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REPUBLIC OF SOUTH AFRICA

SiVEST

DEPARTMENT OF HUMAN SETTLEMENTS

Greater Amaoti Housing Project

Draft Scoping Report

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Client:	Department of Human Settlements

Confidentiality Statement

DEPARTMENT OF HUMAN SETTLEMENTS

GREATER AMAOTI HOUSING PROJECT

DRAFT SCOPING REPORT

EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT DESCRIPTION

SiVEST SA (Pty) Ltd has been appointed by the Department of Human Settlements for eThekwini Municipality to undertake the Environmental Impact Assessment (EIA) for the proposed Greater Amaoti Housing Project located within the eThekwini Municipality, in line with the National Environmental Management Act, 1998 (Act 107 of 1998).

The proposed development entails the formalisation and development of the Greater Amaoti area. The project area is approximately 1235,59 ha in extent and is located on a portion of Wards 52, 53, 55, 56, 57, 59 and 102 of the eThekwini Metropolitan Municipality. This project aims at delivering approximately 25 357 Greenfield and Brownfield residential units together with supporting infrastructure and social facilities.

The project falls under the definition of an activity which must follow an Environmental Impact Assessment Process as described in Part 3 of Chapter 4 of the Environmental Impact Assessment Regulations, 2014 (as amended on 7th April 2017).

The following services will be provided:

Roads

The existing internal roads network will be upgraded in line with the demands of the development and the proposed traffic assessments and are expected to carry high traffic volume and will therefore be asphalt and paved surfacing.

Stormwater Drainage

The existing stormwater drainage will be upgraded in line with the requirements of the development. In stormwater management a distinction can be made between two types of storms, namely storms of low and high severity. For storms of low severity, which occur frequently, underground pipes, catch-pits, concrete-lined channels and soak-away pits system will be provided to avoid the frequent problems resulting from overland flow. This system is called minor system.

By considering the effects of the less frequent storms, a major system can be identified which supports the minor system. The major system may include attenuation ponds, larger conduits and natural or artificial channels. The major system would frequently make use of the road system to convey excess water to suitable points of discharge.

The stormwater from the development will drain towards the natural streams located within the development, incorporating the 100-year flood-lines.

The following will be considered during the design of stormwater drainage:

- Stormwater catch-pits are provided at approximately 100m intervals.
- Outlet structures are designed as stilling basins to reduce and limit the discharge velocity to 1m/s.
- Minimum pipe size will be 450mm diameter and will vary up to 1200mm diameter.
- The bridges will be designed to incorporate the 100-year flood-line.

Water Supply

The existing water supply reticulation will be upgraded in line with the requirements of the development.

Water Demand

The water demand will be as calculated below:

Land Use	**AADD**	**Unit**	**No. of Units**	**Kl/day**
Residential 1	0,75	Kl/day/unit	21 035	15 776,25
High Density Residential 3	0,6	Kl/day/unit	4 322	2 593,20
Total Annual Average Daily Demand				**18 369,45**

The Total Water Demand for the development will be 18 369.45kl/day.

Firefighting

The provision for firefighting will be as per standards set by the Municipal Emergency Services.

Pipeline Design

The following will be considered during the detailed design of water network:

- Hydraulic design of the pipeline network will be done to achieve a minimum head of 24m under peak demand and maximum head of 60m.
- Velocities in pipes will generally not exceed the following under peak demand: 3.5m/sec for pipe diameters less or equal to 150mm and 2.5m/sec for pipe diameter greater or equal to 200mm.
- Isolating valves will be provided to isolate any section of pipeline with not more than 4 valves and so that the total length of main included in an isolated section does not exceed a nominal 600 m. No more than 60 dwellings will be isolated at a given time.
- Pressure reducing valves will be provided to reduce pressure where required.
- Minimum pipe size in the network will be 75mm diameter and vary up to 355mm diameter.
- Pipe material will be Class 12uPVC/mPVC with spigot and socket couplings and engineered restraints, SABS 966 approved.
- Fire demand: Group 1, low risk with 8m residual head at peak flow.

- Hydrants spaced at no more than 240m to be installed in lieu of scour and air release devices at low and high points in the network, on 75mm diameter pipes and larger pipes.
- Pipes will be laid in the road reserve.
- Trenching, bedding, and backfilling shall conform to SANS 1200 LB and SANS 1200 DB and to Class B bedding, backfilled to 93% of Mod. AASHTO density.
- House connections will consist of 40mm diameter class 12 HDPE pipes, reducing to 25mm dia.
- Peak factor will be 4.

Reservoir and Water Tower

The proposed development is situated in undulating topography and there are areas without sufficient water pressure. For the proposed medium income level of service, it will be necessary for the reservoirs and water towers to be erected in the area.

It is expected that both the structures will be made constructed above the ground and will be constructed of 35MPa reinforced concrete. Reservoirs will be designed in circular shape and will vary from 5Ml to 20Ml in volume approximately 6m above the ground. Water towers will be designed in circular shape approximately 35m above the ground and will vary from 0.5Ml to 2Ml in volume. The above will be confirmed upon the completion of the Bulk Investigation and the designs.

Sanitation

The existing water supply reticulation will be upgraded in line with the requirements of the development.

Total Sewer Discharge

The estimated Annual Average Dry Weather Flow will be as follows:

Total AADD	18 369,45 kl/day
Annual Average Weather Flow (80%)	14 695,56 kl/day
Infiltration rate (15%)	2 204,33 kl/day
Total Residential Sewer Design Flow	16 899,89 kl/day

Total Sewer Design Flow for the Development is 16 899,89 kl/day.

Pipeline Design

The following will be considered during the detailed design of sewer network:
- Hydraulic design of the sewers will be done to ensure full-borne with minimum and maximum velocity of 0.7m/s and 2.5m/s respectively.
- The pipe slopes will be:
  - ✓ 1 : 80 at head.
  - ✓ 1 : 80 for 160mm dia pipe.
  - ✓ 1 : 120 for 200mm dia pipe.
  - ✓ 1 : 1600 for 250mm dia pipe.
  - ✓ 1 : 200 for 300mm dia pipe.
- Inspection manholes will be placed at convenient positions.

- Maximum distance between manholes will be 80m.
- Minimum manhole diameter will be 1 250mm.
- Minimum pipe size for the main will be 160mm diameter and will vary up to 600mm diameter.
- Pipe material will be Maincore Class 400uPVC pipes.
- Pipes will be laid both in the road reserve and mid-block.
- Infiltration of ground water and stormwater will be limited by ensuring watertight manholes and pipeline construction and testing thereof.
- Stormwater infiltration for 150mm diameter pipe is 0.012 litres per second per 100m.
- Peak factor will be 2.3.

Relocation Plan

A Draft Relocation Plan has been prepared for the proposed project. Two properties have been identified for relocation of residents. Due to the size of the project and for purposes of this relocation, more temporary housing will be constructed.

The Greater Amaoti Housing Project will be done in 5 proposed phases. The phases are as follows:

- Phase 1: 7 961 stands/units
- Phase 2: 5 903 stands/units
- Phase 3: 3 052 stands/units
- Phase 4: 2 546 stands/units
- Phase 5: 5 851 stands/units

As each phase of the project commences, 200 beneficiaries will be removed and relocated to the proposed relocation site to allow for the construction to take place. Once construction of the 200 houses is completed, beneficiaries will then be removed back to the newly constructed units and this process will be implemented for all 5 phases and the duration of the project. This process of relocation of beneficiaries will begin with Phase 1. Within the proposed relocation site, interim services will be provided. These include water, sanitation, and electricity. This will ensure that beneficiaries have access to infrastructure during the relocation period and limit any negative impacts on their daily living.

