575.88 m<sup>2</sup>**

**Table 1: Dweller Coordinates**

<b>Name</b>	<b>Ha</b>	<b>Area_m</b>
Dweller 1	1.21	12096.15
Dweller 2	1.21	12096.07
Dweller 4	1.21	12096.04
Dweller 5	1.21	12095.96
Dweller 3	1.21	12095.93
Dweller 6	1.21	12095.72

**Total grazing area:  
1 182 276.57 m<sup>2</sup>**

**Grazing plots total area:  
1 294 982.05 m<sup>2</sup>**

#### **Coordinates:**

See the polygons below to be read in conjunction with the table of coordinates below.

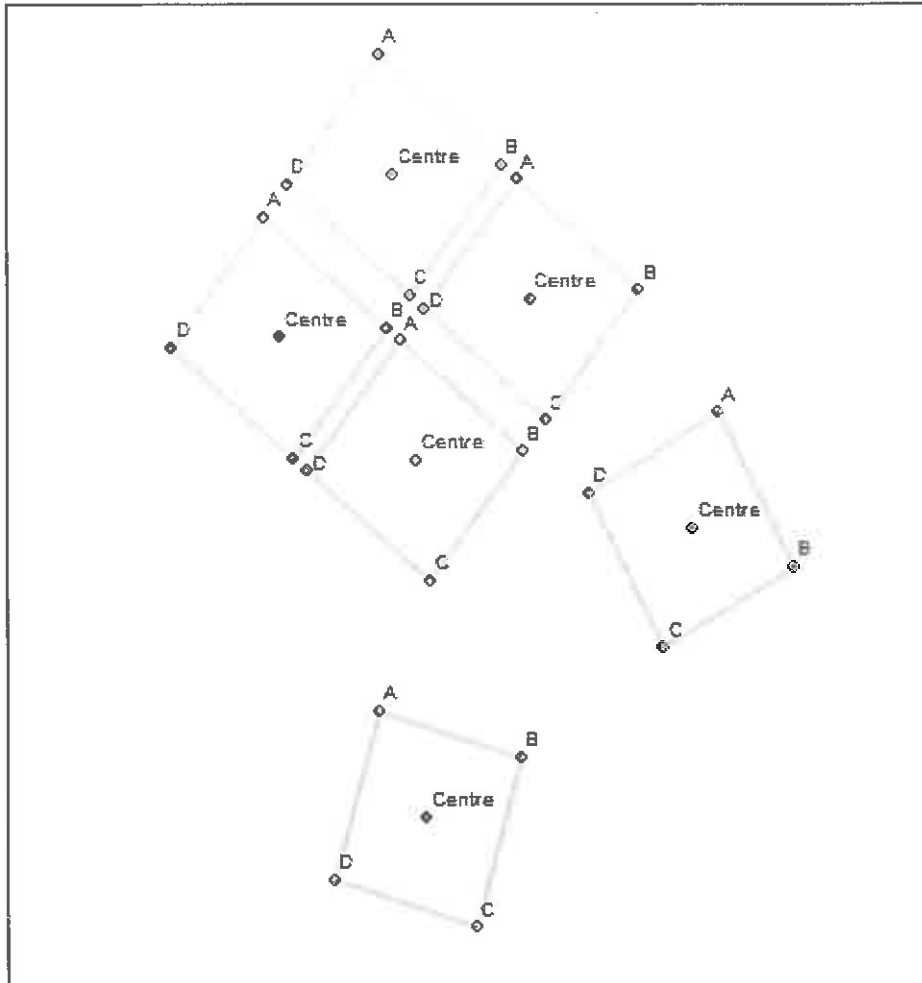


Figure 1: Polygons of Dwellers Plots

Table 2: Table of Coordinates

Dwelling type	Dweller no	Point	latitude	Longitude
Dweller_residential_plots	Dweller 1	A	28 ° 11' 41.538" S	29 ° 33' 21.751" E
		B	28 ° 11' 43.971" S	29 ° 33' 24.814" E
		C	28 ° 11' 46.855" S	29 ° 33' 22.524" E
		D	28 ° 11' 44.421" S	29 ° 33' 19.461" E
		Centre	28 ° 11' 44.195" S	29 ° 33' 22.110" E
	Dweller 2	A	28° 11' 44.300" S	29° 33' 25.178" E
		B	28° 11' 46.734" S	29° 33' 28.241" E
		C	28° 11' 49.617" S	29° 33' 25.950" E

Dwelling type	Dweller no	Point	latitude	Longitude
		D	28° 11' 47.184" S	29° 33' 22.887" E
		Centre	28° 11' 46.929" S	29° 33' 25.544" E
	Dweller 3	A	28 ° 11' 49.430" S	29 ° 33' 30.226" E
		B	28 ° 11' 52.848" S	29 ° 33' 32.129" E
		C	28 ° 11' 54.639" S	29 ° 33' 28.911" E
		D	28 ° 11' 51.220" S	29 ° 33' 27.009" E
		Centre	28 ° 11' 52.007" S	29 ° 33' 29.621" E
	Dweller 4	A	28 ° 11' 45.157" S	29 ° 33' 18.882" E
		B	28 ° 11' 47.591" S	29 ° 33' 21.945" E
		C	28 ° 11' 50.474" S	29 ° 33' 19.654" E
		D	28 ° 11' 48.040" S	29 ° 33' 16.591" E
		Centre	28 ° 11' 47.809" S	29 ° 33' 19.296" E
	Dweller 5	A	28 ° 11' 47.877" S	29 ° 33' 22.308" E
		B	28 ° 11' 50.310" S	29 ° 33' 25.371" E
		C	28 ° 11' 53.194" S	29 ° 33' 23.080" E
		D	28 ° 11' 50.760" S	29 ° 33' 20.017" E
		Centre	28 ° 11' 50.520" S	29 ° 33' 22.703" E
	Dweller 6	A	28 ° 11' 56.058" S	29 ° 33' 21.822" E
		B	28 ° 11' 57.096" S	29 ° 33' 25.355" E
		C	28 ° 12' 0.849" S	29 ° 33' 24.253" E
		D	28 ° 11' 59.812" S	29 ° 33' 20.720" E
		Centre	28 ° 11' 58.430" S	29 ° 33' 23.001" E
Dweller_grazing_plots	Dweller 1	A	28 ° 12' 18.151" S	29 ° 33' 9.111" E
		B	28 ° 12' 22.060" S	29 ° 33' 12.372" E
		C	28 ° 12' 35.507" S	29 ° 33' 10.061" E
		D	28 ° 12' 39.483" S	29 ° 32' 57.170" E
		E	28 ° 12' 31.459" S	29 ° 32' 50.477" E
		Centre	28 ° 12' 30.150" S	29 ° 33' 2.822" E
	Dweller 2	A	28 ° 12' 9.424" S	29 ° 33' 1.831" E
		B	28 ° 12' 18.151" S	29 ° 33' 9.111" E



Dwelling type	Dweller no	Point	Latitude	Longitude
		C	28 ° 12' 31.459" S	29 ° 32' 50.477" E
		D	28 ° 12' 22.733" S	29 ° 32' 43.197" E
		Centre	28 ° 12' 20.297" S	29 ° 32' 56.208" E
	Dweller 3	A	28 ° 12' 0.698" S	29 ° 32' 54.552" E
		B	28 ° 12' 9.424" S	29 ° 33' 1.831" E
		C	28 ° 12' 22.733" S	29 ° 32' 43.197" E
		D	28 ° 12' 14.007" S	29 ° 32' 35.918" E
		Centre	28 ° 12' 11.826" S	29 ° 32' 48.893" E
	Dweller 4	A	28 ° 11' 54.351" S	29 ° 33' 3.437" E
		B	28 ° 12' 11.430" S	29 ° 33' 17.685" E
		C	28 ° 12' 14.552" S	29 ° 33' 13.663" E
		D	28 ° 12' 22.060" S	29 ° 33' 12.372" E
		E	28 ° 12' 0.698" S	29 ° 32' 54.552" E
		Centre	28 ° 12' 6.630" S	29 ° 33' 7.203" E
	Dweller 5	A	28 ° 11' 47.480" S	29 ° 33' 13.057" E
		B	28 ° 12' 4.199" S	29 ° 33' 27.005" E
		C	28 ° 12' 11.430" S	29 ° 33' 17.685" E
		D	28 ° 11' 54.351" S	29 ° 33' 3.437" E
		Centre	28 ° 11' 59.360" S	29 ° 33' 15.557" E
	Dweller 6	A	28 ° 11' 40.814" S	29 ° 33' 22.390" E
		B	28 ° 11' 45.915" S	29 ° 33' 28.846" E
		C	28 ° 11' 57.642" S	29 ° 33' 35.455" E
		D	28 ° 12' 4.199" S	29 ° 33' 27.005" E
		E	28 ° 11' 47.480" S	29 ° 33' 13.057" E
		Centre	28 ° 11' 52.102" S	29 ° 33' 25.124" E

**Appendix A: Site Plan – Layout Plan**



### Legend

- Homesteads
- ⊙ Centre of site
- Ingula relocation high water marks (two peaks in the area/the highest points)
- 5m Contours
- Rivers
- Plots
- ▭ Farms
- ▭ Farm Portions
- ▭ Ingula relocation boundary
- ▭ Ingula nature reserve boundary
- ▨ Option 1 Plots grazing area

#### Site Boundary Coordinates

Point	Latitude	Longitude
A	28° 11' 40.814" S	29° 33' 22.390" E
B	28° 11' 45.915" S	29° 33' 28.846" E
C	28° 11' 57.642" S	29° 33' 35.455" E
D	28° 12' 14.552" S	29° 33' 13.663" E
E	28° 12' 35.507" S	29° 33' 10.061" E
F	28° 12' 39.483" S	29° 32' 57.170" E
G	28° 12' 14.007" S	29° 32' 35.918" E
H	28° 11' 40.814" S	29° 33' 22.390" E
Centre	28° 12' 9.999" S	29° 33' 5.744" E

### Basic Assessment (BA) for Relocation of Dwellers at Ingula Pumped Storage Scheme

CLIENT:



Date: 10/5/2020	CHECKED: DP	PROJECT: 000065
DRAWN: N.Didiza	APPROVED: DP	SCALE: 1:18,000
DRAWING: Figure 8.1 1: Local Setting with Considered Alternatives		REV: 1e



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Environmental Stewardship



Projection: Geographic, Datum: HH94  
Source: NGI Aerial Imagery  
SIZE: A2

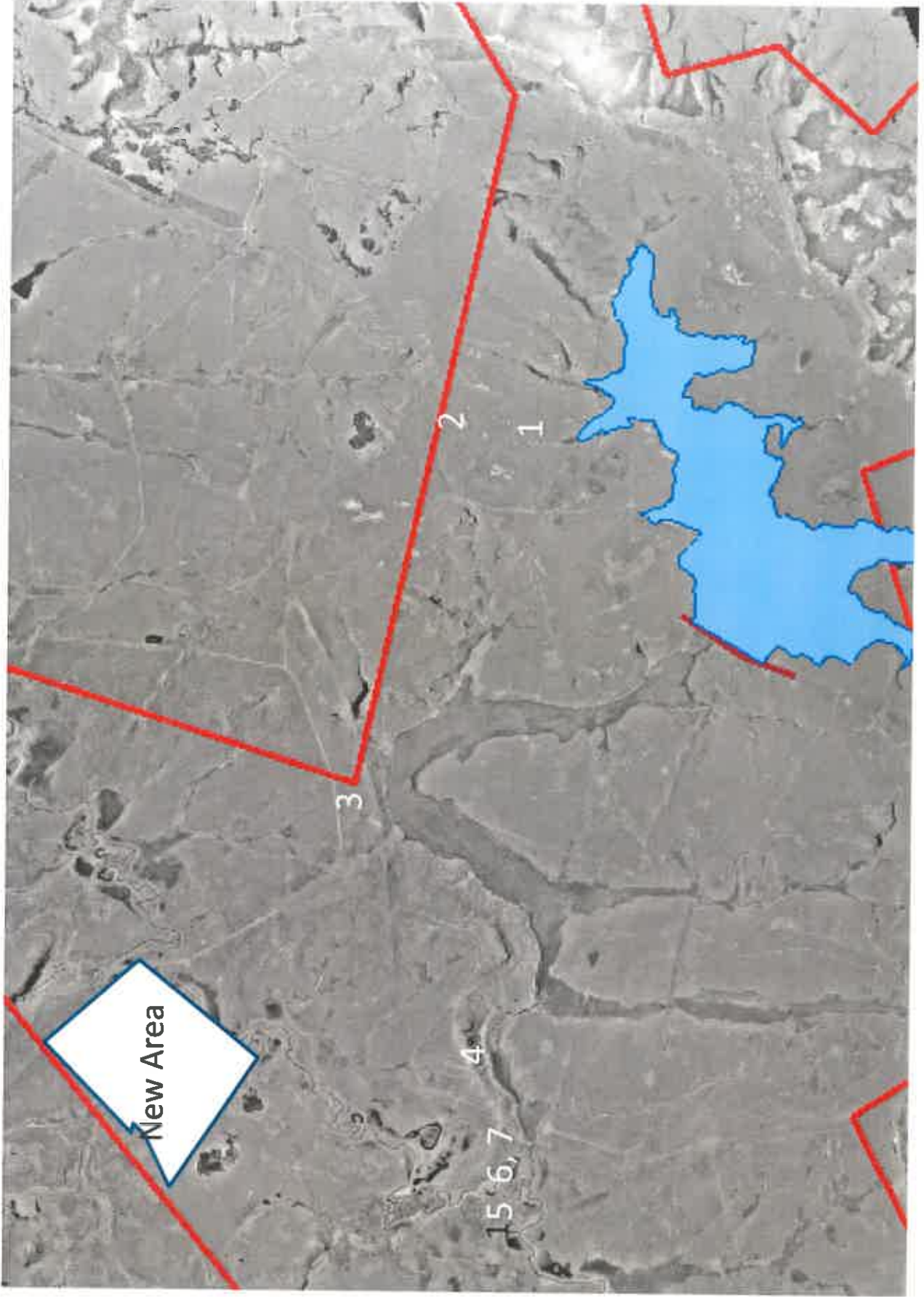
# Relocation Houses

GIS Link

[http://mp2vmsa676.elec.eskom.co.za/Ingula App Viewer/](http://mp2vmsa676.elec.eskom.co.za/Ingula_App_Viewer/) (Use Google Chrome)

Activate layers: Buildings (2012 Ingula Data)  
Aerial Photo: 2015





1



2



### 3. Mdaki





# 4 Dlamini



# 5, 6, 7 (3 Houses)



5



9

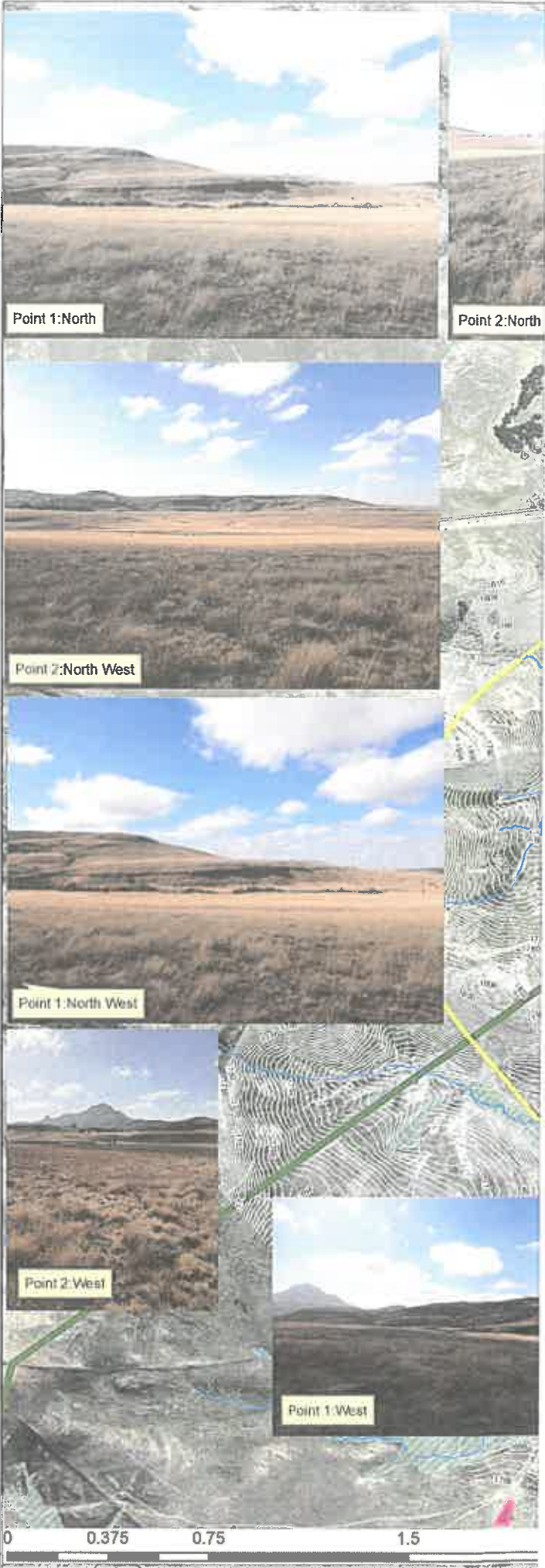


7





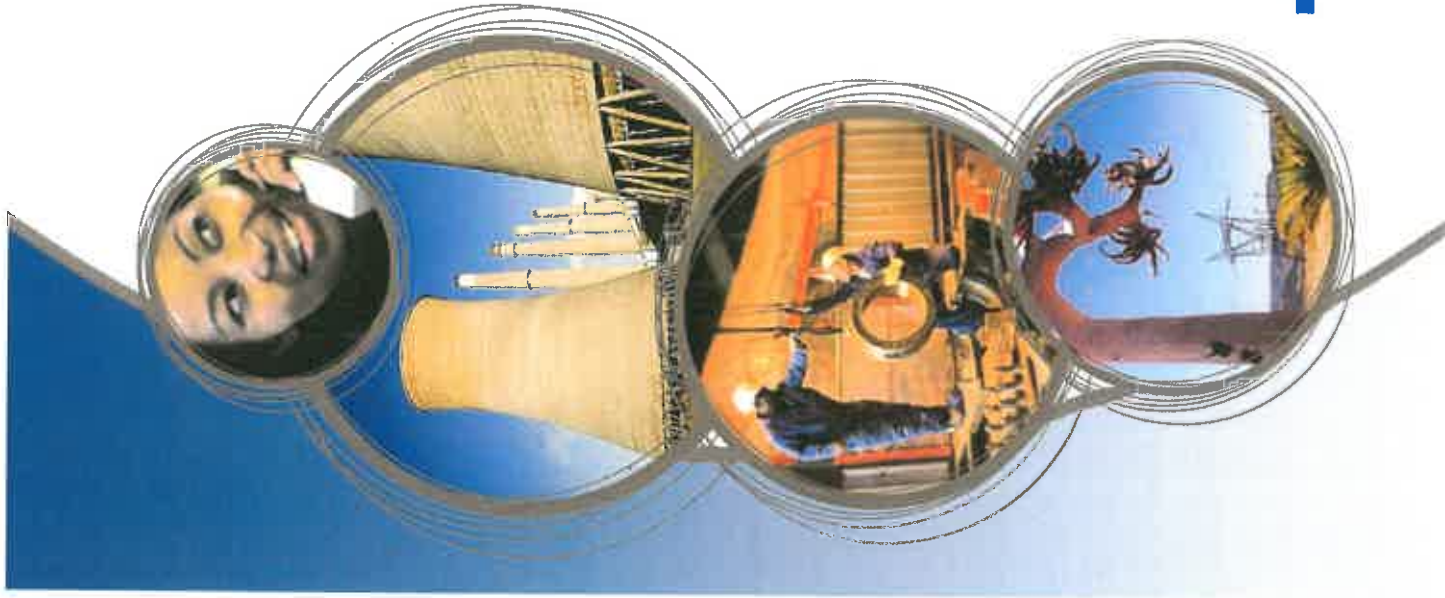
**Appendix B: Photographs**



**Appendix C: Facility Illustration (s)**



**Appendix C1: Facility Illustration Design Considerations**



# Ingula Agri-Village Project

Concept Phase



- Ingula Power Station is a pumped storage scheme and was commissioned in 2016.
- The development of the power station required Eskom to engage with and subsequently purchase the farms of all the land owners whose land compromised of the said wetland ecosystems.
- The farms had dwellers that required resettlement and relocation and resulted in the provision of a new project, the Ingula Agri-Village project.
- The project is lead by C&S with all other disciplines providing a supporting role.

