ENVIRONMENTAL IMPACT REPORT (EIR)

FOR THE PROPOSED AMENDMENT OF THE EXISTING LADYSMITH EXT 18 TOWNSHIP (MODELKLOOF) RESIDENTIAL LAYOUT, GENERAL PLAN AND THE DEVELOPMENT CONDITIONS IN LADYSMITH WITHIN THE KWAZULU NATAL PROVINCE

ENVIRONMENTAL REGISTRATION NO: KZN/EIA/0001598/2021
REPORT DATE: August 2021

STATUS: FINAL



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EXECUTIVE SUMMARY

Background

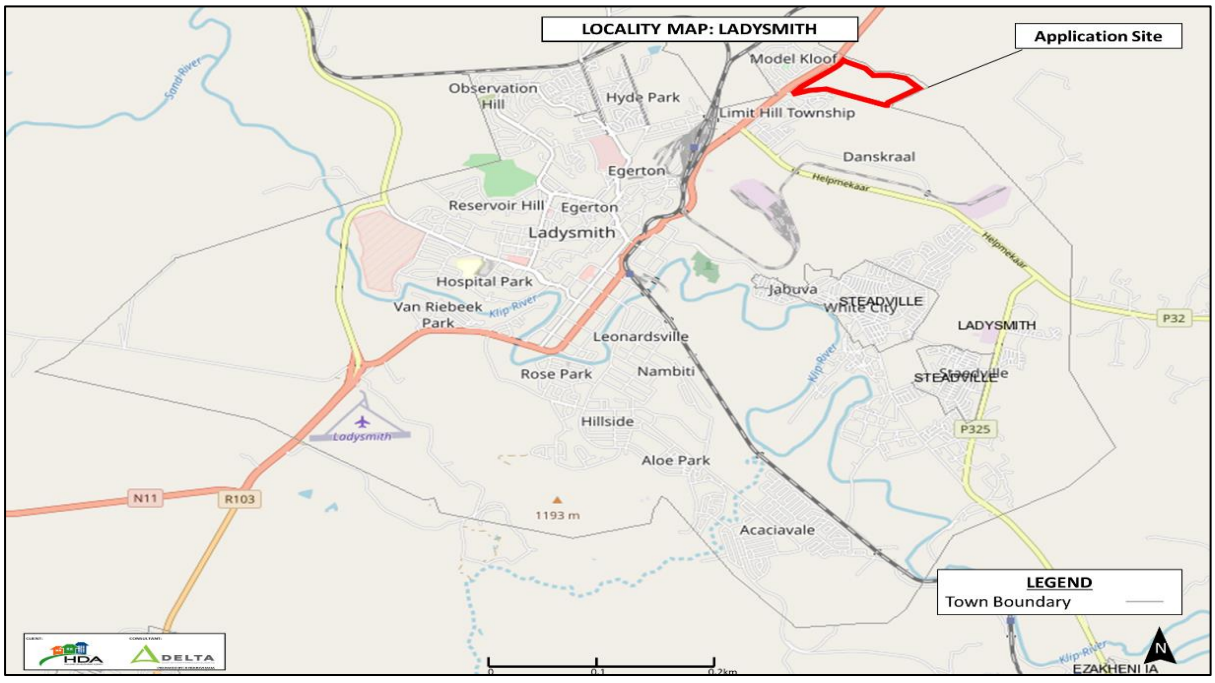
The Housing Development Agency, herein referred to as HDA, is a national public development agency that promotes sustainable communities by making well-located and appropriately planning land and buildings available for the development of human settlements. As its primary activity, the HDA assembles state, private, and communal land and buildings and releases it for development. In addition, the HDA provides project delivery services in the form of land acquisition and management, project structuring, project planning, capacity assembly, as well as the management of projects.

In terms of Section 7(2) of the Housing Development Agency Act, (Act 23 of 2008), the act requires the HDA to introduce and manage a land inventory and information system in support of the identification and acquisition of state, privately and communally owned land which is suitable for residential and community development. With regards to this project, the KZN Department of Human Settlements in collaboration with HDA has acquired land, namely Ladysmith Extension 18 (Modelkloof) in Alfred Duma Local Municipality measuring approximately 75 Hectares in extent, consisting of 230 serviced Erven, located near services.

Location

The subject property is located along the N11 in the Ladysmith within ward 22 which is adjacent to Limit Hill and Danskraal Township, within Ladysmith ext. 18.

Figure 1 – Locality Map



Applicable Legislation and Listed Activities

The National Environmental Management Act (NEMA), 1998 listed activities applied for in respect of the Environmental Impact Assessment Regulations, 2014 (as amended), and for which Environmental Authorisation is required, are:

Table 1 – Relevant NEMA Listed Activity

Listing Notice, no	Activity Number	Description of the listed activity	Applicability to the listed activity
2	15	The clearance of an area of 20 hectares or more of indigenous vegetation	The primary aim of the project is directed at reducing the current housing backlog within the Alfred Duma Municipality. The potential yield for the project is 1201 units comprising of social housing, residential erven. A total of 45 hectares of indigenous vegetation will be cleared.

National Water Act listed activities applied for in respect of the Water Use License Regulation, 19988 and for which Water Use License is required are:

Table 2 – Relevant NWA Act Listed activity

Section	Activity No	Sub-section
21	C	Impeding or diverting the flow of water in a watercourse;
21	I	Altering the bed, banks, course, or characteristics of a watercourse

A Heritage License under the National Heritage Resources Act [NHRA], 1999 (Act No. 25 of 1999) for Heritage Impact Assessments as required in Section 38(8) of the NHRA.

Table 3 – Relevant NHRA Act Listed Activity

Section	Subsection	Description
38	(1) (c) (i)	Any development or other activity which will change the character of a site— (i) exceeding 5 000 m2 in extent

Alternatives

According to DEAT (2004) Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs and Tourism (DEAT), Pretoria. Consideration of alternatives is one of the most critical elements of the environmental assessment process. Its role is to provide a framework for sound decision-making based on the principles of

sustainable development. The different categories of alternatives that can be identified include: (a) property on which or location where the activity is proposed to be undertaken; (b) type of activity to be undertaken; (c) design or layout of the activity; (d) technology to be used in the activity; (e)or operational aspects of the activity.

For this application, the application considered option the layout activity. Two layout options where considered, see table below:

Table 4 – Layout Activity

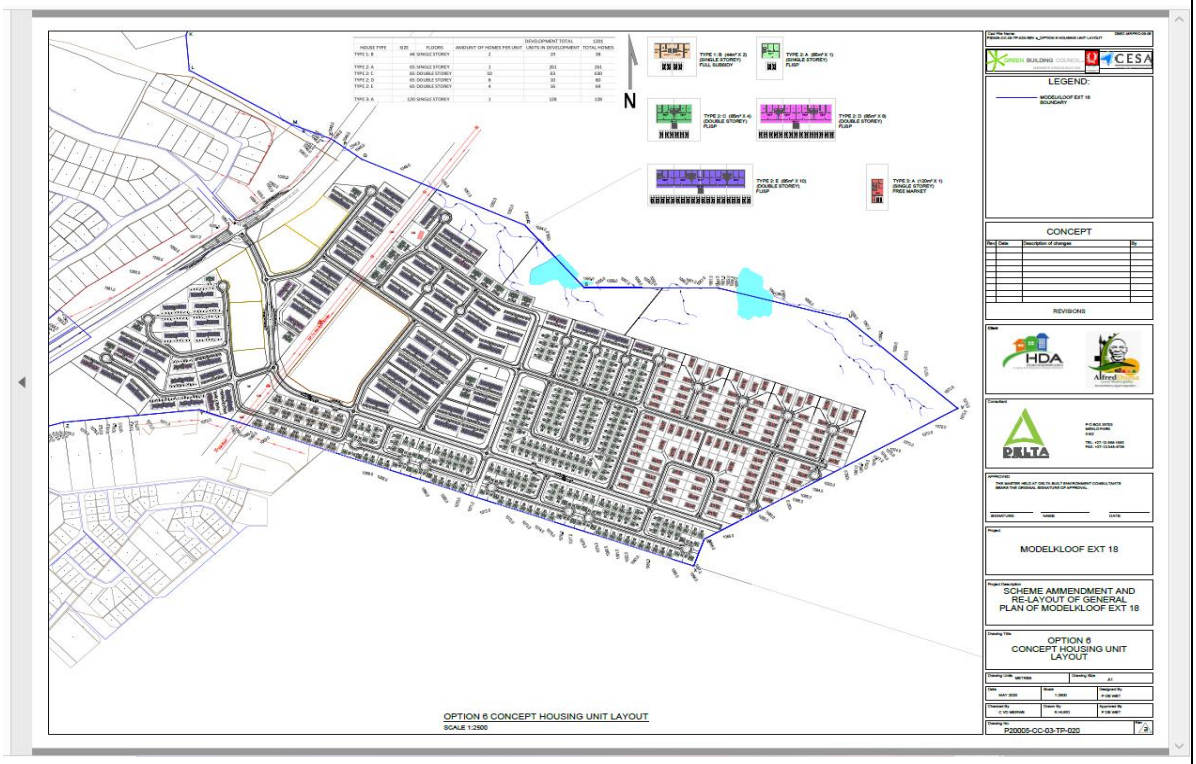
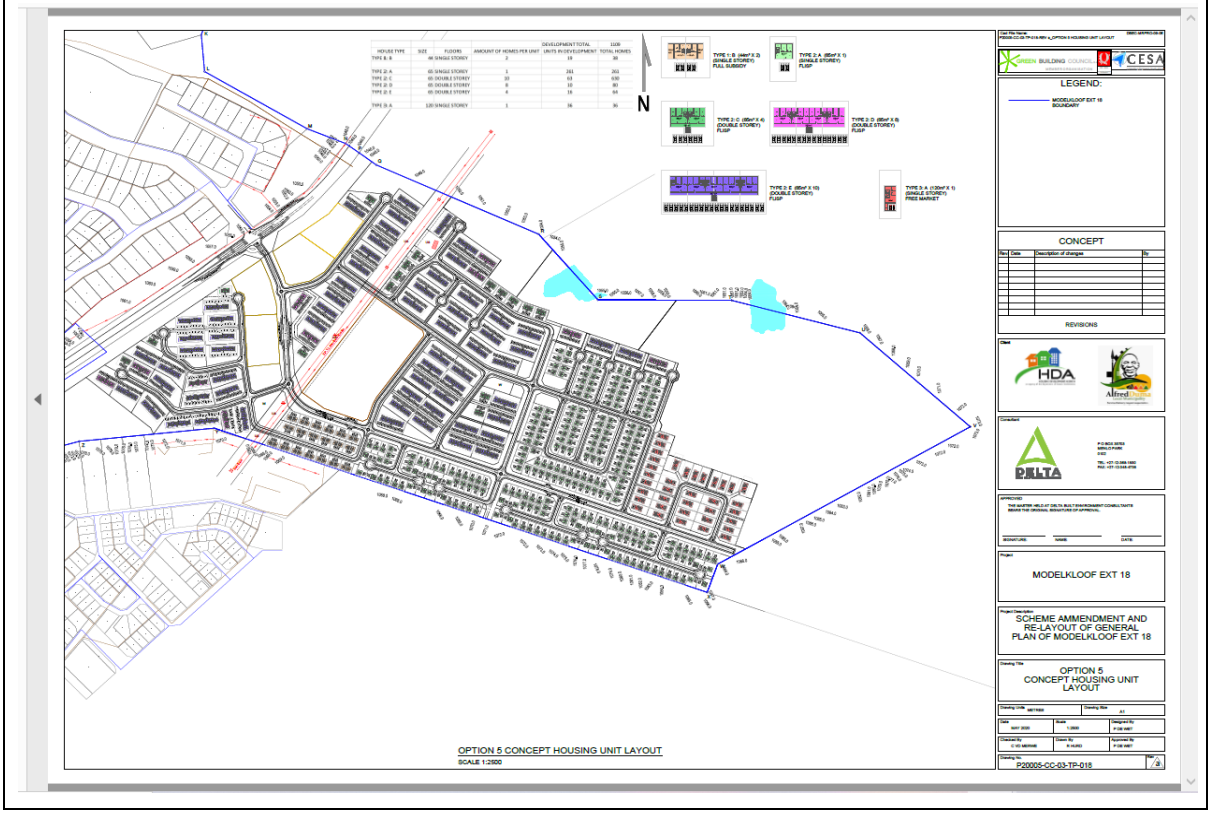
Preferred Alternative
Proposed **1201** units development made up of single and double storey buildings. The applicant would like to have a higher yield of residential units. This will ensure that the municipalities social and long-term financial objectives are achieved. To achieve this objective, part of the rocky ridge will be utilised. The Botanical Specialist does not object to the use of the rocky ridge, provided mitigation measures included in the report are adhered to. Reference is made to Appendix E1 – Botanical Assessment Report. Proposed layout is as follows: **Figure 2 – Preferred Layout** 
Alternative Layout
Alternative design will have 1109 units made up of single and double storey buildings. This alternative will preserve the greater part of the rocky ridge area but yield less units. Proposed layout is as follows:

Figure 3 – Alternative Design



Public Participation

Initial notification was held between the 12th of February 2021 and 13th of February 2021. This included newspaper publication in Isizulu and English language, site notices in both languages and written notices that were distributed through the ward councillor to all houses within 100m of the proposed site. After the first 30-day notice period, a draft scoping and plan of study report was circulated to all registered interested and affected members in a format agreed on with each party.

The next public participation activity includes the distribution of this draft Environmental Impact Report to all registered interested and affected members. Upon receipt of decision by the competent authority, all registered interested and affected members will be notified of the decision and allowed an opportunity to appeal.

Specialist Studies

Specialist Studies chosen were according to the Department of Fisheries, Forestry and Environment (DFFE) screening report as published on their website (See https://screening.environment.gov.za/screeningtool). In terms of the screening report, the environmental aspects that reflects a classification of high to very high were conducted. All the specialist with classified as high, very high were done and those classified as medium of low were left out.

Conclusion

We, as the appointed Environmental Assessment Practitioner having looked at the findings by the specialist, we recommend that the project be approved, and the conditions set out in the Environmental Management Plan be included in the Environmental Authorisation as conditions that the applicant must comply with. We recommend an authorisation valid for 10 years. This will allow the applicant sufficient opportune time to complete the project planning, detailed design, funding arrangements and procurement for construction, to start construction and implement rehabilitation.

DOCUMENT CONTROL

Environmental Reg No	KZN/EIA/0001598/2021
Title	Proposed amendment of the existing Ladysmith ext. 18 Township residential layout, general plan, and the development conditions in Modelkloof, Ladysmith.
Author	Grace Magaya
Specialist Consultants	Delta Built Environmental PTY LTD Leoni Botes Heritage Specialist NCC Environmental – Biodiversity Specialist
Client	Housing Development Agency (HDA)
Report Status	Draft Environmental Impact Report

Assumptions and gaps in knowledge

The purpose of this report is to identify all potential impacts the proposed development may have and provide mitigation measures. However, there are gaps in knowledge, when the EIR was undertaken. These include:

- Environmental Consultant – The municipality is yet to confirm that their have capacity to accommodate additional services such as electricity, water and sewer to accommodate the proposed development.
- Fauna Assessment - The site inspection was a single site visit and no specialist sampling techniques utilised. It is always assumed that the longer the observation is taken, the more detail is available for better decision making.
- Wetland and Aquatic Assessment - It was assumed during this assessment that information and available ecological data on freshwater/aquatic ecosystems from previous reserve determination studies were reliable sources to utilise. Wherever data from existing sources and previous reports or literature are presented or discussed in this report, the relevant sources have been duly acknowledged in the text and are provided in the reference list. Lack of surface flow in the study area confined the aquatic biota assessments to a desktop survey as no field-based methods were feasible to carry out. Maps produced were aided by the available data at the time of this study

and physical ground-truthing of the entire study area within a 500m radius from the site boundary was not undertaken given time and physical access constraints.

WHAT IS AN ENVIRONMENTAL IMPACT ASSESSMENT?

An EIA evaluates the potential impact of human actions, for example, development proposals, on the receiving environment, and how the opportunities and constraints in this environment influence the intended human actions .

EIA is a systematic and consultative process that gathers detailed information on the social, economic, and ecological consequences of a development proposal. The competent environmental authority uses the information gathered during this EIA process to inform a decision on the development proposal . The aim of this decision-making process is to maximize socio-economic outcomes, while ensuring ecological integrity by avoiding and/or mitigating potential negative biophysical impacts . In South Africa the environment is characterized by very high socio-economic needs, limited resources and a degrading biophysical environment.

EIA in South Africa is therefore a means for giving effect to the ”environmental right” enshrined in Section 24 of the Constitution, which calls for the securing of ecologically sustainable development and the promotion of justifiable economic and social development. It is, however, important to remember that while one strives for the best environmental option, there are limitations to what is in fact feasible and practical in terms of time, cost and technology . The aim of EIA in South Africa, therefore, is to follow a process that will determine the best practicable environmental option, that is, to promote sustainable development through the effective management of social, environmental and economic impacts, so that:

- Valuable environmental resources are safeguarded by avoiding unacceptable negative irreversible changes through implementing acceptable mitigation measures.
- Human health and safety must be protected; and
- The social and economic dimensions of the proposed development are enhanced.