APPLICABILITY OF NEMA EIA REGULATIONS, 2014 (AS AMENDED IN 2017)

The following activities are being applied for:

Listing Notice	Activity	Description
GNR 327, April 2017 (Listing Notice 1)	Activity 13 The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	Water towers and pressure break tanks will be required however existing reservoirs will be used where possible. Capacity to supply to be confirmed.

Listing Notice	Activity	Description
GNR 327, April 2017 (Listing Notice 1)	Activity 19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	Infilling and dredging of watercourses may occur for the construction of the proposed development and associated infrastructure.
GNR 325, April 2017 (Listing Notice 2)	Activity 15 The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The site is approximately 1200 hectares in extent. An indigenous vegetation delineation identified that within the project boundary, 336,23 ha of indigenous vegetation was present. Based on the proposed layout, approximately 46,39 ha of indigenous vegetation will be required to be cleared for the proposed development.
GNR 324, April 2017 (Listing Notice 3)	Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	Portions of the site fall within a Critical Biodiversity Area.

Listing Notice	Activity	Description
	a. KwaZulu-Natal v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;	
	<u>Activity 14</u> The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. d. KwaZulu-Natal vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; xi. Inside urban areas: (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose;	Portions of the site fall within CBA and D'MOSS. Civil infrastructure may be required to be constructed within watercourses in these areas.

DETAILS OF ALTERNATIVES CONSIDERED

No activity alternatives have been identified as the area has for the most part already been settled on through informal housing. The project proposes the in-situ upgrade of an already existing housing area. The IDP of the eThekwini MM identifies the Amaoti area as an area that requires improved economic and social infrastructure, which is in line with the proposed project. The proposed development is aligned with the eThekwini Municipality SDF as the Amaoti area has been identified as a Mega Housing Project/Catalytic project.

No location alternatives where considered as the development involves the insitu upgrade or formalisation of a settlement that has been in existence for many years.

No layout alternatives have been assessed as this is an in-situ upgrade with the layout being constrained by natural features as well as human settlement patterns. The area is currently informally developed and the project aims to formalize housing on existing stands. The layout has stayed outside of the environmental sensitive areas as far as possible.

The “no-go” alternative should in all instances be considered as part of the EIA process. It assumes that the activity does not proceed, implying a continuation of the current status quo. The no-go option is, however, not a feasible option in terms of this development and would go against the constitution of South Africa and infringe upon the basic human rights of access to adequate housing. Residents in this area are living in very poor conditions, some without access to running water and electricity, and simply cannot afford for the interventions proposed as part of this development to not be approved.

The socio-economic survey undertaken for the project area confirmed that there are people within the project area that do not have access to basic services. Should the project not go ahead, this lack of basic services in the Amaoti area is likely to remain and people would continue to live without these basic services. Pollution will also likely continue to increase coupled with health issues that arise from living in unsanitary conditions.

PUBLIC PARTICIPATION PROCESS UNDERTAKEN FOR SCOPING PHASE

The Public Participation Process has been undertaken in line with Chapter 6 of the EIA Regulations 2014 (as amended 2017).

SiVEST will notify I&AP’s via email of the availability of the report. Site notices will be placed around the vicinity of the site and at the Amaoti Library. Fliers will be distributed through the community as well as to adjacent landowners by members of the community and people will be informed about the proposed development. Adverts will be placed in The Mercury and the Isolezwe. The project will be presented at a Project Steering Committee meeting and all key stakeholders and ward councillors will be provided with the opportunity to comment.

Registered stakeholders will be provided with an opportunity to provide comments. The Draft Scoping Report (DSR) will be made available for a 30-day comment period. The documents will also be made available on SiVEST’s website (www.sivest.co.za/Downloads.aspx) for review and comment. A copy of the DSR report will be left at the Amaoti Library for viewing by the public.

All issues that are raised during the review period for the DSR (this report) will be recorded and addressed by the Environmental Assessment Practitioner (EAP) in a Comments and Responses Report (C&RR) attached to the Final Scoping Report and the Final Report will be amended, as necessary based on issues or concerns raised.

The Final Scoping Report will be submitted to the ETDEA with all comments received and responses sent during the public comment period.

IMPACT METHODOLOGY USED

The SiVEST Impact Assessment method, dated 28 July 2017 (attached as **Appendix G**) has been utilised to assess the following potential impacts identified in the assessment phase and presented in the following sections.

The method used in this impact assessment determines significance (can be both positive and negative) of an impact by multiplying the value of the environmental system or component affected by the magnitude of the impact on that system or component (System or Component Value x Impact Magnitude).

In this method, all significant impacts on the natural or biophysical environment are assessed in terms of the overall impacts on the health of ecosystems, habitats, communities, populations and species. Thus, for example, the impact of an increase in stormwater runoff generated by a development can only be assessed in terms of the impact on the health of the affected environmental systems.

Similarly, all significant impacts on the social and socio-economic environment are assessed in terms of the overall impacts to the quality of life, health and safety of the affected population, communities and/or individuals, with the exception of impacts on resources that are assessed on their own.

IMPACTS AND RISKS IDENTIFIED FOR THE PROPOSED DEVELOPMENT

Environmental Aspect	Potential Impact
Agricultural	▪ Soil compaction and erosion. ▪ Soil pollution as a result of construction activities. ▪ Continued spread of alien invasive species as a result of the disturbance.
Biodiversity – Geology	▪ The excavation of rocks creates a void with steep gradient or high stepped walls and can create naturally unstable slope conditions. ▪ Drilling and blasting can create airblast shockwaves and flying rocks. ▪ Dust generation from earthworks.
Biodiversity - Soil	▪ Disturbance or burial of soils as a result of the construction of access roads, infrastructure or stockpiles ▪ Degradation of soil characteristics during medium to long-term stockpiling ▪ Chemical spillages contaminate the soil profile ▪ Concentrated storm runoff from the infrastructure areas is erosive, causing sheet, rill and donga erosion features Inadequate topsoil restoration or creation of unnatural surface

Environmental Aspect	Potential Impact
	topography or slope form which could impact lower or adjacent slopes due to increased runoff velocity; ▪ Erosion of restored topsoil due to inadequate erosion control measures; ▪ Low productivity of rehabilitated soils due to inadequate soil fertility or high erosion rates
Biodiversity – Indigenous Flora	▪ Loss of Red Listed/Protected species ▪ Loss of genetic variation within a species ▪ Illegal collection of protected species ▪ Negative change in the threat status of a species ▪ Disturbance of indigenous vegetation types and negative impacts of dust or polluted runoff beyond the project area boundaries. ▪ Fragmentation of habitats or isolation of small areas that results in degradation or changes in populations reliant on movement or interchange between habitats or scattered populations. ▪ Cumulative impact of illegal collecting or land use during long-term or life of development can degrade areas and reduce the viability of adjacent areas. ▪ Inadequate control of alien species can result in establishment of populations or seed sources that threaten adjacent areas.
Biodiversity – Fauna	▪ Loss of Red Listed/Protected fauna species ▪ Loss of local fauna populations ▪ Loss of genetic variation within species ▪ Isolation of local populations ▪ Disturbance of remnant terrestrial wild mammal, avian, amphibian and insect fauna through physical habitat destruction, noise, traffic and movement of people ▪ Large developments can threaten migration routes or flight paths. Cumulative impact of illegal collecting, road kills or power line related deaths reduce population viability in the long-term ▪ Inadvertent killing of slow-moving animals during earthworks ▪ Potential increase in feral animals and impact on indigenous fauna e.g. cats, rats ▪ Illegal hunting or disturbance ▪ Disturbance during breeding season can precipitate long-term cumulative effect on populations ▪ Potential permanent change in habitats due to inadequate monitoring and degradation of rehabilitated areas due to inadequate maintenance.
Biodiversity – Sensitive Terrestrial Ecosystems	▪ Loss of ecological functionality ▪ Loss of biodiversity ▪ Environmental degradation ▪ Loss of habitat for fauna and flora species