## Project Objective



- The objective of this project is to therefore provide dwellings for the six (6) remaining families.
- Agri-Village to accommodate the remaining dwellers as follows:
  - Six (6) individual dwellings
  - Accommodating approximately 60 individuals,
  - Internal access roads with minor upgrades to the external main road (gravel)
  - Ablutions, rondawels and borehole water for potable water, irrigation and reticulation,
  - Waste disposal
  - Electrical reticulation

## C&S Scope



- Six Dwellings- One per household/ family
- Each dwelling consists of:
  - Ablution Block with one shower and toilet
  - Rondawel
  - Kraal
  - Either Option A, B or C house layouts which were determined on baselined information provided by the Client
- Sewer Reticulation
- Internal Access Roads

## Site Location: Two Sites Available for the Agri-Village



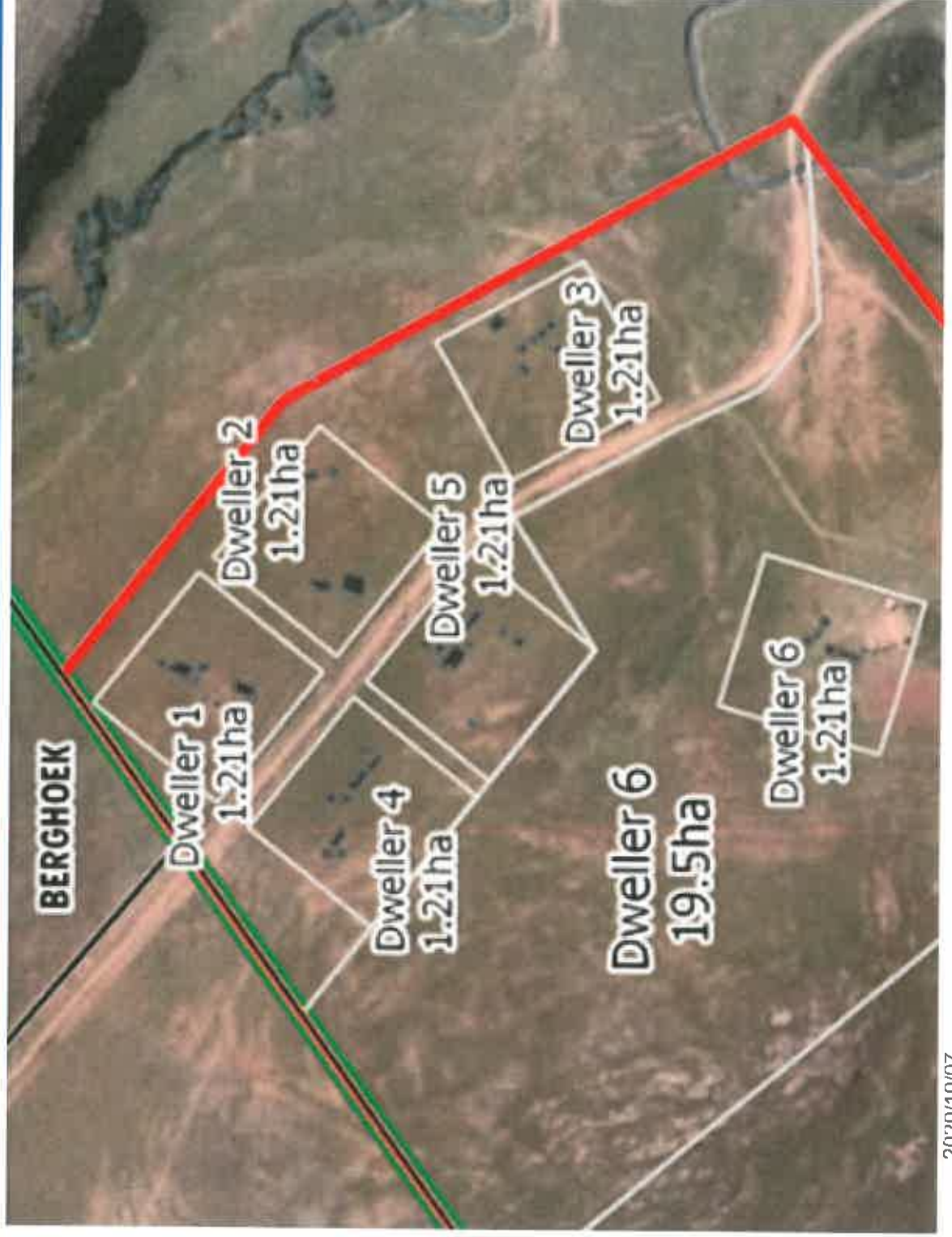
- The proposed sites for the new Agri-village are located in an open unused area.
- Located approximately 6km from the Bedford Dam perimeter gate.
- The site is located within the Free State region with the closest town being Harrismith.
- Plot A is the preferred site.
- Site preference will however be determined once the Geohydrological surveys are completed (Appendix A- Scope for Geohydrological Survey & GI)
- The *Contractor* is required to conduct the survey and propose the most feasible site. The chosen site will be determined with the *Client* & COE.



# Site Location: Two Sites Available for the Village



# Site Location: Plot A





# Site Location: Plot B



# Site Options

Site Design Criteria	Site Location		Most Feasible Site
	Plot A	Plot B	
Internal Access Roads	<ol style="list-style-type: none"> <li>1. Dwellings positioned within close proximity of one another.</li> <li>2. Terrain is flat; therefore there is minimal cut and fill.</li> <li>3. Fewer river crossings indicated in this area.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dwellings spaced further apart, therefore the length of internal access roads is much greater.</li> <li>2. Terrain is hilly, subsequently increase in cut and fill volumes.</li> <li>3. Due to increased road lengths &amp; surface terrain, the number of river crossings and culverts are increased.</li> <li>4. A major stream crossing which will require an upgrade and registration with Department of Water Affairs.</li> </ol>	Plot A
Stormwater Management	<ol style="list-style-type: none"> <li>1. Dwellings are positioned within close proximity; therefore stormwater management requirements are manageable &amp; practical.</li> </ol>	<ol style="list-style-type: none"> <li>1. Due to increased road lengths &amp; surface area, there are increased stormwater management requirements.</li> </ol>	Plot A
Geotechnical Investigations	<ol style="list-style-type: none"> <li>1. Dwellings are positioned within close proximity of one another; therefore GI is required across a smaller area.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dwellings are positioned far apart; therefore entire area of 131 ha is to be tested.</li> </ol>	Plot A
Sewer & Water Reticulation	<ol style="list-style-type: none"> <li>1. Dwellings are positioned within close proximity of one another; therefore reticulation is required across a smaller area.</li> <li>2. Terrain is flat and therefore a gravity system is possible.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dwellings are positioned far apart; therefore extent of reticulation is increased.</li> <li>2. Terrain is hilly and there is an increased possibility for the need of a rising main option and pumps for the sewer &amp; water reticulation respectively.</li> </ol>	Plot A
Fencing	<ol style="list-style-type: none"> <li>1. Dwellings are positioned within close proximity of one another; therefore fencing is required across a smaller area.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dwellings are positioned far apart; therefore extent of fencing is increased.</li> </ol>	Plot A
Sewer Treatment			The options are the same for both Plot A and Plot B.

## Dwellers



- Dwellings consist of either two bedroom or/and three bedroom houses with the number of units per dwelling provided by the baseline information.
- Each dweller is provided with an Ablution Block & Rondavel.

	Philemon Shabalala	Ephraim Shabalala	Bheki Shabalala	Josiah Dlamini	Paulos Mkhwanazi	Christina Shabalala
Type A Sheet 1	-	-	-	1	-	-
Type A Sheet 11	-	-	-	1	1	-
Type B Sheet 2	-	-	-	-	1	-
Type B Sheet 15	1	1	1	-	1	1
Type C Sheet 3	1	-	4	1	1	-
Type C Sheet 12	3	4	1	1	1	1
Rondavel Type C	-	-	-	-	1	-
Rondavel Type F	1	1	1	1	1	1
Ablution Block	1	1	1	1	1	1
<b>Existing Floor Area</b>	<b>144 m<sup>2</sup></b>	<b>150 m<sup>2</sup></b>	<b>241 m<sup>2</sup></b>	<b>275 m<sup>2</sup></b>	<b>300 m<sup>2</sup></b>	<b>72 m<sup>2</sup></b>
<b>New Floor Area</b>	<b>233.02 m<sup>2</sup></b>	<b>220.67 m<sup>2</sup></b>	<b>296.47 m<sup>2</sup></b>	<b>333.12 m<sup>2</sup></b>	<b>395.26 m<sup>2</sup></b>	<b>141.47 m<sup>2</sup></b>

## Sewer Reticulation



- Two possible options for the sewer reticulation, one for each proposed site.
- Plot A is the preferred/ most feasible site and therefore only proposed reticulation is provided for Plot A.
- Min & Max Sewer Loads = 7980 & 14 250m<sup>3</sup>
- Design Assumptions:
  - Maximum number of occupants per room in a dwelling = 2 people
  - Minimum Design Load per Person = 70l/c/day
  - Optimum Design per Dwelling Unit (2 bedroom) = 500l/day
  - Optimum Design Load per Dwelling Unit (3 bedroom) = 750l/day i.e. equivalent to a Middle to Upper-Income Dwelling with 2 bedrooms



## Anticipated Sewerage Generation- Pipe Sizing



Dweller	No. of 2 bedroom dwellings	No. of 3 bedroom dwellings	Maximum No. of Occupants	Minimum Sewer Load (l/day)	Optimum Sewer Load (l/day)
Philemon Shabalala	5	0	20	1400	2500
Ephraim Shabalala	5	0	20	1400	250
Christinah Shabalala	2	0	8	560	1000
Bheki Shabalala	6	0	24	1680	3000
Paulos Mkhwanazi	4	1	22	1540	2750
Josiah Dlamini	2	2	20	1400	2500
<b>TOTAL</b>	<b>24</b>	<b>3</b>	<b>114</b>	<b>7980</b>	<b>14 250</b>

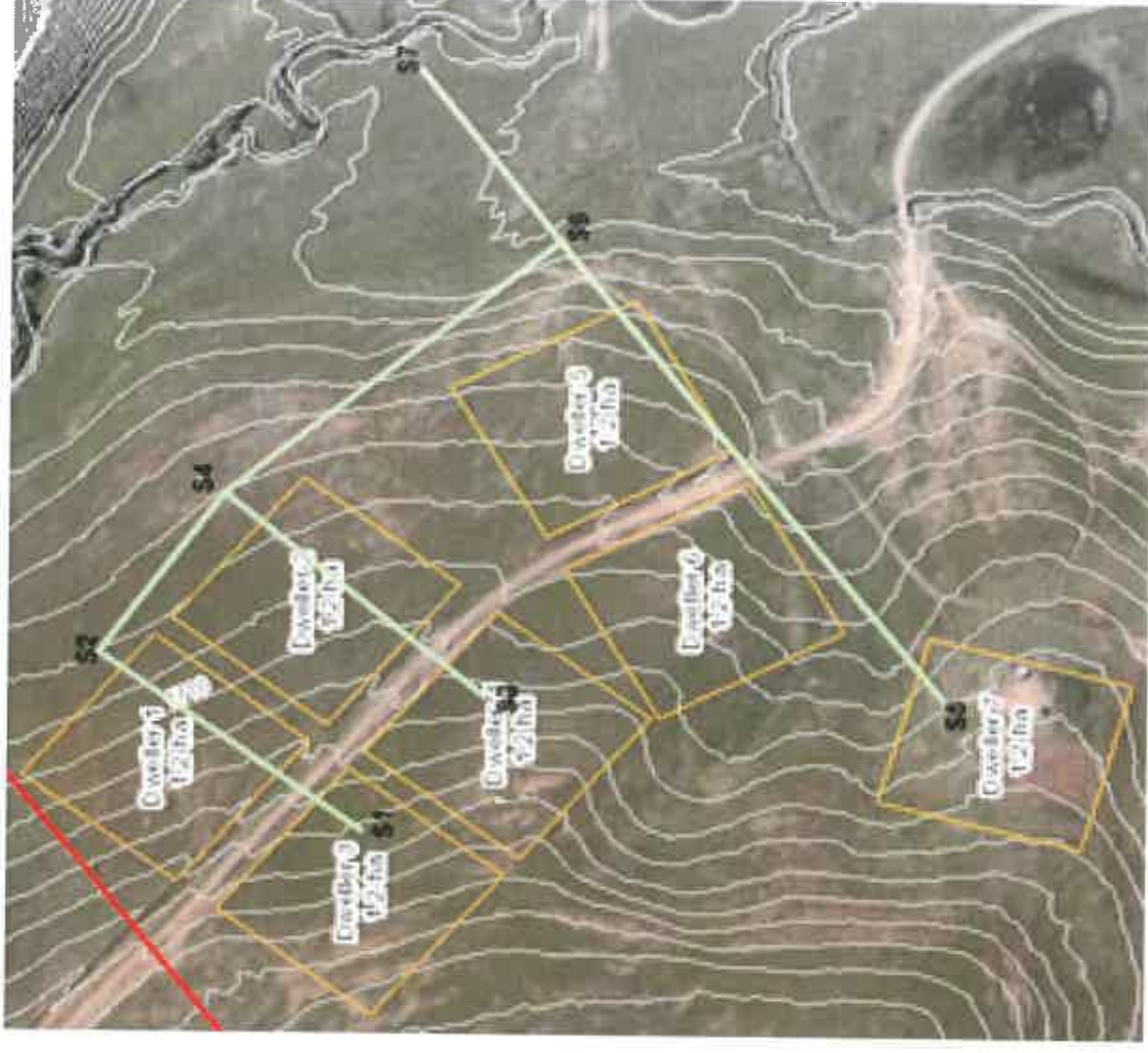
Should it be found that Plot A is fatally flawed and unavailable for use for the Agri-Village, the design flows above are also applicable Plot B.

## Proposed Sewer Layout

Proposed Sewer Layout with tie-in at S7 into holding and/ or treating system.

Pipe size of 100mm Ø will be adequate (Manning's Eqn.)

However the pipe sizes will be verified once the topographical survey has been completed.



## Potable Water



- Potable water demand for the Agri-Village is designed in accordance with the requirements of SANS and Guideline for Human Settlement Planning and Design (Red Book).
- Potable water is to be sourced from boreholes.
- The yields provided by the boreholes are to meet as a minimum a daily water requirement of 38m<sup>3</sup>/day.
- It is advised however that a daily water requirement of 43m<sup>3</sup>/day be provided to accommodate for population growth within the village.

## Borehole Pumps (LPS Scope)



- Nine pumping options were considered:
  - Mechanical pumps (Hand, Wind, Hydraulic rams & Hydropower pumps)
  - Petrol & Diesel pumps (Mechanical & Electrical)
  - Electric Pumps (Wind electric pumps, PV)
- The most feasible option for the area is the wind pump used in conjunction with the hydraulic ram.
  - Low maintenance
  - No electric/ power requirement



## Chemical Scope



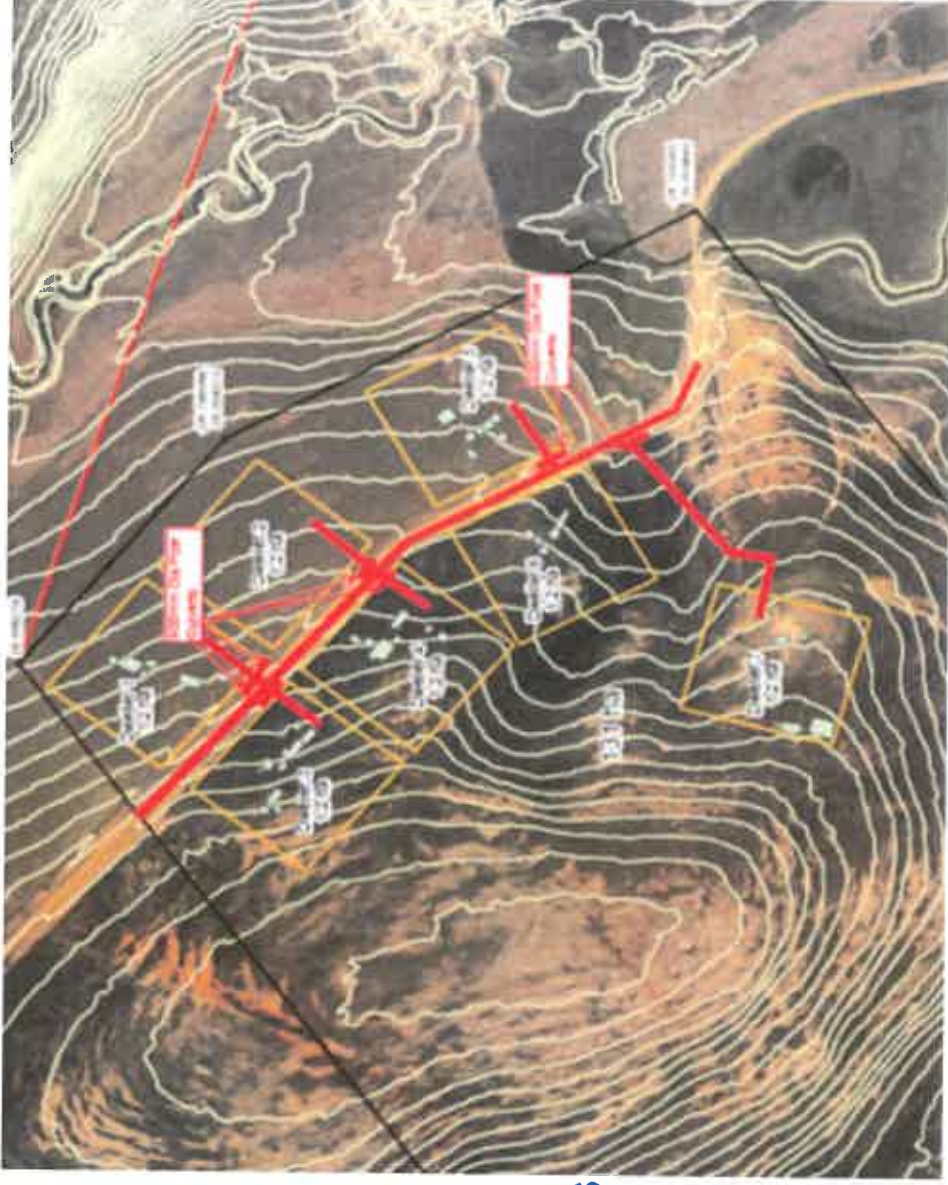
- Water requirements for human consumption
- Water requirements for livestock & agricultural farming: }
  - Geohydrological Survey
  - **Chemical Analysis**
  - **Borehole Siting**

- Sewage treatment requirements:
- **Collection &/or Treatment**
  - Septic Tank with Soakaway (preferred option but does not meet environmental standards of the area)
  - Conservancy Tank (Temporary Retention and requires regular collection & disposal)
  - **Packaged Plant (Only option that meets environmental standards)**

- There were no geotechnical investigations carried out in the concept phase of the project.
- The proposed location is currently unused and no future use for the area is planned.
- It is assumed that the geotechnical conditions in the proposed locations are suitable for the placement of the Agri-Village and is not fatally flawed.
- A geotechnical investigation and a geohydrological study will be required to be conducted by the *Contractor* to determine the founding conditions and water availability for the Agri-Village buildings and its associated infrastructure.
- Appendix A details the requirements of the Geotechnical Investigation and Geohydrological Survey.

## Internal Access Roads – Plot A

- The internal roads to be constructed directly from the main road.
- This will result in a number of cut and fills required to access the respective dwellings. The total length of routes for this option is approximately 450m of driveway.



- Sewage System- Solar panels, battery chargers, batteries, inverters, cables & combiner box(es) with all necessary MCB's for protection & isolation. (black box system provided by package plant supplier)
- Lighting and Small Power- Electrical reticulation design for the dwellings will be equipped with all necessary components to achieve the complete electrical reticulation however the reticulation will be energized in future.
- Earthing and lightning protection

- Three Options:
  - Fully integrated and operational C&I system
  - Partial electro-mechanic design solution
  - Mechanical design solution
- The best suited option is based on the user requirements, the location of the site, environmental conditions, accessibility to local supplied spares and the operating and maintenance of the systems. Both Option 2 and Option 3 are viable options to implement and will be determined by the mechanical and electrical design solutions. The preferred option would be Option 3 for the dwellers that require minimal training or induction to operate the system, has the least complex system to maintain and provide the lowest cost from a C&I perspective.

## Way Forward



- Technical Specification/ Works Information:
  - *Contractor* required to execute Geohydrological Testing for determination of most feasible site (assumed water will be sourced from boreholes successfully)
  - Geotechnical testing for the chosen site
  - *Contractor* to design all works for chosen site to meet requirements specified above & in Concept Report.