CHECKLIST AGAINST NEMA ACT

An environmental impact report (EIR) must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include-

Table 5 - Checklist

	Regulatory Requirement in NEMA	**Applicable Section**
A	Details of: - i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	Section 1.3
B	The location of the activity, including- i. the 21-digit Surveyor General code of each cadastral land parcel. ii. where available, the physical address and farm name. iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 1.2
C	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A
D	A description of the scope of the proposed activity, including: - i. all listed and specified activities triggered. ii. a description of the activities to be undertaken, including associated structures and infrastructure;	Section 1.1 Section 2.2 Section 2.1
E	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process	Section 2.3
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
G	A motivation for the preferred development footprint within the approved site as contemplated in the approved scoping report	Section 4

H	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including: -	
	i. details of the development footprint alternatives considered.	Section 4.1
	ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.	Section 5
	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.	Section 5.5
	iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	Section 3
	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-	Section 7
	i. can be reversed.	
	ii. may cause irreplaceable loss of resources; and	
	iii. can be avoided, managed or mitigated.	
	vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	
	vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	
	viii. the possible mitigation measures that could be applied and level of residual risk.	
	ix. the outcome of the site selection matrix.	Section 7.3
	x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such, and	Section 7.4
	xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 7.5
I	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including –	Section 7
	i. a description of all environmental issues and risks that were identified during the environmental impact assessment process; and an assessment of the	

	significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures	
J	An assessment of each identified potentially significant impact and risk, including – i. cumulative impacts. ii. the nature, significance and consequences of the impact and risk. iii. the extent and duration of the impact and risk. iv. the probability of the impact and risk occurring. v. the degree to which the impact and risk can be reversed. vi. the degree to which the impact and risk may cause irreplaceable loss of resources; and vii. the degree to which the impact and risk can be mitigated.	Section 7
K	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.	Section 8
L	An environmental impact statement which contains – i. a summary of the key findings of the environmental impact statement ii. a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and iii. a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	Section 9
M	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation	Section 10
N	The final proposed alternatives which respond to the impact management measures, avoidance and mitigation measures identified through the assessment	Figure 16
O	Any conditions that where were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	Section 10
P	A description of assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation proposed	DOCUMENT CONTROL

Q	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Section 10
R	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	EXECUTIVE SUMMARY
S	an undertaking under oath or affirmation by the EAP in relation to- i. the correctness of the information provided in the report. ii. the inclusion of comments and inputs from stakeholders and interested and affected parties. iii. an inclusion of inputs and recommendations from specialists 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 or affected parties.	Section 11
T	Where applicable detail of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts	N/A
U	An indication of any deviation from the approved scoping report, including the plan of study including- i. any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and i. a motivation for the deviation;	N/A
V	Any specific information that may be required by the competent authority; and	N/A
W	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

TABLE OF CONTENTS

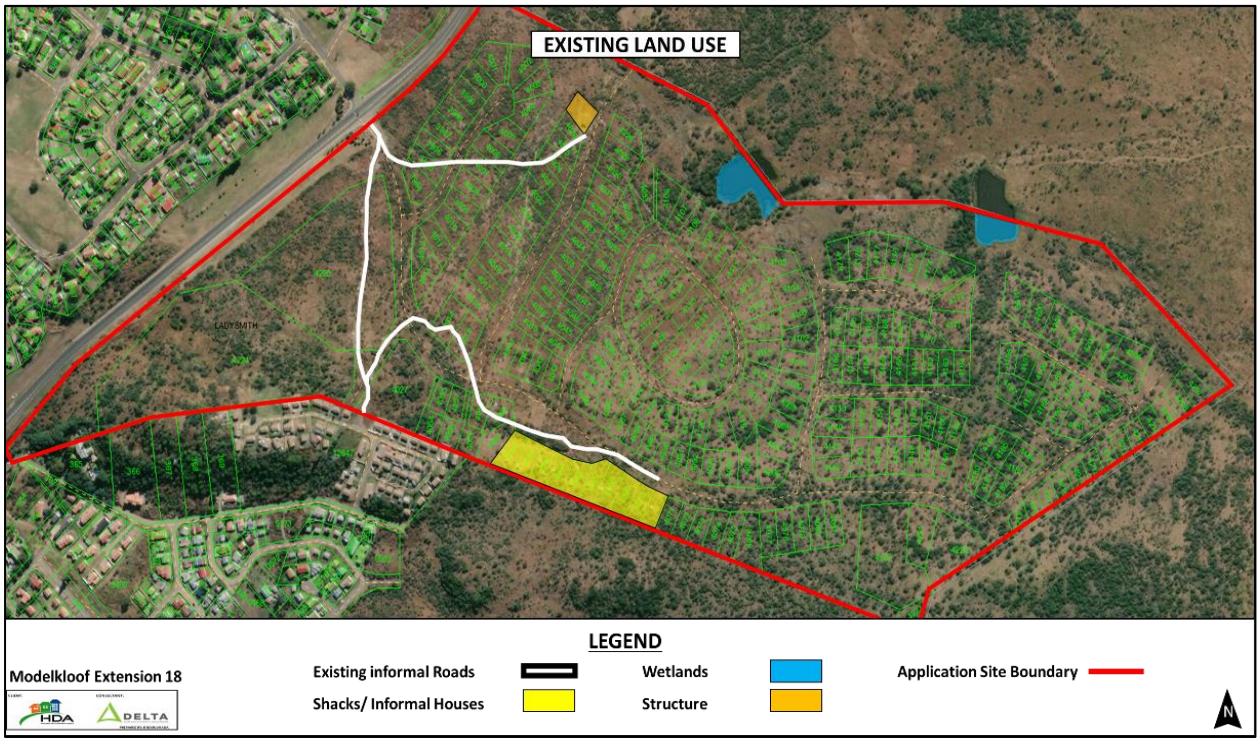
SECTION 1 - INTRODUCTION

1.1 Background Information

The Housing Development Agency, herein referred to as HDA, is a national public development agency that promotes sustainable communities by making well-located and appropriately planning land and buildings available for the development of human settlements. As its primary activity, the HDA assembles state, private, and communal land and buildings and releases it for development. In addition, the HDA provides project delivery services in the form of land acquisition and management, project structuring, project planning, capacity assembly, as well as the management of projects.

In terms of Section 7(2) of the Housing Development Agency Act, (Act 23 of 2008), the act requires the HDA to introduce and manage a land inventory and information system in support of the identification and acquisition of state, privately and communally owned land which is suitable for residential and community development. With regards to this project, the KZN Department of Human Settlements in collaboration with HDA has acquired land, namely Ladysmith Extension 18 (Modelkloof) in Alfred Duma Local Municipality measuring approximately 75 Hectares in extent, consisting of 230 unserviced Erven, located near services. The following map is an indication of the current land use:

Figure 3 – Existing layout and land-use



1.2 Locality

In terms of Section appendix 3(1) of the EIA Regulations (2014, as amended), an Environmental Impact Assessment Report must include – (b) the location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel, (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties. (c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken. (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.

The subject property is located along the N11 in the Ladysmith town within Ward 22 adjacent to Limit Hill and Danskraal Township, within Ladysmith ext. 18. The following tables provides the site jurisdiction as property details.

Table 6 - Jurisdiction

Competent Authority	KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs
District Municipality	uThukela District
Locality Municipality	Alfred Duma Local Municipality
Province	KwaZulu Natal
Town	Ladysmith
Closest Suburb	Limit Hill Township

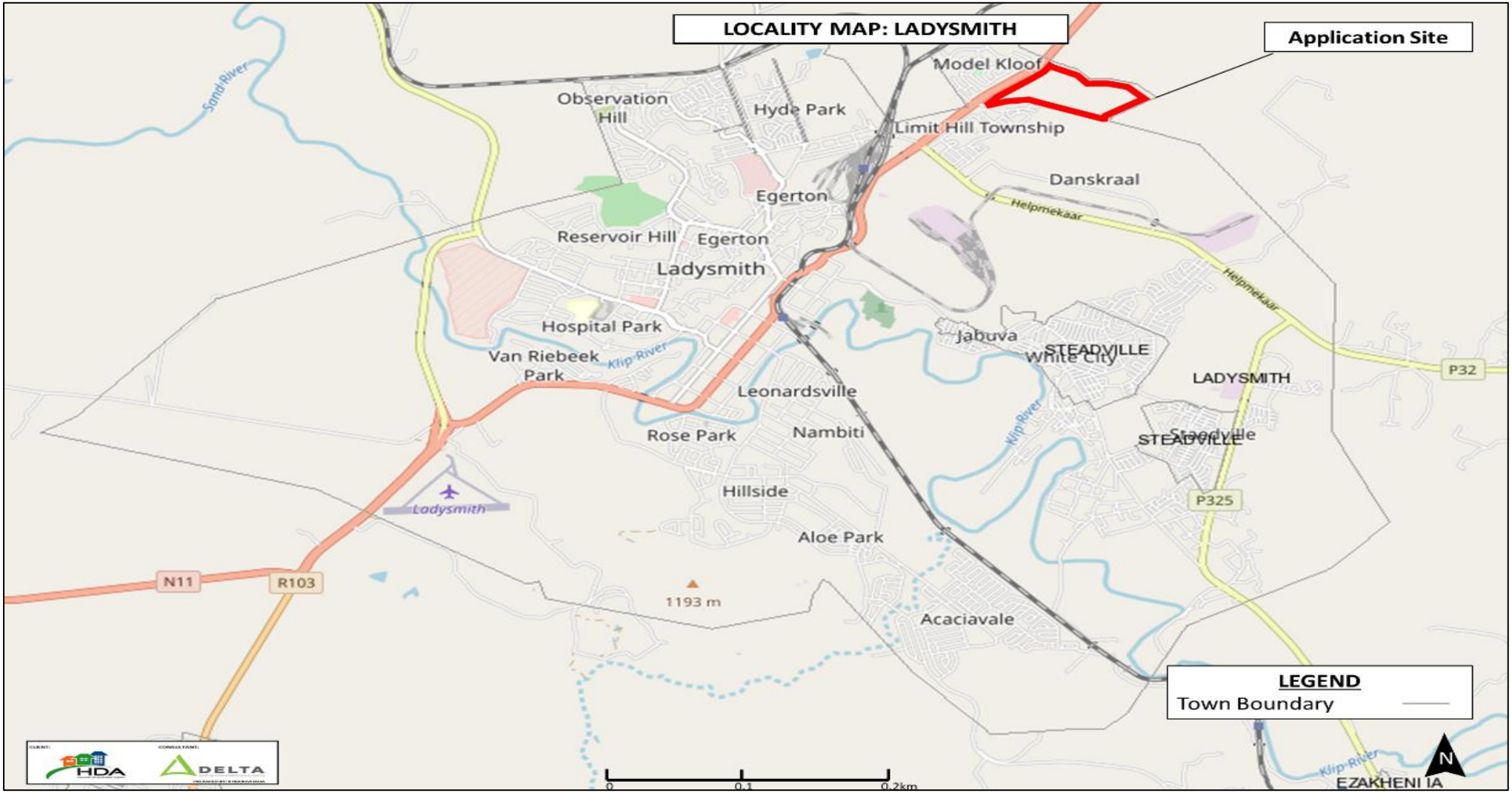
Table 7 – Property Details

For a full list, refer to Appendix A of this report.

Property Type	Township / Farm Name	Portion
ERF 4078	Ladysmith Ext 18	0
ERF 4149	Ladysmith Ext 18	0
ERF 4027	Ladysmith Ext 18	0
ERF 4121	Ladysmith Ext 18	0
ERF 4224	Ladysmith Ext 18	0
ERF 4059	Ladysmith Ext 18	0
ERF 4153	Ladysmith Ext 18	0
ERF 4058	Ladysmith Ext 18	0

ERF 4004	Ladysmith Ext 18	0
ERF 4231	Ladysmith Ext 18	0
ERF 4225	Ladysmith Ext 18	0
ERF 4236	Ladysmith Ext 18	0
ERF 4232	Ladysmith Ext 18	0
ERF4019	Ladysmith Ext 18	0
ERF 4233	Ladysmith Ext 18	0

Figure 4 – Locality Map



1.3 The Environmental Assessment Practitioner (EAP)

According to Appendix 2, Section 2 (1), of the EIA Regulations (2014) (as amended), a *"scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

(a) details of:

(i) the EAP who prepared the report; and

(ii) the expertise of the EAP, including a curriculum vitae

GKM Consulting PTY LTD was appointed by Delta Built Environmental Consultants on behalf of Housing Development Agency to apply for Environmental Authorisation (EA) for the proposed construction of a township in Ladysmith ext. 18 adjacent to Limit Hill and Danskraal Township. Details of the consultant are as follows:

EAP	:	Grace Magaya
Professional Reg.	:	EAPASA 2018/129
Company	:	GKM Consulting PTY LTD
Address	:	74 Third Street, Northmead, Benoni, 1501
Mobile Number	:	+27 81 494 1611
Email	:	grace@gkmenvironmental.co.za
Website	:	www.gkmenvironmental.co.za

GKM Consulting PTY LTD was established in 2012 as a specialist consulting company and has experience in undertaking Basic Assessment Reports, Scoping Environmental Impact Assessment Reports, Environmental Monitoring, Biodiversity Assessments, Water Use License for all type of projects that is large, medium, and small projects within South Africa.

Table 8 - Project Team

Mrs Grace Magaya Environmental Consultant	Holds a bachelor's degree in environmental management through the University of South Africa and is EAPASA Registered. She has over 8 years' experience in conducting Environmental Impact Assessments (EIA) in South Africa
Mr Trevor O'Donoghue Botanical Specialist	The ecologist for this report holds a master's degree in Vegetation Assessment
Mr Ronaldo Retief Fauna Specialist	Mr. Ronaldo Retief holds a master's degree in Zoology and is professional registered with SACNASP registered. He has over 12 years' experience in conducting biodiversity assessments as well as environmental impact assessment.

Mr Craig Burne Wetland Assessment	Mr Craig Burne the wetland and aquatic specialist involved in this project is professionally registered with SACNASP and holds a master's degree in aquatic Assessment.
Ms Leoni Botes Heritage Impact Specialist	Ms Leoni Botes holds a holds a Bachelor's Degree in Archaeological and Cultural history obtained from the University of Pretoria. She is registered with SA Society for Cultural History (CH002).
Mr. Piet De Wet Geotechnical Investigation	Mr. Piet De Wet is a professional registered civil engineer and holds a Bachelor's Degree in Civil Engineering.
Ms Debra Weldon Agricultural Specialist	Ms Debra Weldon is a registered Environmental Scientist and holds a Masters in Environmental Biology. SACNASP – Ref 121210.

SECTION 2 – DESCRIPTION OF THE SCOPE OF THE PROPOSED ACTIVITY

2.1 A description of the activities to be undertaken including associated structures.

The KZN Department of Human Settlements in collaboration with HDA has acquired land, namely Ladysmith Extension 18 (Modelkloof) in Alfred Duma Local Municipality measuring approximately 75 Hectares in extent, consisting of 230 un-serviced Erven, located near services.

The primary aim of the project is directed at reducing the current housing backlog within the Alfred Duma Municipality. The potential yield for the project is 1201 units comprising of social housing, residential erven.

In is envisaged that this project will address the housing demand by providing access to housing opportunities for the GAP housing and the middle-income earners within the town of Ladysmith

2.2.1 All listed activities and Specified activities

The above-mentioned activities trigger the National Environmental Management Act, 1998 (Act No 107 of 1998) Government Regulation Number 983, 984 and 985 as of 4 December 2014

Table 9 – Listed Activity

Regulation	Activity Number	Description	Relevance
GNR Listing No 2	15	The clearance of an area of 20 hectares or more of indigenous vegetation.	The primary aim of the project is directed at reducing the current housing backlog within the Alfred Duma Municipality. The potential yield for the project is 1201 units comprising of social housing, residential erven. A total of 45 hectares of indigenous vegetation will be cleared.

2.3 Applicable policy and legislative context

The following legislation, policies, and guidelines are applicable to the application as contemplated in the EIA Regulations, 2014 (as amended on 07 April 2017) and NEMA, 1998.

Table 10 - Legislation, policies, and guidelines

TITLE OF LEGISLATION, POLICY OR GUIDELINE	ADMINISTERING AUTHORITY	PROMULGATION DATE
Constitution of the Republic of South Africa, 1996	National	18 December 1996
National Environmental Management Act, 1998 (Act 107 of 1998) as amended	National & Provincial	27 November 1998
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	National & Provincial	07 June 2004
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	National & Provincial	April 1999
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	National & Provincial	10 March 2009
National Water Act, 1998 (Act No. 36 of 1998)	National & Provincial	06 December 1999
Environmental Impact Assessment Regulations (Listing Notice 1, 2 and 3)	National & Provincial	7 April 2017
National Road Traffic Act, 1996 (Act No. 93 of 1996)	National & Provincial	November 1996
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)	National & Provincial	June 1993
Alfred Duma Integrated Development Plan	Local	2020/2021
Spatial Planning and Land use Management Act (16/2013	Local	7 March 2019

The following table provides a description of compliance with the relevant legislation, policy, or guideline.

Table 11 - Description of compliance with legislation, policies, and guidelines

LEGISLATION, POLICY OR GUIDELINE	DESCRIPTION OF COMPLIANCE
The Constitution of the Republic of South Africa, 1996	The right to an environment that is not harmful to the health and well-being of people will be protected.
National Environmental Management Act [NEMA],	The proposed development triggers activities listed in listing notices GN R.983 and GN R.985 of the NEMA EIA Regulations 2014 (as

1998 (Act 107 of 1998) as amended	amended). A basic assessment has been undertaken for Environmental Authorisation as per GNR. 982.
NEMA Environmental Impact Assessment Regulations (GNR. 982, 983, 984 & 985) of December 2014 as amended	The proposed development triggers activities listed in listing notices GN R.983 and GN R.985 of the NEMA EIA Regulations 2014 (as amended). A basic assessment has been undertaken for Environmental Authorisation as per GNR. 982.
National Environmental Management: Biodiversity Act [NEM:BA], 2004 (Act No. 10 of 2004)	The proposed development falls within a Critically Endangered Ecosystem and an Ecological Support Area. An indication of ecological sensitivity assessment and a follow up biodiversity assessment were undertaken to determine the presence of threatened species, likely impacts and mitigation required. The NEMBA invasive species list, 2016 has been considered as part of this basic assessment.
National Heritage Resources Act [NHRA], 1999 (Act No. 25 of 1999)	A notification of intent to development was sent to the South African Heritage Resources Agency (SAHRA) in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).
National Environmental Management: Waste Act [NEM: WA], 2008 (Act No. 59 of 2008)	Reasonable measures have been provided for the prevention of pollution and ecological degradation to ensure that the development is ecologically sustainable.
National Water Act [NWA], 1998 (Act No. 36 of 1998)	A General Authorisation was applied for in terms of Section 21(c) and (i) water uses in terms of the National Water Act, 1998 (Act 36 of 1998) and DWS granted this. Please refer to Appendix F.
National Road Traffic Act [NRTA], 1996 (Act No. 93 of 1996)	All vehicles and relevant operators will adhere to the National Road Traffic Act, 1996 (Act 93 of 1996) and all regulations under this Act.
Occupational Health and Safety Act [OHSA], 1993 (Act No. 85 of 1993)	The Contractor will ensure the health and safety of all workers and that of others that may be at risk as per the Occupational Health and Safety Act, 1993 (Act 85 of 1993).
uThukela District Municipality IDP	This document presents the first phase of the review of the fourth generation of an Integrated. Development Plan (IDP) for uThukela district municipality (UTDM). The IDP is prepared in compliance with the requirements of Chapter 5, particularly Section 25 of Local Government Municipal Systems Act (32 of 2000), which obliges a municipal council to adopt a single, all-inclusive, and strategic plan for the development of the municipality, within a prescribed period after the start of its elected term. It outlines a development agenda

	for the municipality for the period 2018 to 2022.The 2018/2019 uThukela IDP Review informs the budget and tries to respond to community needs. The document sets the level of economic growth for the district thereby identifying economic opportunities and areas of investments.
Alfred Local Municipality	The Alfred Duma Local Municipality vision encompasses the following five dimensions of development in which we strive at: • **Economic:** a broad diverse and inclusive economy that grows at least at a 3% growth rate per annum to create conducive conditions for employment opportunities, • **Social**: social harmony and inclusiveness, poverty alleviation and equity Service delivery: an excellent service delivery for all residents • **Social cohesion:** unity and strength and good social relations Environmental sustainability and diversity: development that meets the needs of today without compromising the ability of the future generations to meet their own needs. We strive for tolerance of diversity, and we strive to be a resilient town that can adept and survive all conditions imposed upon it.