Environmental Aspect	Potential Impact
	▪ Alteration of population dynamics and biotic interactions of species ▪ Loss of refuge areas for climate protection sensitive species and corridors that allow these species to migrate to refuge areas as the temperature and rainfall change
Biodiversity – Surface Water	▪ Permanent impact on catchment by capturing surface runoff and/or diverting drainage systems. Degradation of stream channels through long-term reduced runoff and periodic discharge of very high volumes destabilizes the system ▪ Altered storm water runoff response due to large impervious areas and concentrated runoff in drainage systems ▪ Loss of habitat for fauna and flora species ▪ Displacement of fauna species <u>Storm water runoff and drainage</u> ▪ Increased erosion, dust generation and potential chemical contaminants reduce surface water quality or result in discharge that exceeds the maximum concentrations permitted by the National Water Act ▪ Vehicle wash bays and workshop facilities produce petrochemical and solvent which contaminated surface runoff; ▪ Sanitary conveniences, fuel depots or storage facilities of potentially polluting substances can contaminate surface water. ▪ Permanent impact on catchment by capturing surface runoff and/or diverting drainage systems. Degradation of stream channels through long-term reduced runoff and periodic discharge of very high volumes destabilizes the system ▪ Altered storm water runoff response due to large impervious areas and concentrated runoff in drainage systems
Biodiversity – Noise	▪ Noise from construction machinery disrupting fauna movement and may cause displacement
Biodiversity – Artificial Lighting	▪ Disruption of the physiological and behavioral patterns of fauna species
<u>Wetland</u> ▪ Clearing of areas for development ▪ Compaction of soils & sedimentation Drainage patterns change due to increased hardened surfaces ▪ Drainage patterns change due to crossings ▪ Stormwater management	▪ Impeding the flow of water. ▪ Loss of aquatic habitat ▪ Siltation of watercourse. ▪ Erosion of watercourse. ▪ Sedimentation of the watercourse. ▪ Flow sediment equilibrium change ▪ Water quality impairment

Environmental Aspect	Potential Impact
▪ Construction and upgrade of the roads ▪ Bridge constructions ▪ Additional Associated Infrastructure Borrow Pits ▪ Cutting/reshaping of embankments Traffic / vehicle activity	
Socio-economic	▪ Provision of housing ▪ Provision of basic services ▪ Improvement in quality of life ▪ Access to opportunities ▪ Potential employment opportunities/skills transfer
Heritage	▪ Impact to heritage resources (mainly buildings older than 60 years old) ▪ Impact to palaeontological resources

PLAN OF STUDY FOR EIA

The EIA report will be informed by the scoping phase. The following steps will be undertaken as part of the EIA phase:

- The proposed layout will be further investigated in order to avoid or minimize negative impacts and maximize potential benefits;
- Environmental impact statements regarding the potential significance of residual impacts, taking into account proposed mitigation measures will be provided in the EIA;
- An Environmental Management Programme (EMPr) covering construction and decommissioning phases of the proposed development will be prepared. The EMPr will include input from specialists and will incorporate recommendations for mitigation and monitoring.
- The Draft Relocation Plan will be investigated further during the EIA Phase to ensure that the site chosen is suitable and environmental considerations have been taken into account.

Description of alternatives to be considered and assessed

The EIA phase will include a detailed analysis of the proposed layout for the project which will include environmental (with specialist input) and technical evaluations. Any additional alternatives identified through this process will be reported on in the EIA report.

Specialist Studies

The following specialist studies have been undertaken for the project:

- Agricultural (September 2020);
- Biodiversity (April 2017, updated April 2019, reviewed 2020);
- Geotechnical (October 2020);
- Socio-economic (July 2020);

- Heritage (November 2021);
- Water Resources (April 2017, updated April 2019, reviewed 2020);
- Stormwater, Roads, Water status quo reports (April 2020) and engineering details (March 2021).

The findings of the specialist studies have been included in the Scoping Phase of this project. The associated Impact Assessment tables will be included in the draft EIA report. Should the need for additional specialist studies be identified through the consultation process, these studies will be commissioned in the EIA Phase to further advise on the potential impacts that may arise from the proposed development. The specialist studies may identify opportunities and constraints as associated with the site and the proposed development.

Consultation with Competent Authority

SiVEST will consult with EDTEA as follows:

- Pre-application meeting with EDTEA.
- Submission of application form to obtain EIA reference number.
- The Draft Scoping report will be made available for comment to I&Aps, key stakeholders and the authorizing authority.
- After the Draft Scoping Report has been made available for comment within the public domain, comments will be incorporated into the Issues and Response Report and Final Scoping Report.
- The Final Scoping Report will then be submitted to EDTEA for approval.
- A site visit with EDTEA is proposed once the Final Scoping Report has been submitted.
- The Draft EIA report will be made available for comment to I&Aps, key stakeholders and the authorizing authority.
- After the Draft EIA report has been made available for comment within the public domain, comments will be incorporated into the Issues and Response Report and Final EIA Report for submission to EDTEA.
- Apart from the above-mentioned occasions, further consultation with authorities will occur whenever necessary.

DEPARTMENT OF HUMAN SETTLEMENTS

GREATER AMAOTI HOUSING PROJECT

DRAFT SCOPING REPORT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

DEPARTMENT OF HUMAN SETTLEMENTS

GREATER AMAOTI HOUSING DEVELOPMENT

DRAFT SCOPING REPORT

1. INTRODUCTION

SiVEST SA (Pty) Ltd has been appointed by the Department of Human Settlements for eThekwini Municipality to undertake the Environmental Impact Assessment (EIA) for the proposed Greater Amaoti Housing Project located within the eThekwini Municipality, in line with the National Environmental Management Act, 1998 (Act 107 of 1998).

The proposed development entails the formalisation and development of the Greater Amaoti area. The project area is approximately 1235,59 ha in extent and is located on a portion of Wards 52, 53, 55, 56, 57, 59 and 102 of the eThekwini Metropolitan Municipality. It is estimated that the project will deliver approximately 20 000 Greenfield and Brownfield residential units together with supporting infrastructure and social facilities.

The project falls under the definition of an activity which must follow an Environmental Impact Assessment Process as described in Part 3 of Chapter 4 of the Environmental Impact Assessment Regulations, 2014 (as amended on 7th April 2017).