# Checklist Items



	Checklist item	
1	Stakeholder requirements (SRD) – signed	✓
2	SRD compliance/deviations	✓
3	Identify and resolve conflicting requirements	✓
4	Legal and regulatory constraints considered	✓
5	Operability and performance targets met	✓
6	Safety, plant availability / reliability aspects addressed	✓
7	Design deficiencies of the past addressed in the new design	n/a
8	Conceptual RAM Assessments and preliminary RAM analysis report	n/a
9	Execution / build feasibility and Risks (site selection)	✓
10	Operational concept specifications	✓
11	Process flow conceptualised	✓
12	Documentation and IM Requirements identified	✓
13	Conceptual design analysis (Risk, Trade – off, Feasibility, Viability)	✓
14	Environmental Assessment	In progress
15	Technology maturity and market availability assessed	✓
16	CAPEX cost estimation	In progress

# Thank You



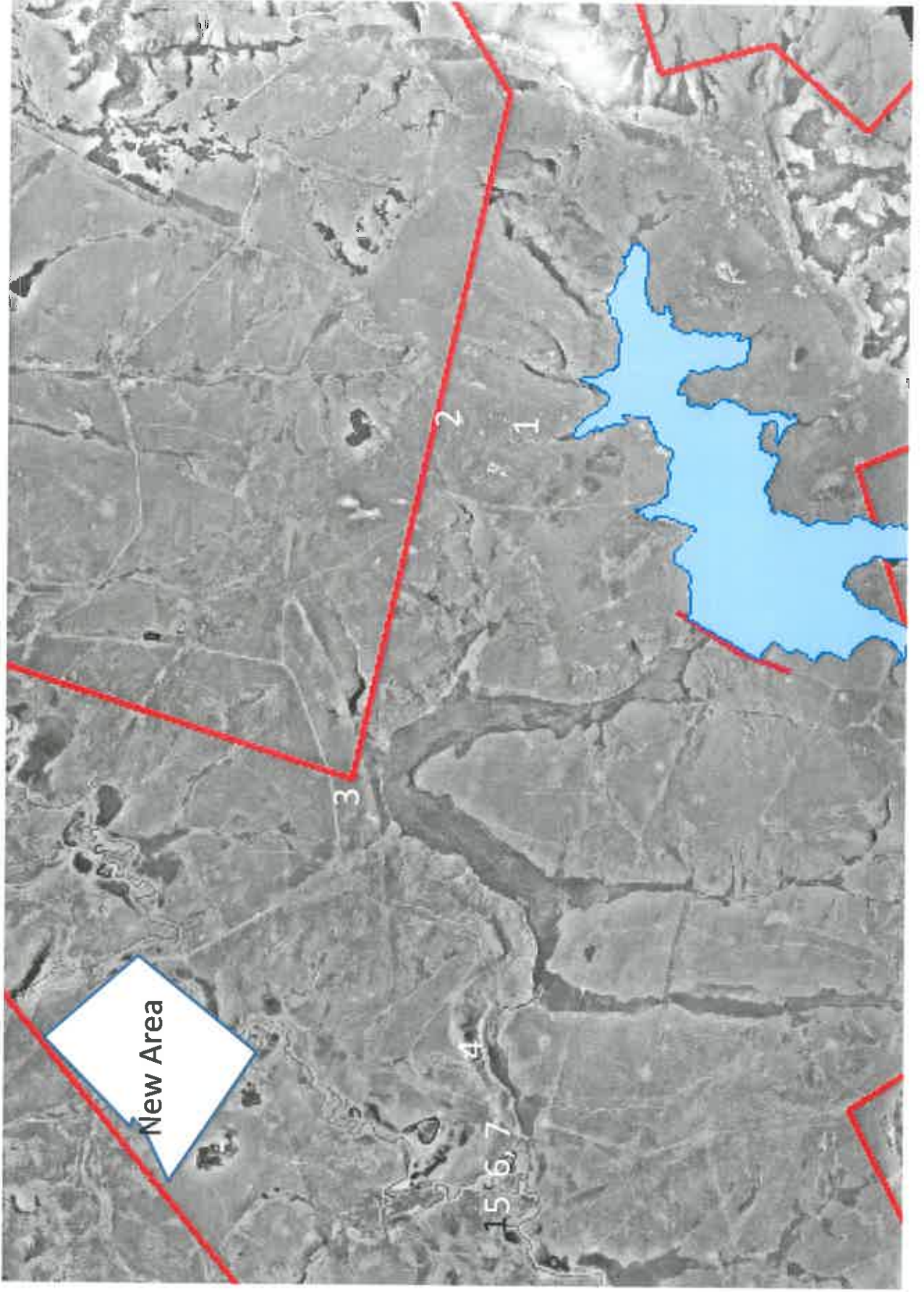
**Appendix C2: Relocation Houses – Current Homestead Views**

# Relocation Houses

GIS Link

[http://mp2vmsa676.elec.eskom.co.za/Ingula App Viewer/](http://mp2vmsa676.elec.eskom.co.za/Ingula_App_View/) (Use Google Chrome)

Activate layers: Buildings (2012 Ingula Data)  
Aerial Photo: 2015





1



2





### 3. Mdaki



# 4 Dlamini





# 5, 6, 7 (3 Houses)





5





9

7



**Appendix C3: Signed Layouts**

Meeting 27/02/19

① Present:

Philemon Shabeta

Ephraim Shabeta

Paulos Mkhama


Josiah Dlamini

Bhek: Shabeta


---

② Choice of Sites


Dweller 3 = Josiah Dlamini

Gen' dlamini 


Dweller 4 = Paulos Mkhama

Jabu 

Dweller 7 = Christina Shabeta

nonkhahla Shabeta 

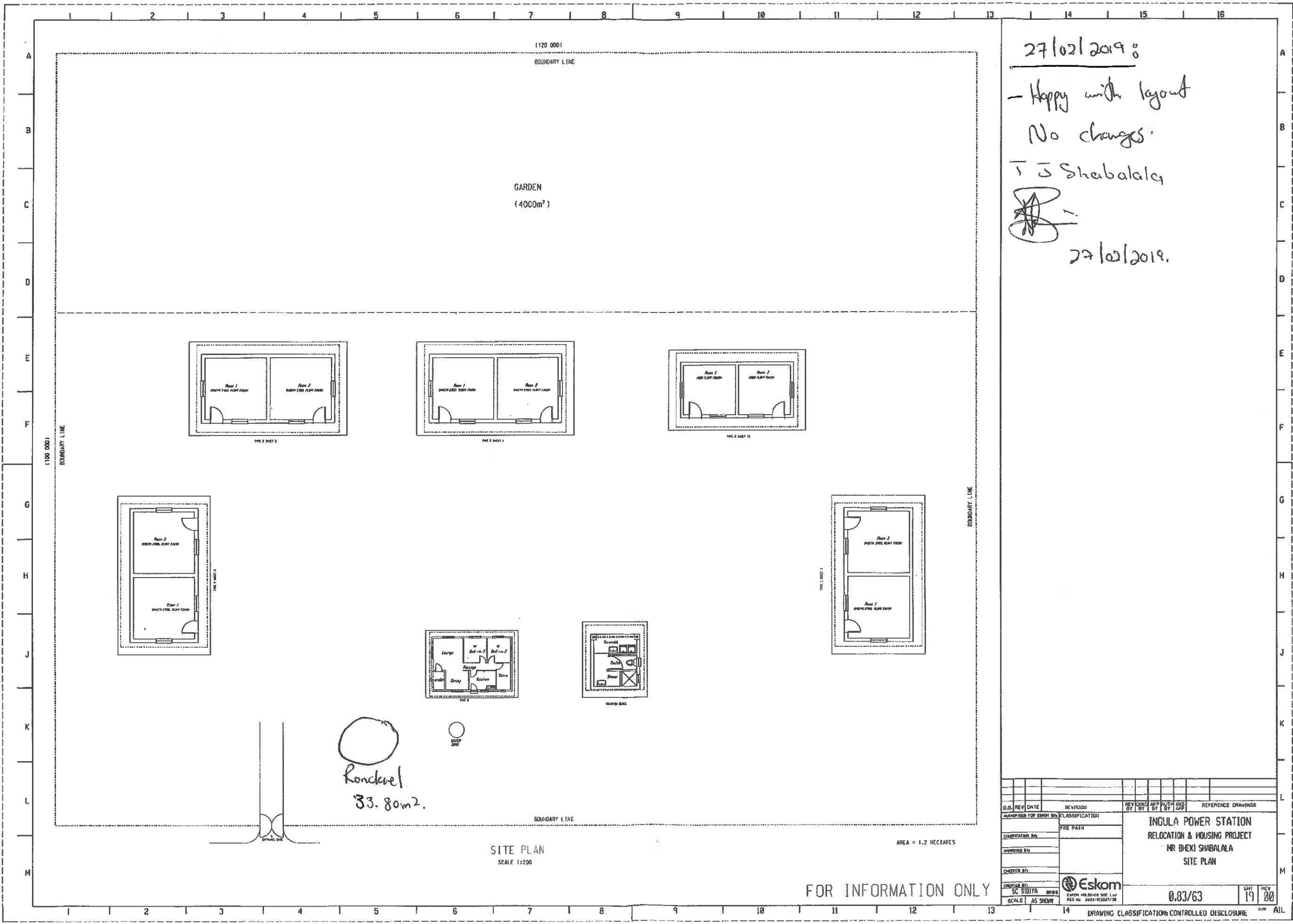
Dweller 6 = Bhek: Shabeta


T S Shabeta 


---

③ Philemon and Ephraim Shabeta opted not to sign just as yet. We will be drafting a letter to deal with him



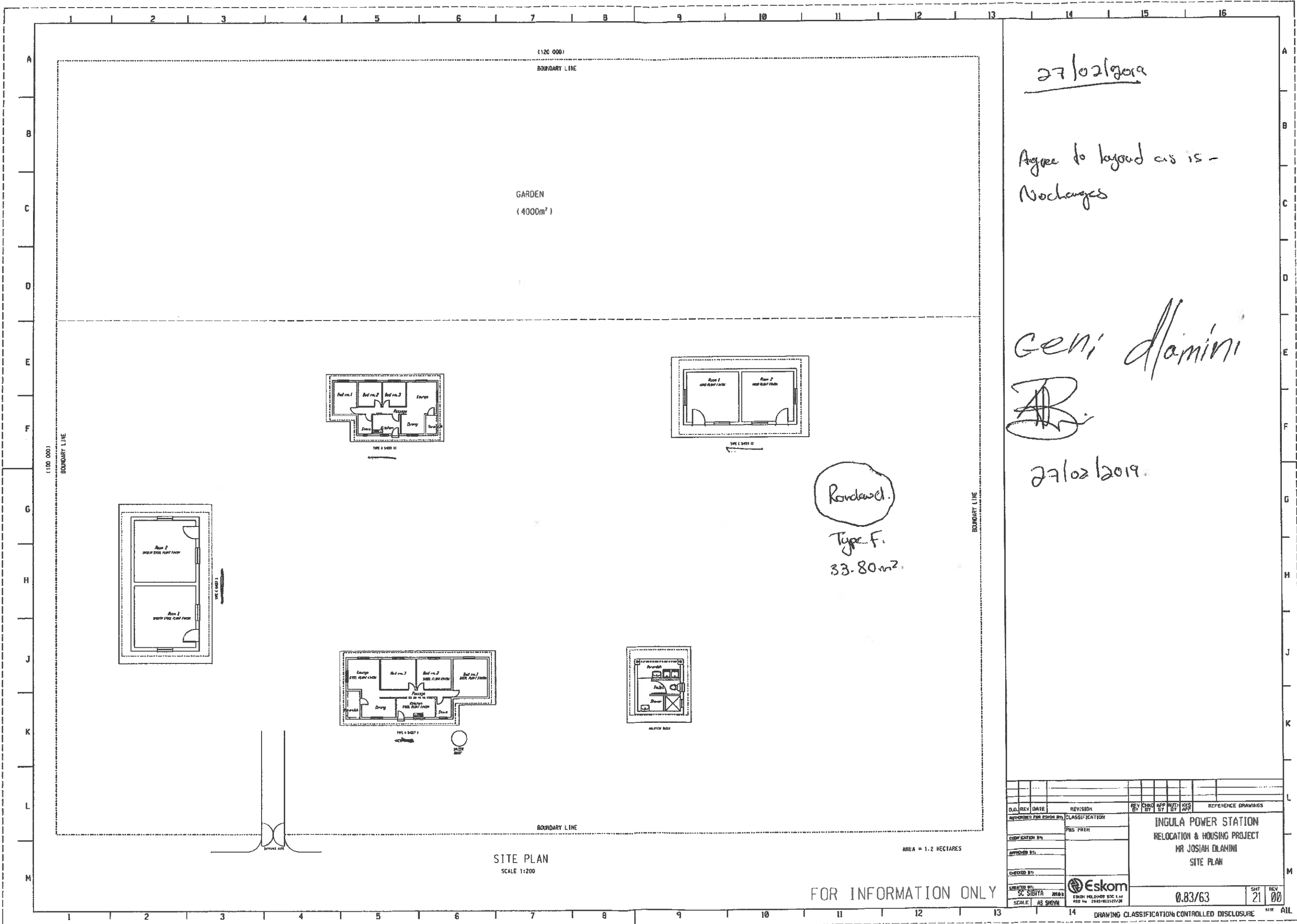


27/02/2019:  
 - Happy with layout  
 No changes  
 T S Shabalala  
  
 27/02/2019.

D.O.	REV	DATE	REVISION	REV	CHKD	APP	DATE	REF
AUTHORIZED FOR ISSUE BY: _____ CLASSIFICATION: _____ COMPILATION BY: _____ APPROVED BY: _____ CHECKER BY: _____ CONSULTANT BY: SC SIBIYA			REFERENCE DRAWINGS: FRS PATH			<b>INGULA POWER STATION            RELOCATION &amp; HOUSING PROJECT            MR BHEKI SHABALALA            SITE PLAN</b>		
SCALE: AS SHOWN								0.83/63
DRAWING CLASSIFICATION: CONTROLLED DISCLOSURE								SHEET 19 OF 00

FOR INFORMATION ONLY





27/02/2019

Agree to layout as is -  
No changes

Geni Dlamini  


27/02/2019

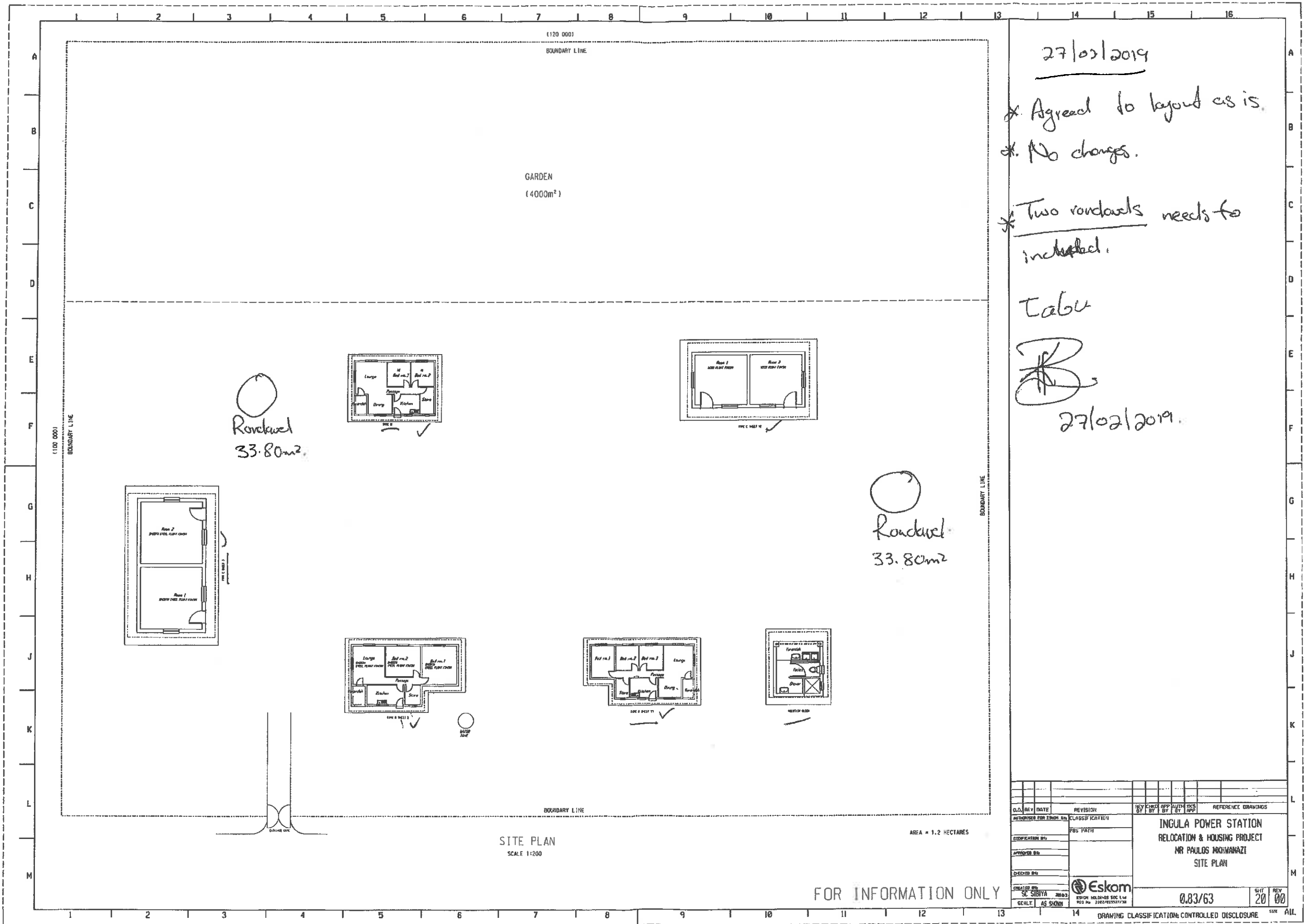
Rounded.  
 Type F.  
 33.80m²

SITE PLAN  
 SCALE 1:200

AREA = 1.2 HECTARES

FOR INFORMATION ONLY

D.O.	REV	DATE	REVISION	REV	BY	APP	BY	REV	DATE	REFERENCE DRAWINGS
CLASSIFICATION			INGULA POWER STATION RELOCATION & HOUSING PROJECT MR JOSIAH DLAMINI SITE PLAN							
CREATED BY			Eskom							
SCALE			0.83/63							
SHEET			21							
REV			00							
DRAWING CLASSIFICATION			CONTROLLED DISCLOSURE							



27/02/2019

\* Agreed to layout as is.  
\* No changes.

\* Two rondavels needs to included.

Tabu

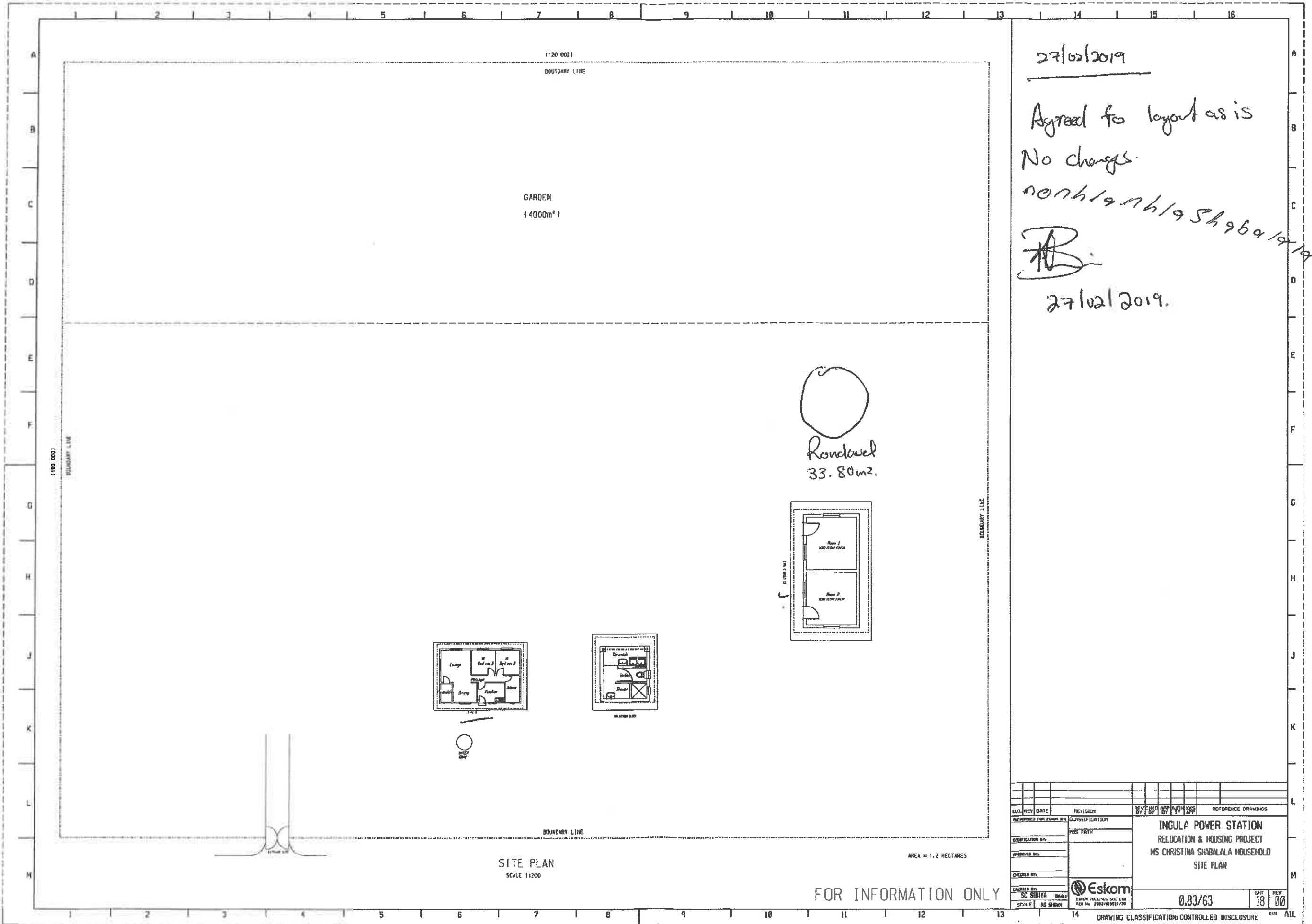
27/02/2019

SITE PLAN  
SCALE 1:200

AREA = 1.2 HECTARES

FOR INFORMATION ONLY

CLD.	REV	DATE	REVISION	BY	CHECK	APP	AUTH	DATE	BY	APP	REFERENCE DRAWINGS
AUTHORIZED FOR ESKOM BY: _____ CLASSIFICATION: _____ FS PATH: _____			<b>INGULA POWER STATION RELOCATION &amp; HOUSING PROJECT MR PAULOS MCHWANAZI SITE PLAN</b>								
CREATED BY: SC SIBIYA SCALE: AS SHOWN			 ESKOM (P.L.C.) REG. NO. 2002/003273/30			0.83/63			SHT 20 REV 00		



27/02/2019

Agreed to layout as is  
No changes.

nonhlahla Shabalala

*[Signature]*

27/02/2019.