SECTION 3 – DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Climate

Ladysmith is situated at an altitude of approximately 1015m above sea level, a region with a relatively mild climate with regional rainfall averaging around 750m falling predominantly in the summer months. The climate is somewhat temperate with warm to hot summers and mild to cold winters. The days are usually bright and sunny and the nights clear and cool. The average maximum temperature is 25°C, average minimum being 10°C with a mean annual temperature of 16.5°C. The highest temperatures are experienced during the month of January where temperatures can exceed 30°C. July is the coldest month of the year with temperatures of 3°C on average during the night. During winter temperatures can drop below freezing with an average of 15 frost days per year common in the region (ADM IDP, 2019/2020).

3.2 Geology and Soils

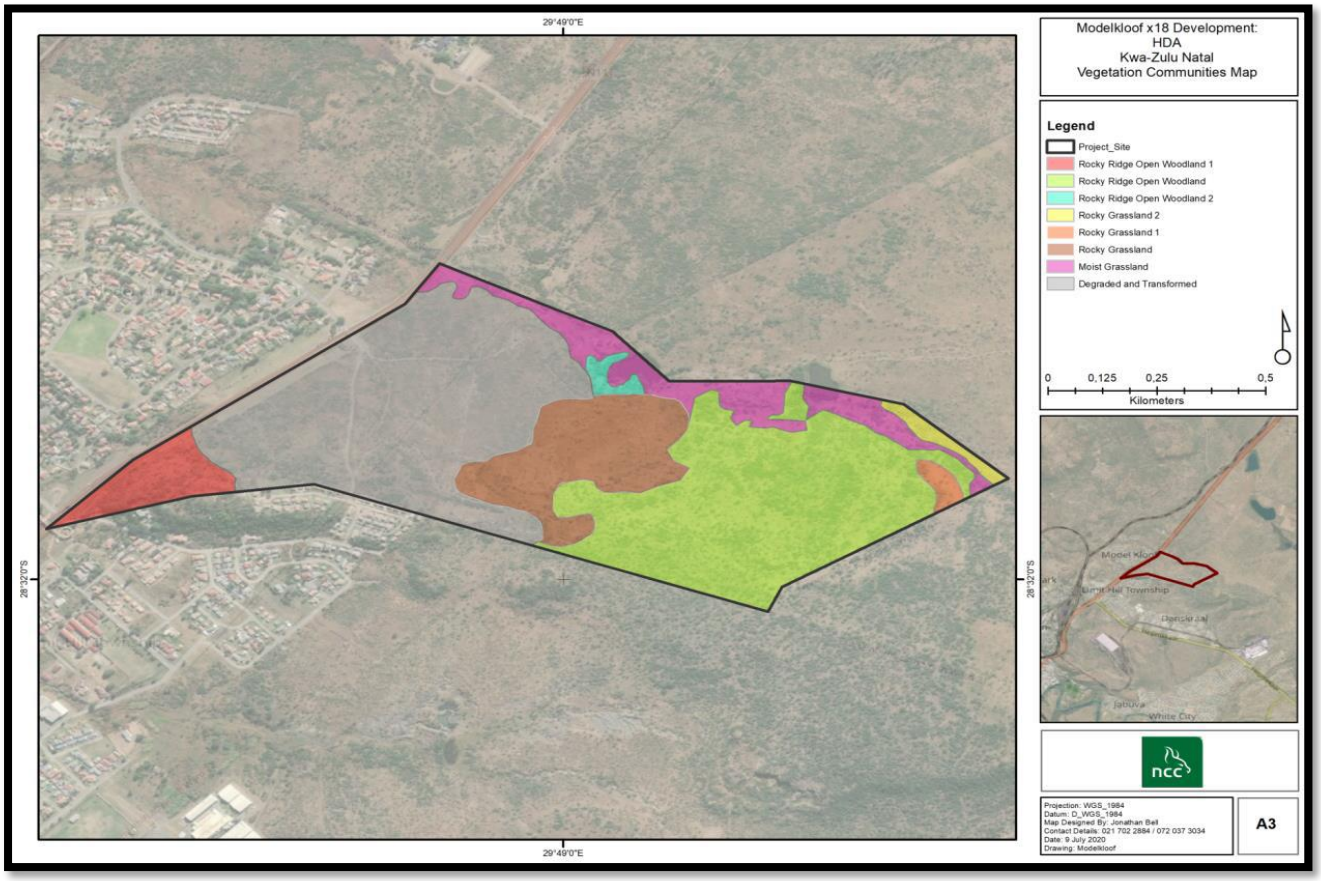
The uppermost unit of the Ecca Group, the Volksrust Formation, is largely comprised of blue-grey or black siltstones with shales exposed at the base of the Normandien Formation along the Drakensberg escarpment foothills in the Klip River catchment northwest of Ladysmith (Lindström, 1987, Geological Survey, 1988). Towards the west, these rocks form the low-lying parts of the Sand River catchment where rocks have been up-thrown against the Normandien /Adelaide rocks by the Tugela Fault which runs east-west along the river valley through Colenso (Bothma and Singh, 2012). In the Ladysmith area, these rocks are highly intruded by dolerite sills with colluvial hillslope sediments mantling the slopes. Soils are commonly clay-rich with structured profiles with the underlying Masotcheni Formation colluvium largely comprised of unconsolidated surficial deposits which are highly erodible, often forming deep dendritic gullies (dongas) in certain areas (Bothma and Singh, 2012).

Soils have an erodibility K-factor of between 0.4 and 0.47 and are mostly clay in nature with moderate susceptibility to detachment and gully formation (Bothma and Singh, 2012). Erodible colluvial deposits are common in the Ladysmith / Emnambithi area with relatively thin soils on hillslopes. Excavability is predicted to be difficult in many parts (Bothma and Singh, 2012) and when exposed to increments of water, clay soils tend to soften and liquefy often causing difficulty during construction owing to the low strength and stiffness properties.

3.3 Vegetation

The vegetation in the study area falls within both the Savanna and Grassland Biome and more specifically is classified as Thukela Thornveld (Mucina & Rutherford 2006) and Savanna (Scott-Shaw & Escott, 2011). The terrestrial biodiversity study and report for the project, carried out by NCC (2020), can be referred to for further information on terrestrial vegetation.

Figure 5 – Vegetation Communities Map



3.4 Faunal

No beetles of conservation priority were recorded within the quarter degree square 2928DB. The likelihood of these species occurring within the quarter degree square cannot be excluded. Suitable habitat does occur at the site.

None of the baboon spiders were recorded within the QSD 2829DB, however suitable habitat for spiders exists around the wetland areas, the rocky outcrops, and the grassland areas.

None of the red listed scorpions were recorded within the QSD 2829DB. The chance-finding scorpions around the wetland areas and the rocky outcrop areas cannot be excluded.

3.5 Services

There are currently no infrastructure services on the site, therefor the developer will have to provide for the following services during the construction phase of the project:

- Temporary ablution facilities - Ablution facilities must be provided at a ratio of for every 10 employees there should be 1 toilet.
- Water – water tank must be provided throughout the development phase of the project.
- Electricity – no fires are permitted on site. The use of alternative energy such as solar, gas and electricity are recommended.

- Access roads – there are an access from the N11 to the development site. On site roads within the proposed development must be mapped staying within the development footprint and it must be ensured that everyone adheres to the use of these temporary roads.

Bulk Infrastructure services for the development must be planned, designed and installed as outlined in the development engineering services reports in line with the approved development layout.

3.6 Traffic impact

As this will be a new development, there is currently no access provided to the site. Provision has been made for an access point to the site at the intersection of theN11 and Riddel Road, refer to Figure 6 below:

Figure 6 – Access Road

3.6 Fresh Water Resources

The following figure shows the surrounding drainage (non-perennial and perennial rivers) in relation to the proposed development footprint. At the catchment and water management level, the footprint is situated in quaternary catchment V12G in the Pongola-uMzimkhulu / Mtamvuna Water Management Area (WMA), formerly called the Thukela WMA prior to promulgation of GN1056 dated 16 September 2016 when new WMAs were established in the country, reducing in number from nineteen to nine. The relevant DWS authority in this case is the Pongola-uMzimkhulu proto-CMA (Catchment Management Agency).

Figure 7 – Freshwater Assessment around Ladysmith x18 township

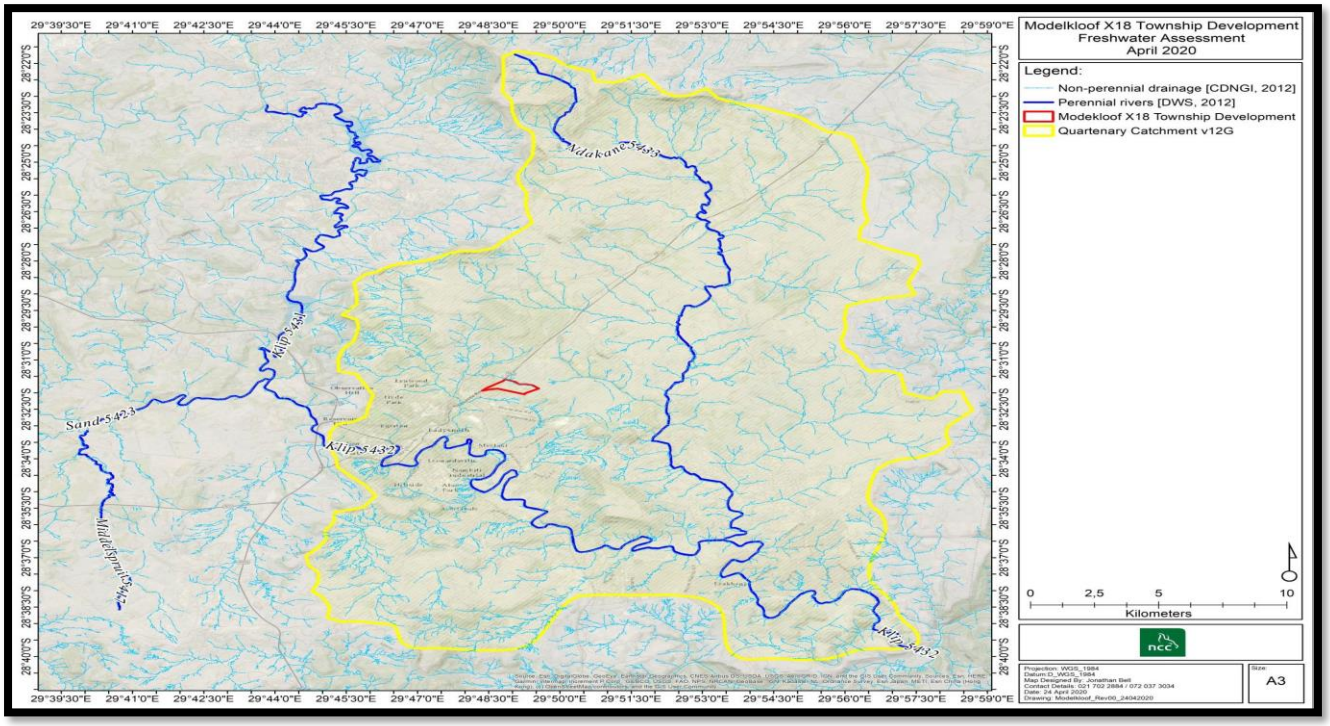
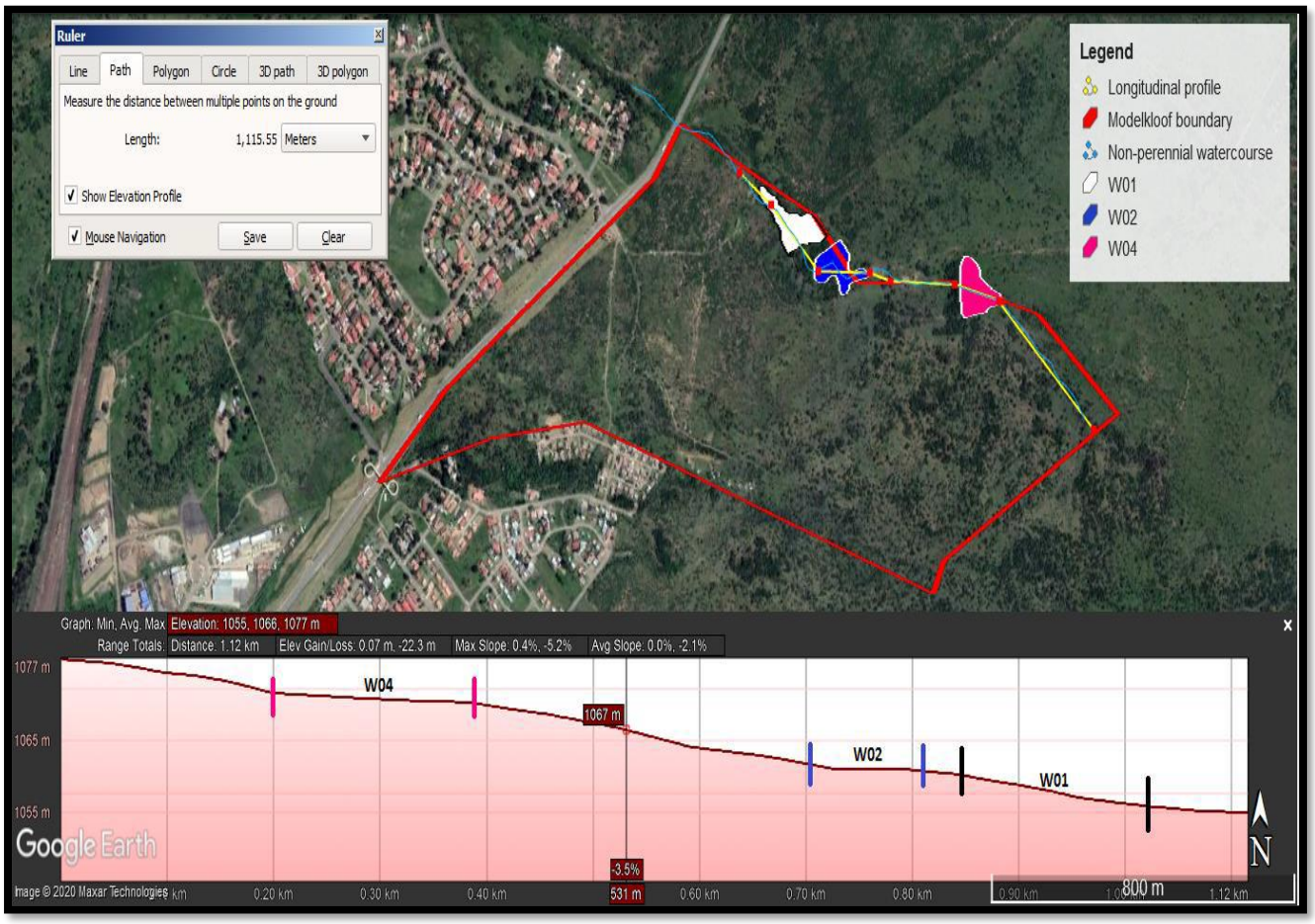


Figure 8 – Wetlands around Ladysmith ext. 18 Township



SECTION 4 - A DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY, SITE AND LOCATION

4.1 Details of alternatives considered

In terms of Section Appendix 3(1) of the EIA Regulations (2014, as amended), an Environmental Impact Assessment Report must include:

(h) A full description of the process followed to reach the proposed development footprint within the approved site as contemplate in the approved scoping report, including –

(i) Details of the development footprint alternatives considered.

The identification of alternatives is a key aspect of the success of the EIA process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider and assess in the EIA phase. There are, however, some significant constraints that must be considered when identifying alternatives for a project of this scope. Such constraints include social, financial, and environmental issues, which will be discussed in the evaluation of the alternatives.

Alternatives can typically be identified according to:

- Location alternatives,
- Layout/Design alternatives,
- Process/Technological alternatives, and
- Activity alternatives (including the No-Go option).

For any alternative to be considered feasible such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. The need for the proposed development includes the need:

- To address the current housing shortage,
- To improve service delivery,
- To prevent extensive conditions of poverty, and
- To prevent the further persistence of social imbalances.