2. DETAILS OF THE APPLICANT

2.1 Name and contact details of the Applicant

Name and contact details of Applicant:

Table 1: Name and contact details of the applicant

Business Name of Applicant	eThekwini Municipality
Physical Address	17 Doveside Place, Canehaven Drive, Phoenix
Postal Code	4068
Telephone	031 311 2483
Cell	082 263 7895
Email	Ntombi.ndaba@durban.gov.za

3. DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

3.1 Name and contact details of the Environmental Assessment Practitioner (EAP)

Name and contact details of the EAP who prepared this report:

Table 2: Name and contact details of EAP who prepared the report

Business Name of EAP	SiVEST SA (PTY) Ltd
Physical Address	4 Pencarrow Crescent, La Lucia Ridge Office Estate
Postal Address	PO Box 1899, Umhlanga Rocks
Postal Code	4320
Telephone	031 581 1500
Fax	031 566 2371
Email	michelleg@sivest.co.za

3.2 Names and expertise of representatives of the EAP

Table 3: Names and details of the expertise of each representative of the EAP involved in the preparation of this report

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
Michelle Nevette	MEnvMgt. (Environmental Management) Cert Sci.Nat. Registration No. 120356	IAIA, EAPASA Registration No. 2019/1560	19
Michelle Guy	MSc. (Environmental Science) Pr.Sci.Nat. Registration No. 126338	IAIA, EAPASA Registration No. 2019/868	9
Luvanya Naidoo	BSc (Geography) Pr.Sci.Nat. Registration No. 126107	IAIA, EAPASA Registration No. 2019/1404	12

CV's of SiVEST personnel is attached in **Appendix A.** The EAP declaration is attached in **Appendix A**.

3.3 Names and expertise of the specialists

Table 4: Names and expertise of specialists

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Experience (years)
The Biodiversity Company	Wayne Jackson (reviewed and updated by Andrew Husted)	Wetland Assessment Report	Reviewer: Pr Sci Nat (400213/11)	12
	Anita Rautenbach (reviewed and updated by Andrew Husted)	Biodiversity Assessment	Reviewer: Pr Sci Nat (400213/11)	12
Umlando Consulting	Gavin Anderson	Heritage Assessment	Masters of Philosophy in Archaeological/Social Psychology: 1996, UCT	24
Alan Smith Consulting	Alan Smith	Desktop Paleontological Impact Assessment	PhD Geology Pr. Sci. Nat	14
Lindsay Napier Architect	Lindsay Napier	Built Environment Assessment	PrArch, PGDiploma (Architecture)	20
K2M Environmental (Pty) Ltd	Gert Watson	Agricultural Assessment	B.Art. et. Scient (Planning)	15
Ganwa Consulting and Development	Nhlanhla Ngomane	Socio-Economic	Master Public Health	20
	Nonhalnhla Ngobo		Honors in Community and Development Studies	5
ILZ Consulting	Sphesihle Mdlalose	Geotechnical Impact Assessment	BSc Hons Engineering Geology	11
	Golden Manhanyi		BSc Hons Geohydrology	11
SCIP Engineering Group	Marco Fourie	Engineering Services	B.Ing. M.Eng. (Pr. Eng)	9

4. LOCATION OF THE ACTIVITY

4.1 Location and Wards

The proposed development entails the formalisation and development of the Greater Amaoti area. Forming part of Inanda, the Amaoti study area is located within the interior of Durban, West of the N2 freeway. From the South of the site, primary access is obtained off Curnick Ndlovu Highway and Bonga Mambumba Drive provides access from the North.

The project area is approximately 1235,59 ha in extent and is located on a portion of Wards 52, 53, 55, 56, 57, 59 and 102 of the eThekwini Metropolitan Municipality (see **Appendix B** for a locality and layout of the different wards). The proposed development is made up of the following settlements:

- Amaoti
- Amaoti-E
- Amaoti Cuba
- Amawothi
- Amawoti-E
- Amawoti-F
- Goqokazi
- Langalibalele
- Lower Angola
- Lusaka
- Lusaka 1
- Lusaka 2
- Mocambique
- Namibia
- Nigeria
- Shastri Park
- Tanzania
- Upper Amaotana
- Westham
- Zambia
- Zimbabwe

A full list of property details and Surveyor 21 Digit Codes is included in **Appendix C**

Refer to **Figure 1** below for a layout of the project and ward boundaries.

The Amaoti Study area consists mainly of undulating topography. Twenty-four percent of the study area is characterized as steep. The Durban Metropolitan Open Space System accounts for 107ha and there are approximately 42km of natural drainage. The existing movement network accounts for 58km and consists of mainly dirt tracks and footpaths. Apart from the settlement of Cuba, the site is occupied primarily by informal residential development situated on large parcels averaging approximately 1ha each. The study area lies outside of any Town Planning Scheme boundaries and has no formal zoning.