NO.	REV	DATE	REVISION	REV. BY	CHKD. BY	APP. BY	DATE	REFERENCE DRAWINGS
AUTHORIZED FOR ISSUE BY: CLASSIFICATION:				INGULA POWER STATION RELOCATION & HOUSING PROJECT MS CHRISTINA SHABALALA HOUSEHOLD SITE PLAN				
EDIFICATION No:				Eskom SOUTH AFRICAN NATIONAL ELECTRICITY REGULATORY AUTHORITY REG No: 2012/10021/20				
APPROVED BY:				0.83/63				
DRAUGHTSMAN:				SHEET 18 OF 20				
DRAWN BY:				DRAWING CLASSIFICATION: CONTROLLED DISCLOSURE				
CHECKED BY:				ALL				
CREATED BY: SC SIBIYA								
SCALE: AS SHOWN								

FOR INFORMATION ONLY

SITE PLAN  
SCALE 1:200

AREA = 1.2 HECTARES

**Appendix C4: Photographic Illustration of Current and Planned Final Outputs**



**ESKOM - INGULA - BASIC ASSESSMENT**

**BASIC ASSESSMENT REPORT IN TERMS OF THE NATIONAL ENVIRONMENTAL  
MANAGEMENT ACT (No.107 OF 1998) REGARDING THE ENVIRONMENTAL AUTHORISATION  
APPLICATION FOR THE PROPOSED RELOCATION OF DWELLERS AT INGULA PUMPED  
STORAGE SCHEME LOCATED IN THE FREE STATE PROVINCE, WITHIN THE THABO  
MOFUTSANYANA DISTRICT MUNICIPALITY, UNDER THE JURISDICTION OF PHUMELELA AND  
MALUTI A PHOFUNG LOCAL MUNICIPALITIES**

**Document Name: EIB - Photographic Illustration of Current and Planned Final Outputs**

**Date: 09 October 2020**

**Document Status: Ver 1**

**Myezo Ref: EIB 2020/01**

**Appendix C4: Photographic Illustration of Current and Planned Final Outputs**



**Existing Structures**



**Planned Final Outputs**

**Appendix D: Specialist Reports-See Volume 4 of 4**

**Appendix E: Comments and Response Report Tables**



**MYEZO ENVIRONMENTAL  
MANAGEMENT SERVICES**  
*Environmental Stewardship*

**Issues and Comments Register**

<b>Document Name: QMS-Project Assistant- Issues and Comments Register</b>	<b>Issue date: 03 September 2020</b>	<b>Revision Date: 03 September 2023</b>	<b>Revision: 1</b>	<b>Status: Pending</b>
<b>Document No.: QMS/0027-PA8-13-1</b>				

**ESKOM - INGULA - BASIC ASSESSMENT PROCESS**

**ISSUES AND COMMENTS RAISED IN RELATION TO THE RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED WITHIN THE BORDERS OF FREE STATE AND KWAZULU NATAL PROVINCES: BASIC ASSESSMENT**

**Document Name: EIB - PI/APs - Issues and Comments Register**

**Date: 03 September 2020**

**Myezo Ref: EIB 2020/01**

<b>ISSUE/COMMENT</b>	<b>RAISED BY</b>	<b>RESPONSE</b>	<b>MODE OF RECEIPT</b>	<b>SECTION WHERE ADDRESSED IN THE BAR</b>
<b>Health and Education</b>				
1. We travel long distances to get to the clinic, we would	Norhlanhla Shabalala	There is limited land within the nature reserve for the development of such amenities. Eskom acknowledge the need for a	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	



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appreciate having one close by		health facility close to the reserve. The Social Survey Report (2005) indicate that there is a mobile clinic that services the area once a month, thus residents will have to make use of such services. In addition, when the relocation process is finalised, the dwellers will be situated close to the major roads and this might positively impact access to basic services such as clinics. However, Eskom will make efforts to pass the concern to the relevant and responsible authorities through existing inter-governmental and stakeholder forums.		
2. We walk a very long distance to get to the clinic and we have to pay money for the public transports	Thuleleni Shabalala	Addressed, refer to Response 1.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7
3. May we please have a school and a clinic	Nesta Bessie Mkhwanazi	1. Addressed. Refer to Response	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7 addresses the possibility of proximity to roads and other services
4. May we please have a school, clinic, electricity, and a community hall	G Dlamini	Regarding the issue of school, clinic and community, it should be noted that the provision of such amenities was not part either options signed for on the agreements between Eskom	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 8. Solar will be installed

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		<p>and the dwellers. The issue of limited land for development of amenities was discussed with the dwellers before the signing of the agreements.</p> <p>Concerning electricity provision, the new houses at the relocation site will have solar power and also equipped for possible connection to the national grid in the future.</p>		
<p>5. We need a school; our kids have to leave home at a very young age because there is no school around</p>	<p>Thuleleni Shabalala</p>	<p>Addressed. Refer to Response 1 and 4</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 7 addresses the possibility of proximity to roads and other services</p>
<b>Access Roads</b>				
<p>6. The road is not of good standard, ambulances struggle to get to their place because of the roads.</p>	<p>Nonhlanhla Shabalala</p>	<p>The state of the road is applicable to the existing settlement setting. With the implementation of the project, the relocation site will be closer to the road which will also be upgraded during the construction of the new houses. During operational phase, the maintenance of the road will be cooperatively undertaken by Eskom and the residents, through community forums.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4. Existing access roads may be upgraded during the construction of houses at relocation site</p>
<p>7. May we please have proper roads</p>	<p>Nesta Bessie Mkhwanazi</p>	<p>Addressed. Refer to Response 6.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to</p>	<p>Section 4. Existing access roads may be upgraded during</p>

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8. The roads are not of good standard, cars cannot move, there are potholes and rivers, may we also have a bridge	Thuleleni Shabalala	Addressed, refer to Response 6.	the notification of stakeholders about the environmental authorization process.	the construction of houses at relocation site
9. There are no proper roads.	Fikile Martha Mdaki	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
10. May we please have proper road	G Dlamini	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
11. Please fix the road used by pedestrians because the rain season is around the corner, rivers will get full and it will be hard to use the route.	Nesta Bessie Mkhwanazi	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site
12. The condition of the road is very bad, and it is not promising that the municipality will get it fixed	Siphamandla Mchunu	Addressed, refer to Response 6.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4. Existing access roads may be upgraded during the construction of houses at relocation site

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<b>Job Opportunities</b>				
<p>13. Please hire people from around the community because they know how to control the veld fires</p>	G Dlamini	<p>There is a local forum, which is dedicated in addressing employment matters and ensure that job creation and opportunities are distributed in an equitable and fair manner During project implementation (construction), operational and decommissioning phases a commitment is made to prioritize the locals when allocating jobs and opportunities.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	Sections 7 and 10
<p>14. Eskom said they will create job opportunities so that people can be able to survive, years have passed and there are still no jobs.</p>	Beauty Mavuso	<p>This has been addressed, job opportunities will be made available and the locals will be given first priority. However, due to the current economic situation, job opportunities may be not be on a large scale. During the construction phase of the relocation project, there may be need for unskilled and semi-skilled labour and these will be sourced from the community. In addition, Eskom has noted the matter that creating job opportunities for the whole community might be impossible, thus, communities</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	Sections 7 and 10



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15. We would appreciate it if Eskom can provide job opportunities for us and also take our children to tertiary.	G Dlamini	are encouraged to start small scale self-sustenance projects. Also refer to Response 13.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10
16. We need job opportunities.	Thuleleni Shabalala	Issues of employment opportunities addressed in Response 13 and 14 above. Concerning sponsoring children's education, Eskom may assist the parents with employment or self-employment opportunities thereby empowering them to meet the financial needs of their children's academics. Residents are encouraged to take advantage of opportunities provided by bursary funds such as NSFAS. In addition, the agreement between Eskom and the dwellers was that a mentorship and training programme will be established, thus, residents are encouraged to maximize such opportunities once they arise.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10
17. We put our CVs in the UBuhle buyeza agricultural cooperative, we were not successful	G Dlamini	Communities are encouraged to start up their small businesses for self-sustenance. Eskom will therefore facilitate ways to	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10 refer to how employment opportunities may be created

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18. Eskom, may we please have jobs and electricity, we are dying of hunger.	Nesta Bessie Mkhwanazi	secure grants from different funders, private and public, for the cooperatives. The main aim is to empower families to sustain a profitable self-employment model such as market farming as well as curbing the need to seek employment.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 4, 7 and 10
19. There were forests where we used to fetch firewood, now they are all gone.	Fikile Martha Mdaki	Seeing that this area will be managed as a nature reserve, cutting of trees that are not	Comment submitted on the response sheet on 08 August 2020, subsequent to	Section 4 refers to how solar will be installed and this will
<b>Deforestation</b>				

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		<p>supervised will not be allowed. Firewood can be availed in a controlled structured manner, as part of the alien invasive control and management processes</p> <p>This means that cleared alien invasive species can be given to locals for use as firewood.</p>	<p>the notification of stakeholders about the environmental authorization process.</p>	<p>be used instead of firewood</p>
<b>Veld Fires and Reserve Management</b>				
<p>20. The livestock cannot be controllable because they did not use wire to separate the yards</p>	<p>Fikile Martha Mdaki</p>	<p>Nature reserve is legislated to ensure free movement of wildlife and cattle will only graze under controlled conditions, therefore, grazing areas will be fenced. As a reminder of the current agreements and for background, it is also important to note that, as agreed with Eskom in the negotiations, any dweller wishing to increase their livestock beyond the agreed number must consult with the Plant Manager and be prepared to pay the R30 (subject to negotiation depending on environmental costs) per month per excess livestock. Adaptive management principles are adopted pertaining to grazing within the nature reserve. Entry point will be</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4 describes how there will be plots for grazing and gardens</p>



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<p>21. Ever since Mr Dijari left, the veld fires are not controlled. The grazing lands burn, and our livestock is left with no food and ends up dying.</p>	<p>Nesta Bessie Mkhwanazi</p>	<p>management and monitored to avoid overgrazing. Sensitive areas such as certain indicated floodplains will be off-limits for grazing.</p> <p>Eskom will manage and properly control any burning if required. It is acknowledged that the dwellers are keen to participate in veld fire control in the interest of protecting their properties and livestock, but this participation must be within the veld fire control committees and Eskom policies. Dwellers will be trained on smart farming and this includes livestock. Next year more bales will be cut early to provide assistance but importantly, firebreaks must be burnt and completed by prescribed timelines in alignment with regulatory framework and these cannot be individual's responsibilities.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4 describes how there will be plots for controlled grazing and gardens</p>
<p>22. No environmental concern.</p>	<p>Siphamandla Mchunu</p>	<p>Even though there are no concerns here from the dwellers, Eskom is committed in working with the occupiers of land to ensure that they are aware of environmental compliance requirements such as the need to preserve wetlands and avoid them, and not to aggravate the already</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 10: Environmental Impacts Analysis</p>

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		erodible soils as recommended by experts and within the key principles of adaptive management concept which is also adopted in handling grazing matters within the nature reserve.		
23. The grazing land gets burned, can we please be the ones who burn the veld because we are familiar with the place, we will be able to control it so that there is a portion that is left for our livestock.	G Dlamini	Fires are one of the reasons why Eskom wants to move them (this is addressed in the report briefly). Eskom has committed to train them in environmental management skills. Ingula Nature Reserve Management will determine where there is need for controlled burning to remove moribund as recommended by Dr Menits.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 describes how there will be plots for controlled grazing and gardens
24. The grazing lands have been burnt and our livestock has no food.	Beauty Mavuso	Refer to Response 21.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 describes how there will be plots for controlled grazing and gardens
<b>Safety</b>				
25. We are not safe here at Eskom.	Beauty Mavuso	The motivation for the relocation is to ensure that the nature reserve is adequately managed, which is the reason why the dwellers are being moved from the most sensitive to the less sensitive part of the nature reserve, which also located on the edge to enable better access and control of	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 1, 2 and 3 describes the relocation site and its attributes



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26. Firefighting equipment should be close by so that we can be able to protect ourselves because the fires start at night.	Beauty Mavuso	nature reserve activities. There is as such limitations placed on what the dwellers can do because this is a nature reserve. However, safety aspects are at the forefront of Eskom's key priorities and the dwellers will be covered under those safety rules and protocols.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 6
27. Eskom does nothing for us.	Beauty Mavuso	Eskom considers dwellers for temporary and long-term employment opportunities that fit their skills. It is also important and crucial to note that Eskom has gone beyond the legal and IFC requirements to make sure that dwellers' standard of life improves. The	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 1, 2 and 3 describes the relocation benefits
<b>Dissatisfaction about Eskom</b>				

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		current economic challenges also affect Eskom's capacity to provide much needed employment opportunities. Nevertheless, there are structures and forums which include affected local municipalities and ward representatives, where employment strategies are discussed and implemented, which the key adopted principle being prioritization of locals		
28. Eskom does not help us with anything.	G Dlamini	There were various challenges facing the implementation of the relocation such as economic hardships and the COVID-19 pandemic. The project will be underway soon. Also refer to Response 27	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 1, 2 and 3 describes the relocation benefits
<b>Socio-economic and Livelihoods</b>				
29. If successful, the project will enable people to get work, get skills and various business opportunities.	Siphamanda Mchunu	These are some of the identified positive impacts in the SEIA report. Refer to Section 14.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 10
30. May we please be provided with bigger yards so that we can be able to	Nesta Bessie Mkhwanazi	Agreements have been signed in terms of how many hectares each household is getting; and how it can be used. With training in smart farming, the	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4

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plough and also have our livestock inside the yards?		land sizes provided can be sustainable utilised. Refer to Response 20.		
31. I have cows, goats, sheep, and horses.	Thuleleni Shabalala	There are limitations (Ingula Management Plan) in terms of how many and what animals any dweller can keep. To alleviate the impact of these restrictions, measures have been agreed to with the families. On the first limitation, families can get written approval from the Plant Manager to either modify or develop their houses in the future. Also, if they want to graze more livestock than is allowed, it must be negotiated and will be based on environmental consideration and cost. (Families would have to pay a monthly fee of R30 livestock unit per month.)	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4
32. I do not have any businesses; I survive on farming. I plant mealies, beans, potatoes then I sell so that I can survive. My livestock includes (Cows, goats, sheep, horses, and chickens) I also sell them so that I can survive	Nesta Bessie Mkhwanazi	A livelihoods restoration plan will be implemented including skills develop training.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 5 and 16

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33. I survive on (mealie, beans, potatoes) I also have (Cows, goats, sheep) I sell pigs	G Dlamini	Addressed, refer to Response 32	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 (grazing and gardening), 5 and 16 (livelihoods)
<b>Project Implementation Recommendations</b>				
34. The material to be used when working should be kept in the community	Beauty Mavuso	Leftover material from construction is subject to recycling, reuse and approved disposal. Any re-allocation of such material should be done within safety regulations to ensure that it is safe for human usage and will not result in litigation risks.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 10
35. To cut the cost the project should consider building next to the old labour camp, next to the road for access to services.	Siphamandla Mchunu	Alternatives were considered where the community and reserve planners considered the area which is being recommended as favorable and options were agreed upon. The two options with respect to allocation or appropriation of land occupancy are now being considered along with a determination of the availability of water through ground water investigations are underway. The availability of water is a crucial factor which supersedes relocation costs	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 8.10

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<b>Business Development</b>				
36. May we please have a tractor that will grind grass for the cows	G Dlamini	Addressed, please refer to Response 22.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
<b>Water Supply</b>				
37. May we please have a windmill in every household.	G Dlamini	Windmills per household are part of the infrastructure to be provided for the relocation project.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
<b>Specific Project Alternatives</b>				
38. I prefer an alternative where I will be living alone but I'm concerned about the hectares, they seem to be small.	Thuleleni Shabalala	The agreements have already been signed and the dwellers were in agreement to what was offered in terms of plot sizes and settlement or layout plans. Refer to Response 39 as well.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7
39. I choose an alternative where I will be living alone so that I can be able to do my own thing and to avoid conflicts.	Nonhlanhla Shabalala	The environmental impacts of the two options will be evaluated with this input in mind.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7
<b>Enterprise and Skills Development</b>				

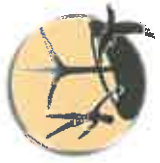




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40. When the building commences, can we please have builders with certificates	G Dlamini	Locals will be given 1st preference depending on the availability of the skills categories and other qualifying criteria.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 8 and 10
<b>Communication</b>				
41. Communication through cellphones is hard since there is no network coverage here.	Fikile Martha Mdaki	Improvements in communication and or network coverage were not part of the agreed services to be offered by Eskom as this is a responsibility of the dwellers and their service providers. However, Eskom note this to be a very relevant concern.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
42. May we please have network towers.	G Dlamini	Addressed, please refer to Response 41	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
<b>Current Relocation Buildings and Management of Outputs</b>				
43. The building of the houses commenced this year. We are not satisfied with the houses.	Beauty Mavuso	The Mavuso Family was initially part of the relocation project but have opted to be built a house in Matiwaneskop (tribal area); north of Ladysmith. Eskom is responsible for the building project, which commenced in July and currently in progress.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 1

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		<p>Ms Mavuso is dissatisfied and wants two roundavels verses the one that is currently planned. Eskom Real Estate is to meet with the Mavuso Family to address the (roundavel) issue and provide detailed explanation of the guild lines that was applied for a like-for-like building agreement.</p>		





# MYEZO ENVIRONMENTAL MANAGEMENT SERVICES

*Environmental Stewardship*

## Issues and Comments Register

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Document No.: QMS/0027-PA8-13-1				

### ESKOM - INGULA - BASIC ASSESSMENT PROCESS ISSUES AND COMMENTS RAISED IN RELATION TO THE RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED WITHIN THE BORDERS OF FREE STATE AND KWAZULU NATAL PROVINCES: BASIC ASSESSMENT

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<b>Health and Education</b>				
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		area once a month, thus residents will have to make use of such services. In addition, when the relocation process is finalised, the dwellers will be situated close to the major roads and this might positively impact access to basic services such as clinics. However, Eskom will make efforts to pass the concern to the relevant and responsible authorities through existing inter-governmental and stakeholder forums.		
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15. We would appreciate it if Eskom can provide job	G Dlamini	Issues of employment opportunities addressed in Response 13 and 14 above.	Comment submitted on the response sheet on 08 August 2020, subsequent to the	Sections 7 and 10

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
opportunities for us and also take our children to tertiary.		Concerning sponsoring children's education, Eskom may assist the parents with employment or self-employment opportunities thereby empowering them to meet the financial needs of their children's academics. Residents are encouraged to take advantage of opportunities provided by bursary funds such as NASFAS. In addition, the agreement between Eskom and the dwellers was that a mentorship and training programme will be established, thus, residents are encouraged to maximize such opportunities once they arise.	notification of stakeholders about the environmental authorization process.	
16. We need job opportunities.	Thuleleni Shabalala	Addressed, refer to Response 13 14 and 15.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10
17. We put our CVs in the UBuhle buyeza agricultural cooperative, we were not successful	G Dlamini	Communities are encouraged to start up their small businesses for self-sustenance. Eskom will therefore facilitate ways to secure grants from different funders, private and public, for the cooperatives. The main aim is to empower families to sustain a profitable self-employment model such as market farming as well as curbing the need to seek employment.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 7 and 10 refer to how employment opportunities may be created

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
18. Eskom, may we please have jobs and electricity, we are dying of hunger.	Nesta Bessie Mkhwanazi	The issue of electricity will be addressed since solar power is going to be installed as part of the relocation developmental activities. In addition, there are plans to connect the dwellers to the grid in the future. Dwellers will be given first priority for employment opportunities that fit their skills, if any arise. Where possible, they will also be trained and equipped with new skills to meet the needs of certain vacancies that may arise such as nature reserve patrols. Residents should also make use of Eskom facilitated funded cooperatives and practice farming which will alleviate hunger.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 4, 7 and 10
<b>Deforestation</b>				
19. There were forests where we used to fetch firewood, now they are all gone.	Fikile Martha Mdaki	Seeing that this area will be managed as a nature reserve, cutting of trees that are not supervised will not be allowed. Firewood can be availed in a controlled structured manner, as part of the alien invasive control and management processes. This means that cleared alien invasive species can be given to locals for use as firewood.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 refers to how solar will be installed and this will be used instead of firewood

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<b>Veld Fires and Reserve Management</b>				
20. The livestock cannot be controllable because they did not use wire to separate the yards	Fikile Martha Mdaki	Nature reserve is legislated to ensure free movement of wildlife and cattle will only graze under controlled conditions, therefore, grazing areas will be fenced. As a reminder of the current agreements and for background, it is also important to note that, as agreed with Eskom in the negotiations, any dweller wishing to increase their livestock beyond the agreed number must consult with the Plant Manager and be prepared to pay the R30 (subject to negotiation depending on environmental costs) per month per excess livestock. Adaptive management principles are adopted pertaining to grazing within the nature reserve. Entry point will be management and monitored to avoid overgrazing. Sensitive areas such as certain indicated floodplains will be off-limits for grazing.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 describes how there will be plots for grazing and gardens
21. Ever since Mr Dijari left, the veld fires are not controlled. The grazing lands burn, and our livestock is left with no food and ends up dying.	Nesta Bessie Mkhwanazi	Eskom will manage and properly control any burning if required. It is acknowledged that the dwellers are keen to participate in veld fire control in the interest of protecting their properties and livestock, but this participation	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 describes how there will be plots for controlled grazing and gardens

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
		<p>must be within the veld fire control committees and Eskom policies. Dwellers will be trained on smart farming and this includes livestock. Next year more bales will be cut early to provide assistance but importantly, firebreaks must be burnt and completed by prescribed timelines in alignment with regulatory framework and these cannot be individual's responsibilities.</p>		
<p>22. No environmental concern.</p>	<p>Siphamandla Mchunu</p>	<p>Even though there are no concerns here from the dwellers, Eskom is committed in working with the occupiers of land to ensure that they are aware of environmental compliance requirements such as the need to preserve wetlands and avoid them, and not to aggravate the already erodible soils as recommended by experts and within the key principles of adaptive management concept which is also adopted in handling grazing matters within the nature reserve.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 10: Environmental Impacts Analysis</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<p>23. The grazing land gets burned, can we please be the ones who burn the veld because we are familiar with the place, we will be able to control it so that there is a portion that is left for our livestock.</p>	G Dlamini	<p>Fires are one of the reasons why Eskom wants to move them (this is addressed in the report briefly). Eskom has committed to train them in environmental management skills. Ingula Nature Reserve Management will determine where there is need for controlled burning to remove moribund as recommended by Dr Mentis.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4 describes how there will be plots for controlled grazing and gardens</p>
<p>24. The grazing lands have been burnt and our livestock has no food.</p>	Beauty Mavuso	<p>Refer to Response 21.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 4 describes how there will be plots for controlled grazing and gardens</p>
<b>Safety</b>				
<p>25. We are not safe here at Eskom.</p>	Beauty Mavuso	<p>The motivation for the relocation is to ensure that the nature reserve is adequately managed, which is the reason why the dwellers are being moved from the most sensitive to the less sensitive part of the nature reserve, which also located on the edge to enable better access and control of nature reserve activities. There is as such limitations placed on what the dwellers can do because this is a nature reserve. However, safety aspects are at the forefront of Eskom's key priorities and the dwellers will be covered under those safety rules and protocols.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Sections 1, 2 and 3 describes the relocation site and its attributes</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<p>26. Firefighting equipment should be close by so that we can be able to protect ourselves because the fires start at night.</p>	<p>Beauty Mavuso</p>	<p>It must be noted that the current scenario, whereby dwellers are scattered throughout the reserve; makes it difficult to manage these fires. Also, currently there is no centralised point to store fire equipment and each family manages associated fire risks alone. The planned relocation will ensure that there is an organized and structured manner to address fires.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 6</p>
<p><b>Dissatisfaction about Eskom</b></p>				
<p>27. Eskom does nothing for us.</p>	<p>Beauty Mavuso</p>	<p>Eskom considers dwellers for temporary and long-term employment opportunities that fit their skills. It is also important and crucial to note that Eskom has gone beyond the legal and IFC requirements to make sure that dwellers' standard of life improves. The current economic challenges also affect Eskom's capacity to provide much needed employment opportunities. Nevertheless, there are structures and forums which include affected local municipalities and ward representatives, where employment strategies are discussed and implemented,</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Sections 1, 2 and 3 describes the relocation benefits</p>