The alternatives are described, and the advantages and disadvantages are presented below:

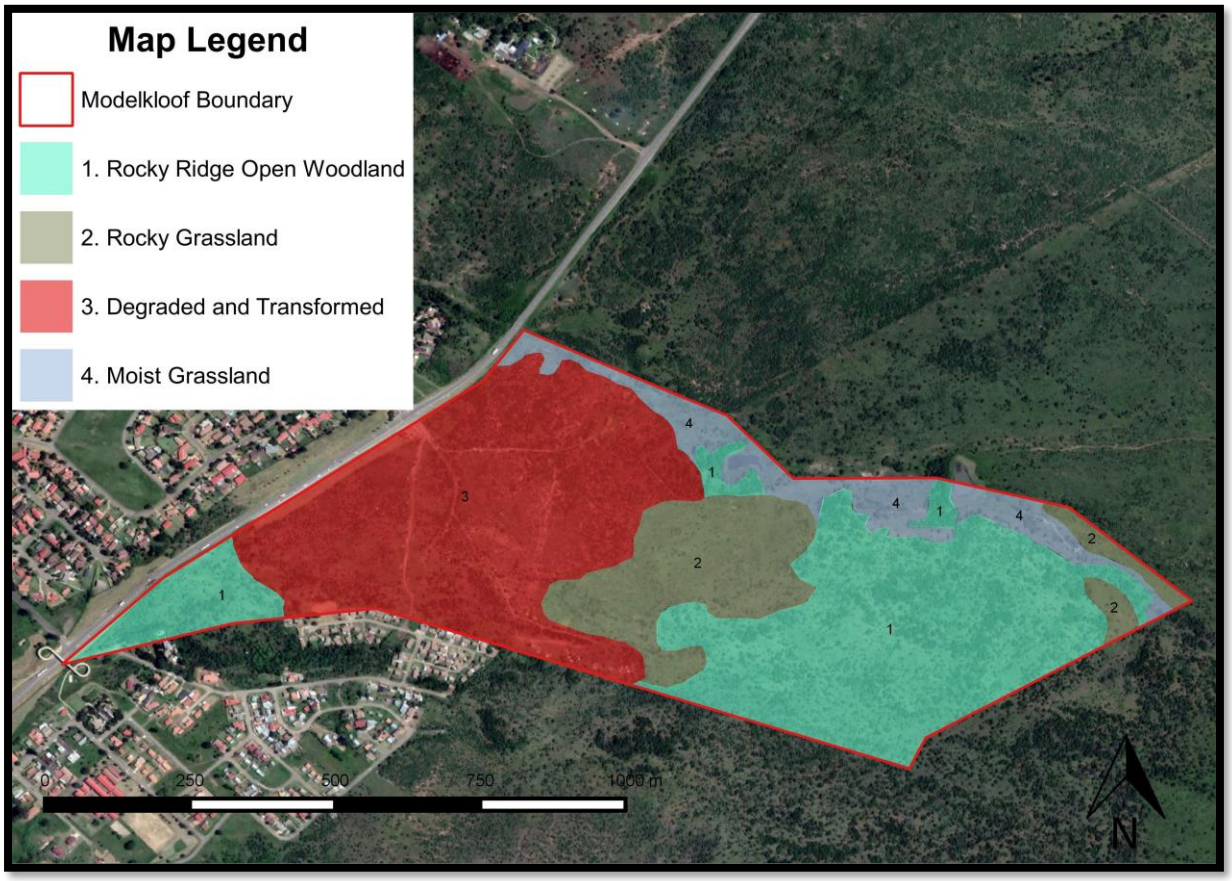
4.1.1 Location

The land is owned by the Housing Development Agency to implement the proposed development. Alternatives sites could not be considered because the client only has this option for this proposed development. This proposed development received planning approvals in 1972 and 50% of bulk service were installed. The portion of Ladysmith Ext 18 to the west of the N11 was developed and bulk services

installed. The portion of the approved and registered township to the east of the N11 were not developed although it has been approved at the time and have been reflected as residential urban development in the municipal spatial development framework plan

4.1.2 Design / Layout Alternative

Design and layout alternatives ensure the consideration of different design and spatial configurations of the proposed development on a specific area, in order to enhance the positive impacts and to reduce the negative impacts. The proposed site contains areas classified as of high value. The reason for this classification is the existence of wetlands and rocky ridge. The botanical specialist recommends a design layout that avoids areas classified as high value in order to protect the integrity of the existing environment. The following map provides us with a summary of the conservation value of the proposed area and alternatives were designed in line with this map.



4.1.2.1 Preferred

Preferred layout entails the establishment of a township with 1201 residential units. The residential units will be provided in double and single storey units to accommodate more units in an area classified as of low conservation value. Included in the layout are educational facilities, transport facilities religious facilities, municipal services, business facilities and health facilities. This layout will maintain part of the integrity of the rocky ridge open woodland.

The motivation behind the preferred alternative is the number of units that will be accommodated to address the market demand and backlogs. The municipality as well as the developer prefer a higher number of units to be built to accommodate the high demand for housing units. Reference is made to Appendix C1 for the proposed layout.

According to a market survey for housing development done by Alfred Duma Local Municipality (2018), It was discovered that ADLM households spend most of their income on services, followed by non-durable goods. The highest expenditure in the services is in the Transport and communication services. This is as a result of staying far away from the town and people have to travel daily through public and private transport which is expensive. Thus, staying closer to work will cut the household's transport costs and increase chances of sustaining their housing. Most of the Households are hesitant on taking a loan to buy a house owing to the number of expenses they already incur monthly, and other households even have a bad record. Thus, the government intervention through housing programs will be highly welcomed and many households are expected to apply in their numbers even if they do not qualify due to needing a formal shelter.

Most of the people in ADLM are employed in the Wholesale and retail trade, catering and accommodation industry (23.9%). Unless the employees from these industries hold high positions such as managers, there are slim chances that a bank can loan someone who work as a tiller or packer at a retailer, waiter at a restaurant, etc.

There are many people leaving ADLM compared to those who are coming into ADLM. Thus, it is assumed that those who are leaving do so because of searching better economic opportunities offered in other places such as eThekwini Municipality. Therefore, young people might prefer to stay in town but renting instead of owning as they intend to move out of ADLM as soon as an opportunity arises. Furthermore, those who are coming into ADLM might also share similar perspective of not staying long in ADLM and would require temporary stay in the town. Therefore, a demand for rental housing is there and will continue to be there as long there are job opportunities in ADLM.

4.1.2.2 Alternative

The preferred layout entails the establishment of a township with 1201 residential units. The residential units will be provided in double and single storey units in order to accommodate more units in an area classified as of low conservation value. Included in the layout are educational facilities, religious facilities, municipal services, business facilities and health facilities. This layout will maintain the integrity of the rocky ridge open woodland.

Alternative design will have less housing units that is 1,109 units thus avoiding some part of the site classified as Rocky Ridge. Reference is made to Appendix C2 for the proposed alternative layout. Detailed impact assessment will be included in the Environmental Impact Report.

4.1.3 Technology Alternative

Process alternatives imply the investigation of alternative processes or technologies that can be used to achieve the same goal. This includes using environmentally friendly designs or materials and re-using scarce resources like water and non-renewable energy sources. No technology alternatives were considered. However, environmentally friendly features are recommended for consideration under section 10 of this report.

4.1.4 Activity Alternative

Activity alternatives were not considered because the applicant's intention and objective were to address an existing housing shortage. No activity alternative was considered.

4.1.5 No-go option.

The 'no-go' or 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

The no-go alternative means that the potential benefits of local and regional benefits because of the establishment of the proposed township establishment would not be realized in the short term. For example:

- Employment opportunities during construction and at operational phase.
- If the proposed township development does not proceed in its entirety, then the municipality will not be able to meet its mandate with regards to providing decent housing for the local community; and
- Risk of Informal settlement taking over is high because there are already informal settlements taking place in the proposed development area.

On the other hand, if the no-go alternative is pursued, the following positives will be realised:

- Land if not invaded may remain in the current largely undisturbed state it is in.
- Savings in the form of resources that would have been used to development this proposed site.

SECTION 5 – DETAILS OF PUBLIC PARTICIPATION PROCESS

5.1 Approach

Public Participation is the cornerstone of any EIA. The principles of NEMA as well as the EIA Regulations govern the EIA process, including public participation. These include provision of sufficient and transparent information on an on-going basis to stakeholders to allow them to comment, and ensuring the participation of previously disadvantaged people, women, and the youth.

The public participation process is primarily based on two factors; firstly, on-going interaction with the environmental specialists and the technical teams in order to achieve integration of technical assessment and public participation throughout. Secondly, to obtain the bulk of the issues to be addressed early on in the process, with the latter half of the process designed to provide environmental and technical evaluation of these issues. These findings are presented to stakeholders for verification that their issues have been captured and for further comment. Input into the public participation process by members of the public and stakeholders can be given at various stages of the EIA process. Registration on the project can take place at any time during the EIA process up until the final EIA report is submitted to Department of Environmental Affairs (DEA). There are however set periods in which comments are required from Interested and / or Affected Parties (I&APs) in order to ensure that these are captured in time for the submission of the various reports. The comment periods during the Scoping phase were implemented according to NEMA EIA Regulations.

5.2 Aims of the Public Participation Process (PPP)

The primary aims of the PPP are:

- To inform interested and affected parties (I&APs) and key stakeholders of the proposed development.
- To initiate meaningful and timeous participation of I&APs.
- To identify issues and concerns of key stakeholders and I&APs with regards to the proposed development
- To promote transparency and an understanding of the proposed project and its potential environmental impacts.
- To provide information used for decision-making.
- To provide a structure for liaison and communication with I&APs and key stakeholders.
- To assist in identifying potential environmental impacts associated with the proposed development.
- To ensure inclusivity (the views, needs, interests and values of I&APs must be considered in the decision-making process).

- To focus on issues relevant to the project and issues considered important by I&APs and key stakeholders.
- To provide responses to I&AP queries.
- To encourage co-regulation, shared responsibility, and a sense of ownership.

In addition to the guidance of the PPP in the EIA Regulations, every effort was also made to conform to the requirements of the Promotion of Administrative Justice Act 2000 (Act 3 of 2000), which ensures that the client acts in the best interests of the public to make sure that the public has free access to information regarding developments that may have an impact on I&APs.

5.3 The Role of Registered Interested and Affected Parties

The EIA regulations emphasise the importance of public participation. In terms of the EIA regulations, registered interested and/or affected parties:

- May participate in the application process.
- May comment on any written communication submitted to the competent authority by the applicant or environmental consultant.
- Must comment within the timeframes as stipulated by the EIA Regulations.
- Must send a copy of any comments to the applicant or Environmental Assessment Practitioner (EAP) if the comments were submitted directly to the competent authority; and
- Must disclose any direct business, financial, personal, or other interests that the person has in the application being granted or refused.

5.4 The Role of the EAP

In terms of the EIA regulations, the EAP:

- Manages the application process,
- Must be independent,
- Must undertake the work objectively – even if this results in views and findings that are not favourable to the applicant,
- Must disclose material information that may influence the decision, and
- Must conduct a public participation process.

The following actions will be taken upon receiving comments/queries/issues:

- The contact details provided will be entered into the project database for use in future notifications.
- Confirmation of receipt of comments will be done by email or letter.
- Issues raised will be addressed comments in the Issues & Response Report.

5.5 Overview of the Public Participation Process

Public Participation was and will be done in accordance with the National Environmental Management Act, 1998, government Notice Number 38282, 4th of December 2014 as amended section 41. The

following will be done as part of the public participation process for this Environmental Impact Report (EIR)

- Reports Review – copies of this draft environmental impact report will be made available to all registered interested and affected members, municipalities, and organs of state in a form agreed upon by each party which is as follows:

Table 12 – List of IAPs

Interested and Affected Party	Format
Alfred Duma Local Municipality	Electronic Copy
uThukela District	Hardcopy
Competent Authority – KZNEDTEA	Hardcopy
Ezemvelo	Hardcopy
Amafa	Online upload
Registered Community Members	Electronic Copy
Department of Water and Sanitation	Electronic

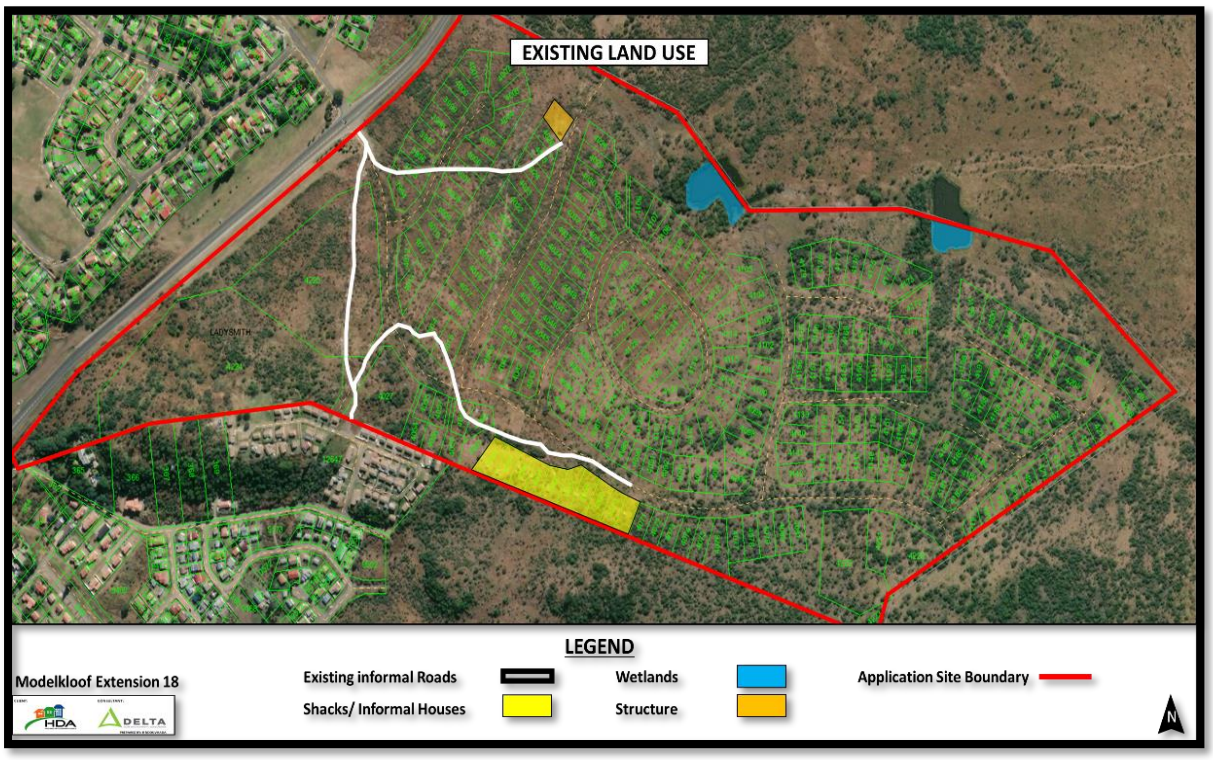
- Interested and Affected Party Register - A register was opened during the compilation of the scoping report and will be kept open until the end of the project. A copy of the register to date is included in this application as Appendix D6. In line with the POPI Act and clarification provided by DFFE, the register with contact details will only be given the competent authority. All the other interested and affected members will receive a list of names with designation only.
- Summary of Issues raised by IAPs – All comments that were received during the notification period, circulation of the draft scoping report as well as comments that will be received during the circulation of this draft EIR will be included to the Final EIR for decision, reference is made to Appendix D5. To protect personal details of those that participated in this process, no contact details will be included in the reports that will be circulated to the public. Only the competent authority will have full details of the IAPs that registered.
- Appeal Process – when the appointed EAP receive the decision competent authority, the EAP will notify all Registered IAPs. An appeal period of 14 days will be allowed after which the applicants will be responsible for the implementation and ensuring conditions set by the competent authority are adhered to.

SECTION 6 – NEED AND DESIRABILITY

The subject property is located along the N11 in the Ladysmith town within Ward 22 at the following coordinates: -28.530156, 29.81622. The subject property is known as Modelkloof - Ladysmith Township Extension 18 and is situated to the north-east of the Ladysmith town. It is surrounded by the Limit Hill Township and Danskraal Township. The subject property is 75 hectares in extent. The Municipality is anchored around Ladysmith Town which serves as a service and administrative center, and a commercial hub for uThukela District and beyond. It is strategically located at the intersection of two major national and provincial development corridors and trade routes.

Regional access is provided by the N11 which runs in a north- south direction linking KwaZulu-Natal with Mpumalanga Province; and the N3 which runs in an east west direction linking eThekwini and Gauteng. The railway line linking KwaZulu-Natal with Gauteng and Mpumalanga Provinces runs through the Municipality. As such, the Municipality is highly accessible at both regional and national level.
As shown in the figure below the subject property has internal informal roads, a few residential houses (informal houses) located on a southern section of the subject property, wetlands and a natural drainage channel that forms the northern boundary of the property, a power line traversing the site from north to south and a derelict substation, whilst the rest of the site is currently vacant with dense natural vegetation.

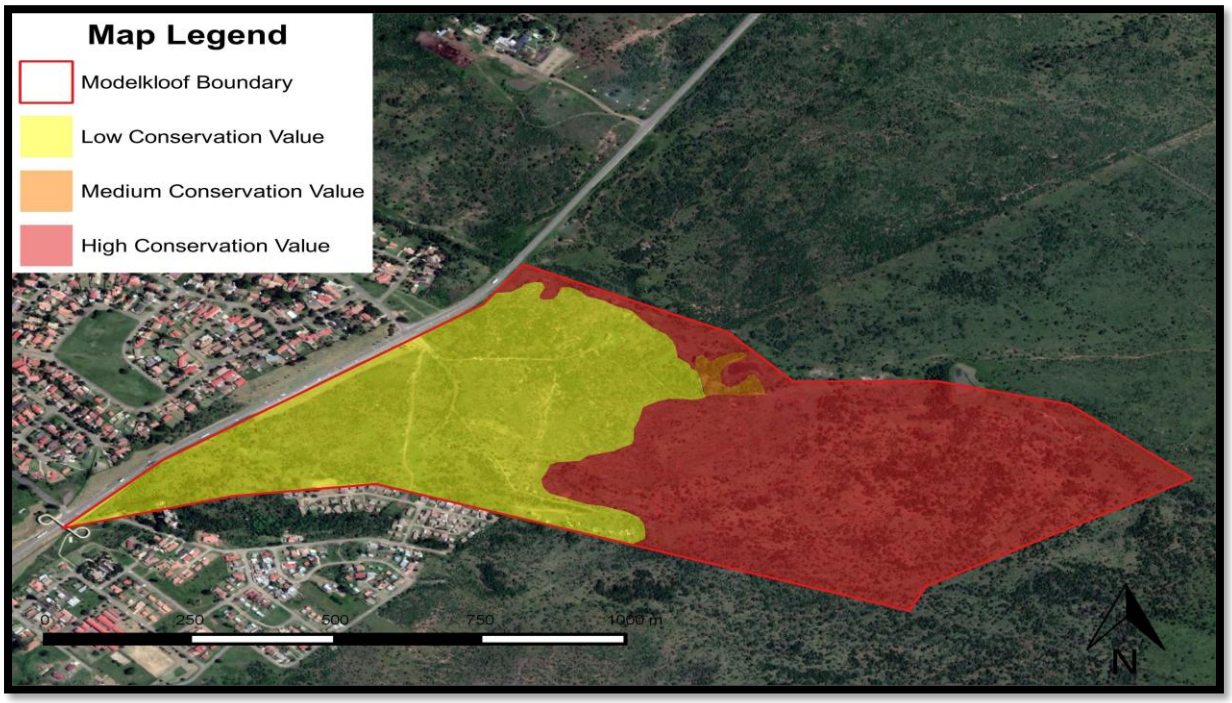
Figure 9 - Existing Land Use



6.1 Impact on ecological integrity

The results in terms of the vegetation within the study site ranges from high to low conservation value. The effects of agricultural activities over the long terms have not affected the vegetation as much as urbanisation from the eastern section of the study area. Over the long term the adjacent land uses has impacted negatively on the condition of the vegetation units closer to the fragmented areas adjacent to the R602 road, however where habitat connectivity remained intact, the vegetation cover is high with high species richness and should be maintained. The construction will have a negative impact on vegetation units rated as high conservation value and alternatives should therefore be considered. There were no plants found that were protected under the NEMBA published list of critically endangered, endangered, vulnerable, and protected species, however this does not mean that they do not occur in the study site and close monitoring during construction should be implemented.