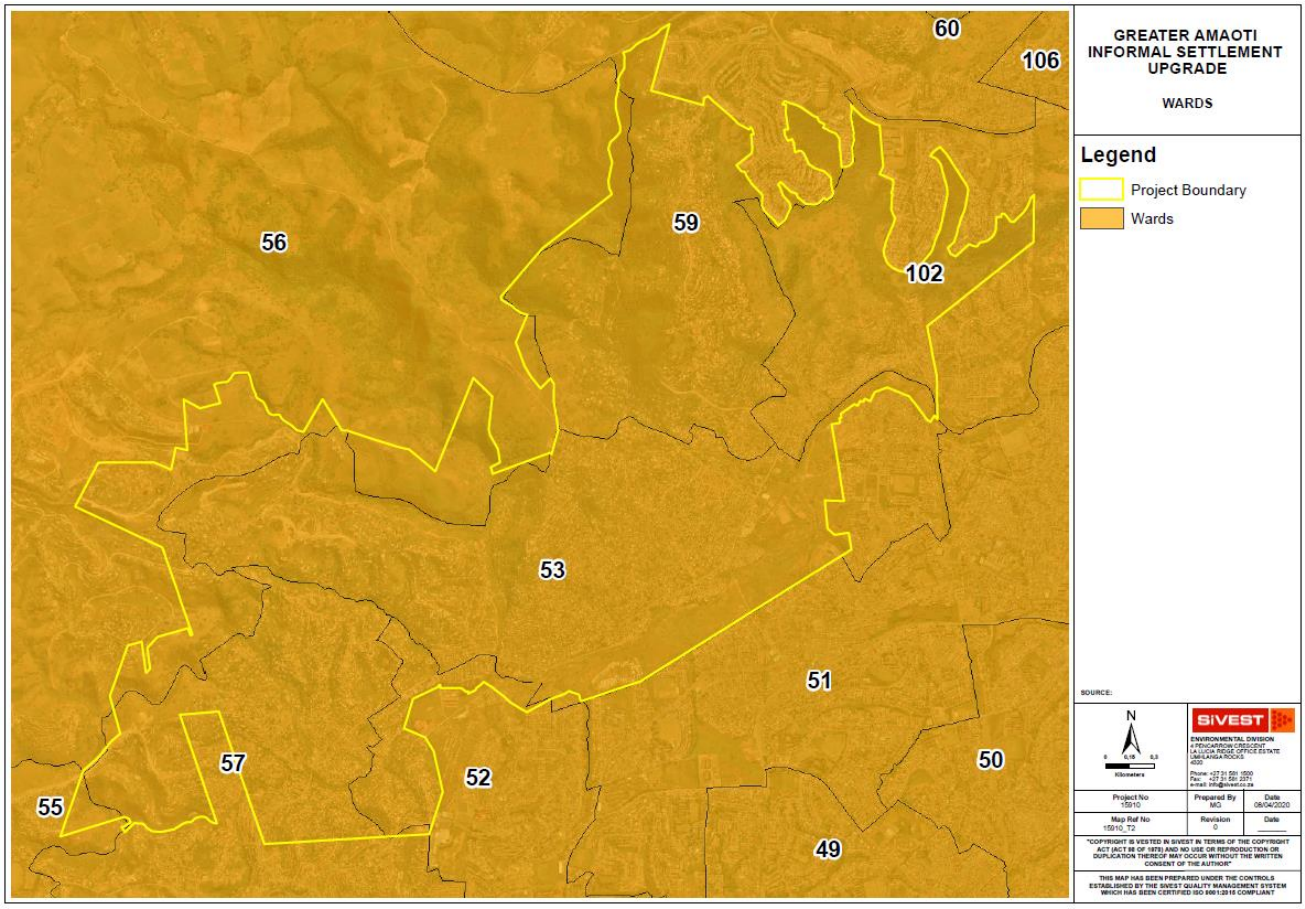

Figure 1: Project and ward boundaries

4.2 Geographical Coordinates of the site

The coordinates for the sites are as follows:

- Latitude: 29° 40’ 41.26” S,
- Longitude: 30° 59’ 29.44” E

5. SITE DEVELOPMENT PLAN

The Site Development Plan is attached in **Appendix C**.

Photographs of the site are included in **Appendix D**.

6. ACTIVITY INFORMATION

6.1 Housing

The proposed development entails the in-situ formalisation and development of the Greater Amaoti area. Greater Amaoti is located within the INK (Inanda, Ntuzuma, KwaMashu) area, approximately 20km north of Durban. It comprises a mix of residential townships and informal settlements. Greater Amaoti, which is located within Inanda, is one of the largest informal settlements in eThekwini and South Africa, comprising 12 sub-areas and is one of a series of communities forming the Greater Inanda Area. There are approximately 20,000 households residing in informal structures. Seventy percent of Durban's street children originate from the area. The area is also characterised by low economic activity, inadequate infrastructure, and high levels of unemployment, HIV/Aids, poverty and crime.

The greater Inanda area forms part of a larger sub-metro catchment including Inanda, Ntuzuma, KwaMashu and Phoenix. While KwaMashu, Ntuzuma and Phoenix were previously established as townships to accommodate low to medium income housing, much of the Inanda area consisted of a "released area" being mostly in the ownership of a large number of individuals. Consequently, the development of Inanda occurred largely on an informal basis with few formal facilities and services. This project aims at delivering approximately 25 357 Greenfield and Brownfield residential units together with supporting infrastructure and social facilities.

The total extent of the proposed development site is approximately 1235,59 ha. The project area is currently used for low to medium residential purposes, consisting of houses that are both formal and informal.

The following land uses are proposed for the development:

- Mixed Use Development;
- High Density Residential;
- Interface Zones;
- Medium Density Residential;
- Open Space;
- Parkway;
- Road & Pedestrian.

According to the Conceptual Design Framework prepared by the Town Planners, the proposed movement framework is predicated on a modified grid, which serves to reinforce some of the existing routes as well as provide new vehicular linkages that improves both north-south and east-west connectivity within the study area.

The Amaoti Framework outlines that the proposed layout is designed on principles of walkability, compaction and facilitating the establishment of multiple sustainable urban neighbourhoods. At strategic interceptory points, within a 5 and 10-minute walking distance, a mixed use higher density settlement typology is prescribed in order to create thresholds and opportunities to support a neighbourhood centre. The same opportunity has been created along the mobility corridor, incorporating retail and potential social facility clusters. The proposed land uses are structured in accordance with the movement network with the highest densities situated within 400m of critical intersections, effectively establishing a series of mixed use cores along the main activity spine and

within the interior portions of the Study Area. Within 200m on either side of the primary mobility route and along the Linear Parkway, densities are high and incorporate retail and public institutions. An intermediate zone provides the transition to the predominant medium density residential land use. The densities and land uses alluded to by the plan is in line with the densification strategy currently being championed by eThekwini Municipality and accommodates all segments of the residential property market including the affordable housing bracket.

6.2 Internal Services

The following infrastructure and services are proposed:

- Roads and access.
- Stormwater;
- Water supply;
- Sewage;
- Electrical;

The proposed services will be designed to incorporate the expected low to medium income type of level of service. The standard for all services is in accordance with the Municipal Design Guidelines and the Neighbourhood Planning and Design Guide (Red Book). Where a potential conflict arises between any guidelines, the minimum standard required by eThekwini Municipality will be adhered to.

Roads

The existing internal roads network will be upgraded in line with the demands of the development and the proposed traffic assessments and are expected to carry high traffic volume and will therefore be asphalt and paved surfacing. The recommendations contained in the following guidelines will be adhered for the design:

- Technical Recommendations for Highways (TRH1) for Prime Coats and Bituminous Curing Membrane.
- Draft TRH4 (Technical Recommendations for Highways) - Structural Design of Flexible Pavements for Inter Urban and Rural Roads.
- Technical Recommendations for Highways (TRH14) for Guidelines for Road Construction Material.
- UTG2 (Urban Transport Guidelines) - Structural Design of Asphalt Surfaced Roads for South Africa will be applied where required.
- Urban Transport Guidelines (UTG3) for Structural Design of Urban Roads for South Africa.

Stormwater Drainage

The existing stormwater drainage will be upgraded in line with the requirements of the development. In stormwater management a distinction can be made between two types of storms, namely storms of low and high severity. For storms of low severity, which occur frequently, underground pipes, catch-pits, concrete-lined channels and soak-away pits system will be provided to avoid the frequent problems resulting from overland flow. This system is called minor system.

By considering the effects of the less frequent storms, a major system can be identified which supports the minor system. The major system may include attenuation ponds, larger conduits and natural or artificial channels. The major system would frequently make use of the road system to convey excess water to suitable points of discharge.

The stormwater from the development will drain towards the natural streams located within the development, incorporating the 100-year flood-lines.

The following will be considered during the design of stormwater drainage:

- Stormwater catch-pits are provided at approximately 100m intervals.
- Outlet structures are designed as stilling basins to reduce and limit the discharge velocity to 1m/s.
- Minimum pipe size will be 450mm diameter and will vary up to 1200mm diameter.
- The bridges will be designed to incorporate the 100-year flood-line.

Water Supply

The existing water supply reticulation will be upgraded in line with the requirements of the development.

Water Demand

The water demand will be as calculated below:

Land Use	AADD	Unit	No. of Units	Kl/day
Residential 1	0.75	Kl/day/unit	21 035	15 776.25
High Density Residential 3	0.6	Kl/day/unit	4 322	2 593.20
Total Annual Average Daily Demand				**18 369.45**

The Total Water Demand for the development will be 18 369.45kl/day.

Firefighting

The provision for firefighting will be as per standards set by the Municipal Emergency Services.

Pipeline Design

The following will be considered during the detailed design of water network:

- Hydraulic design of the pipeline network will be done to achieve a minimum head of 24m under peak demand and maximum head of 60m.
- Velocities in pipes will generally not exceed the following under peak demand: 3.5m/sec for pipe diameters less or equal to 150mm and 2.5m/sec for pipe diameter greater or equal to 200mm.