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
28. Eskom does not help us with anything.	G Dlamini	which the key adopted principle being prioritization of locals  There were various challenges facing the implementation of the relocation such as economic hardships and the COVID-19 pandemic. The project will be underway soon. Also refer to Response 27	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 1, 2 and 3 describes the relocation benefits
<b>Socio-economic and Livelihoods</b>				
29. If successful, the project will enable people to get work, get skills and various business opportunities.	Siphamandla Mchunu	These are some of the identified positive impacts in the SEIA report. Refer to Section 14.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 10
30. May we please be provided with bigger yards so that we can be able to plough and also have our livestock inside the yards?	Nesta Bessie Mkhwanazi	Agreements have been signed in terms of how many hectares each household is getting; and how it can be used. With training in smart farming, the land sizes provided can be sustainable utilised. Refer to Response 20.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4
31. I have cows, goats, sheep, and horses.	Thuleleni Shabalala	There are limitations (Ingula Management Plan) in terms of how many and what animals any dweller can keep. To alleviate the impact of these restrictions, measures have been agreed to with the families. On the first limitation, families can get written approval from the Plant Manager to either modify or develop their houses in the future. Also, if they	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4



ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
		want to graze more livestock than is allowed, it must be negotiated and will be based on environmental consideration and cost. (Families would have to pay a monthly fee of R30 livestock unit per month.)		
32. I do not have any businesses: I survive on farming. I plant mealies, beans, potatoes then I sell so that I can survive. My livestock includes (Cows, goats, sheep, horses, and chickens) I also sell them so that I can survive	Nesta Bessie Mkhwanazi	A livelihoods restoration plan will be implemented including skills develop training.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 5 and 16
33. I survive on (mealie, beans, potatoes) I also have (Cows, goats, sheep) I sell pigs	G Dlamini	Addressed, refer to Response 32	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 4 (grazing and gardening), 5 and 16 (livelihoods)
<b>Project Implementation Recommendations</b>				
34. The material to be used when working should be kept in the community	Beauty Mavuso	Leftover material from construction is subject to recycling, reuse and approved disposal. Any re-allocation of such material should be done within safety regulations to ensure that it is safe for human usage and will not result in litigation risks.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 10

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
35. To cut the cost the project should consider building next to the old labour camp, next to the road for access to services.	Siphamandla Mchunu	Alternatives were considered where the community and reserve planners considered the area which is being recommended as favorable and options were agreed upon. The two options with respect to allocation or appropriation of land occupancy are now being considered along with a determination of the availability of water through ground water investigations are underway. The availability of water is a crucial factor which supersedes relocation costs when it comes to promotion of livelihoods and cost(s).	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 8.10
<b>Business Development</b>				
36. May we please have a tractor that will grind grass for the cows	G Dlamini	Addressed, please refer to Response 22.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
<b>Water Supply</b>				
37. May we please have a windmill in every household.	G Dlamini	Windmills per household are part of the infrastructure to be provided for the relocation project.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
<b>Specific Project Alternatives</b>				

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
38. I prefer an alternative where I will be living alone but I'm concerned about the heclares, they seem to be small.	Thuleleni Shabalala	The agreements have already been signed and the dwellers were in agreement to what was offered in terms of plot sizes and settlement or layout plans. Refer to Response 39 as well.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7
39. I choose an alternative where I will be living alone so that I can be able to do my own thing and to avoid conflicts.	Nonhlanhla Shabalala	The environmental impacts of the two options will be evaluated with this input in mind.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Section 7
<b>Enterprise and Skills Development</b>				
40. When the building commences, can we please have builders with certificates	G Dlamini	Locals will be given 1st preference depending on the availability of the skills categories and other qualifying criteria.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	Sections 8 and 10
<b>Communication</b>				
41. Communication through cellphones is hard since there is no network coverage here.	Fikile Martha Mdaki	Improvements in communication and or network coverage were not part of the agreed services to be offered by Eskom as this is a responsibility of the dwellers and their service providers. However, Eskom note this to be a very relevant concern.	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	
42. May we please have network towers.	G Dlamini	Addressed, please refer to Response 41	Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.	

ISSUE/COMMENT	RAISED BY	RESPONSE	MODE OF RECEIPT	SECTION WHERE ADDRESSED IN THE BAR
<p><b>Current Relocation Buildings and Management of Outputs</b></p> <p>43. The building of the houses commenced this year. We are not satisfied with the houses.</p>	<p>Beauty Mavuso</p>	<p>The Mavuso Family was initially part of the relocation project but have opted to be built a house in Matiwaneskop (tribal area); north of Ladysmith. Eskom is responsible for the building project, which commenced in July and currently in progress.</p> <p>Ms Mavuso is dissatisfied and wants two roundavels verses the one that is currently planned. Eskom Real Estate is to meet with the Mavuso Family to address the (rondaveel) issue and provide detailed explanation of the guild lines that was applied for a like-for-like building agreement.</p>	<p>Comment submitted on the response sheet on 08 August 2020, subsequent to the notification of stakeholders about the environmental authorization process.</p>	<p>Section 1</p>

**Appendix F: Environmental Management Programme (EMPr)-See volume 3 of 4**

**Appendix G: Other Information**

**Appendix G1: Declaration by EAP**



## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

### DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

File Reference Number:  
NEAS Reference Number:  
Date Received:

(For official use only)

DEA/EIA

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

#### PROJECT TITLE

**BASIC ASSESSMENT REPORT IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (No.107 OF 1998) REGARDING THE ENVIRONMENTAL AUTHORISATION APPLICATION FOR THE RELOCATION OF DWELLERS AT INGULA PUMPED STORAGE SCHEME LOCATED IN THE FREE STATE PROVINCE, WITHIN THE THABO MOFUTSANYANA DISTRICT MUNICIPALITY, UNDER THE JURISDICTION OF PHUMELELA AND MALUTI A PHOFUNG LOCAL MUNICIPALITIES**

#### Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

#### Departmental Details

##### Postal address:

Department of Environmental Affairs  
Attention: Chief Director: Integrated Environmental Authorisations  
Private Bag X447  
Pretoria  
0001

##### Physical address:

Department of Environmental Affairs  
Attention: Chief Director: Integrated Environmental Authorisations  
Environment House  
473 Steve Biko Road  
Arcadia



Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:  
Email: [EIAAdmin@environment.gov.za](mailto:EIAAdmin@environment.gov.za)

## 1. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP Company Name:	Myezo Environmental Management Services (Pty) Ltd		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	Status level	Percentage Procurement recognition
EAP name:	Babalwa Fatyi		
EAP Qualifications:	Master of Science (Cum Laude)		
Professional affiliation/registration:	South African Council for National Scientific Professionals		
Physical address:	378 Kinross Avenue		
Postal address:	Postnet, Suit B165, Private Bag, Lynnwood.		
Postal code:	0040	Cell:	082
Telephone:	(012) 998 7642	Fax:	(012) 998 7641
E-mail:	babalwa@myezo.co.za		

The appointed EAP must meet the requirements of Regulation 13 of GN R982 of 04 December 2014, as amended.

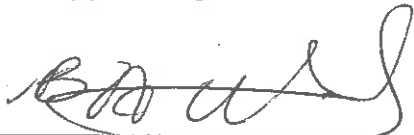
## 2. DECLARATION BY THE EAP

I, Babalwa Fatyi, declare that –

- I act as the independent environmental assessment practitioner in this application;
- 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 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 will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- 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, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

**Disclosure of Vested Interest (delete whichever is not applicable)**

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;



Signature of the Environmental Assessment Practitioner

Myezo Environmental Management Services (Pty) Ltd.

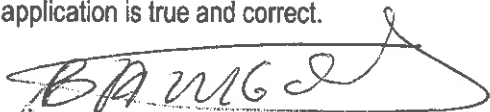
Name of Company:

10 December 2020

Date

**3. UNDERTAKING UNDER OATH/ AFFIRMATION**

I, Babalwa Fatyi, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.



Signature of the Environmental Assessment Practitioner

Myezo Environmental Management Services (Pty) Ltd.

Name of Company

11 December 2020

Date



COMMISSIONER OF OATHS (RSA)

Marina Van Der Zee

Ex Officio Professional Accountant (SA)

Membership Number: 15964

Suite no 2, Garsfontein Office Park

645 Jacqueline Drive, Garsfontein

Signature of the Commissioner of Oaths

11 December 2020

Date

**Appendix G2: CV for EAP**

**CURRICULUM VITAE**  
**OF**  
**BABALWA ATALANTA FATYI**

## Short Profile

### **Babalwa Atalanta Fatyi**

*Founder and Managing Director of Myezo Environmental Management Services (Pty) Ltd, an Environmental Consulting Company that provides a range of environmental services, cutting across various sectors and specialising in the mining sector.*

### **Babalwa is a:**

- Registered Professional Natural Scientist with Master of Science (Cum Laude) (1999) (Registration No. 400123/01).
- Registered Environmental auditor: Institute of Environmental Management and Assessment (IEMA), Lincoln, UK. (Registration No.0025153)
- Associate Member: Land Rehabilitation Society of Southern Africa (LaRSSA) (Registration No. 91430)
- Associate Member: Institute of Waste Management of Southern Africa (IWMSA) (Registration No. 10105011)
- Registered Member: Women in Mining South Africa (WIMSA)
- Received a SA Association for Advancement of Science Award or an outstanding MSc degree in the Faculty of Science, 1999.
- Businesswomen Association: Finalist for Regional Achiever Awards, 2007.
- Celebrating Excellence in Organizations Global: Africa's Most Influential Women Awards (Arts and Culture Sector 2015) and Professional Service (2016).
- Author of Greetings from My Core and When Mulberry Trees are Uprooted- Poetry Books.
- Published in Journals such as South African Journal of Botany and Journal of Arid Environments, amongst others.
- Woman Entrepreneur of the Year for the Tshwane Business Awards, 2016.
- CEO Global Professional Services Awards, 2017
- CEO Global Pan African Awards, 2019

### **Academic Qualifications**

- Master of Science - Wits University (Cum Laude), 1999
- Bachelor of Science Honours (Botany) - Wits University, 1997
- Bachelor of Science - University of Transkei, 1996

Babalwa has environmental consulting experience, having worked for a consulting company, SRK Consulting from 1999 to 2002. She has also worked for a mining company from 2002 to 2005, responsible for overseeing the company's compliance with its environmental obligations and was active in promoting environmental consciousness through all the different mining development phases. Her work experience has allowed her an insight with respect to sector specific environmental requirements ranging from authorizations, implementation and monitoring. She is thus still active in promoting environmental stewardship, through utilisation of a series of integrated environmental management tools, for attainment of long lasting and meaningful economic prosperity. She is experience in undertaking sustainability project using integrated environmental management tools such as environmental impact assessment and is a registered environmental auditor for compliance

and monitoring stages of developments. She subscribes to the forward thinking of keeping resources in use for as long as possible, extracting the maximum value from them whilst in use, and then recovering and regenerating used products and materials at the end of each service life of these products and materials.

Babalwa has contributed to the redesign of the University curriculum regarding sustainability courses, which she did as part of her partnership with Cape Town University of Technology and City of Tshwane Universities, in their Integrated Workplace Learning Programme.

The contribution in the curriculum includes assessment of the current industry requirements and comparing those with what learners are being exposed to at school and providing areas of improvements or new courses that are required to achieve united Nations Sustainable Development Goals by have learners and industry who are focusing on the fields that will ensure achievement of the world wide targets.

Babalwa is a regular invited speaker on a range of topics, which promote stewardship and sustainability from leadership, business, entrepreneurship, motivational, and cover various subjects such as environmental management, cultural diversity and values based leadership, green economy y and sustainability, indigenous knowledge and purpose driven leadership. She has been a guest speaker at conferences, participated in trend talks, fire side chats, blogs, enlightening conference talks and understands a variety of audiences.

As a South African female business owner and entrepreneur, she is determined to be a voice of consciousness, an instrument of change in the manner in which development and environmental matters are handled. She sees her poetry as a conduit through which, all the information that has been imparted unto her through various spheres of association, schooling and by unsung heroic mentors, can be released unto others and be utilized in collaborative thought processes and contribute in decision making for the betterment of our country.

**PERSONAL DETAILS**

**Name** Babalwa Atalanta Fatyi (South African)

**Postal Address:** Postnet Suite B165, Private Bag X18, Lynnwood Ridge, 0040

**Tel:** (012) 998-7642 **Cell:** 082 772 2418

**Fax:** (012) 998-7641

**Website:** babalwaonline.co.za

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**WORK EXPERIENCE****2005 – to date**

*Myezo Environmental Management Services (Founder and Director)*

- Environmental management programmes
- Environmental impact assessments
- Environmental auditing
- Public consultation
- Water licence use

**2003 – 2005**

*Trans Hex Operation (Pty) Ltd*

Environmental Management Co-ordinator with activities including:

- Development of legal registers
- Water Use Licence applications
- Environmental Auditing (internal audits)
- Environmental management programmes
- Implementation of various statutes for both land and marine operations
- Implementation of environmental management plans
- Rehabilitation and closure plans
- Development of waste management plans
- Stake holder involvement
- Environmental awareness and competence training

**1999 – 2003**

SRK Consulting - Environmental Department. Activities include:

- Environmental impact assessments
- Public/stakeholder consultation
- Environmental management programme reports
- Environmental training
- Environmental auditing
- Environmental management systems
- Project co-ordination and management

*A list of projects undertaken to date is provided in Page 9.*



**1996 – 1998**

University of the Witwatersrand

- Teaching assistant.
- Participated in Wits Partnership Programme - Teaching biological and physical sciences in high schools.

### **SKILLS COMPETENCY TRAINING**

- Executive preparation programme - Preparation for active participation in the mining industry: Provided by Mining Qualifications Authority in conjunction with University of Johannesburg for a period of six months - 2005.
- Microsoft Project - Basic/Intermediate Course provided by Companion ICT Training – 20 May 2013.
- Safety, Health, Environment and Quality Awareness provided by Hydro Training Academy (Pty) Ltd- 28 January 2014.
- Competence to Perform Basic First Aid provided by Hydro Training Academy (Pty) Ltd- 12 February 2014.
- SHE Representative by Hydro Training Academy (Pty) Ltd-07 March 2014.
- B-BBEE Champions Course by Transcend Corporate Advisors-21-23 January 2014.
- Transition from ISO 14001: 14001:2015 Environmental Management Systems, CEM-03.6b, in North West University.
- Global Mapper advanced on training GIS case studies and examples, advanced data processing, and LIDAR processing, 3D modelling and terrain analysis.
- Gearing Up: Skills Needed for the Workforce of the Future by Astrotech (Pty) Ltd – 15 April 2020

### **EDUCATION**

#### **Junior Secondary**

Ngqunge Junior Secondary School – Physical Science, Mathematics and Chemistry – Umtata - 1986

#### **High School**

Matriculated at St John's College. – Physical Science, Mathematics and Chemistry- Umtata – 1990

#### **Qualifications obtained**

- BSc (University of Transkei), 1996
- BSc (Hons) Wits), 1997
- MSc Wits (*Cum Laude*), 1999

#### **Major courses obtained**

- Botany
- Zoology

*All the above-mentioned courses enhanced my understanding of structure and functioning of ecosystems as well as integrated environmental management and its associated tools such as environmental impact assessment. The research equipped me with thinking and problem-solving skills including drawing well reasoned conclusions from complex data, recognising developing problems and handling them.*

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## OTHER AREAS OF COMPETENCY

### Languages

- English: speak, read, write – Excellent
- Xhosa: Speak, read, write – Outstanding
- Zulu: speak; read, write – Good

### Environmental legislation

*I have acquired skills in environmental legislation interpretation. I have an excellent understanding of legal requirements with respect to various environmental management tools.*

### Skills acquired

- Project management skills
- Report writing skills
- Colleague liaison skills
- Communication skills
  - Presentation and facilitation skills
  - Stakeholder and regulatory involvement
- Environmental legislation interpretation and application
- Business development skills
- Client partnering skills
- Budget control and monitoring skills
- Statistical analysis (Stats packages: Systat)

*Undertaking environmental impact assessments and public consultation within the consulting industry has strengthened my skills in being able to realise the objectives of the clients as well as empower the public so they better understand their environmental rights and opportunities in a particular development situation. Working in various phases of development projects has enhanced my appreciation of the holistic view/approach in project management. In addition, my role within the mining industry has strengthened my expertise with respect to implementation of various programmes.*

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## AWARDS

- Business Women Association: Finalist for Regional Achiever Awards 2007.
- South African Association for Advancement of Science Medal: awarded for an outstanding MSc degree in the Faculty of Science (2000).
- Celebrating Excellence in Organizations Global (CEO): Finalist in Africa's Most Influential Women Awards. Arts and Culture Sector 2015 and Professional Services Sector in 2017
- Women of Wonder Awards (WOW) (2016): One of the recipient for the prestigious Annual Women of Wonder Awards for hard work, perseverance and dedication that has managed to courageously strive to achieve dreams and aspirations and serve as a role model to South Africans.
- First runner up for BBQ Awards (BBQ- October 2016): South Africa's Premier Black Business Awards.
- Nominated for Phenomenal African Woman Awards (PAW – 2016): Women with A Difference.
- Professional Businesswoman of South Africa (PBWSA - 2016): Celebrating the Power of Colour/ It's All About You.

- Winner - 2016 Standard Bank Tshwane Business Awards (Women Entrepreneur of the Year).
- Nominated as one of the top 100 Difference Makers in South Africa. And made it to Top 10 South African Difference makers in 2017.
- CEO Global Professional Services Award of 2017.
- CEO Global Pan African Awards (2019 Awards): Regional Winner in the SME sector of CEO's Most Influential Women in Business & Government. The awards are the leading African recognition programme honouring excellence in the private and public sector. The programme covers 23 economic sectors and has for the past 19 years independently recognised those leaders who are the pinnacle of their industry). The SADC South leg of the recognition programme is the first part of the CEO Global's recognition programme that takes it around the continent to 8 regions. In each of these regions, country and regional winners are identified.
- CEO Global Pan African Awards (2019 Awards): Country Winner in the SME sector of CEO's Most Influential Women in Business & Government.

### **SOCIO-ECONOMIC CONTRIBUTIONS**

- National Research Foundation Mentorship Programme- Mentor for 2017.
  - Tsogang Re Direng board of Directors Non-Profit Organisation Director: Advisory and coaching role.
  - Vintage Recycling Project Non-Profit Company Director: Strategic Direction Guidance.
  - Part of the #FutureFit mentoring programme lead by Hadithi Media which is part of the Global mentoring initiative (Also participated in Global mentoring walk in 2018) and is set up in South Africa with @ikamvayouthsa #Mamelodi. This also incorporates the parents and community as pillars carved to support the mindset that is fit for the future in their kids as they manoeuvre their way in this VUCA (volatile, uncertain, complex and ambiguous) world.
  - International Association for Impact Assessment South Africa (IAIASa): IAIAsa Student Mentorship Programme (ISMP) – Mentor 2018.
  - Myezo Growth and Development Institute: Board of Directors -upliftment and empowerment of youth and communities.
  - Judging Black Business Quarterly (BBQ) Awards in March 2019 at Emperors Palace.
- Contributions to promote the message of environmental stewardship and consciousness, through poetic engagements available on request.*

### **AFFILIATIONS**

- International Association of Impact Assessments - South African Affiliate
- The Institute of Directors in Southern Africa - South African Affiliate
- Institute of Environmental Management Assessment – United Kingdom (Registration Number: 0025153)

### **PROFESSIONAL REGISTRATION**

- Registered in terms of Article 11 of the Natural Scientific Professions Act, 1993 (Act 106 of 1993). Professional title: Pr. Sci.Nat (400123/01).
- Associate Environmental Auditor: Institute of Environmental Management and Assessment (IEMA), Lincoln, UK. (0025153).
- Associate Member: Land Rehabilitation Society of Southern Africa (LaRSSA), (91430)

### **COMPANY CONTRIBUTIONS**

- SRK's Business Development Committee: Represented environment department in discussions on general company marketing initiatives and activities (2001).
- Employment Equity Committee: Review, monitor and make recommendations on SRK's employment policies, procedures and practices as stipulated in the Employment Equity Policy and Plan (2000-2003).
- Visionary (2005-todate)

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## PUBLICATIONS

**B.A Mbalo (Fatyi)** and E. T. F. Witkowski (1997): Tolerance to soil surface temperatures experienced during and after the passage of fire in seeds of selected savanna woody plant species. *South African Journal of Botany*, 63: 423-425.

N. Mol and **B.A Mbalo (Fatyi)** (2001): South African Legislation: A step in the right direction. Presented at the Chamber of Mines Conference on Environmentally Responsible Mining: Conference Proceedings, 2001.

ETF Witkowski and **BA Mbalo (Fatyi)** (2002): Interactive effects of post fire cues, soil nitrate and smoke on germination. *Journal of Arid Environments* 38: 541- 550.

**B.A Fatyi** (2014) Greetings from my core. Xlibris. United Kingdom: Greetings from my core is about acknowledgement of our role in the sustainability agenda through all the areas of our lives.

**B.A Fatyi** (2017) When Mulberry Trees are Uprooted. Xlibris. United Kingdom: Self-help poetry book about hope, aspirations and encouragement to be the best we can be.

## SPEAKING ENGAGEMENTS

**Africa MBA Indaba Conference and Career Fair (Fatyi) (2016):** One of the 70 Dynamic speakers at the Africa MBA Indaba Conference and Career Fair under the session *'Women Trailblazers - Hear stories from successful women who have navigated the business world and are breaking down barriers for the next generation of women' (panel)*, which was addressing amongst others the prejudices experienced on my journey, how as women we overcame and continue to overcome, how are we paying it forward for those that will come behind us and the advice that we would say now to our younger self as "Women" Trailblazers.