Figure 10 – Site Vegetation Sensitivity



In terms of risks to watercourses during construction, threat ratings based on expert workshops indicate that threats posed by the residential sector (residential housing infrastructure and paved roads) are mostly low to very low.

6.2 Socio Economic Context

Alfred Duma Local Municipality forms part of the uThukela District Municipality, with Ladysmith, Ezakheni, Stead Ville and Colenso / Inkanyezi as main urban areas. Ladysmith is the primary urban area, located along the N11 national route, 20 kilometres off the N3 national route.

The priority development issues for Alfred Duma Local Municipality are physical infrastructure and services; social development and services; economic development; land reform, etc. Urban areas have

far more services than rural ones but a much smaller population, indicating a clear imbalance in service provision. The Driefontein Complex has been identified as an area for priority spending. It has the highest population concentration but the lowest service standards.

People

According to Census 2011, Alfred Duma Local Municipality has a total population of 237 437 people of whom 91,8% are black African, 1,0% are coloured, 2,7% are white, and 4,4% are Indian/Asian. The other population groups make up the remaining 0,2%.

Of those aged 20 years and older, 4,6% have completed primary school, 33,2% have some secondary education, 30,9% have completed matric, and 9,0% have some form of higher education, while 8,1% of those aged 20 years and older have no form of schooling.

Living Conditions

There are 58 058 households in the municipality, with an average household size of 4,0 persons per household. 22,7% of households have access to piped water either in their dwelling or in the yard. 82,1% of households have access to electricity for lighting.

Economy

72 249 people are economically active (employed or unemployed but looking for work), and of these, 34,0% are unemployed. Of the 39 523 economically active youth (15 – 35 years) in the area, 43,4% are unemployed.

SECTION 7 – IMPACTS AND RISKS IDENTIFIED FOR EACH ALTERNATIVE

According to Appendix 2, Section 2 (1), of the EIA Regulations 2014 (as amended) a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include:*

(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration, and probability of such identified impacts, including the degree to which these impacts—

(aa) can be reversed,

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed, or mitigated.

(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives,

(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects,

(viii) the possible mitigation measures that could be applied and level of residual risk.

7.1 Methodology

As a means of determining the significance of the various impacts that can occur or may be associated with the proposed development, a series of assessment criteria were used for each impact. These criteria include an examination of the nature, intensity and probability of the impact occurring, and assessing whether the impact will be positive or negative for the natural, social as well as biophysical environments at, and surrounding the site. The assessment of impact has been done according to a synthesis of the following assessment criteria in terms of the EIA Regulations Guideline Document, April 1998:

Nature of the impact: This is an appraisal of the type of effect the activity would have on the affected environment. This description includes what is being affected and how.

Table 8 - Geographical extent of impact

RATING	EXTENT	DESCRIPTION
1	Site	The actual extent
2	Local	The site and immediate surrounding will be impacted on.

3	Regional	The surrounding area and adjacent neighbouring properties will be impacted on.
4	Provincial	Impact will extend to provincial boundary.
5	National	Impact will extend beyond provincial boundaries.

Table 9 - Duration of impact

RATING	DURATION	DESCRIPTION
1	Temporary	The impact will disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase
2	Short term	The impact will be relevant to the end of a construction phase
3	Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated
4	Long term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter
5	Permanent	This impact is not reversible and human intervention e.g., rehabilitation, is unlikely to negate the impact sufficiently (e.g., acid mine drainage)

Significance is calculated as Extent + Intensity + Duration x Probability (E + I + D X P)

Table 10 - Intensity of impact

RATING	INTENSITY	DESCRIPTION
2	None	No Impact
4	Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected
6	Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way
8	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases
10	Permanent	Process will cease

Table 11 - Probability of impact

RATING	PROBABILITY	DESCRIPTION
1	Improbable	Improbable, chances of this impact are 0
2	Low Likelihood	The chance of this impact occurring is between 0 and 25%. However, mitigation measures might be needed in the event of this impact occurring
3	Probable	A distinct possibility, the chance of this impact actually occurring is approximately 50% and therefore it needs to be mitigated
4	Highly Likely	The impact is most likely to occur, and the planning phase must address the relevant mitigation measures to limit the impact
5	Definite	This impact will occur regardless of any prevention measures or is currently occurring. Mitigation measures or contingency plans must be implemented to contain the impact

Table 12 - Significance Rating

RATING	VALUE	DESCRIPTION
High	101 – 150	Where natural, cultural, or social functions or processes are altered to the extent that it will permanently cease
Medium	51 – 100	Where the affected environment is altered but natural, cultural, and social functions and processes continue albeit in a modified way
Low	0 – 50	Where the impact affects the environment in such a way that natural, cultural, and social functions and processes are not affected

7.2 Impact Analysis

During the Scoping Phase, impacts are assessed and rated on a broader issue level and are regarded as preliminary. This is because, at the Scoping Phase of the EIA process, a limited amount of information on project-related detail is available, and baseline data on the project affected environment and social systems has not yet been gathered other than from the initial site visit. This information requires input from the specialist assessments, which are only undertaken at the completion of the Scoping Phase and therefore a definitive assessment of project specific impacts cannot be completed at this stage. The environmental and social consequences of the project and alternatives are discussed more broadly than what is required in the EIR.

The following section assesses the impact of the proposed preferred design layout and the alternative design. Potential impacts are broken down into three phases i.e., those that will occur during the planning phase, construction phase and operational phase.

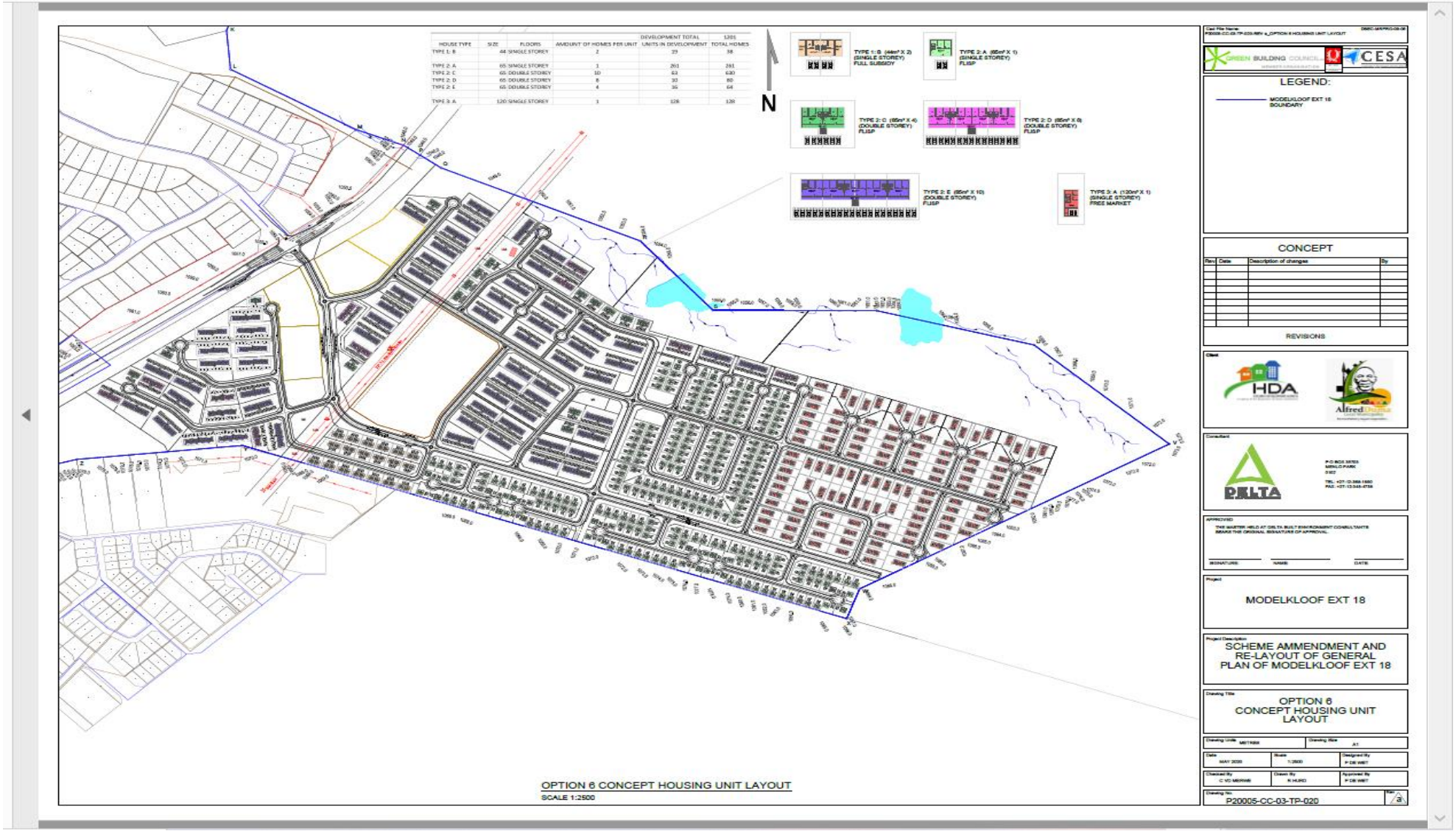
7.2.1 Assessment of potential impacts associated with the preferred design layout.

The preferred design entails the construction of residential units in double storey format in order to confine buildings within an area referred to as being of **LOW** conservation value.

7.2.1.1 The Planning Phase

The purpose of this phase is to ensure that the project starts off in compliance to all regulatory requirements and that all personnel involved in the project are aware of all applicable environmental regulations. The following tables outlines potential impacts likely to be addressed during the planning phase and proposed mitigation measures:

Figure 11 – Preferred Design



Storage of Hydrocarbons

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Storage of hydrocarbons	Extent	3	Hazardous materials stored in bunded and lockable area. Material Safety Data Sheet (MSDS) sheets to be kept on site for all hazardous products.	Extent	1
	Duration	4		Duration	2
	Intensity	8		Intensity	2
	Probability	3		Probability	2
	Significance Rating	80 – High		Significance Rating	10 -Low

Can be reversed?	No	**May cause irreplaceable loss of resources?**	Yes	**Can be avoided, managed, or mitigated?**	Yes

Sewage

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Impact on sewer services	Extent	2	Chemical toilets during construction. One chemical toilet should be provided for every ten people. Do not use bush for toilet facilities.	Extent	1
	Duration	3		Duration	2
	Intensity	4		Intensity	2
	Probability	3		Probability	2
	Significance Rating	32 – Low		Significance Rating	10 – Low

Can be reversed?	Yes	**May cause irreplaceable loss of resources?**	No	Can be avoided, managed, or mitigated	Yes

Construction waste

Potential Impact	Significance Before Mitigation		Mitigation Measures	Significance After Mitigation	
Management of construction waste	Extent	2	Construction waste placed in a demarcated area and disposed of accordingly. Area should be condoned to prevent the dispersal by wind and rain. Waste disposal certificates kept on record.	Extent	2
	Duration	4		Duration	2
	Severity	6		Severity	2
	Probability	5		Probability	2
	Significance Rating	66–Med		Significance Rating	12-Low
Can be reversed?	Yes		**May cause irreplaceable loss of resources -** Yes	**Can be avoided, managed, or mitigated?**	Yes

Hazardous Waste

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Management of hazardous waste	Extent	2	All hazardous waste stored in bunded and lockable area. Hazardous waste removed by certified waste contractor. Waste disposal certificates kept on record.	Extent	1
	Duration	2		Duration	1
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	24 – Low		Significance Rating	10 - Low
Can be reversed?	No		**May cause irreplaceable loss of resources –** Yes	**Can be avoided, managed, or mitigated?**	Yes

Domestic Waste

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
Management of domestic waste	Extent	3	Waste management system formulated and implemented. All employees subjected to induction. Domestic waste removed from the site by a certified waste contractor. Waste disposal certificates kept on record.	Extent	1
	Duration	4		Duration	4
	Severity	6		Severity	2
	Probability	5		Probability	3
	Significance Rating	72 – Medium		Significance Rating	16 – Low
Can be reversed	Yes	**May cause irreplaceable loss of resources**	No	**Can be avoided, managed, or mitigated**	Yes

Electricity Consumption

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
ELECTRICITY CONSUMPTION	Extent	2	Fair and minimal usage should be encouraged. Machinery utilised for the wall construction to be maintained and serviced.	Extent	1
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	5		Probability	3
	Sign Rating	30 – Low		Sign Rating	21 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	0 - No loss	Reversibility	3 - Reversible

Water Consumption

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
WATER CONSUMPTION	Extent	2	Fair and minimal usage should be encouraged. Water to be supplied from the municipality. Confirmation from municipality on the capacity and need to be provided.	Extent	1
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	5		Probability	3
	Sign Rating	60 – Med		Significance Rating	12 – Low
Can be reversed	No		**May cause irreplaceable loss of resources** -No	**Can be avoided, managed, or mitigated**	Yes

Fuel Consumption

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Management of fuel consumption	Extent	2	All construction vehicles will be maintained so as to operate efficiently. Idling times of machinery to be minimised.	Extent	1
	Duration	2		Duration	1
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	28 – Low		Significance Rating	8 - Low
Can be reversed?	Yes		**May cause irreplaceable loss of resources –** Yes	**Can be avoided, managed, or mitigated?**	Yes

Raw Materials Consumption

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Management of raw materials	Extent	3	Raw materials will be used efficiently. Recycling will be implemented on applicable waste streams.	Extent	2
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	5		Probability	5
	Significance Rating	66–Med		Significance Rating	36 - Med
Can be reversed	No		**May cause irreplaceable loss of resources** – Yes	**Can be avoided, managed, or mitigated?**	No

Health and Safety

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Management of health and safety issues	Extent	3	Health and safety awareness training. Various safety topics to be discussed during toolbox talks. Compile relevant health and safety operating procedures.	Extent	1
	Duration	4		Duration	2
	Severity	6		Severity	2
	Probability	3		Probability	2
	Significance Rating	24 – Low		Significance Rating	10 - Low
Can be reversed?	Yes	**May cause irreplaceable loss of resources**	No	**Can be avoided, managed, or mitigated?**	Yes

Threat of Fire

Potential Impact	Significance Before Mitigation		Mitigation Measures	Significance After Mitigation	
Management of potential fires	Extent	3	Fire and emergency plans implemented. Adequate fire-fighting equipment instituted as recommended, especially should construction be undertaken during the dry winter months.	Extent	1
	Duration	4		Duration	1
	Probability	3		Probability	2
	Severity	8		Severity	2
	Significance Rating	80 – High		Significance Rating	8 - Low
Can be reversed?	Yes		**May cause irreplaceable loss of resources**	**Can be avoided, managed, or mitigated?**	Yes

Safety and Security

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Management of safety and security	Extent	2	Site security ensures site is secured and only authorised access allowed. Appoint people from local community. Restrict informal settlement.	Extent	1
	Duration	2		Duration	1
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	28 – Low		Significance Rating	8 - Low
Can be reversed	No	**May cause irreplaceable loss of resources**	Yes	**Can be avoided, managed, or mitigated?**	Yes

Traffic Disruptions

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Management of Traffic	Extent	3	Traffic warning and calming measures. Construction vehicles to travel at low speed. Normal operating hours for workforce.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	5		Probability	3
	Significance Rating	44 – Low		Significance Rating	12 - Low
Can be reversed	Yes		**May cause irreplaceable loss of resources** - No	**Can be avoided, managed, or mitigated?**	Yes

Potential loss of Cultural Heritage and Paleontological Features

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Potential loss of Cultural Heritage and Paleontological Features	Extent	3	Any graves or archaeological finds should be reported to heritage practitioner and work should be stopped.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	36 – Low		Significance Rating	10 – Low
Can be reversed	No	**May cause irreplaceable loss of resources**	Yes	**Can be avoided, managed, or mitigated?**	Yes

Potential Employment

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Management of potential social benefit - employment	Extent	2	Employment and skills to contractors. Local economy benefits by utilising building materials and services.	Extent	4
	Duration	2		Duration	4
	Severity	2		Severity	8
	Probability	3		Probability	5
	Significance Rating	14 – Low - P		Significance Rating	48 – Med – P
Can be reversed?	No		**May cause irreplaceable loss of resources -** No	**Can be avoided, managed, or mitigated?**	Yes

Site Establishment

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Site establishment	Extent	3	Site camp must be established outside the 32m watercourse buffer. All visitors and workers must use approved walkways. There should be at least one ablution facility at the office.	Extent	1
	Duration	3		Duration	1
	Severity	6		Severity	4
	Probability	4		Probability	3
	Significance Rating	60 – Med		Significance Rating	20 – Low
Can be reversed?	Yes		**May cause irreplaceable loss of resources? -** No	**Can be avoided, managed, or mitigated?**	Yes

7.2.1.2 The Construction Phase

This section deals with all impacts envisaged during the construction phase:

Dust Pollution

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DUST EMISSIONS	Extent	3	Dust suppression implemented. Minimise dust generation construction activities.	Extent	1
	Duration	3		Duration	1
	Severity	6		Severity	2
	Probability	5		Probability	3
	Sign Rating	66 - Medium		Sign Rating	10 - Low
Can be reversed?	No	**May cause irreplaceable loss of resources?**	Yes	**Can be avoided, managed, or mitigated?**	Yes

Air Quality

Potential Impact	Significance Before Mitigation		Mitigation Measures	Significance After Mitigation	
EMISSIONS FROM VEHICLES AND EQUIPMENT (CO_2, NO_X, SO_X, VOCS, ETC.)	Extent	2	All construction vehicles maintained, Idling times to be minimized	Extent	1
	Duration	2		Duration	1
	Severity	4		Severity	2
	Probability	5		Probability	4
	Significance Rating	32 – Low		Significance Rating	12 - Low
Can be reversed?	**No**	**May cause irreplaceable loss of resources**	**No**	**Can be avoided, managed, or mitigated**	**Yes**

Noise Pollution

Potential Impact	Significance Before Mitigation		Mitigation Measures	Significance After Mitigation	
NOISE	Extent	2	All construction vehicles maintained. Idling times minimised. Operations do not occur before or after normal working hours from 07:00 to 17:00. Noise monitoring undertaken as spot checks. When required, noise mufflers are utilised. Keep an open channel of communication with all stakeholders. Keep record of any concerns raised in complaints register.	Extent	1
	Duration	2		Duration	2
	Severity	4		Severity	2
	Probability	4		Probability	3
	Significance Rating	32 - Low		Significance Rating	15 - Low
Can be reversed?	No	**May cause irreplaceable loss of resources?**	No	**Can be avoided, managed, or mitigated?**	Yes