- Isolating valves will be provided to isolate any section of pipeline with not more than 4 valves and so that the total length of main included in an isolated section does not exceed a nominal 600 m. No more than 60 dwellings will be isolated at a given time.
- Pressure reducing valves will be provided to reduce pressure where required.
- Minimum pipe size in the network will be 75mm diameter and vary up to 355mm diameter.
- Pipe material will be Class 12uPVC/mPVC with spigot and socket couplings and engineered restraints, SABS 966 approved.
- Fire demand: Group 1, low risk with 8m residual head at peak flow.
- Hydrants spaced at no more than 240m to be installed in lieu of scour and air release devices at low and high points in the network, on 75mm diameter pipes and larger pipes.
- Pipes will be laid in the road reserve.
- Trenching, bedding, and backfilling shall conform to SANS 1200 LB and SANS 1200 DB and to Class B bedding, backfilled to 93% of Mod. AASHTO density.
- House connections will consist of 40mm diameter class 12 HDPE pipes, reducing to 25mm dia.
- Peak factor will be 4.

Reservoir and Water Tower

The proposed development is situated in undulating topography and there are areas without sufficient water pressure. For the proposed medium income level of service, it will be necessary for reservoirs and water towers to be erected in the area.

It is expected that both structures will be constructed above the ground and will be constructed of 35MPa reinforced concrete. Reservoirs will be designed in circular shape and will vary from 5Ml to 20Ml in volume approximately 6m above the ground. Water towers will be designed in circular shape approximately 35m above the ground and will vary from 0.5Ml to 2Ml in volume. The above will be confirmed upon the completion of the Bulk Investigation and the designs.

Sanitation

The existing water supply reticulation will be upgraded in line with the requirements of the development.

Total Sewer Discharge

The estimated Annual Average Dry Weather Flow will be as follows:

Total AADD	18 369,45 kl/day
Annual Average Weather Flow (80%)	14 695,56 kl/day
Infiltration rate (15%)	2 204,33 kl/day
Total Residential Sewer Design Flow	16 899,89 kl/day

Total Sewer Design Flow for the Development is 16 899,89 kl/day.

Pipeline Design

The following will be considered during the detailed design of sewer network:

- Hydraulic design of the sewers will be done to ensure full-borne with minimum and maximum velocity of 0.7m/s and 2.5m/s respectively.
- The pipe slopes will be:
  - ✓ 1 : 80 at head.
  - ✓ 1 : 80 for 160mm dia pipe.
  - ✓ 1 : 120 for 200mm dia pipe.
  - ✓ 1 : 1600 for 250mm dia pipe.
  - ✓ 1 : 200 for 300mm dia pipe.
- Inspection manholes will be placed at convenient positions.
- Maximum distance between manholes will be 80m.
- Minimum manhole diameter will be 1 250mm.
- Minimum pipe size for the main will be 160mm diameter and will vary up to 600mm diameter.
- Pipe material will be Maincore Class 400uPVC pipes.
- Pipes will be laid both in the road reserve and mid-block.
- Infiltration of ground water and stormwater will be limited by ensuring watertight manholes and pipeline construction and testing thereof.
- Stormwater infiltration for 150mm diameter pipe is 0.012 litres per second per 100m.
- Peak factor will be 2.3.

6.3 Relocation Plan

A Draft Relocation Plan has been prepared for the proposed project. The purpose of the relocation plan is to detail the location and process for removal of people to temporary accommodation while formal housing is being constructed. Relocations need to be done timeously, within the budget, and with communication with affected people to ensure a smooth transition. Two properties have been identified for relocation of residents (**Figure 2**).

Figure 2: Location of temporary housing for relocation

Due to the size of the project and for purposes of this relocation, more temporary housing will be constructed. The Greater Amaoti Housing Project will be done in 5 proposed phases. The phases are as follows:

- Phase 1: 7 961 stands/units
- Phase 2: 5 903 stands/units
- Phase 3: 3 052 stands/units
- Phase 4: 2 546 stands/units
- Phase 5: 5 851 stands/units

The various Phases of the development are illustrated in **Figure 3** below.

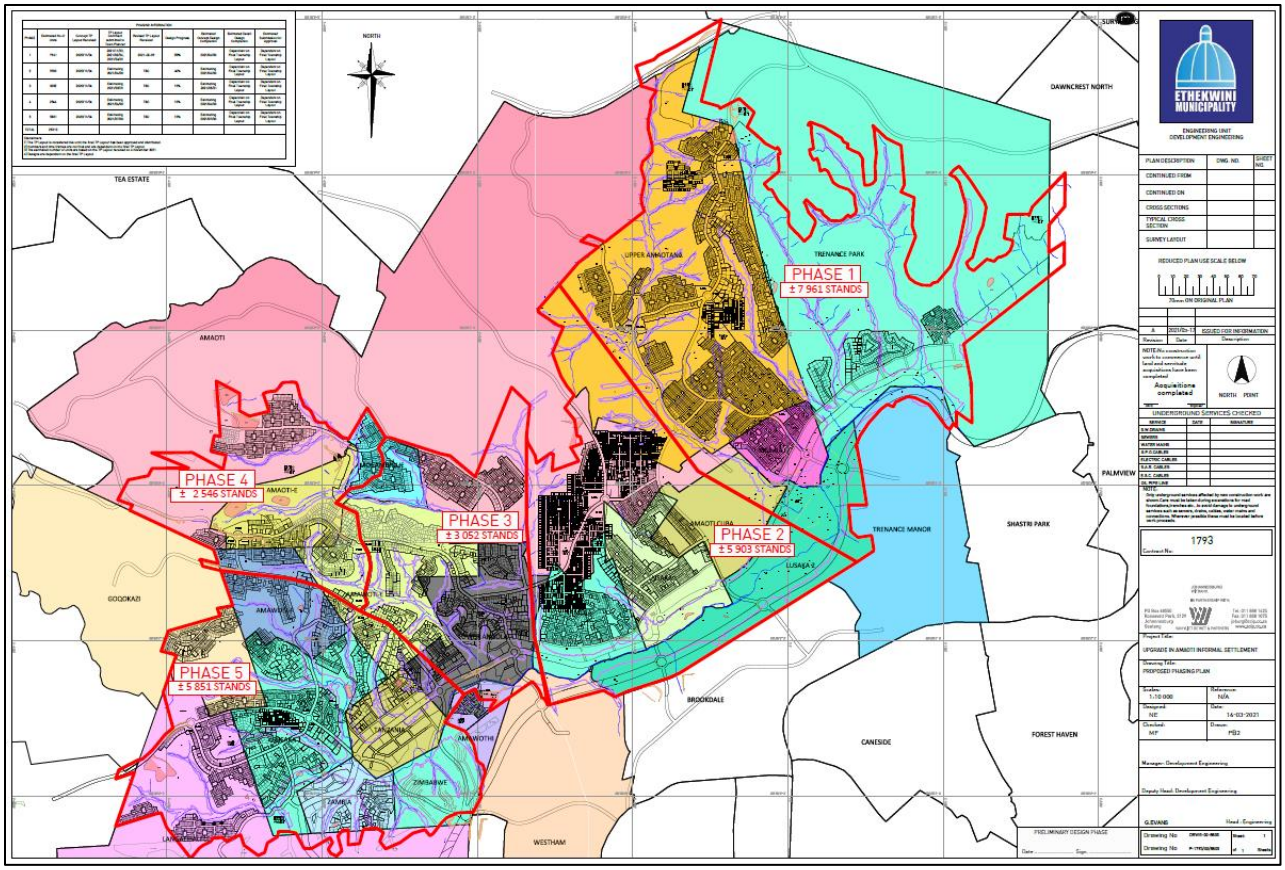

Figure 3: Amaoti Phasing Plan

As each phase of the project commences, 200 beneficiaries will be removed and relocated to the proposed relocation site to allow for the construction to take place. Once construction of the 200 houses is completed, beneficiaries will then be removed back to the newly constructed units and this process will be implemented for all 5 phases and the duration of the project. This process of relocation of beneficiaries will begin with Phase 1. Within the proposed relocation site, interim services will be provided. These include water, sanitation, and electricity. This will ensure that beneficiaries have access to infrastructure during the relocation period and limit any negative impacts on their daily living.