**PASA Global and BMW Best Auto (2015):** Ultimate Achievers Seminar where I have performed *The Woman I Have Become* and also spoke on *"How to build a Successful Enterprise"*.

**Progressive Women in Golf (2016):** Annual fundraising golf day where I have performed poetry

**PASA Global and Tenacity TV (2017):** Ultimate Achievers Seminar Event was for those with or who have more than a wish list but who have a Goal – what Napoleon Hill called *"A dream with a deadline"* The focus of the event was on wealth creation with a diverse and complementary program to maximise all aspects of business, entrepreneurial and personal development.

**Tsogang Re Direng (2017):** Fund Raising Event where I was a speaker emphasized the importance of staying true to yourself and authentic personal brand, 15 teenagers were reached and 20 adults.

**Naledi Farm (2017):** Guest speaker at The Harvest Table on the topic *"Reconnecting with our Authentic Self"*.

**IAIAsa (2017):** Guest speaker on the topic of *Indigenous knowledge and knowledge management*. Where the highlight was based on the value of honouring our indigenous knowledge and making sure we do not lose it but that we rather bring it into the sustainability agenda.

**Prof Segalo on behalf of Tsogang Re Direng (2018):** *Fund Raising Event* where I was a speaker and provided a narrative addressing sustainable development goals of education, gender equality and poverty alleviation.

**The Liverpool Legends (2018):** Presented a Poetic Narrative: *"Empowered and will not be disenfranchised"* with the message of hope brought about by the football stars and Madiba Legacy.

**IAP2 in collaboration with IAIAasa (2018):** Rendered a presentation on the theme: *"Dynamic and Rapid Changing Nature of Public Consultation and Engagement by Civil Society within the Field of Environmental Management"*

**IAP2 (2018):** Collaborated with Dim- Dep faces for environmental success doing a stage act and poetic narration of the *"Value of protection of our natural resources"* as part of welcome dinner for international delegates.

**Ethekwini Local Municipality (2018)** Guest Speaker for topic titled *"Dr Nelson Rolihlahla Mandela the Environmental Champion"* at the Mayoral Reception and Nelson Mandela Lecture ahead of the IAIA18 Conference held at the Moses Mabhida Stadium, Ethekwini Municipality.

**IAIA18 (2018a):** Guest speaker on the topic of *"Indigenous Knowledge: A Poetic Narrative"*. Where the highlight was on information and knowledge, through the opportunity of honouring our indigenous knowledge and incorporating it into the sustainability agenda.

**Future Fit Programme with Ikamva Youth (2018):** Speaker with the theme *"Solutions thinking, design and project management"*.

**South African Council for Natural Scientific Professions (SACNASP) (2018):** Guest speaker where I educated, registered and dispatched *"For such a times as these"*, the natural Scientist Tale of heeding the Global trumpet call towards sustainable development/ green economy.

**IAIAasa (2018):** Guest speaker at a Full Day Conference where I performed a poetic narrative *"Indigenous knowledge"* where the highlight was on information and knowledge through the opportunity of honouring our indigenous knowledge and incorporating it into the sustainability agenda.

**Future Fit Programme with Ikamva Youth (2018):** Speaker with the theme *"Reporting effectively for meaningful engagement"* where she was coaching some Matric students to compile a report on social researches they have conducted in their communities.

#### SHORT COURSES (Week)

- **Carbon Tax Workshop.** Hosted by Imbewu Sustainability Legal Specialists – 2019
- **Mine Closure and Recent Case Law Workshop.** Hosted by Imbewu Sustainability Legal Specialists – 2019
- **The Integration of Climate Change Assessments in EIAs.** Hosted by International Association for Impact Assessment South Africa (IAIASa) - 2019
- **Waste Management and Waste-to-Energy: Biogas Basics and Entrepreneurial Opportunities in South Africa,** unlocking business opportunities for women-owned entities with interest to participate in the sector. Hosted by UNIDO in partnership with UN Women - 2018.
- **IAIA18 Annual Conference: 38<sup>th</sup> Annual Conference** focusing on Environmental Justice in Societies in Transition - 2018.
- **Gauteng Waste Management Forum: Waste management.** Hosted by the Gauteng Department of Agriculture and Rural Development - 2018.
- **Tyre Industry in the Republic of South Africa; Management Plans:** Hosted by the Department of Environmental Affairs (DEA) – 2018.
- **Sustainability Week South Africa:** Conference on the advancement discussion on the Green Economy by creating platforms for African stakeholders from across sectors to share knowledge, thought leadership, experience, and to learn from each other. Hosted by the City of Tshwane - 2017.
- **IAIASa Annual Conference: 22nd Annual National Conference** focusing on inspiring integrated environmental management; crafting innovative solutions to persistent environmental and social problems - 2017.

- **Monitor the Application of Health, Safety and Environmental Protection Procedures:** In accordance to the Occupational Health and Safety (OSH) (Act 85 of 1993); hosted by Hydro Training Academy - 2017
- **IAIAsa Workshop:** City of Johannesburg (COJ) Stormwater Manual - 2017.
- **Global Climate Change Indaba: Issues around climate change and the implications.** Hosted by the Gauteng Department of Agriculture and Rural Development - 2017.
- **IAIAsa Workshop:** Corporate Governance Matter - 2017.
- **Africa MBA Indaba Conference and Career Fair:** Investment Conference, Women Trailblazers and Learning Revolution platform - 2016.
- **Environmental Impact Assessment (EIA) 2014 Legal Regime Workshop:** Hosted by Imbewu Sustainability Legal Specialists– 2014.
- **Induction Training Workshop in Occupational Health and Safety:** Hosted by SHESHA Management Services – 2015.
- **Mineral Resources Compliance and Reporting Conference:** 6<sup>th</sup> Annual Conference. Hosted by Intelligence Transfer Centre - 2015.
- **Individual Voice 1 Pronunciation Programme:** Hosted by The Voice Clinic – 2015.
- **Transition from ISO 14001: 2004 to ISO14001: 2015 Environmental Management System:** hosted by North West University under the Centre for Environmental Management – 2015.
- **SHE Representative Training** - Hosted by Hydro Training Academy – 2014.
- **Corporate Elegance and Etiquette Training:** Hosted by P.C.E.E Consultants – 2014.
- **Implementing Integrated Management Systems: ISO 9001, ISO 14001 and OHSAS 18001–** Potchefstroom University - 2006.
- **Mining Qualifications Authority:** Executive preparation programme focusing on understanding key elements and principles of mining: presented by University of Johannesburg - 2005.
- **Microsoft Project 2000:** Introduction: project management tool. Presented by Executrain - 2001.
- **National Environment Management: Integrated Coastal Management Act, 24 of 2008:** Presented by Imbewu Sustainability Legal Specialists – 2010.
- **Environmental Auditing:** Techniques and Methodologies. Presented by Eagle Environmental - 1999.
- **Implementing Environmental Management Systems (SABS/ISO 14001):** Presented by Centre for Environmental management –Potchefstroom University - 2002.
- **Waste Management for Environmental Managers:** Presented by Centre for Environmental Management –Potchefstroom University - 2003.
- **Environmental Management Tools in the Workplace:** Presented by Centre for Environmental management –Potchefstroom University - 2003.
- **Sustainable Development short course** - Tools and techniques at mining operations. Presented by centre for sustainability in mining and industry - 2003.
- **Environmental Auditor's course:** Aspects International, UK - IEMA approved. Presented by Crystal Clear Consulting and Merchants (Pty) Ltd - 2004.
- **Business Finances for Non-Financial Managers:** Presented by Weidemann Consulting: Engineering and Management - 2001.
- **Introduction to Ground Water.** Presented by Ground Water Division of the Geological Society of South Africa - 2000.
- **Resource Conservation Biology:** University of Witwatersrand - 1998.
- **Population and Ecosystem Modelling:** University of Witwatersrand -1998.
  - Good understanding of Scenario models -exploring management options; harvesting models adaptive management, surplus production, optimum sustainable yield, stock reduction, over - harvesting, uncertainty and harvest quotas.
- **Resource Economics:** University of Witwatersrand - 1998.
- **Geographic Information Systems (IDRISI for windows)** University of Witwatersrand -1998.

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## REFERENCES

**Mr Mervyn Carstens**

Executive Director: SA Land operations  
Trans Hex Operations (Pty) Ltd  
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7499  
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**Mr Muleso Kharikha**

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Department of Environmental Management Services  
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Email: jkharikha@deat.gov.za

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## PROJECT EXPERIENCE

(Project Manager role in all the projects listed in this section unless otherwise specified)

### APPLICATION FOR ENVIRONMENTAL AUTHORISATION

**Environmental impact assessments and plans as well as associated public involvement (Stakeholder engagement strategists and facilitator roles) in terms of National Environmental Management Act, 1998 (Act No. 107 of 1998)**

***NB. Played a lead role in all projects unless otherwise specified***

- **Rockstar Trading (Pty) Ltd (trading as CDF Chrome):** Environmental management plan (EMP) and stakeholder engagement, in terms of NEMA for a Chrome Beneficiation Plant on Portion 86 of the Farm Hartebeesfontein 445 JO, Madibeng Local Municipality, North West Province (2011).
- **Elgagen (Pty) Ltd:** EMP and stakeholder engagement process design and facilitation, done for a Chrome Beneficiation Plant on Portion 181 (A Portion of Portion 2 of the Farm Zandfontein 447 JQ Madibeng Local Municipality, North West province. (2011).
- **Athi River Mining South Africa (Pty Ltd:** Environmental impact assessment and stakeholder engagement strategy development and facilitation in terms of National Environment Management

Act, 1998 (Act 107 of 1998) for a Proposed Mafikeng Cement Project and Associated Activities, including quarry within Ngaka modiri Molema district Municipality (2010-2011).

- **The GHAAP Abattoir Ostrich (Pty) Ltd (GHAAP), funded by Sishen Iron Ore Company – Community:** Development Trust (SIOC-CDT): Environmental impact assessment/basic assessment for a proposed abattoir and deboning plant in Kuruman located at Portion 1 of ERF 1, next to municipal testing grounds, opposite livestock auction premises, and diagonally opposite the red meat abattoir within Ga-Segonyana Municipality under John Taolo Gaetsewe District Municipality, Northern Cape (2011).
- **Solid Waste Technologies SA (Pty) Ltd:** Public participation coordination for hazardous waste treatment facility in City Deep- Johannesburg (2009) and application for environmental authorisation for a transfer station in Durban (2010).
- **Sasol Mafutha (Pty) Ltd:** Sub-contracted to SE Solutions to assist with public involvement coordination and reports review for four EIA's done for Mafutha Mine, Town development, Coal to Liquid plant and Services corridor (2009–2010).
- **Independent Development Trust:** EIA and associated public involvement lead, for proposed secondary school in Freedom Park (2008 -2010).
- **Metsweding District Municipality:** EIA and associated public involvement lead for proposed Cemetery at Ekandustria (2008 - 2010).
- **SES Labour Solutions:** Public participation coordination for proposed capacity expansion of the iron making, steelmaking and rolling facilities at Arcelor Mittal Steel South Africa, Newcastle Works (2008 - current).
- **SES Labour Solutions:** Public participation coordination for planned coke oven expansion at Arcelor Mittal Steel (2007-2008).
- **SES Labour Solutions:** Public consultation coordination for a planned by-product mixing plant at Arcelor Mittal Steel (2006).
- **Clear Channel Independent:** EIA and associated public participation management for proposed erection of advertising billboards (2006-2007).
- **Toka Outdoor Advertising (Pty) Ltd:** EIA and associated public participation management for proposed erection of advertising billboards (2006-2007).
- **Mbokod Outdoor (Pty) Ltd:** EIA and associated public participation management for proposed erection of advertising billboard (2006).
- **Dolphin Outdoor:** EIA and associated public participation management for proposed erection of advertising billboards (2006).
- **Primedia Outdoor (Pty) Ltd:** EIA and associated public participation management for proposed erection of advertising billboards (2006-2007).
- **Matla Consultants:** Environmental scoping study and associated public participation management for a road upgrade in the Brits District, Northwest Province (2005).
- **Rustenburg Local Municipality:** Basic assessment/EIA and associated public participation management for the proposed construction of Bokamoso Sewage Pipeline, Rustenburg Local Municipality, North West Province (2012).
- **Mafikeng cement (Pty) Ltd:** Environmental Impact Assessment and associated public participation management and stakeholder engagement facilitation for the proposed Mafikeng Cement Project within Mahikeng and Ditsobotla Local Municipalities, North West Province (2010).



- **Tsosoletso Resources (Pty) Ltd:** Environmental Management Plan for Sunbury Siding Project, within Mpumalanga Province (2012).
- **Trans Hex Operations (Pty) Ltd** -Application for consolidating application in Terms of Sub-Regulation 14(1) of EIA Regulations, 2010 (GNR 543 of 18 June 2010), under the National Environmental Management Act, 1998 (Act No. 107 of 1998) for Environmental Authorization for Sea Concession 5a, 6a, 7a,3b and 5b within the Administrative District of Namaqualand (2015)
- **SALP Constructions (Pty) Ltd**-Environmental Management Plan for the proposed development at Masebe Nature Reserve with the Mogalakwane Local Municipality, Limpopo (2014).
- **Gijima Supply Chain Management Services (Pty) Ltd**-Environmental Control Officer for Arbor Siding, within Mpumalanga Province (2015-to-date).
- **West Coast Resources (Pty) Ltd**- Amendment of an Environmental Management Programme, coupled with Environmental Impact Assessment and stakeholder engagement strategy development and facilitation, in support of a mining right held by West Coast Resources (WCR), over the Namaqualand Mines, in terms of the National Environmental Management Act (Act No. 107 of 1998) and Mineral and Petroleum Resources Development Act, (Act No. 28 of 2002), within the Administrative District of Namaqualand, Northern Cape (2013 – 2016).
- **Sound Mining Solution (Pty) Ltd:** EIA in support of the mining right for Coal prospecting proposed development in the Farm Vetleegte 304 LQ, situated in Lephalale municipality, District of Waterberg, Limpopo province (2018).
- **Aplorox (Pty) Ltd:** EIA for Forfar Railway Siding located at Portion 1 of the Farm Van Dykspuit 214 IR, Bronkhorstspuit, Kungwini District Municipality, Gauteng Province (2018).
- **Eskom Holdings Soc Ltd:** Subcontracted by Nako Illiso (Pty) Ltd to undertake Public Involvement in respect to a proposed Eskom's Donatello Gas Insulated Substation within Sandton, Gauteng Province (2018).
- **Translogix (Pty) Ltd:** Environmental Management Programme for a coal handling railway siding located on Portion 237R of the farm Rietkol within the Victor Khanye Local Municipality, Nkangala District Municipality, Mpumalanga (2018).
- **Transnet SOC Ltd:** Subcontracted by Hydroscience (Pty) Ltd to conduct Stakeholder Engagement Process regarding the decommissioning of a pipeline from Johannesburg to Durban (2018-2019).
- **Alpha Logistics Solutions (Pty) Ltd:** Compilation of an Environmental Management Programme (EMPr) for Olifansfontein Chrome Railway Siding as part Transnet Freight rail tender submission (2020).

**Basic Assessment Report in terms of National Environmental Management Act (Act No. 107 of 1998)**

- **Aplorox CC**-Basic Assessment Report for the proposed coal storage at Forfar Siding on Portion 131 of the Farm Vaalbank 511-JR with the Kungwini Local Municipality, Gauteng (2014).
- **Lebone Engineering (Pty) Ltd**-Basic Assessment Report and leader for stakeholder engagement and facilitation for the environmental studies that was undertaken in Klip Middle Soweto, in Johannesburg, with the city of Johannesburg Municipality (2015-2016)
- **Vuka Africa Consulting Engineers and Project Managers (Pty) Ltd**- Basic Assessment Process and associated stakeholder engagement for the construction of the proposed Bokamoso Sewage Outfall Pipeline (current), North West Province (2012-2013).

- **SALP Constructions (Pty) Ltd-** Application of Environmental Authorisation, Basic Assessment Report with associated stakeholder engagement and facilitation, for the proposed development at Masebe Nature Reserve with the Mogalakwane Local Municipality, Limpopo (2014 – 2015).
- **Vuka Africa Consulting Engineers and Project Managers (Pty) Ltd-** Basic Assessment Report for the K11 Bypass in Randfontein, Rand West City Local Municipality, Gauteng Province. (2016 – current).
- **Leko Engineering-** Basic Assessment Report for the Caledonian Stadium upgrade in Tshwane Municipality (2017- 2018).
- **Zethu Consulting Services (Pty) Ltd –** Basic Assessment Report for the Matsulu Waste Transfer Station within Mbombela Local Municipality, Mpumalanga Province (2017 – 2018)
- **Gubha Mining Resources (Pty) Ltd:** Basic Assessment Report in support of a prospecting right in terms of Section 16 of the Mineral and Petroleum Development Act, 2002 (Act No. 28 of 2002) for proposed development at Naudesbank in Mpumalanga (2015).
- **Gijima Supply Chain Management Services (Pty) Ltd:** Basic Assessment Report regarding the proposed activities at the existing operating Arbor Railway Siding a coal handling site in Delmas, Mpumalanga Province (2018).
- **Thomas Properties Consultants (Pty) Ltd:** Basic Assessment Reports for 65 sites for the construction of Telkom masts within the various sites in South Africa (2018).
- **Sasol Mining (Pty) Ltd:** Joint Venture with MDT Environmental (Pty) Ltd for the purpose of compiling Basic Assessment Report regarding the proposed maintenance and desiltation activities upstream and downstream to Vulindlela Bridge crossings in Phola township within Emalahleni Local Municipality, Mpumalanga (2019).
- **Eskom Holdings Soc Ltd:** Basic Assessment Report for the proposed Relocation of Dwellers at Ingula Pumped Storage Scheme Located within the Borders of Free State and KwaZulu Natal Provinces (2020).
- **Nichume Logistics (Pty) Ltd:** Basic Assessment Report, Water Use Authorisation Application and Atmospheric Emissions Licence Application for a proposed operation of a railway siding at Highveld Industrial Park in Emalahleni within Mpumalanga Province.

### **APPLICATION FOR MINING AUTHORISATION**

#### **Environmental impact assessments and plans in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)**

- **Double Ring Mineral Resources (Pty) Ltd:** Environmental Management Plan for the proposed gold processing site within the Farm Batavia 176 KP in Thabazimbi, Limpopo Province (2012).
- **ALS BEE Projects:** Environmental Management Plan for TCC Gravel Mine in support of mining permit (Site 1 and 2) on Portion of the Remainder Portion 488 of Town and Townlands, 235 JQ Potchefstroom within Tlokwe City Council (2011).
- **Smart Geo Science:** Environmental Management Plan amendment for a mining permit for Batavia Project, within Mpumalanga Province (2012).
- **Smart Geo Science:** Environmental Management Plan for an application for prospecting right, for Remainder and Portion 1(Samekos) of Farm Kookfontein No 31, Portion 1,2,3,4 and the Remainder of farm No 33, Portion 1 and the Remainder of Farm 49, Portion 1,2,3 and the Remainder of Farm Van Wyksfontein No 50 and Portion 1,2 and Remainder of Farm of Farm No 51. Barkley west, within Northern Cape Province.

- **Smart Geo Science:** Environmental Management Plan for an application for prospecting right, for portion 2 and 63 of the Farm Middelvlei 255 IQ, District of Randfontein (2012).
- **Alizay Properties 31 (Pty) Ltd:** Environmental Management Plan in support of the prospecting operation, in respect of the farms Blaauwkop 271 it, Schimmelhoek 272 it, Steenkoolspruit 275 it, Onverwacht 273 it and others (situated within the Magisterial District of Ermelo, Mpumalanga Province).
- **Silver Unicorn Trading 33 (Pty) Ltd:** Environmental Management Plan for an application for prospecting right, for Silver Unicorn Trading 33 (Pty) Ltd located at portion of the farm and remaining extent of portion 112 of farm Nooitgedacht 268 it, situated within the Magisterial District of Ermelo, Mpumalanga Province (2011).
- **African Exploration Mining and Corporation (Pty) Ltd:** Environmental Management Plan in support of application for a prospecting right, on Farms Paynesvale 608, Kingston 607, Klippan 377, Geduld 661, Thanet 126 and Steyn'Shoek, within the Magisterial District of Kroonstad, Free State Province (2010).
- **Sound Mining Solution (Pty) Ltd:** Social and Labour Plan in support of application of prospecting right for the proposed development in the Farm Vetleegte 304 LQ in the Lephalale Local Municipality, Waterberg District, Limpopo Province (2018).

**Environmental management programmes and stakeholder engagement and facilitation in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)**

- **Athi River Mining South Africa (Pty) Ltd:** Environmental Management Programme and stakeholder engagement and facilitation in support of a mining right in terms of Section 39 and of Regulation 50 and 51 of Mineral and Petroleum Resource Development Act, 2002 (Act No.28 of 2002), Mahikeng, North West Province. (2012-2013).
- **Enermin Africa (Pty) Ltd:** Environmental Management Programme and associate environmental studies and stakeholder engagement and facilitation, in support of a mining right in terms of Section 39 and of Regulation 50 and 51 of Mineral and Petroleum Resource Development Act, 2002 (Act No.28 of 2002), Mahikeng, North West Province. (2012-2013).
- **Trans Hex Operation (Pty) Ltd:** Development of environmental management plans and environmental performance audits for marine and land operations (2005-2012 (on going)).  
Projects include:
  - Environmental management programme updates, audit and closure plan for Brazil Farm.
  - Environmental management programme updates for Hondeklip Bay Operation.
  - Environmental management plans for more than 30 prospecting rights application in the Limpopo, Gauteng, Northwest and Northern Cape.
  - Closure plans for more than twenty prospecting rights.
- **Environmental Resource Management (SA):** Coordination and management of an environmental impact statement for a Burkina Faso Zinc Mine (2005).
- **Mineral Capital Assets:** Development of prospecting environmental management plans for farms on the Northwest Province. (2005).