Silt

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
SILT	Extent	4	Engineering design to minimise silt discharge during rainstorm events utilised and wetlands.	Extent	2
	Duration	4		Duration	3
	Severity	8		Severity	6
	Probability	5		Probability	4
	Significance Rating	104 - High		Significance Rating	54 - Med

Can be reversed?	Yes	**May cause irreplaceable loss of resources?**	Yes	**Can be avoided, managed, or mitigated?**	Yes

Surface Water Run-Off

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
SURFACE WATER RUN-OFF	Extent	3	Engineering design to minimise silt discharge during rainstorm events.	Extent	2
	Duration	2		Duration	1
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	60 - Medium		Significance Rating	10 - Low
Can be reversed?	No	**May cause irreplaceable loss of resources?**	Yes	**Can be avoided, managed, or mitigated?**	Yes

Contamination of Water through Hazardous substances

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
CONTAMINATION OF WATER THROUGH HAZARDOUS SUBSTANCES	Extent	2	Measures implemented ensure no hydrocarbons and/or other pollutant liquids are spilt. They should be contained, and a clean-up protocol followed.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	28 – Low		Significance Rating	10 - Low
Can be reversed?	No	Loss of Resource	1 - Partial	Reversibility	2 - High degree

Disturbances of natural drainage

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DISTURBANCES OF NATURAL DRAINAGE LINES	Extent	3	Area may not be used for ablution purposes. Vehicles serviced under controlled conditions on hardened bunded surfaces. No construction rubble to be dumped in drainage lines/ watercourses.	Extent	2
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	4		Probability	3
	Significance Rating	60 – Med		Significance Rating	28 - Low
Mitigation Efficiency	5 - Very high	Loss of Resource	1 - Partial	Reversibility	1 - Medium

Disturbances / Pollution of Ground Water

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DISTURBANCES /POLLUTION OF GROUND-WATER	Extent	3	Measures implemented ensure no hydrocarbons and/or other pollutant liquids are spilt. They should be contained, and a clean-up protocol followed.	Extent	1
	Duration	1		Duration	1
	Severity	2		Severity	2
	Probability	2		Probability	1
	Significance Rating	12 – Low		Significance Rating	6 - Low
Mitigation Efficiency	5 - Very high	Loss of Resource	1 - Partial	Reversibility	1 - Medium

Disturbance of Aquatic Ecological Systems

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DISTURBANCE OF AQUATIC ECOLOGICAL SYSTEMS	Extent	3	Measures implemented ensure disturbances to aquatic ecological systems are prevented. Delineate 32 m buffer of the channelled valley bottom wetland with danger tape and pegs.	Extent	2
	Duration	3		Duration	2
	Severity	6		Severity	2
	Probability	5		Probability	3
	Significance Rating	66 – Med		Significance Rating	14 - Low
Mitigation Efficiency	5 – High	Loss of Resource	1 - Partial	Reversibility	1 - Medium

Loss of Topsoil

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF TOPSOIL	Extent	2	Prevent wind and water erosion. Stockpile topsoil separately. Stockpile not to exceed 2 m in height.	Extent	1
	Duration	3		Duration	2
	Severity	3		Severity	2
	Probability	4		Probability	2
	Significance Rating	48 - Low		Significance Rating	20 – Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	2 - High

Loss of land capability

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF LAND CAPABILITY	Extent	2	Entire scarred area to be levelled off as close as possible surrounding topography not to hinder water drainage and cause channelling, which may in time lead to erosion.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	5		Probability	4
	Significance Rating	40 – Low		Significance Rating	14 - Low
Mitigation Efficiency	4 - High	Loss of Resource	2 - Substantial	Reversibility	1 - Med

Alteration of Topography

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
ALTERATION OF TOPOGRAPHY	Extent	2	Entire scarred area to be levelled off as close as possible surrounding topography not to hinder water drainage and cause channelling, which may in time lead to erosion.	Extent	1
	Duration	1		Duration	3
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	24 - Low		Significance Rating	12 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Soil Pollution

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
Management of soil pollution	Extent	2	Measures implemented to ensure that no hydrocarbons and/or other pollutant liquids are spilt. Contained and a clean-up protocol is followed.	Extent	1
	Duration	4		Duration	2
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	36 - Low		Significance Rating	10 - Low
Mitigation Efficiency	5 – High	Loss of Resource	2- Substantial	Reversibility	2 - High

Loss of habitat

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
Management of loss of habitat	Extent	2	Areas not earmarked for construction activities clearly demarcated with barrier tape and droppers prevent vehicular movement. Areas earmarked for construction need to be cleared of bushes, trees, and plants. Should be done in consultation with the ECO. Corridors for surrounding natural areas maintained and protected, and demarcated as no-go areas, consultation with the ECO. Alien vegetation to be cleared in consultation with ECO.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	32 – Low		Significance Rating	10 -Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Loss of Fauna

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF FAUNA	Extent	3	Impact on the loss of habitat will be limited to the servitude of the development. Feeding or leaving of food for stray or wild animals in the area is forbidden. No animals hunted, trapped, or disturbed. Nesting and breeding sites for birds and mammals avoided. Should fauna be encountered during site clearance or during construction activities, earthworks shall cease immediately, until such fauna have been safely relocated. No animal killed unless an immediate threat to human health is perceived.	Extent	2
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	3		Probability	2
	Significance Rating	54 – Medium		Significance Rating	24 - Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Loss of Flora

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF FLORA	Extent	2	Prior to construction, woody vegetation matter shall be stripped, collected, and disposed of. Alien, invasive species eradicated as far as possible. No trees/ vegetation outside the construction area damaged/ removed. Removal of plant material for medicinal purposes is prohibited. Planting of exotic grasses should not occur, instead, non- invasive indigenous flora should be used where required. Cleared wood /vegetation not to be used as burning wood or for any other purpose. Developments within the buffer zones of the wetland ecosystems must be minimised. Any developments within wetland buffer zone rehabilitated according to an authorised rehabilitation plan to prevent the restriction of water flow and soil erosion. Geophytes must be removed, rescued before construction starts by an appropriate service provider, kept in favourable conditions, and replaced into the open and conserved areas. Building or waste material discarded in an authorised location, which should not be within the wetland buffer zone. Access to wetland area limited to construction workers, only for specific activities that are conducted within the wetland.	Extent	1
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	3		Probability	2
	Significance Rating	48 – Low		Significance Rating	20 - Low

			Movement of construction workers through the wetland and trampling of wetland vegetation be minimised.		
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Degradation of Ecological Systems

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DEGRADATION OF ECOLOGICAL SYSTEMS	Extent	2	Corridors for surrounding natural areas must be maintained and protected and demarcated as no-go areas. Areas earmarked for construction of structures, i.e., construction site offices need to be cleared of bushes, trees, and plants.	Extent	1
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	3		Probability	2
	Significance Rating	48 – Low		Significance Rating	20 - Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Disruptions of natural corridors

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DISRUPTION OF NATURAL CORRIDORS	Extent	3	Corridors for surrounding natural areas must be maintained and protected and demarcated as no-go areas.	Extent	3
	Duration	5		Duration	5
	Severity	6		Severity	4
	Probability	4		Probability	4
	Significance Rating	72 – Medium		Significance Rating	48 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Pollution incidents

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
POLLUTION INCIDENTS	Extent	2	Impact on loss of habitat should be limited to the development locality and possible surrounding areas should accidental spillages occur. Cleaned immediately and MSDS sheets utilised.	Extent	2
	Duration	2		Duration	2
	Severity	4		Severity	3
	Probability	3		Probability	3
	Sensitivity	3		Sensitivity	3
	Significance Rating	48 – Low		Significance Rating	42 - Low
Mitigation Efficiency	1 – Low	Loss of Resource	2 - Substantial	Reversibility	2 - High

Visual Impact

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
VISUAL IMPACTS	Extent	2	Bollards and protective barriers as well as safety tape may be utilised around the site. PPE and warning tape for safety indication. Waste to be managed.	Extent	1
	Duration	5		Duration	3
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	40 - Low		Significance Rating	12 - Low
Mitigation Efficiency	5 – High	Loss of Resource	2 - Substantial	Reversibility	3 - Reversible

Loss of cultural heritage and Palaeontological Features

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF CULTURAL HERITAGE AND PALAEONTHOLOGICAL FEATURES	Extent	3	Any graves or archaeological finds should be reported to heritage practitioner and work should be stopped.	Extent	2
	Duration	2		Duration	2
	Severity	4		Severity	2
	Probability	5		Probability	3
	Significance Rating	40 - Low		Significance Rating	14 - Low
Mitigation Efficiency	4 - High	Loss of Resource	1 - Partial	Reversibility	2 - High

Loss of sense of place

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF SENSE OF PLACE	Extent	1	Rehabilitation and landscaping. Traffic calming and traffic mitigation measures.	Extent	1
	Duration	2		Duration	2
	Severity	3		Severity	3
	Probability	3		Probability	2
	Sensitivity	4		Sensitivity	1
	Significance Rating	42 – Low		Significance Rating	18 - Low
Mitigation Efficiency	3 - Medium	Loss of Resource	1 - Partial	Reversibility	2 - High

Change of land-use

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
CHANGE OF LAND USE	Extent	2	Rehabilitation and landscaping. Provide agricultural areas for domestic informal benefit.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	2		Probability	2
	Significance Rating	28 - Low		Significance Rating	10 - Low
Mitigation Efficiency	1 - Low	Loss of Resource	1 - Partial	Reversibility	2 - High

Impact on Economy

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DECLINE/INCREASE IN ECONOMY	Extent	4	Employment and skills to contractors. Local economy benefits by utilising building materials and services.	Extent	5
	Duration	3		Duration	3
	Severity	6		Severity	10
	Probability	4		Probability	5
	Significance Rating	66 – Med - Pos		Significance Rating	130 – High - Pos
Mitigation Efficiency	5 - High	Loss of Resource	0 - No loss	Reversibility	3 - Reversible

Impact on property value

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DECLINE/INCREASE IN PROPERTY VALUE	Extent	4	Employment and skills to contractors. Local economy benefits by utilising building materials and services.	Extent	5
	Duration	3		Duration	3
	Severity	6		Severity	10
	Probability	4		Probability	5
	Significance Rating	66 – Med - Pos		Significance Rating	130 – High - Positive
Mitigation Efficiency	5 - High	Loss of Resource	0 - No Loss	Reversibility	3 - Reversible

Impact on Traffic

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
Increased traffic during construction	Extent	3	Ensure there are speed limits signs within the proposed development and adjacent roads, Traffic marshals must be deployed at the access gate into the property to regulate traffic	Extent	1
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	4		Probability	2
	Significance Rating	60 – Med		Significance Rating	20 - Low
Mitigation Efficiency	5 - High	Loss of Resource	0 - No Loss	Reversibility	3 - Reversible

7.2.1.3 The operational phase

The following table outlines potential impacts associated with the operational phase of this proposed development:

Safety and Security

Potential Impact	Significance Before Mitigation		Mitigation Measures	Significance After Mitigation	
SAFETY AND SECURITY	Extent	2	Site security ensures site is secured and only authorised access allowed. Appoint people from local community. Restrict informal settlement.	Extent	1
	Duration	3		Duration	5
	Severity	6		Severity	10
	Probability	3		Probability	5
	Significance Rating	48 – Low – Pos		Significance Rating	110 – High - Positive
Mitigation Efficiency	1 - Very Low	Loss of Resource	0 - No loss	Reversibility	3 - Reversible

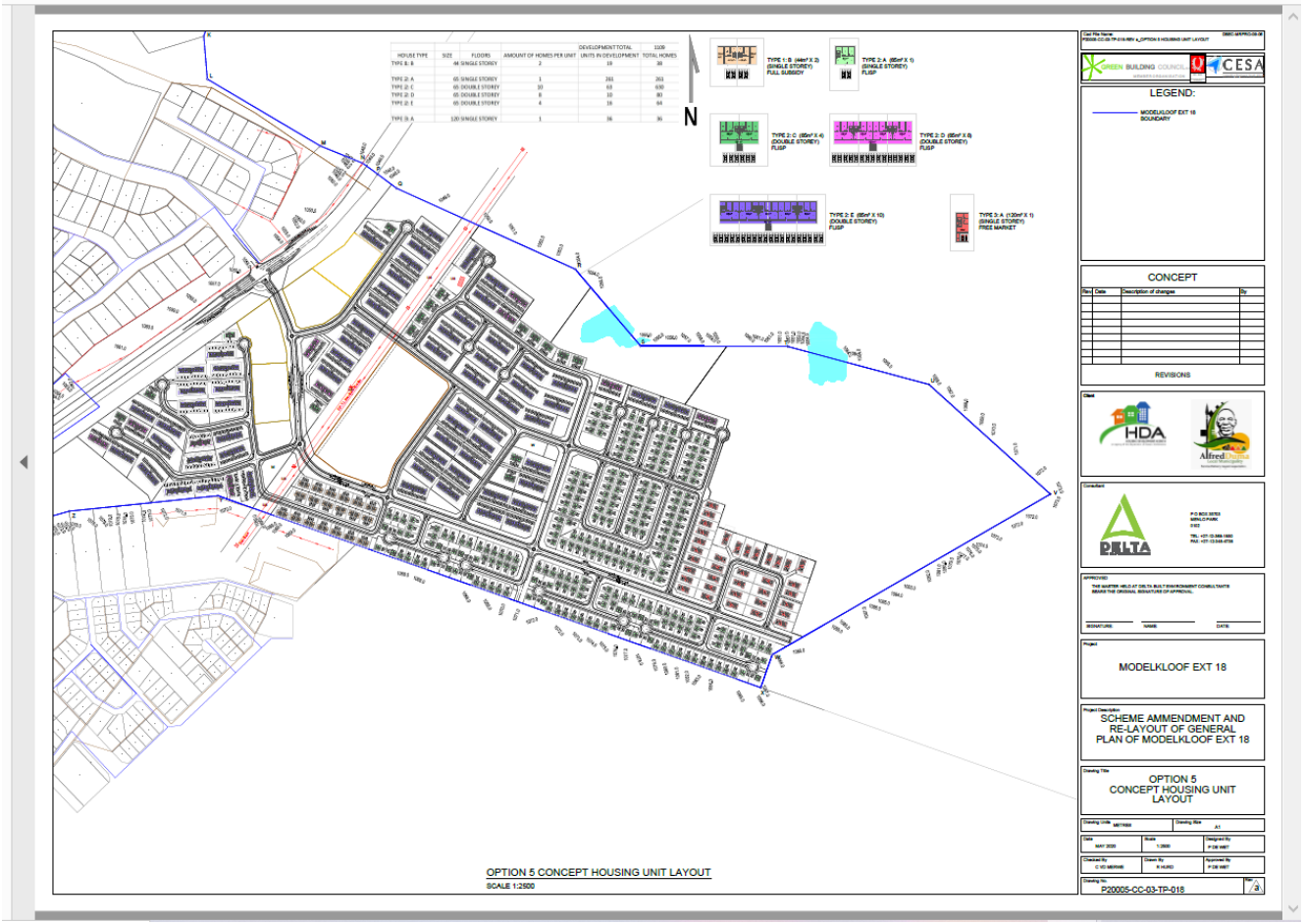
Maintenance

Potential Impact	Significance Before Mitigation		Mitigation Measures	Significance After Mitigation	
Maintenance of the fence	Extent	2	Work must be undertaken under the applicable TFR terms of refence	Extent	1
	Duration	3		Duration	5
	Severity	6		Severity	6
	Probability	4		Probability	5
	Significance Rating	44 – Low		Significance Rating	60 - Med
Mitigation Efficiency	1 - Very Low	Loss of Resource	0 - No loss	Reversibility	3 - Reversible

7.2.2 Assessment of potential impacts associated with the alternative design layout.

Alternative design entails the construction of 1109 residential units with a mixture of double storey building that will encroach the area of high conversation value.

Figure 12 – Map showing area of high conservation



7.2.2.1 <u>The Planning Phase.</u>

Potential impacts are the same as the ones under the preferred alternatives.