Before the relocation process takes place, the affected community and beneficiaries will be notified accordingly about the relocation for purposes of the project. This will be done through the established Project Steering Committee (PSC) which includes councillors and members from all 6 wards of the project. This will allow for a smooth process of relocation and those affected beneficiaries relocate voluntarily. As construction begins on the different phases of the project, beneficiaries will be notified of the progress to keep them aware of the duration of their stay at the relocation site, within the temporary housing.

7. NEMA LISTED ACTIVITIES

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327, 325 and 324 for activities which must follow a full Environmental Impact Assessment Process. The project will trigger the following listed activities:

Table 5: Listed activities in terms of NEMA

Listing Notice	Activity	Description
GNR 327, April 2017 (Listing Notice 1)	Activity 13 The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	Water towers and pressure break tanks will be required however existing reservoirs will be used where possible. Capacity to supply to be confirmed.
GNR 327, April 2017 (Listing Notice 1)	Activity 19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	Infilling and dredging of watercourses may occur for the construction of the proposed development and associated infrastructure.

Listing Notice	Activity	Description
GNR 325, April 2017 (Listing Notice 2)	Activity 15 The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The site is approximately 1200 hectares in extent. An indigenous vegetation delineation identified that within the project boundary, 336,23 ha of indigenous vegetation was present. Based on the proposed layout, approximately 46,39 ha of indigenous vegetation will be required to be cleared for the proposed development.
GNR 324, April 2017 (Listing Notice 3)	Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. a. KwaZulu-Natal v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;	Portions of the site fall within a Critical Biodiversity Area.
	Activity 14 The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse;	Portions of the site fall within CBA and D'MOSS. Civil infrastructure may be required to be constructed within watercourses in these areas.

Listing Notice	Activity	Description
	(b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. d. KwaZulu-Natal vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; xi. Inside urban areas: (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose;	

8. POLICY AND LEGISLATIVE CONTEXT

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

8.1 The Constitution

The Constitution of the Republic of South Africa, Act 108 of 1996 sets the legal context in which environmental law in South Africa occurs and was formulated. All environmental aspects should be interpreted within the context of the Constitution, National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989.

The Constitution has enhanced the status of the environment by virtue of the fact that an environmental right has been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management through, for example, access to health care, food and water and social security (Section 27). An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

The Constitution of South Africa (No. 108 of 1996) provides environmental rights and includes implications for environmental management. Section 24 of the Constitution states that:

"Everyone has the right –

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

The Constitution is the overarching legislation for South Africa. Although it provides for certain rights and obligations, the NEMA has been promulgated in order to manage the various spheres of both the social and natural environment.

8.2 National Environmental Management Act, 1998 (Act No. 107 of 1998)

The National Environmental Management Act (Act No. 107 of 1998) was promulgated in 1998 but has since been amended on several occasions from this date. This Act replaces parts of the Environment Conservation Act (Act No 73 of 1989) with exception of certain parts pertaining to Integrated Environmental Management.

The act intends to provide for:

- co-operative environmental governance by establishing principles for decision-making on matters affecting the environment;
- institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state;
- to provide for the prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment; and
- to provide for matters connected therewith.

NEMA is the overarching legislation which governs the EIA process and environmental management in South Africa. Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an environmental authorisation. Activities that may significantly affect the environment must be considered, investigated and assessed prior to implementation.

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), "development must be socially, environmentally and economically sustainable", which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

The proposed construction of the Greater Amaoti Housing Development requires environmental authorisation in terms of NEMA and the Environmental Impact Assessment (EIA) Process is being undertaken in accordance the EIA Regulations 2014 (as amended in 2017) that consist of the following:

- Listing Notice 1 - GN No. 327 (7 April 2017);
- Listing Notice 2 – GN No. 325 (7 April 2017);
- Listing Notice 3 – GN No. 324 (7 April 2017);
- EIA procedure - GN No. 326 (7 April 2017).

The project triggers activities under Listing Notice 1, 2 and 3 and thus needs to be subjected to an Environmental Impact Assessment Process. The listed activities are explained in Section 7.2 above.

8.3 The National Heritage Resources Act 1999 (25 of 1999)

The National Heritage Resources Act promotes good management of the heritage resources of South Africa which are deemed to have cultural significance and to enable and encourage communities to ensure that these resources are maintained for future generations.

The aim of the Act is to introduce an integrated, three-tier system for the identification, assessment and management of national heritage resources (operating at a national, provincial and local level). This legislation makes provision for a grading system for the evaluation of heritage resources on three levels which broadly coincide with their national, provincial and local significance.

This Act requires investigation to determine the impact of heritage resources when developments exceed the thresholds list in section 38 (1) of the act:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50 m in length;
(c) any development or other activity which will change the character of a site—
(i) exceeding 5 000 m^2 in extent; or
(ii) involving three or more existing erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

Under the legislation the South African Heritage Resources Agency (SAHRA), was established, which replaced the National Monuments Council. SAHRA is responsible for the preservation of heritage resources with exceptional qualities of special national significance (Grade I sites). A Provincial Heritage Resources Authority, established in each province, will protect Grade II heritage resources which are significance within the context of a province or region. Buildings and sites of local interest (Grade III sites) is the responsibility of local authorities as part of their planning functions.

There is extensive national legislation covering heritage and archaeological sites. Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that, as described above, an assessment of potential heritage resources in the development area needs to be done. **A Heritage Impact Assessment has therefore been commissioned to explore how the proposed development may impact on heritage resources as protected by the Act.**

8.4 National Water Act (Act 36 of 1998)

The National Water Act (NWA) No 36 of 1998 was promulgated on the 20th of August 1998. This Act is important in that it provides a framework to protect water resources against over exploitation and to ensure that there is water for socio-economic and economic development, human needs and to meet the needs of the aquatic environment. The Act also recognises that water belongs to the whole nation for the benefit of all people.

It is important to note that water resources are protected under the Act. Under the act, water resources as defined include a watercourse, surface water, estuary or aquifer. A watercourse is defined as a river or spring, a natural channel in which water flows regularly or intermittently, or a wetland, lake or dam into which, or from which water flows.

One (1) of the main aims of the Act is the protection of water resources. 'Protection' in relation to a water resource entails:

- Maintenance of the quality of the water resource to the extent that the water use may be used in a sustainable way;
- Prevention of degradation of the water resource; and
- The rehabilitation of the water resource.