- **Enermin Africa (Pty) Ltd:** Environmental Management Programme Report for the proposed Koi Koi Stone Quarry Project (2012), MR.
- **Mafikeng Cement (Pty) Ltd:** Environmental Management Programme Report submitted for an application for mining right for Mafikeng Cement Project (2012), MR.
- **Trans Hex Operations (Pty) Ltd:** Revised Environmental Management Programme Report updates for Sea Concession 5a, 6a, 7a, 3b and 5b Northern Cape (2013), MR.
- **Alexkor SOC Ltd:** Environmental Management Programme in respect of Sea Concession 1(c) Mining Project, Northern Cape Province (2013) MR.
- **Alexkor SOC Ltd:** Environmental Management Programme in respect of Sea Concession 4(a) Mining Project, Northern Cape Province (2013) MR.
- **Alexkor SOC Ltd:** Section 93 order in for a mining right issued on Portion 14, 15, 16, 17 and 19 of the Farm Korridor WES No.2, Farm 1, Farm Brandkaros No.617, Farm Arrisdraft No.616, Farm No.155 and Remainder of Farm Gypsums No.5 Situated in the Administrative District of Namaqua (2013).

#### Country reports, sustainability reports and closure plans

- **Department of Environmental Affairs and Tourism:** Fourth Country Report for United Nations Convention to Combat Desertification, including stakeholder engagement and facilitation of regional workshops (2008).
- **Wesizwe:** Development of sustainability framework including policies, standards and guidelines (2008-2009).
- **Etruscan Resources Inc:** Environmental Management Programme and associated stakeholder engagement and facilitation of workshops and open days, in support of a mining right application (2007)
- **Trans Hex Operations (Pty) Ltd:** Closure plans and associated performances assessment audits and financial provision calculations for prospecting farms. (200-current).
- **Unimining Joint Venture:** Implementation of environmental measures during rehabilitation of an asbestos Mine – Heningvlei (2006-2007).
- **Department of Minerals and Energy-Council for Scientific and Industrial Research Project for abandoned Mines:** Myezo subcontracted by CSIR for development of Environmental Best Practice guidelines for Granite Mines in the North –West Province. (2005).
- **Alexkor SOC Ltd:** Alexkor's Five Year Implementation Land Rehabilitation Plan at its Alexander Bay Mine in Northern Cape (2014).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken in the following farms in Northern Cape by Trans Hex. (10 Closure Plans were prepared) (2009).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken in the following farms in North West by Trans Hex. (23 Application for Closure Plans were prepared) (2009).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificates in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), were prepared for various prospecting activities undertaken in the following farms in Limpopo by Trans Hex. (19 Application for Closure Plans were prepared) (2009).

- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificate in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), for Sea Concession 11c, 13c and 18d, Vredendal District, Western Cape (2012).
- **Trans Hex Operations (Pty) Ltd:** Application for Closure Certificate in terms of Section 43 (4) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), in for Portion 1 of Farm Amam No. 46, Namaqualand District, Northern Cape (2013).
- **Alexkor SOC Ltd:** Climate Change Plan as Directed by the Department of Public Enterprises Climate Change Policy Framework for State Owned Companies (2014).
- **Gordon Institute of Business Science and JP Morgan:** Development of a Research Proposal to determine the level of readiness in South African Business Schools to engage with the green economy and related key global, continental and national development agenda with the view to inform research and innovation as well as teaching and community engagement of such schools (2018).
- **Kimopax (Pty) Ltd:** Compilation of Rehabilitation Plans for five mines for Exxaro Coal Mine Central Mines (2018).

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### *Environmental Training*

- **Gropec (Pty) Ltd:** Developed training material and provided environmental awareness training to about 600 employees of Eskom's Kendal Powerstation on matters related environmental rights as prescribed by Section 24 of National Environmental Management Act (107 of 1998) and waste management, auditing and general matters related to pollution control. (2012-2013).
- **Elgagen (Pty) Ltd:** Environmental awareness training for personnel responsible for implementing the EMP and also awareness provided for the adjacent community to partner with the plant in monitoring environmental commitments (2010).
- **Trans Hex Operations (Pty) Ltd:** Ongoing environmental training of employees with environmental obligations to promote compliance with conditions of the environmental management plans – Environmental awareness and competence training on how to implement environmental commitments (for Baken Mine, Bloeddrift Mine and Reuning Mine. Focusing on Mining and Earth moving, Mineral Processing and Support and services such as water supply personnel. Training also incorporated members of community property association who are responsible for monitoring EMP implementation on site. (2005, 2006, 2009 and 2010).
- **Reuning Mine:** Environmental awareness training on waste management for all employees with environmental responsibilities to ensure that there is waste minimisation and proper handling and management of waste disposal landfill sites (2010).
- **CGM Louis Trichardt Joint Venture, Kutama-Senthumule Maximum Security Prison:** Training of senior construction site personnel in environmental management. (2000).
- **Etruscan Diamonds (Pty) Ltd:** Environmental training of employees with environmental obligations to promote compliance with conditions of the environmental management plans (2008).
- **Etruscan Diamonds (Pty) Ltd:** Environmental training of the community who were 26% shareholders in the mining venture to be able to understand the environmental commitments and assist in monitoring compliances (2008).
- **Abongi Bemvelo Services:** Environmental training of personnel in environmental management – introduction to mining (2008).
- **Gropec (Pty) Ltd:** Environmental Awareness Training Course for Eskom's Kendal Power Station employees, Witbank, Mpumalanga (2012).

- **Gropec (Pty) Ltd:** Managing Environmental Aspects – Waste Management Training Course for Eskom's Kendal Power Station employees, Witbank, Mpumalanga (2013).
- **Aplorox (Pty) Ltd:** Environmental Management and Waste Management Training Course (2017).
- **Gijima Supply Chain Management Services (Pty) Ltd:** Environmental Management and Waste Management Training Course (2017).
- **Brazen Alger Rail Logistics cc:** Environmental Awareness and Waste Management Training Course at Hawerklip Railway Siding (2018).

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### ***Environmental Auditing***

- **Trans Hex Operations (Pty) Ltd:** Lead auditor for annual external audits undertaken for Trans Hex's mining operations- Baken Mine, Bloeddrif Mine and Reuning Mine, Northern Cape (2005, 2006, 2007 and 2008).
- **Trans Hex Operations (Pty) Ltd:** Lead Auditor for biannual performance assessment external audits for Baken Mine, Bloedfirr Mine and Reuning Mine, Northern Cape (2010, 2012).
- **Trans Hex Operations (Pty) Ltd:** Lead auditor and environmental audit reports compilation for prospecting mining closure applications (More than 20 audits and closure application (2008-ongoing).
- **Trans Hex Operations (Pty) Ltd:** Lead auditor for Annual and quarterly internal audits undertaken for five mining operations in preparation for the external audits (2003-2004).
- **Trans Hex Operations (Pty) Ltd:** Annual and two-yearly external monitoring and performance assessment audits and annual financial provision revision for Sea Concession 11(a) and 12(a) and 13 (a), Northern Cape 2005-2011 (in progress).
- **Trans Hex Operations (Pty) Ltd:** Performance assessment audits for sea concession area 3(b), 5(b) (5a), 6(a) and 7(a), Northern Cape (2012).
- **Trans Hex Operations (Pty) Ltd:** Performance assessment biannual audits for Hondeklip Bay Mine and Brazil Mine. (2012).
- **Makson Trading Enterprise CC:** Performance Assessment Report for Makson Trading Enterprise CC located in Xhalanga Local Municipality within the Magisterial District of Chris Hani, in Eastern Cape Province (2015).
- **Double Ring Mineral Resources (Pty) Ltd:** Performance Assessment for prospecting activities on Farm Goedehoop 196 HT, Piet Retief in Mpumalanga Province (2012).
- **Enermin Africa (Pty) Ltd:** Performance Assessment for Enermin Africa (Pty) Ltd prospecting activities on Farm Molopo Ratshidi 302, within the Mafikeng Local Municipality, North West Province (2013).
- **Alexkor Ltd:** Performance assessment report for the prospecting activities undertaken over Sea Concession 1(c), within the Administrative District of Namaqualand, Northern Cape (2013).
- **Double Ring Mineral Resources (Pty) Ltd:** Performance assessment report for the mining activities on Farm Batavia 176 KP, within the Magisterial District of Thabazimbi, Limpopo province (2013).
- **Trans Hex Operations (Pty) Ltd-**Performance Assessment Report for Sea Concession 11(A), 12(A), 13(A) and corresponding Surf Zones and Admiralty Strip (2013).
- **Trans Hex Operations (Pty) Ltd-**Performance assessment report for Transhex Bloeddrif Agricultural Activities located on Farm 11 and Portion 5 of Bloeddrif within the Richtersveld Local Municipality, Northern Cape Province (2013).
- **Trans Hex Operations (Pty) Ltd-**Performance Assessment Audit for Baken Mine Situated in The Richtersveld Local Municipality Under the Namakwa District Municipality, Northern Cape Province (2014).

- **Trans Hex Operations (Pty) Ltd**-Performance Assessment Audit for Bloeddrift Mine Situated in The Richtersveld Local Municipality Under the Namakwa District Municipality, Northern Cape Province (2014).
- **Trans Hex Operations (Pty) Ltd**-Performance Assessment Audit for Reuning Mine Situated in The Richtersveld Local Municipality Under the Namakwa District Municipality, Northern Cape Province (2014).
- **Alexkor SOC Ltd**: Renewal report for the prospecting activities undertaken over Sea Concession 1(c) within the Administrative District of Namaqualand, Northern Cape Province (2013).
- **Alexkor SOC Ltd**: Performance assessment for the prospected Sea Concession 1(c) located with Administrative District of Namaqualand, Northern Cape Province (2013).
- **Gijima Supply Chain Management Services (Pty) Ltd**: Monthly Performance Assessment Audit for the operation of a Railway Siding on portion 1 of Farm Vandykspruit 214 IR within Delmas Local Municipality in the Nkangala district, in Mpumalanga Province (2015- ongoing).
- **Wescoal (Pty) Ltd**: Performance Assessment Audit for Water Use Licence for the Goodehoop Processing Plant located on Portions 38, 43 and 45 of the Farm Goedehoop315 JS within, Steve Tshwete Local Municipality in the Nkangala District in Mpumalanga Province. (2018).
- **Trans Hex Operations (Pty) Ltd**: Environmental Management Programme Assessment Audit for Baken Mine located in Sanddrif within the Richtersveld Local Municipality in Northern Cape Province (2018).
- **Wescoal (Pty) Ltd**: Performance Assessment Audit for Water Use Licence for the Goodehoop Processing Plant located on Portions 38, 43 and 45 of the Farm Goedehoop315 JS within, Steve Tshwete Local Municipality in the Nkangala District in Mpumalanga Province. (2019).
- **Wescoal (Pty) Ltd**: Performance Assessment Audit for Environmental Management Programme (EMPr), Water Use Licence (WUL) and GN704 at Keaton Mines' Vangaatfontein Colliery 251 IR, Vogelfontein 222 IR, Brakfontein 277 IR and Rietkuil 249 IR within Victor Khanye Local Municipality, Mpumalanga Province. (2019).
- **Brazen Alger Logistics cc**: Monthly Dust Fallout Monitoring at Hawerklip Railway Siding (2019-ongoing).
- **Eskom Holdings SOC**: Legal compliance audits for Transmission business units, including the office of the group executive and East Grid site in Durban, in line with the Transmission mandate. Tasks included identification of relevant and applicable National, Provincial, Local legislation and international protocols, treaties to which RSA subscribes to determine compliance for the Divisions to enable transmission to be better positioned to determine compliance obligations and meet certification requirements. (2019).
- **Transnet Freight Rail**: Environmental Control Officer (ECO) to monitor compliance with the Environmental Authorisation (EA) and it's approved Environmental Management Programme (EMPr), as well as conditions of Water Use License (WUL) for re-construction and upliftment of the existing railway line in Phalaborwa, Limpopo Province (Phase 1 – Railway line upgrade) (2019).
- **Jit Consulting & Project Management (Pty) Ltd**: Provision of Environmental Control Officer (ECO) Services for the Reeston serviced Sites Housing Project, Buffalo City Metropolitan Municipality (2020).
- **Eskom Holdings SOC Limited**: Provision of Environmental Control Officer (ECO) Services for the proposed Construction of the Powerline from Ariadene Substation to Venus Substation, within Kwazulu Natal Province (2020).

***Boat Launching Application in terms of Regulation 7 of the regulations published in terms of Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and GN No. 1399 of 21 December 2001***

- **Trans Hex Operations (Pty) Ltd**: Boat Launching Application in terms of Regulation 7 of the

regulations published in terms of Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and GN No. 1399 of 21 December 2001 for the proposed Brazil Boat Launching Site, in Northern Cape (2012).

***Waste License Application in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)***

- **Trans Hex Operations (Pty) Ltd:** Environmental Impact Assessment Report for Baken and Bloeddrift Mine Waste Disposal Site, Northern Cape (2012).
- **Matsulu Waste Transfer Station:** Basic Assessment Report for License Application for the proposed construction of a Waste Transfer Station in Matsulu Township in Mbombela Local Municipality (2017).

***Water Use Licence Application in terms of the National Water Act, 1998 (Act No. 36 of 1998)***

- **Trans Hex Operations (Pty) Ltd:** Integrated Water and Waste Management Plan (IWWMP) in terms of the National Water Act, 1998 (Act No. 36 of 1998), for De Punt Mine located within the Matzikana Municipality, Western Cape (2013).
- **Trans Hex Operation (Pty) Ltd:** Water use licence applications (2006-ongoing).
- **Enermin Africa (Pty) Ltd:** Water Use Licence Application for Koi-Koi Crushers Project, Situated on Part of Farm Molopo-Ratshidi 302 Jo, within Mafikeng Local Municipality.
- **Vuka Afrika Consulting Engineers and Project Managers:** Water use licence application for the construction of the proposed Bokamoso Sewage Outfall Pipeline (2011-current), North West Province.
- **Aplorox (Pty) Ltd:** Water Use Licence Application for the Proposed Operations of Railway Siding and Associated Environmental Aspects on Forfar Railway Siding Portion 131 of The Farm Vaalbank 511 Jr Within the Kungwini Local Municipality (2014).
- **Clover Alloys (SA) (Pty) Ltd:** Water Use Licence Application for the proposed Crushing and Screening Beneficiation Plant on Portion 23 (Portion 13-Lg 306) of Farm Rietfontein, Under Rustenburg Local Municipality (2014).
- **Richtrau 256 (Pty) Ltd:** Water Use Licence application for a proposed prospecting right within farm Panfontein 437 IR in the Magisterial District of Meyerton (2018).

***Rectification of an Unlawful Activity in terms of Section 24 G of the National Environmental Management Act, 1998 (Act No. 107 of 1998)***

- **Alexkor SOC Ltd:** Application for rectification an unlawful activity on Farm No. 1 and Port Nolloth Reserve No. 115 within the Namaqualand District Municipality, Northern Cape.

**Environmental Screens**

- **Gijima Supply Chain Management Services (Pty) Ltd:** Environmental screen tool designed for use in assessing lease application for Arbor Siding Project within Emalahleni Local municipality, Mpumalanga (2014 and 2016).

**Master Plans Development**

- **AM Consulting Engineers (Pty) Ltd for OR Tambo District Municipality –** Environmental Services for the Development of a Master Plan for Electrification Process for OR Tambo District Municipality within the Eastern Cape Province (2020)



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## OTHER PROJECTS INVOLVEMENT PRIOR TO 2005

### *Environmental Impact Assessments*

- **BHP/Resolute Joint Venture, Belahouro Gold Project:** Co-ordination of pre-feasibility level environmental scan for Belahouro Gold Mining Project, Burkina Faso (1999).
- **Rio Tinto Zimbabwe, National Power United Kingdom, Zimbabwe Electricity Supply Authority, Gokwe North Project, Zimbabwe:** Gokwe North Power Project environmental impact assessment (EIA), Zimbabwe: Legislation interpretation for an EIA to ensure compliance with World Bank requirements (1999).
- **Maguga dam Joint Venture:** Co-ordinated and managed Environmental impact assessment as required by the Swazi Environmental Authority for the construction of an attenuation dam downstream of Maguga Dam to regulate flow into the Komati River, Swaziland. (2001)
- **Jeffares and Green Inc and Gauteng Department of Public Works and Transport, PWV 9 Road:** Co-ordination and public involvement of the scoping study in support of environmental authorisation for the development of the PWV 9 toll highway, Gauteng. (1999 – 2001).
- **Ericsson Cellular SA (Pty) Ltd / Skanska Telecom Networks (Pty) Ltd / Proconord International OY, Installation of Cellullar Network:** Co-ordinated site screening, visual impact assessment and report writing for the proposed installation of cellular base stations, Gauteng. (2000-2001).
- **Rustenburg Local Municipality:** Basic Assessment for Construction of the Proposed Bokamoso Sewage Pipeline on Portion 1,2,10,13,50 and 86 of the Farm Paardekraal 279 JQ, Portion 19 and 38 of the Farm Waterval 303 JQ and Remainder of Farm Waterval 303 JQ, Rustenburg Local Municipality, North West Province (2013).

### *Environmental Management Programme Reports*

- **Barplats Mines Limited, Re-opening of Crocodile River Mine:** Co-ordination and a management of an EIA for the re-opening of Crocodile River Mine in the North West Province. The EIA was used to produce an environmental management programme report (EMPR) that was submitted to obtain mining authorisation in terms of the Minerals Act (No. 50 of 1991). (1999-2000).
- **Nkomati Joint Venture, Expansion of Nkomati Mine:** Management of a public involvement programme for an EIA to produce an EMPR for expansion of the Nkomati Mine, Mpumalanga, using open cast mining methods. (1999-2000).
- **Kroondal Platinum Mines Limited, Phase II Expansion:** Management of a public involvement programme for an amendment to an environmental management programme report, North West Province (2000-2001).
- **Rustenburg Platinum Mine-Union Section:** Co-ordination of an amendment (tailings dam, opencast section, a railway line and a mineral processing plant) to an environmental management programme report, Northwest, (2001-2002).
- **Rustenburg Platinum Mine-Union Section:** Management of a revision of an approved environmental management programme report into environmental management system format according to ISO 14001 specifications, Northwest Province (2001-2003).

- **Rustenburg Platinum Mine-Rustenburg Section:** Co-ordination of an environmental management programme report for an open cast mine in Waterval 306 JQ farm in Rustenburg, Northwest. (2001-2002).
  - **Anglo American Platinum, Potgietersrust Platinums Limited:** Managed compilation of an environmental management programme report amendment for a new tailings dam in Potgietersrust, Northern Province. (2002).
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**Name** : Babalwa Atalanta Fatyi  
**Profession** : Professional Scientist  
**Specific Function** : Project Leader/ EAP/Public Participation Specialist  
**Experience** : 20 years  
**Nationality** : South African  
**BI & Male/Female Status** : Black Female  
**Professional Qualifications** : MSc [Cum Laude] University of Witwatersrand 1999  
 BSc Honours (Botany) University of Witwatersrand 1997  
 Bachelor of Science University of Witwatersrand 1996  
**Professional Membership** : SACNASP - Professional Scientist – 1993 (Registration No. 400123/01).  
 Registered Environmental Auditor: (IEMA), Lincoln, UK (Registration No. 0025153).  
 Associate Member: Land Rehabilitation Society of Southern Africa (LaRSSA) (Registration No. 91430).  
 International Association for Impact Assessment South Africa (IAIASa): Registered Member and Mentor

LANGUAGE	SPEAK	READ	WRITE
English	Y	Y	Y
Xhosa	Y	Y	Y
Zulu	Y	Y	N

**Some of the roles where expertise is offered within the sector**

As Project Leader	As EAP for Basic Assessment or EA Amendment	As Public Participation Specialist
<ul style="list-style-type: none"> <li>Draft Project Schedule and submit to Client before commencement of work</li> </ul>	<ul style="list-style-type: none"> <li>Arrange pre-application meetings with the client and regulatory authorities</li> </ul>	<ul style="list-style-type: none"> <li>Public Involvement Strategy Development</li> </ul>
<ul style="list-style-type: none"> <li>Meeting facilitation between Regulatory Authority and the Client</li> </ul>	<ul style="list-style-type: none"> <li>Manage the Public Participation Process ensuring that all stakeholders are engaged with and that all comments received are addressed</li> </ul>	<ul style="list-style-type: none"> <li>Review of existing documentation such as Engineers' designs as well as pre-consultation meeting minutes with Regulatory Authority to ensure that all concerns to be raised by IAPS are responded to</li> </ul>
<ul style="list-style-type: none"> <li>Coordinate meetings between the Client and Regulatory Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Oversee the EIA process and compile Basic Assessment report including associated EMPr (for the planning, construction Operational EMPr)</li> </ul>	<ul style="list-style-type: none"> <li>Manage Team responsible for stakeholder identification</li> </ul>
<ul style="list-style-type: none"> <li>Produce meeting minutes for meetings between client and Regulatory Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Submit the application form and draft and Final Environmental Studies Reports to the Regulatory authorities</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the Client is made aware of the IAPs concerns as well as providing feedback to the IAPs</li> </ul>
<ul style="list-style-type: none"> <li>Manage all Team Members ensuring that objectives and timeframes are met</li> </ul>	<ul style="list-style-type: none"> <li>Address the Appeals Process if need be</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder Engagement monitoring and evaluation</li> </ul>
<ul style="list-style-type: none"> <li>Progress Reports</li> </ul>	<ul style="list-style-type: none"> <li>Compilation of the Environmental Report to be submitted as part of the EA amendment process</li> </ul>	<ul style="list-style-type: none"> <li>Reporting on stakeholder engagement results</li> </ul>
<ul style="list-style-type: none"> <li>Review of reports</li> </ul>		
<ul style="list-style-type: none"> <li>Cashflow/invoicing</li> </ul>		
<ul style="list-style-type: none"> <li>Client communication</li> </ul>		

<ul style="list-style-type: none"> <li>▪ Ensure that there is compliance with legal frameworks and best practice</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Management of Team outputs</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Manage specialist investigations and outputs such as reports</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Document review support and provide strategic direction on the process and approach</li> </ul>		

**SUMMARY**

Babalwa is a South African female business owner and entrepreneur who is determined to be a voice of consciousness, an instrument of change in the manner in which development and environmental matters are handled. Having graduated with BSc degree Majoring in Zoology and Botany she worked for a consulting company, SRK Consulting from 1999 to 2002. She worked for a mining company Transhex (Pty) Ltd from 2002 to 2005 (and later as an independent consultant to-date), responsible for overseeing the company's compliance with its environmental obligations and was active in promoting environmental consciousness through all the different mining development phases. Her work experience gave her an insight with respect to sector specific environmental requirements ranging from authorizations, implementation and monitoring and auditing.