7.2.2.2 The Construction Phase

This section deals with all impacts envisaged during the construction phase:

Dust Pollution

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
DUST EMISSIONS	Extent	3	Dust suppression implemented. Minimise dust generation construction activities.	Extent	1
	Duration	3		Duration	1
	Severity	6		Severity	2
	Probability	5		Probability	3
	Significance Rating	66 – Medium		Significance Rating	10 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	1 - Partial	Reversibility	1 - Medium degree

Noise Pollution

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
NOISE	Extent	2	All construction vehicles maintained. Idling times minimised. Operations do not occur before or after normal working hours from 07:00 to 17:00. Noise monitoring undertaken as spot checks. When required, noise mufflers are utilised. Keep an open channel of communication with all stakeholders. Keep record of any concerns raised in complaints register.	Extent	1
	Duration	2		Duration	2
	Severity	4		Severity	2
	Probability	4		Probability	3
	Significance Rating	32 - Low		Significance Rating	15 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	1 - Partial	Reversibility	1 - Medium

Silt

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
SILT	Extent	4	Engineering design to minimise silt discharge during rainstorm events utilised and wetlands.	Extent	2
	Duration	4		Duration	3
	Severity	8		Severity	6
	Probability	5		Probability	4
	Significance Rating	104 - High		Significance Rating	54 - Med
Mitigation Efficiency	2 - Low	Loss of Resource	1 – Partial	Reversibility	1 - Medium

Surface Water Run-Off

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
SURFACE WATER RUN-OFF	Extent	3	Engineering design to minimise silt discharge during rainstorm events.	Extent	2
	Duration	2		Duration	1
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	60 - Medium		Significance Rating	10 - Low
Mitigation Efficiency	2 – Low	Loss of Resource	1 – Partial	Reversibility	1 - Medium

Contamination of Water through Hazardous substances

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
CONTAMINATION OF WATER THROUGH HAZARDOUS SUBSTANCES	Extent	2	Measures implemented ensure no hydrocarbons and/or other pollutant liquids are spilt. They should be contained, and a clean-up protocol followed.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	28 – Low		Significance Rating	10 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	1 - Partial	Reversibility	2 - High degree

Disturbances of natural drainage

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DISTURBANCES OF NATURAL DRAINAGE LINES	Extent	3	Area may not be used for ablution purposes. Vehicles serviced under controlled conditions on hardened bunded surfaces. No construction rubble to be dumped in drainage lines/ watercourses.	Extent	2
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	4		Probability	3
	Significance Rating	60 – Medium		Significance Rating	28 - Low
Mitigation Efficiency	5 - Very high	Loss of Resource	1 - Partial	Reversibility	1 - Medium

Disturbances / Pollution of Ground Water

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DISTURBANCES /POLLUTION OF GROUND-WATER	Extent	3	Measures implemented ensure no hydrocarbons and/or other pollutant liquids are spilt. They should be contained, and a clean-up protocol followed.	Extent	1
	Duration	1		Duration	1
	Severity	2		Severity	0
	Probability	2		Probability	1
	Significance Rating	12 – Low		Significance Rating	0 - None
Mitigation Efficiency	5 - Very high	Loss of Resource	1 - Partial	Reversibility	1 - Medium

Disturbance of Aquatic Ecological Systems

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DISTURBANCE OF AQUATIC ECOLOGICAL SYSTEMS	Extent	3	Measures implemented ensure disturbances to aquatic ecological systems are prevented. Delineate 32 m buffer of the channelled valley bottom wetland with danger tape and pegs.	Extent	2
	Duration	3		Duration	2
	Severity	6		Severity	2
	Probability	5		Probability	3
	Significance Rating	66 – Medium		Significance Rating	14 - Low
Mitigation Efficiency	5 – High	Loss of Resource	1 - Partial	Reversibility	1 - Medium

Loss of Topsoil

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF TOPSOIL	Extent	2	Prevent wind and water erosion. Stockpile topsoil separately. Stockpile not to exceed 2 m in height.	Extent	1
	Duration	3		Duration	2
	Severity	3		Severity	2
	Probability	4		Probability	2
	Significance Rating	48 - Low		Significance Rating	20 – Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	2 - High

Loss of land capability

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF LAND CAPABILITY	Extent	2	Entire scarred area to be levelled off as close as possible surrounding topography not to hinder water drainage and cause channelling, which may in time lead to erosion.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	5		Probability	4
	Significance Rating	40 – Low		Significance Rating	14 - Low
Mitigation Efficiency	4 - High	Loss of Resource	2 - Substantial	Reversibility	1 - Med

Alteration of Topography

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
ALTERATION OF TOPOGRAPHY	Extent	2	Entire scarred area to be levelled off as close as possible surrounding topography not to hinder water drainage and cause channelling, which may in time lead to erosion.	Extent	1
	Duration	1		Duration	3
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	24 - Low		Significance Rating	12 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Soil Pollution

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
SOIL POLLUTION	Extent	2	Measures implemented to ensure that no hydrocarbons and/or other pollutant liquids are spilt. Contained and a clean-up protocol is followed.	Extent	1
	Duration	4		Duration	2
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	36 - Low		Significance Rating	10 - Low
Mitigation Efficiency	5 – High	Loss of Resource	2- Substantial	Reversibility	2 - High

Loss of habitat

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
LOSS OF HABITAT	Extent	2	Areas not earmarked for construction activities clearly demarcated with barrier tape and droppers prevent vehicular movement. Areas earmarked for construction need to be cleared of bushes, trees, and plants. Should be done in consultation with the ECO. Corridors for surrounding natural areas maintained and protected, and demarcated as no-go areas, consultation with the ECO. Alien vegetation to be cleared in consultation with ECO.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	32 – Low		Significance Rating	10 -Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Loss of Fauna

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
LOSS OF FAUNA	Extent	3	• Impact on the loss of habitat will be limited to the servitude of the development. • Feeding or leaving of food for stray or wild animals in the area is forbidden. • No animals hunted, trapped, or disturbed. • Nesting and breeding sites for birds and mammals avoided. • Should fauna be encountered during site clearance or during construction activities, earthworks shall cease immediately, until such fauna have been safely relocated. • No animal killed unless an immediate threat to human health is perceived.	Extent	2
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	3		Probability	2
	Significance Rating	54 – Medium		Significance Rating	24 - Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Loss of Flora

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
LOSS OF FLORA	Extent	3	• Prior to construction, woody vegetation matter shall be stripped, collected, and disposed of. • Alien, invasive species eradicated as far as possible. • No trees/ vegetation outside the construction area damaged/ removed. • Removal of plant material for medicinal purposes is prohibited. • Planting of exotic grasses should not occur, instead, non- invasive indigenous flora should be used where required. • Cleared wood /vegetation not to be used as burning wood or for any other purpose. • Developments within the buffer zones of the wetland ecosystems must be minimised. • Any developments within wetland buffer zone rehabilitated according to an authorised rehabilitation plan to prevent the restriction of water flow and soil erosion. • Geophytes must be removed, rescued before construction starts by an appropriate service provider, kept in favorable conditions, and replaced into the open and conserved areas. • Building or waste material discarded in an authorised location, which should not be within the wetland buffer	Extent	2
	Duration	5		Duration	4
	Severity	10		Severity	6
	Probability	5		Probability	3
	Significance Rating	130 - High		Significance Rating	54 - Med

			zone. • Access to wetland area limited to construction workers, only for specific activities that are conducted within the wetland. • Movement of construction workers through the wetland and trampling of wetland vegetation be minimized.		
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Degradation of Ecological Systems

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
DEGRADATION OF ECOLOGICAL SYSTEMS	Extent	2	• Corridors for surrounding natural areas must be maintained and protected and demarcated as no-go areas. • Areas earmarked for construction of structures, i.e., construction site offices need to be cleared of bushes, trees, and plants.	Extent	1
	Duration	3		Duration	2
	Severity	6		Severity	4
	Probability	3		Probability	2
	Significance Rating	48 – Low		Significance Rating	20 - Low
Mitigation Efficiency	3 - Medium	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Disruptions of natural corridors

Potential Impact	**Significance before mitigation**		**Mitigation Measures**	**Significance after mitigation**	
DISRUPTION OF NATURAL CORRIDORS	Extent	3	• Corridors for surrounding natural areas must be maintained and protected and demarcated as no-go areas.	Extent	3
	Duration	5		Duration	5
	Severity	6		Severity	4
	Probability	4		Probability	4
	Significance Rating	72 – Medium		Significance Rating	48 - Low
Mitigation Efficiency	2 - Low	Loss of Resource	2 - Substantial	Reversibility	1 - Medium

Pollution incidents

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
POLLUTION INCIDENTS	Extent	2	Impact on loss of habitat should be limited to the development locality and possible surrounding areas should accidental spillages occur. Cleaned immediately and MSDS sheets utilised.	Extent	2
	Duration	2		Duration	2
	Severity	4		Severity	3
	Probability	3		Probability	3
	Sensitivity	3		Sensitivity	3
	Significance Rating	48 – Low		Significance Rating	42 - Low
Mitigation Efficiency	1 – Low	Loss of Resource	2 - Substantial	Reversibility	2 - High

Visual Impact

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
VISUAL IMPACTS	Extent	2	Bollards and protective barriers as well as safety tape may be utilised around the site. PPE and warning tape for safety indication. Waste to be managed.	Extent	1
	Duration	5		Duration	3
	Severity	4		Severity	2
	Probability	3		Probability	2
	Significance Rating	40 - Low		Significance Rating	12 - Low
Mitigation Efficiency	5 – High	Loss of Resource	2 - Substantial	Reversibility	3 - Reversible

Loss of cultural heritage and Palaeontological Features

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF CULTURAL HERITAGE AND PALAEONTHOLOGICAL FEATURES	Extent	3	Any graves or archaeological finds should be reported to heritage practitioner and work should be stopped.	Extent	2
	Duration	2		Duration	2
	Severity	4		Severity	2
	Probability	5		Probability	3
	Significance Rating	40 - Low		Significance Rating	14 - Low
Mitigation Efficiency	4 - High	Loss of Resource	1 - Partial	Reversibility	2 - High

Loss of sense of place

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
LOSS OF SENSE OF PLACE	Extent	1	Rehabilitation and landscaping. Traffic calming and traffic mitigation measures.	Extent	1
	Duration	2		Duration	2
	Severity	3		Severity	3
	Probability	3		Probability	2
	Sensitivity	4		Sensitivity	1
	Significance Rating	42 – Low		Significance Rating	18 - Low
Mitigation Efficiency	3 - Medium	Loss of Resource	1 - Partial	Reversibility	2 - High

Change of land-use

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
CHANGE OF LAND USE	Extent	2	Rehabilitation and landscaping. Provide agricultural areas for domestic informal benefit.	Extent	1
	Duration	3		Duration	2
	Severity	4		Severity	2
	Probability	2		Probability	2
	Significance Rating	28 - Low		Significance Rating	10 - Low
Mitigation Efficiency	1 - Low	Loss of Resource	1 - Partial	Reversibility	2 - High

Impact on Economy

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DECLINE/INCREASE IN ECONOMY	Extent	4	Employment and skills to contractors. Local economy benefits by utilising building materials and services.	Extent	5
	Duration	3		Duration	3
	Severity	6		Severity	10
	Probability	4		Probability	5
	Significance Rating	66 – Med - Pos		Significance Rating	130 – High - Pos
Mitigation Efficiency	5 - High	Loss of Resource	0 - No loss	Reversibility	3 - Reversible

Impact on property value

Potential Impact	Significance before mitigation		Mitigation Measures	Significance after mitigation	
DECLINE/INCREASE IN PROPERTY VALUE	Extent	4	Employment and skills to contractors. Local economy benefits by utilising building materials and services.	Extent	5
	Duration	3		Duration	3
	Severity	6		Severity	10
	Probability	4		Probability	5
	Significance Rating	66 – Med - Pos		Significance Rating	130 – High - Positive
Mitigation Efficiency	5 - High	Loss of Resource	0 - No Loss	Reversibility	3 - Reversible

7.2.2.3 The operational phase

The following table outlines potential impacts associated with the operational phase of this proposed development:

Safety and Security

Potential Impact	Significance Before Mitigation		Mitigation Measures	Significance After Mitigation	
SAFETY AND SECURITY	Extent	2	Site security ensures site is secured and only authorised access allowed. Appoint people from local community. Restrict informal settlement.	Extent	1
	Duration	3		Duration	5
	Severity	6		Severity	10
	Probability	3		Probability	5
	Significance Rating	48 – Low – Positive		Significance Rating	110 – High - Positive
Mitigation Efficiency	1 - Very Low	Loss of Resource	0 - No loss	Reversibility	3 - Reversible

Maintenance of the fence

Potential Impact	**Significance Before Mitigation**		**Mitigation Measures**	**Significance After Mitigation**	
Maintenance of the fence	Extent	2	Work must be undertaken under the applicable TFR terms of refence	Extent	1
	Duration	3		Duration	5
	Severity	6		Severity	6
	Probability	4		Probability	5
	Significance Rating	44 – Low		Significance Rating	60 - Med
Mitigation Efficiency	1 - Very Low	Loss of Resource	0 - No loss	Reversibility	3 - Reversible

7.3 Motivation for No Alternative

The ‘no-go’ option assumes that the development does not go ahead, implying the continuation of the current status quo of the study area. The following will thus arise:

- Designation will have to be repealed and the sez not developed as envisaged,
- The economic growth of the region will not benefit from an extensive industrial and manufacturing cluster and the direct investment and job creation associated with the cluster,
- The region will lose its opportunity to increase its predominantly industrial economy,
- No employment from the SEZ will be created and the region will continue to have a high level of poverty, unemployment, and underdevelopment, and
- The current state of the environment will largely remain in its current condition and the surrounding land uses will remain undisturbed.

7.4 A concluding statement indicating the alternatives, including preferred location of the activity

Table 13 - Summary of Preferred Alternative Impacts

Environmental Aspect	With Mitigation	With Mitigation
Planning Phase		
1. Storage of hydrocarbons	80 – High	10 – Low
2. Sewer	32 – Low	10 – Low
3. Air Quality	32 – Low	12 – Low
4. Construction Waste	66 – Medium	12 – Low
5. Hazardous Waste	24 – Low	10 - Low
6. Domestic Waste	72 – Medium	16 – Low
7. Fuel Consumption	28 – Low	8 - Low
8. Health and Safety	24 – Low	10 - Low
9. Threat of Fire	80 – High	8 – Low
10. Safety and Security	28 – Low	8 – Low
11. Traffic Disruptions	44 – Low	12 – Low
12. Potential loss of cultural heritage	36 – Low	10 – Low
13. Potential Employment	14 – Low	48 – Low
14. Site Establishment	60 – Medium	20 – Low
Construction Waste		
1. Dust pollution	66 – Medium	10 – Low
2. Noise Pollution	32 – Low	15 - Low
3. Silt Pollution	104 – High	54 - Medium
4. Surface run-off	60 – Medium	10 - Low
5. Contamination of water through hazardous substances	28 – Low	10 – Low
6. Disturbance of natural drainage	60 – Medium	28 – Low
7. Pollution of ground water	12 -Low	6 – Low
8. Disturbance of aquatic ecological systems	66 – Medium	14 – Low
9. Loss of Topsoil	48 – Low	20 – Low
10. Loss of land capability	40 – Low	14 – Low
11. Soil Pollution	24 – Low	12 – Low
12. Loss of habitat	36 – Low	10 – Low
13. Loss of Fauna	32 – Low	10 – Low
14. Loss of Flora	54 – Medium	24 – Low
15. Degradation of ecological systems	48 – Low	20 – Low
16. Pollution incidents	48 – Low	20 – Low
17. Loss of cultural heritage	72 – Medium	48 - Low

18. Loss of sense of place	42 – Low	18 Low
19. Change of Land use	28 – Low	10 – Low
20. Impact on Economy	66 – Medium	130 – High
21. Impact on property value	66 – Medium	130 – High
22. Impact on traffic	60 – Medium	20 - Low
Operational Phase		
1. Safety and Security	44 – Low	60 - Medium
2. Maintenance works	40 - Low	60 - Medium

SECTION 8 – SPECIALIST FINDINGS

This section provides the findings of the specialists that were involved in the compilation of this Environmental Impact Assessment, in summary. For detailed assessments, potential impacts and proposed mitigation reference is made to Appendix E of this application.

8.1 Botanical Assessment

Four different vegetation units were identified on the study site namely: 1) Rocky Ridge Open Woodland 2) Rocky Grassland; 3) Degraded and Transformed Areas 4) Moist Grassland. This vegetation unit makes up the largest section of the study area with a total surface area of 28.08 Ha. The vegetation comprises of open woodland made up of clumps and individual medium to large trees growing on the rocky slopes with a well-developed herbaceous layer. The area has high species diversity, and the vegetation is in good condition with some bare patches especially in rocky areas.

8.2 Fauna Assessment

Based on the fauna assessment for the Ladysmith Ext 18 Residential Development the following is noted:

- The site had signs of historical anthropogenic disturbance, however the vegetation in this area has re-established.
- Alien vegetation was also recorded at the site, which indicates human interference or historical activities which led to this scenario.
- Two wetland systems were located on the northern boundary of the site.
- Vegetation communities at the site included rocky and moist grasslands, while rocky woodlands and rocky ridge vegetation were also recorded.
- No fauna species were observed during the site visit under the Red List.
- The occurrence of Red Listed fauna species cannot be excluded at the site as suitable habitat which were classified as high sensitivity occurs at the project site. These include the rocky mountain areas and the grasslands as well as the wetland areas.
- Connectivity on the eastern and northern boundaries of the project site is highly likely due to the connectivity with the outside area and vegetation communities. Low connectivity is expected towards the west due to the urbanisation and degradation of land towards the town of Ladysmith.

Based on the results and conclusions presented in this report, and the outcomes of the field survey, it is the opinion of the specialist that the proposed project can be favourably considered.

8.3 Wetland and aquatic assessment

Based on the findings of the desktop literature review, historical imagery survey and the in-field observations, freshwater ecosystems adjacent to the project footprint and within the broader study area were found to be in a reasonably good ecological condition with a moderate C EIS category. The

rationale is that aquatic biodiversity is low in the catchment reach where Cochrane Spruit flows; only sporadically and intermittently as a small, non-perennial stream.

8.4 Geotechnical Investigation

The following were the findings of the Geotechnical Engineer who undertook an assessment of the site in March of 2021:

- A geotechnical investigation was conducted, which comprised the excavation of a total of 26 test pits to a depth of between 0.5 m and 1.5 m.
- Soft Excavation in terms of the SANS specification will apply to the depth limit of the trial pits excavated on site. Hard rock excavation is anticipated to occur below the refusal depth of the TLB during the fieldwork.
- The field investigation took place in the wet season and no major groundwater seepage was encountered at the test pits investigated.
- It should be noted that selected samples were taken from the various layers of each test pit and that the samples that were representative soil of the site was tested for compaction characteristics.

8.5 Heritage Impact Assessment

- There are no visible restrictions or negative impacts in terms of heritage associated with the site earmarked for development,
- In terms of heritage the proposed project may continue, and
- The discovery of subsurface archaeological and/or historical material as well as graves must be considered in the Environmental Management Programme

8.6 Engineering Report

The following is the result of the site assessment of the existing and additional services required for the project is to be sustainable:

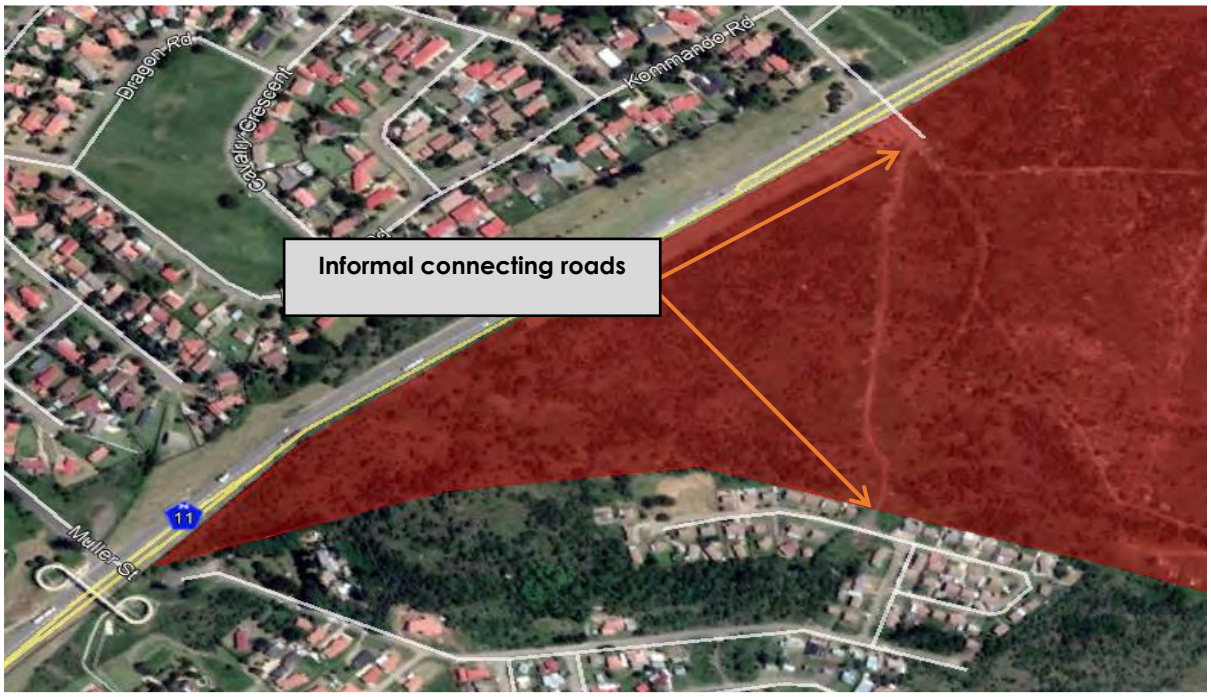
- **Storm Water Management System** - The site currently has no formal stormwater infrastructure and can be described to have a relatively steep topography.
- **Water** - There is no existing water supply from the municipality to the site, that is because there is currently no development on site.
- **Electricity -**
  - High Voltage - This portion of Ladysmith is fed via a 132 kV Eskom overhead line into Erich Trautmann 132/11 kV substation. The substation consists of two 20 MVA transformers. One of these transformers is reserved for the nearby factory, Sumitomo Rubber, and the other feeds the town. This substation feeds Port Natal 11 kV Switch Station, which then feeds E96 Modelkloof Switch Station.
  - Medium Voltage - Modelkloof Switch House is located within the boundaries of the proposed development area as indicated in the figure below. This switch house is fed via an overhead line

from Port Natal Switch House with a total capacity of approximately 4.5 MVA. Modelkloof Switch House distributes power to the surrounding areas via underground 11 kV cabling. There are no 11 kV cables within the proposed development area other than the cables that enter and exit the switch station. The current load on the switch station is not confirmed.