Babalwa is a registered Environmental Assessment Practitioner (EAP) and Professional Natural Scientist (400123/01). She led, project managed and participated in over 25 environmental impact assessments and more than 20 Basic Assessment Reports (BARs) and compiled more than 25 Environmental Management Plans (EMPs) and programmes within the various sectors and industries. Babalwa has developed site specific construction Environmental Management Programmes (EMPrs) for various sites such as railway sidings, linear activities such as power lines, and roads within mining areas and pipelines. Also, she developed more than 40 Rehabilitation Plans, Closure plans and associated Performance Assessment Audits for several mining companies. During the compilation of environmental studies, Babalwa applied environmental laws and regulations such as National Environmental Management Act (Act No. 107 of 1998); National Environmental Management: Biodiversity Act (Act No. 10 of 2004); National Environmental Management: Waste Act (Act No. 59 of 2008); National Environmental Management: Protected Areas Act (Act No. 57 of 2003) as guidelines.

As a qualified EAP, Babalwa has been instrumental in the coordination of the Public Participation Process either as a lead stakeholder engagement specialist and or as an overseer of the process. Partaking her duties as Public participation leader, her duties included engaging with Interested and Affected Parties (IAPs) so as to ensure that their issues and concerns regarding the proposed project activities are adequately captured, addressed, included in the Environmental Report. In addition, Babalwa has experience with working and engaging specialists since a number of environmental reports she compiled to date required that she engage with specialist. When engaging with specialists, her duties include designing of terms of references (ToRs) that are project specific and ensure that specialist studies reports findings and recommendations are included as part of the EIA report to be submitted to the Competent Authority for environmental authorisation.

In addition, she has practical knowledge of water use licence application where she has been involved in conducting legal analysis, ensuring that the requirements of all legislations and applicable policies and standards are considered during the application of the Water Use Licence as well as the development of other relevant documents and reports. In addition, was responsible for the compilation of associated documents such as Integrated Water and Waste Management Plans (IWMMPs), Risk Assessment Reports, River Management Plans and submitting all the reports to the regulatory. During the process, was also involved in the arrangement of pre-consultation meetings with the relevant regulatory authorities, conducting follow up meetings and well as ensuring continual engagement until licence granting. Furthermore, stakeholder engagement was undertaken as part of the Water Use Licence application as set out within the regulations. In addition, was a project leader responsible for overseeing and managing actions by the team throughout the duration of the project as well as Management of the team outputs.

Furthermore, in executing her duties as an EAP, Babalwa has worked with a number of Air Specialist acting as a Project Manager facilitating the application of Atmospheric Emissions Licence. In undertaking the management roles, she has developed the Terms of Reference for the Air Specialist ensuring that the

studies to be undertaken will be in line with the National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA), its regulations and any other applicable legislations and standards. As an Environmental Auditor, she has undertaken several Performance Assessment Audits as a lead auditor or as part of a team, and this has strengthened her capabilities to work and successfully yield positive results working as part of a team. Over the years, Babalwa has used legislations and regulations such as National Environmental Management: Air Quality Act (Act No. 39 of 2004); National Water Act (Act No. 36 of 1998) and many other applicable legislations and regulations as a measure for compliance. Babalwa has managed to develop operational control measures that aim at meeting all the regulatory measures and company policies ultimately achieving compliance. Furthermore, Babalwa has developed audit Terms of References, Audit Plans and Schedule clearly setting the objectives of the audit, Audit checklist for all the audits she conducted, Also, she has been able to advice and ensure that corrective actions are taken whenever necessary as well as development of legal registers so as to ensure that the client complies with all the relevant statutes. Thus, she has knowledge of the Competent Authority expectations when applying for an AEL as well as greater understanding of applicable laws, regulations and standards and policies.

Babalwa Fatyi has experience directing and managing environmental sustainability projects current across various industries and sectors, including: environmental management programmes and associated stakeholder engagements and impact evaluation and development of environmental management plan in support of environmental authorisation applications. She has a broad range of experience in leading the implementation of environmental management plans on sites through development of implementation plans with clear set objectives and structures, roles and responsibilities, design of performance monitoring plans and designing communication and risk management plans throughout the project implementation phases. She is also experienced in conducting Performance assessment audits as well as developing and maintaining integrated Safety, Health and Quality management systems.

Holding the position of Director since 2005, Babalwa has been executing managerial duties working with a team of employees whom she directs, manages, plans, oversees their activities and operations, motivate and provide management programs as part of team building. In executing her duties, Babalwa develops operational components and provide overall direction for each project, manages managers and all employees ensuring that the set targets, policies and goals are implemented and achieved, continually monitor operations and assessments so as to provide optimal environmental services. For the past 14 years as a Director, Babalwa has managed to deliver strong operational performance meeting the standards required by industries as well as regulatory authorities.

To incorporate latest developments within the regulatory realm, Babalwa has attended several workshops so that she has knowledge regarding any statutory changes. For the period from 2010 to 2019 Babalwa has attended workshops that include Strategic Climate Change Legal Briefing: Legal and Business Implications of COP15 and the Copenhagen Accord; Legal Training Workshop: Water Law in South Africa; National Environmental Management: Integrated Coastal Management Act Legal Training Workshop; National Environmental Management: Air Quality Workshop; Contaminated Land Legal workshop; Environmental Law update workshop; Environmental Impact Assessment (EIA) 2014 Legal Regime workshop; Mine Closure and Recent Case Law Development Workshop; and the Carbon Tax Half Day Workshop among other workshops.

**RELEVANT EXPERIENCE** (For more detailed list of projects please refer to the List of Similar projects Annexure 3.1-1 and Annexure 3.1-2 which is the Team Capability as well as the list of projects in the attached full CV.

Company	Position	Duration	Contract name
Sasol Mining (Pty) Ltd	EAP and Project Manager	2019 – Current	Joint Venture with MDT Environmental (Pty) Ltd for the purpose of compiling Basic Assessment Report regarding the proposed maintenance and desiltation activities upstream and downstream to Vulindlela Bridge crossings in Phola township within Emalahleni Local Municipality, Mpumalanga. Project contribution include the undertaking the application process, compilation of an EMPr, stakeholder engagement and meeting facilitation, presentations and liaison with regulatory authorities, specialist studies engagements, report writing and spatial presentation of data. Was also an EAP for the General Authorisation Application for the same project.

<b>Company</b>	<b>Position</b>	<b>Duration</b>	<b>Contract name</b>
Sound Mining Solution (Pty) Ltd	EAP and Stakeholder Engagement Manager	2018-2019	EIA in support of the mining right for Coal prospecting proposed development in the Farm Vetleegte 304 LQ, situated in Lephalale municipality, District of Waterberg, Limpopo province (2018)
Eskom Holdings Soc Ltd	Stakeholder engagement leader	2018-2019	Subcontracted by Nako Illiso (Pty) Ltd to undertake Public Involvement in respect to a proposed Eskom's Donatello Gas Insulated Substation within Sandton, Gauteng Province. Duties undertaken include organising focus group meetings with stakeholders and IAPs, facilitation the meetings, compilation of public participation report.
Aplorox (Pty) Ltd	EAP and Project Manager	2018-2019	EIA for Forfar Railway Siding located at Portion 1 of the Farm Van Dyksput 214 IR, Bronkhorstspuit, Kungwini District Municipality, Gauteng Province
Athi River Mining South Africa (Pty Ltd	EAP	2010 - 2011	Environmental impact assessment and stakeholder engagement strategy development and facilitation in terms of National Environment Management Act, 1998 (Act 107 of 1998) for a Proposed Mafikeng Cement Project and Associated Activities, including quarry within Ngaka Modiri Molema District Municipality
Trans Hex Operations (Pty) Ltd	EAP	2012	Environmental Impact Assessment Report for Baken and Bloeddrift Mine Waste Disposal Site, Northern Cape. The projects included delivery pipelines for the slimes dams.
SALP Constructions (Pty) Ltd	EAP	2012-2013	Application of Environmental Authorisation, Basic Assessment Report with associated stakeholder engagement and facilitation and developing an Environmental Management Programme for SALP Constructions for the proposed development at Masebe Nature Reserve with the Mogalakwane Local Municipality Limpopo. Developed terms of reference for the faunal and flora specialists and mapping all plants that would be affected by construction and different phases when these would be affected and designing a plan for relocation and the plan has to be linked to construction schedule. The faunal species were also identified and the immediate relocations to other parts of the nature reserves from those animals who would not move by themselves where done. The search and rescue operations included involvement of local communities as part of capacitating them and helping them to add the knowledge in their ranger operations.
Double Ring Mineral Resources (Pty) Ltd	EAP	2012	Environmental Management Plan for the proposed gold processing site within the Farm Batavia 176 KP in Thabazimbi, Limpopo Province
Matla Consultants	EAP	2005	Environmental scoping study for a road upgrade in the Brits District, Northwest Province.
Independent Development Trust	EAP	2018-2010	EIA for proposed secondary school in Freedom Park and associated stakeholder facilitation and EMP
Metsweding District Municipality	EAP and Stakeholder engagement leader	2008-2010	EIA for proposed Cemetery at Ekandustria and associated stakeholder facilitation and EMP

<b>Company</b>	<b>Position</b>	<b>Duration</b>	<b>Contract name</b>
Mafikeng cement (Pty) Ltd	EAP and Project Manager	2010	Environmental Impact Assessment and associated public participation management and stakeholder engagement facilitation for the proposed Mafikeng Cement Project within Mahikeng and Ditsobotla Local Municipalities, North West Province
Sasol Mafutha (Pty) Ltd	EAP	2009	Myezo subcontracted to SE Solutions to assist with public involvement and reports review for four EIA's done for Mafutha Mine, Town development, Coal to Liquid plant and Services corridor.
Rio Tinto Zimbabwe, National Power United Kingdom, Zimbabwe Electricity Supply Authority, Gokwe North Project, Zimbabwe	EAP	1999	Gokwe North Power Project environmental impact assessment (EIA), Zimbabwe: Legislation interpretation for an EIA to ensure compliance with World Bank requirements (1999).
The GHAAP Abattoir Ostrich (Pty) (Ltd) (GHAAP) funded by Sishen Iron Ore Company)	EAP and Project Manager	2011	Environmental impact assessment and EMPr for a proposed abattoir and deboning plant in Kuruman located at Portion 1 of ERF 1, next to municipal testing grounds, opposite livestock auction premises, and diagonally opposite the red meat abattoir within Ga-Segonyana Municipality under John Taolo Gaetsewe District Municipality, Northern Cape
Thomas Properties Consultants (Pty) Ltd	EAP and Project Manager	2018	Basic Assessment Reports for 65 sites for the construction of Telkom masts within the various sites in South Africa
Gijima Supply Chain Management Services (Pty) Ltd	EAP and Project Manager	2018-2019	Basic Assessment Report regarding the proposed activities at the existing operating Arbor Railway Siding a coal handling site in Delmas, Mpumalanga Province. Designing terms and reference and managing outputs of heritage specialists.
Zethu Consulting Services (Pty) Ltd	EAP and Project Manager	2017-2018	Basic Assessment Report for the Matsulu Waste Transfer Station within Mbombela Local Municipality, Mpumalanga Province
Rustenburg Local Municipality	EAP and Project Manager	2012	Basic assessment/EIA and associated public participation management for the proposed construction of Bokamoso Sewage Pipeline, Rustenburg Local Municipality, North West Province
Enermin Africa (Pty) Ltd	EAP	2012-2013	EMPr in support of a mining right, Mahikeng, North West Province. Designing terms of reference and managing outputs of an archaeologist and biodiversity specialist (Fauna and fauna)
Lebone Engineering (Pty) Ltd	EAP and Stakeholder engagement leader	2015-2016	Basic Assessment Report, EMPr and leader for stakeholder engagement and facilitation for the environmental studies that was undertaken in Klip Middle Soweto, in Johannesburg, with the city of Johannesburg Municipality
Vuka Africa Consulting Engineers and Project Managers (Pty) Ltd	EAP and Stakeholder engagement leader	2012-2013	Basic Assessment Process, EMPr and associated stakeholder engagement for the construction of the proposed Bokamoso Sewage Outfall Pipeline (current), North West Province
Translogix (Pty) Ltd	EAP and Project Manager	2018	Environmental Management Programme for a coal handling railway siding located on Portion 237R of the farm Rietkol within the Victor Khanye Local Municipality, Nkangala District Municipality, Mpumalanga
Alexkor (Pty) Ltd	EAP	2013	Alexkor's Five Year Implementation Land Rehabilitation Plan at its Alexander Bay Mine in Northern Cape (2014). Performance assessment for the prospected Sea Concession 11(A), 12(A), 13(A) and corresponding Surf Zones and Admiralty Strip.

<b>Company</b>	<b>Position</b>	<b>Duration</b>	<b>Contract name</b>
Transnet Pipelines SOC – subcontracted by Hyderoscience cc	Stakeholder Engagement Manager	2018 – current	Undertaking stakeholder engagement in respect with the decommissioning of a pipeline from Johannesburg to Durban in terms of National environmental Management Act (Act 107 of 1998).
Wescoal (Pty) Ltd	Lead Auditor	2019	Performance Assessment Audit for Water Use Licence (WUL) in terms of National Water Act No 36 of 1998 and Environmental Authorisation in terms of National Environmental Management Act 107 of 1998 and Regulation 704 for the Wescoal Mining Limited's Elandspruit Coal Mine located on various portions of the Farm Elandspruit 291 JS located within the jurisdictions of the Steve Tshwete Local Municipality, under the Great Nkangala District Municipality, Mpumalanga Province.
Wescoal (Pty) Ltd	Lead Auditor	2018	Performance Assessment Audit for Water Use Licence for the Wescoal Mining Limited's Processing Plant (Portions 38, 45 and 46 of the Farm Goedehoop 315 JS), Middelburg, Nkangala District Municipality, Mpumalanga Province.
Aplorox (Pty) Ltd	Lead Auditor	2018	Performance Assessment Audit Undertaken in Compliance with the Requirements of an existing Water Use Licence in terms of National Water Act No 36 of 1998, Atmospheric Emission Licence in terms of National Environmental Management Act: Air Quality Act No 39 of 2004 and Environmental Management Programme (EMPr) in terms of National Environmental Management Act No 107 of 1998 and Eskom's Environmental Management Policy for Forfar Railway Siding located at Portion 1 of the Farm Van Dykspuit 214 IR, Bronkhorstspuit, Kungwini District Municipality, Gauteng Province.
Gijima Supply Chain Management Services (Pty) Ltd	Lead Auditor	2018	Performance Assessment Audit undertaken in compliance with the requirements of audit procedures for ISO-14001 and updating them to be in line with operations for Gijima Supply Chain Management Service (Pty) Ltd, at Abor Railway Siding located on Portion 1 of Farm Van Dykspuit No. 214 IR in Delmas, within Emalaheni Local Municipality, Nkangala District Municipality, Mpumalanga Province.
Enermin (Pty) Ltd	EAP	2015	Water Use Licence Application (WULA) and the compilation of other associated documents as part of for Koi-Koi Crushers Project, Situated on Part of Farm Molopo-Ratshidi 302 JO, within Mafikeng Local Municipality.
Gijima Supply Chain Management Services (Pty) Ltd	EAP	2016	Water Use Licence Application and compilation of associated documents in terms of the national water act (act no. 36 of 1998) for Gijima Supply Chain Management Services (Pty) Ltd within Victor Khanye Local Municipality, Nkangala Magisterial District, Mpumalanga Province.
Clover Alloys (Pty) Ltd	EAP	2014	Water Use Licence Application including the development of associated documents in terms of the National Water Act (Act No. 36 of 1998) and the development of an Environmental Management Programme, in terms of National Environmental Management Act (NEMA) Act No. 107 of 1998, including setting objectives, framework, principles and mitigation measures for rehabilitation and, including the development of Integrated Water and Waste Management Plan (IWWMP), for the proposed Crushing and Screening Beneficiation Plant on Portion 23 (Portion 13-Lg 306) of Farm Rietfontein, Under Rustenburg Local Municipality).



SUMMARY OF OTHER EXPERIENCE

2005 –to date	Myezo Environmental Management Services (Pty) Ltd, Director
2003 -2005	Trans Hex Operation (Pty) Ltd, Environmental Co-ordinator
1999 - 2003	SRK Consulting (Pty) Ltd - Environmental Department, Environmental Co-ordinator
1996 - 1998	University of Witwatersrand, Teaching Assistant

**Appendix G3: Declaration by Applicant**

## **An Undertaking Under Oath or Affirmation by the Applicant**

### **The Applicant**

I, Mr Jabulani Hlophe from **Eskom Holdings SOC Limited** declare under oath that I: -

- Am, or represent, the applicant in this application;
- Appointed the environmental assessment practitioner as indicated above to act as the independent environmental assessment practitioner for this application;
- Will provide the environmental assessment practitioner and the competent authority with access to all information at my disposal that is relevant to the application;
- Will be responsible for the costs incurred in complying with the Environmental Impact Assessment Regulations, 2014, as amended, including but not limited to:
  - Costs incurred in connection with the appointment of the environmental assessment practitioner or any person contracted by the environmental assessment practitioner;
  - Costs incurred in respect of the undertaking of any process required in terms of the regulations;
  - Costs in respect of any fee prescribed by the Minister in respect of the regulations;
  - Costs in respect of specialist reviews, if the competent authority decides to recover costs; and
  - The provision of security to ensure compliance with conditions attached to an environmental authorisation, should it be required by the competent authority;
- Will ensure that the environmental assessment practitioner is competent to comply with the requirements of these regulations;
- Am responsible for complying with the conditions of any environmental authorisation issued by the competent authority;
- Hereby indemnify, the government of the Republic, the competent authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which the applicant or environmental assessment practitioner is responsible in terms of these regulations; and
- Will not hold the competent authority responsible for any costs that may be incurred by the applicant in proceeding with an activity prior to an appeal being decided in terms of these regulations.



Signature of Applicant

Eskom Holdings SOC Limited (ESKOM)

Name of company:

14 December 2020

Date:



Signature of the Commissioner of Oaths:

14 December 2020

Date:

Designation:

.....  
**HANS HERMAN DU PLESSIS**  
Commissioner of Oaths  
Ex Officio  
SA Institute of Professional Accountants  
Membership number 4530  
Suite number 2, Garafontein Office Park  
645 Jacqueline Drive, Garafontein

**Appendix G4: CV for Applicant Representative**

# JABULANI CEBO HLOPHE

19 Del Bianco, Umkomaas 4170 • Cell: 0847001937 • Email: hlopejc@eskom.co.za

## ENVIRONMENTAL MANAGER

An accomplished environmental professional with 15 years' of progressive experience and a proven record in mainstreaming environmental issues, managing and implementing environmental legislation, safety management, environmental management systems, driving compliance strategies and environmental consciousness within and outside the business environment.

### AREAS OF EXPERTISE

- |   |                                   |
|---|-----------------------------------|
| • Environmental Impact Assessments      | • Ecosystems Goods & Services     |
| • Biodiversity Conservation             | • Sustainability & Climate Change |
| • Environmental Law                     | • Relocation and Settlements      |
| • Environmental Awareness               | • Socio-Economic Development      |
| • Community and Stakeholder Management  | • Corporate Engagement            |
| • Staff Management                      | • Water Resources Management      |
| • Law Enforcement and Compliance        | • Environmental Monitoring        |
| • Waste Management                      | • Environmental Policy & Audits   |
| • Corrective and Preventative Action    | • Environmental Offsets           |
| • Environmental Risks and Opportunities | • Land Management                 |
| • Environmental Management System       | • Presentation Skills             |
| • Engagement of Regulatory Authorities  | • Land Management                 |
| • Natural Resource Management           | • Report Writing                  |
| • ISO-Certification Standards (14001)   | • Safety Management               |
| • Budget and Financial Management       | • Environmental Advisory          |

### PROFESSIONAL EXPERIENCE

1. **Environmental Manager:** Ingula Pumped Storage Scheme, Feb 2018 to present
2. **Environmental Officer:** Ingula Pumped Storage Scheme, Feb 2014 to January 2018.
3. **Principal Conservation Planner:** EIA Unit, KZN Wildlife, Sept 2011 to January 2014.
4. **District Conservation Officer:** KZN Wildlife, Dec 2005 to Aug 2011.
5. **Conservation Ranger:** SANParks -Garden Route, Jan 2003 to November 2005

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## EDUCATION AND CERTIFICATIONS

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**Master's Degree in Environmental Management**, University of the Free State, Bloemfontein, 2014.

**B Tech Degree in Nature Conservation**, Mangosuthu Univeristy of Technology, Durban, 2009.

**Certificate in Environmental Compliance; Pollution and Waste Management**, Pretoria University, Pretoria, 2008.

**ISO 14001-2015**, Standard Introduction and Implementation.

**National Diploma in Nature Conservation**, Mangosuthu Technikon, Durban, 2002.

**National Matric Certificate**, Ngebeza High School, Hlabisa, 1998.

**Post Graduate Diploma in Business Administration**, University of the Free State (completing this year).

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## REFERENCES

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<b>Alfred Sigubudu</b>	:	<b>Senior District Conservation Manager</b>
<b>Company</b>	:	<b>EKZN Wildlife</b>
<b>Telephone</b>	:	<b>0364881166/084488115</b>
<b>Peter Nelson</b>	:	<b>Eskom Peaking Environmental Manager.</b>
<b>Company</b>	:	<b>ESKOM</b>
<b>Telephone</b>	:	<b>082746 3801</b>
<b>Dr Adrian Armstrong</b>	:	<b>Principal Scientist</b>
<b>Company</b>	:	<b>Ezemvelo KZN Wildlife</b>
<b>Telephone</b>	:	<b>0338451433</b>