- Low Voltage (400 V) - No low voltage infrastructure exists within the development area. However, low voltage distribution in the surrounding areas is achieved via miniature substations and underground cabling installed in the road reserves.
- Available Capacity - Erich Trautmann Substation currently has two 20 MVA transformers, one feeds the Sumitomo Rubber factory which requires a firm 20 MVA and therefore cannot be used for future developments. It is estimated that the load on the substation is 18 MVA, excluding the rubber factory, resulting in approximately 2 MVA spare capacity. The proposed development will consume well over 2 MVA and therefore the current spare capacity will not suffice.

- **Information, communication, and technology (ICT) - The** development area currently does not contain any ICT infrastructure within its boundaries. However, overhead fibre lines exist along the N11 route, adjacent to the development area. It is proposed that tenants and owners of the properties within the development subscribe to their own, preferred service providers.
- **Road Infrastructure -** There is no current formal road infrastructure within the proposed area. The site lies next to the N11 on the outskirts of Ladysmith. The N11 is a national road that runs from Ladysmith to the Groblersbrug Border Post between South Africa and Botswana. The proposed development site currently has two access points via an informal gravel road at the N11 national road on the western side and at the southern side of the site at a paved road in Limit Hill. The western access is dangerous, as there is no provision for turning movements off the N11 – yet vehicles are doing this. The southern access connects the neighborhood to the south of the site to the N11. As this will be a new development, there is currently no access provided to the site. Provision has been made for an access point to the site at the intersection of the N11 and Riddel Road. The access will require upgrades to accommodate the traffic demand and queuing distance of the additional traffic. The following map shows the existing informal: road connections.

Figure 13 – Informal connecting road



- **Sewage Infrastructure** – Ladysmith is serviced with a wastewater treatment works that is located within a 5km radius from the Modelkloof development. Its location is depicted in the map below:

Figure 14 – Existing Waste Treatment Plant on site

8.7 Agricultural Impact Assessment

The subject property has internal informal roads, a few residential houses (informal houses) located on a southern section of the subject property, wetlands and a natural drainage channel that forms the northern boundary of the property, a power line traversing the site from north to south and a substation,

whilst the rest of the site is currently vacant with dense natural vegetation. In terms of output the agricultural sector is a relatively medium size sector in the regional economy. The area is generally characterized by good potential agricultural land with mixed agriculture being practiced in the form of vegetable, maize, and cattle farming.

According to the Census of Agriculture, there was approximately 63 000 ha of area planted to crops in the district in 2018. The main crop planted was maize followed by potatoes, with the main areas for cropping being Estcourt and Bergville. In addition, there were 1 million chickens, 56 000 pigs, 47 000 cattle and 26 000 sheep in the district in 2018. Beef ranching dominates in Alfred Duma local municipality, whilst chickens are the dominant activity in Inkosi Langalibalele local municipality.

Agricultural performance is declining due to the impact of deregulation, trade liberalization, weakening global and domestic markets, as well as frequent drought conditions and theft, which in turn have caused diminishing profit margins and serious financial problems among farmers.

SECTION 9 – ENVIRONMENTAL IMPACT STATEMENT

(l) an environmental impact statement which contains: -

(i) a summary of the key findings of the environmental impact assessment:

(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and

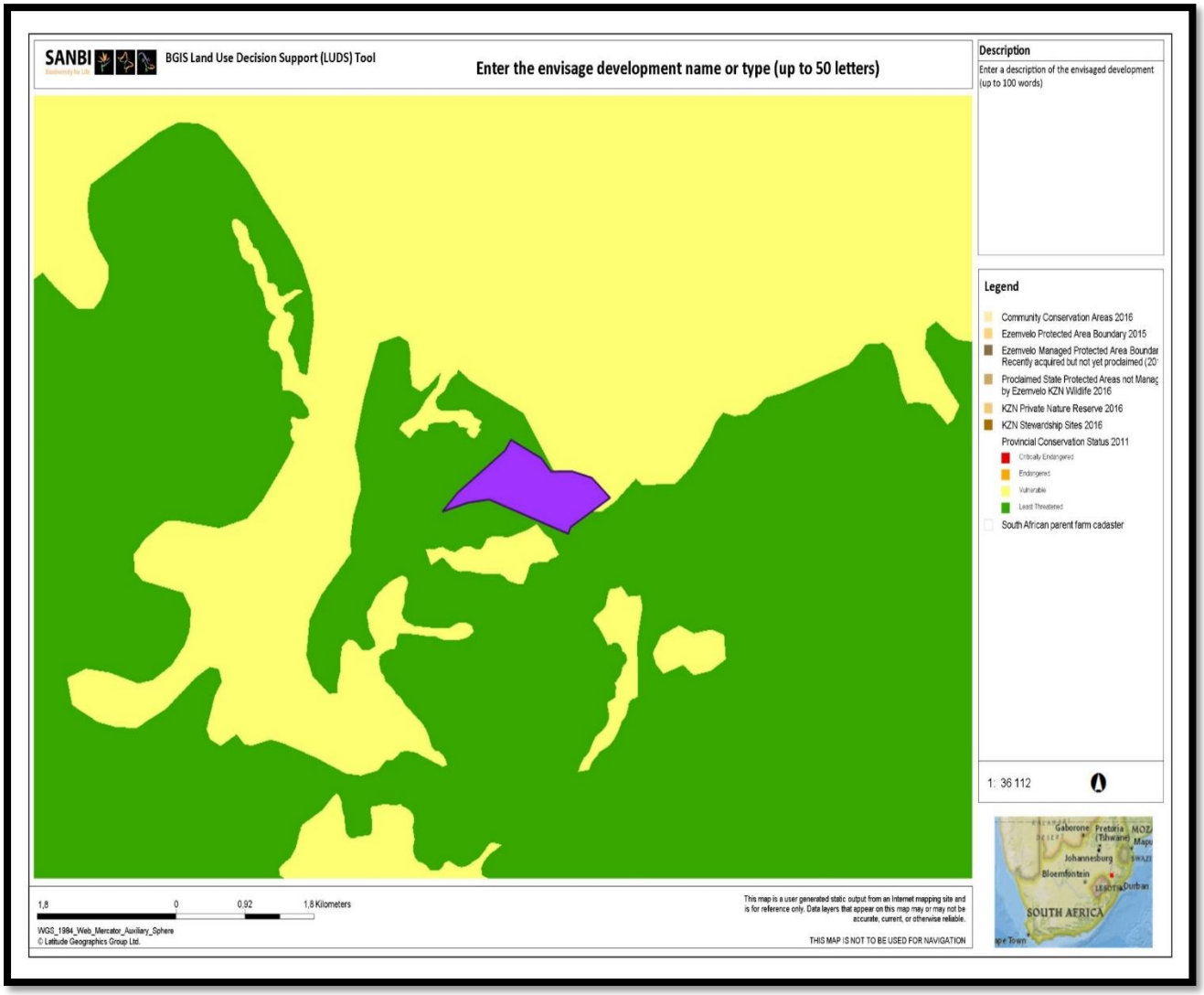
(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Summary of Impacts

The preferred layout entails the establishment of a township with 1201 residential units. The residential units will be provided in double and single storey units in order to accommodate more units in an area classified as of low conservation value. Included in the layout are educational facilities, religious facilities, municipal services, business facilities and health facilities. This layout will maintain the integrity of the rocky ridge open woodland. The impact on the sensitivities will be **HIGH** but impact in terms of social and economic benefits will be long term. This option is recommended by the botanist, who recommends rehabilitation measures

Alternative design will have less housing units that is 1,109 units thus avoiding some part of the site classified as Rocky Ridge. Ecological impact is rated Medium but long term social and economic values are **LOW.**

Figure 15: Sensitivity Map



SECTION 10 – CONCLUSIONS AND RECOMMENDATIONS

Based on the assessment conducted by the EAP and specialists, the following section includes recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation:

- Service Report - From the demand calculations and the investigation into the existing services (for detailed assessment, please refer to Appendix E8), Delta BEC (the specialist that conducted the study) recommend that the township establishment can be achieved favorably subject to the conditions outlined in this report and possible requirements outlined by the municipality.
- Agricultural Impact Assessment - While the political historical reasons for urban sprawl and indiscriminate development is understood, the loss of high potential soils in a resource poor municipality such as ADLM can have serious implications for agricultural production and therefore must be prioritized if there is to be scope for future agricultural development. From an agricultural development perspective this is a very high priority area but also a very complex responsibility. It can only be tackled with proper coordination between ADLM, the Department of Land Affairs, the Land Claims Commission, the Department of Agriculture and Environmental Affairs (KZN), the Department of Housing KZN, uThukela District Municipality and the various bulk service providers.

  Although the geology of the uThukela region has fertile soils that offer high agricultural potential in some areas. This potential is not harnessed by the communities as large-scale agriculture is not possible due to urbanization, water availability, and privatization of land.

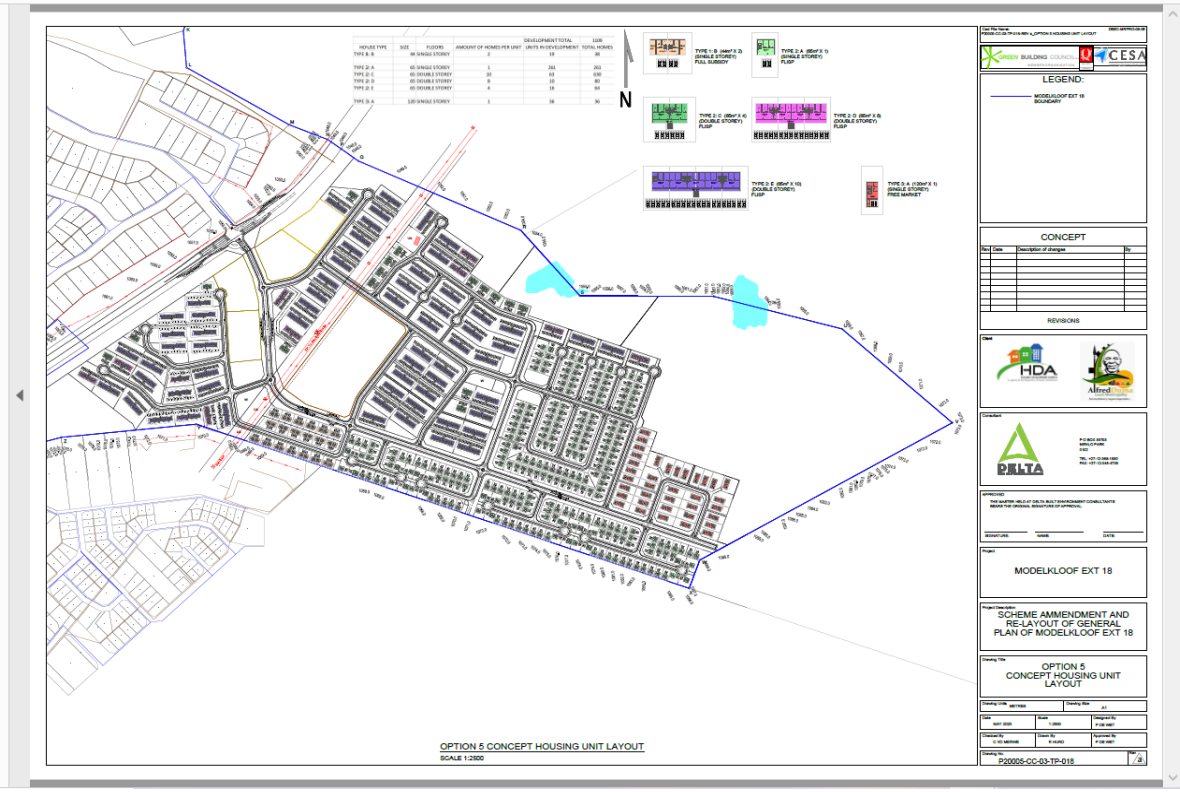
  In urban areas, the cumulative effect of succession has increasingly made land very scarce for farmers on urban outskirts. Since there is so much competition in what land must be used for in urban centers, the value of land has shifted from considering the fertility of land that can be used for the urban agriculture purpose to that of its functions. The economic growth of South Africa depends on infrastructure development, which is the main factor contributing to the transformation of agricultural land.

  Following the principles that guide agricultural development within the ADLM, agricultural development should not be considered when any other possible venture/s may yield a higher rate of return on investment. Furthermore, the Ladysmith ext 18 property does not have a land capacity that will contribute decisively towards the eradication of poverty, unemployment and social ills and it is therefore recommended that the subject property be used for any other economically superior venture.

- Fauna Impact Assessment - Based on the results and conclusions presented in this report, and the outcomes of the field survey, it is the opinion of the specialist that the proposed project can be favorably considered. All mitigation measures provided in this report must nonetheless be adhered to.
    - As far as possible, the proposed development should be restricted to areas that have already been disturbed, and limited further loss of highly sensitive vegetation, wetland areas, drainage lines should be permitted.
    - It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon and preventing movement of workers into sensitive surrounding environments.
    - Where possible, existing access routes and walking paths must be made use of, and new routes limited.
    - All laydown, storage areas etc. should be restricted to within the project area, not beyond the wetland area.
    - No construction rubble should be dropped into the wetland.
    - All building materials should be mixed off site and no mixing should take place in the wetland.
    - Prefabricated material must be used (or prioritized) to limit the fabrication and mixing on site; and
    - Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.
- Heritage Impact Assessment:
    - There are no visible restrictions or negative impacts in terms of heritage associated with the site earmarked for development.
    - In terms of heritage the proposed project may continue.
    - The discovery of subsurface archaeological and/or historical material as well as graves must be considered in the Environmental Management Program.
- Environmental Consultant:
    - The applicant is not excluded from complying with any other statutory requirements that are applicable to the undertaking of the activity. Key legislation that must be complied with include the National Water Act, 1998 (as amended).
    - The applicant must appoint a suitably experienced Environmental Control Officer (ECO) for the construction phase of the development, who will have the responsibility of ensuring that the mitigation/ rehabilitation measures and recommendations are implemented and ensure compliance with the provisions of the EMPr.
    - No alien specie must be used in the rehabilitation of the site, only indigenous plants.
    - Construction must not commence until all the relevant authorisations have been obtained.

- We recommend the preferred alternative below to be implemented. The applicant must adhere to the recommendations provided in the Botanical Assessment Report as well as the Environmental Management Plan.

Figure 16 – Preferred Design



- Botanical Assessment - The results in terms of the vegetation within the study site ranges from high to low conservation value. The effects of agricultural activities over the long terms have not affected the vegetation as much as urbanisation from the eastern section of the study area. Over the long term the adjacent land uses has impacted negatively on the condition of the vegetation units closer to the fragmented areas adjacent to the R602 road, however where habitat connectivity remained intact, the vegetation cover is high with high species richness and should be maintained. The construction will have a negative impact on vegetation units rated as high conservation value and alternatives should therefore be considered. There were no plants found that were protected under the NEMBA published list of critically endangered, endangered, vulnerable and protected species, however this does not mean that they do not occur in the study site and close monitoring during construction should be implemented.

SECTION 11 - OATH / AFFIRMATION BY EAP

11.1 The correctness of the information provided in the report.

The content of this document was prepared based on the authors' qualifications, professional knowledge and the external resources consulted. The findings, results, observations, conclusions, and recommendations expressed in this document apply to the site conditions and features that existed at the time of the start of the relevant investigations and the production of this document.

Although the authors exercised due care and diligence in rendering services and during the preparation of this document, they accept no liability, and the client, by receiving this document, indemnifies the authors against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of the content of this document.

Table 14 – Details of the EAP

Environmental Assessment Practitioner (EAP):	GKM Consulting PTY LTD		
Contact person:	Grace Magaya		
Professional affiliation(s) (if any)	EAPASA Registration Number 2018/129		
Postal address:	74 Third Street, Northmead, Benoni		
Postal code:	1501	**Cell:**	081 494 1611
Telephone:	N/A	**Fax:**	N/A
E-mail:	grace@gkmenvironmental.co.za		

11.2 An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.

I, **Grace Magaya**, declare that –

General declaration:

- I will comply with the requirements for EAPs as stipulated in Regulation 13(1) of the EIA Regulations, 2014,
- I act as the independent environmental practitioner in this application,
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant,
- I declare that there are no circumstances that may compromise my objectivity in performing such work,
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity,
- I will comply with the Act, regulations, and all other applicable legislation,
- I have no, and will not engage in, conflicting interests in the undertaking of the activity,
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority,
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application,
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report.
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct.
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and

- I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B (1) of the National Environmental Management Act, 1998 (Act 107 of 1998)

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 Environmental Impact Assessment Regulations, 2014.

Signature of the environmental assessment practitioner:

Name of company: **GKM Consulting PTY LTD**

Date: **13 October 2021**