In the context of the proposed development and any potential impact on water resources, the definition of pollution and pollution prevention contained within the Act is relevant. 'Pollution', as described by the Act is the direct or indirect alteration of the physical, chemical or biological properties of a water resource, so as to make it (inter alia):

- less fit for any beneficial purpose for which it may reasonably be expected to be used; or
- harmful or potentially harmful to the welfare or human beings, to any aquatic or non-aquatic organisms, or to the resource quality.

This definition of pollution is quite wide ranging, and it applies to all types of water resource. Activities which cause alteration of the biological properties of a watercourse (i.e. the fauna and flora contained within that watercourse are also considered pollution).

In terms of section 19 of the Act owners / managers / people occupying land on which any activity or process undertaken which causes, or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring. These measures may include (inter alia):

- measures to cease, modify, or control any act or process causing the pollution;
- comply with any prescribed waste standard or management practice;
- contain or prevent the movement of pollutants;
- remedy the effects of the pollution; and
- remedy the effects of any disturbance to the bed and banks of a watercourse.

The National Water Act of 1998 pertains to the country's water resources. Moreover, this Act regulates issues including wastewater, the pollution of water bodies and the extraction and use of water resources.

The purpose of the act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety;
- Managing floods and droughts.

And for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation.

In terms of the Amaoti Housing Development, the Department of Water and Sanitation is being consulted with to discuss the project as a whole. A Wetland Delineation, Functional Assessment and Risk Assessment was undertaken to identify the impacts of the project on the water resources within the project area. Twenty-Five (25) HGM units were identified within the project boundary. These were grouped into the following:

- Channelled Valley Bottom – Upper Catchment (HGM A);
- Channelled Valley Bottom – Lower Catchment (HGM B);
- Unchannelled Valley Bottom (HGM C);
- Floodplain (HGM D); and

- Hillslope Seep (HGM E).

The proposed development, specifically the construction of crossings (or bridges) does pose a risk to the identified wetlands, with the level of risk determined to vary from low to moderate. The specialist has assessed these risks and provided recommendations for mitigation. The report is attached in **Appendix F**.

8.5 National Environmental Management: Protected Areas Act, 2003 (Act No.57 of 2003 as amended)

The overarching aim of the National Environmental Management: Protected Areas Act (NEMPAA) No. 57 of 2003, within the framework of NEMA, is to provide for:

- provide for the declaration and management of protected areas;
- provide for co-operative governance in the declaration and management of protected areas;
- effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
- provide for a representative network of protected areas on state land, private land and communal land;
- promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
- promote participation of local communities in the management of protected areas, where appropriate; and
- provide for the continued existence of South African National Parks.

9. KEY DEVELOPMENT STRATEGIES AND GUIDELINES

9.1 Human Settlements Annual Performance Plan 2019/2020

South Africa has experienced rapid urbanization and by 2030 it is estimated that 70% of the population will be urbanized with an estimated 7.8 million people living in cities. The country's urbanization is characterized by an "urbanization of poverty" which has resulted in the following:

- Fragmented urban forms with unequal access to job opportunities, amenities and public services,
- Mushrooming of informal settlements and their locations in precarious conditions,
- Illegal occupation of land/properties both private and government owned,
- Illegal occupations of run down or abandoned buildings,
- Construction of illegal buildings;
- Increase in housing backlog.

According to the Annual Performance Plan (2019/2020) prepared by the Department of Human Settlements, KwaZulu-Natal has the second highest housing backlog in South Africa. The eThekwini Municipality has the highest need for housing compared to the other districts in KwaZulu-Natal. Approximately 75% of the households in the eThekwini Municipality are informal and is it predicted that the increase in demand for housing in eThekwini will be one of the highest in the province. The plan noted that rapid urbanization within the district

was one of the key factors responsible for the increase in informal settlements. People seek improved livelihoods and economic opportunities and as a result, tend to settle in informal settlements around major cities and towns. Based on this, the management of informal settlements in KwaZulu Natal remains a priority.

9.2 Integrated Development Plan, 2017/2018

Reference is made to the eThekwini Municipality's Integrated Development Plan (IDP) 2017/2018 – 2021/2022 (Final report May 2017).

The IDP serves as a tool for transforming local governments towards facilitation and management of development. One of the goals listed in the IDP is to promote access to equitable, appropriate and sustainable level of household infrastructure and community services and facilitate access to housing. Also on the agenda is the reduction in the backlog of housing provision within the municipality.

Like all developing world cities, the eThekwini Municipality is subject to high rates of in-migration from rural areas and small towns in KZN. This has resulted in a rate of urbanisation and population increase that is difficult to project and a large number of new residents require housing and services. African cities are generally dynamic and have fast growing populations, with eThekwini' Municipality being no different, with the majority of this growth happening on the urban periphery where it is easier to access land. With such rapid growth, city development will need to be significantly accelerated to adequately address this challenge.

The provision of housing for residents is a priority in the municipality however this is met with many constraints. The key issues related to housing include:

- High backlogs with limited funding available as it is an unfunded mandate;
- Lack of well-located land;
- Project stalled due to delays experienced in land acquisition, lack of well-located and suitable land, environmental and developmental approvals and conflicting interests, especially with adjoining communities;
- Protracted SCM processes
- Invasion of land and houses
- Delays in housing accreditation process stalling housing delivery

As a result of the constraints stated above, huge housing provision backlogs have been experienced by the city. The Amaoti Housing Development is an initiative to work towards decreasing that backlog.

9.3 EThekwini Municipality Spatial Development Framework

Reference is made to the eThekwini Municipality's Spatial Development Framework (SDF) 2017/2018 – 2021/2022 (Final report May 2018). The SDF is an integral component of the Integrated Development Plan (IDP) and a key spatial transformation tool which guides how the implementation of the IDP should occur spatially. The SDF is also aligned with provincial and municipal sector plans and strategies as a way of ensuring that the desired spatial form and outcomes of the Municipality are achieved.

The agenda of the SDF is built around a series of Sustainable Development Goals (SDGs) which aims to “make cities and human settlements inclusive, safe, resilient and sustainable”. Include in the SDGs are the following:

- No poverty;
- No hunger;
- Good health;
- Clean water and sanitation;
- Good jobs and economic growth;
- Innovation and infrastructure.

The provision of housing within the context of the eThekwini Municipality is an important issue and has been addressed in development guiding documents such as the SDF.

The SDF strives to respond to all the goals and targets within its mandate but of particular importance, amongst others, is to ensure access for all to adequate, safe and affordable housing and basic services and upgrade of slums by 2030.

Like all developing cities, the in-migration from rural areas and small towns has resulted in a rate of urbanisation and population increase that is hard to project, with a large number of new residents requiring housing and services. As a result of the increase in population in the eThekwini Municipality, a large amount of people have settled in informal settlements which are increasing at a rapid rate. As per the SDF, this requires that urgent attention be given to addressing the housing backlog (a backlog of top-structures of approximately 412 000 dwelling units) and a key spatial challenge is to identify residential opportunities on land that is well located, serviced and with good access to public transport as well as social and economic opportunities.

EThekwini Municipality settlement patterns and densities are concentrated within the KwaMashu, Ntuzuma and Inanda area, amongst others. The density patterns have important implications for where people may wish to settle, commuting patterns, public transport and, within the context of this report, provision of housing, basic services and social facilities.

The National Development Plan requires that all municipalities in South Africa prioritise development in rural areas. The provision of housing and basic services is a critical element in the national developmental agenda. Housing, water, electricity, sanitation and social amenities are key and critical services which have been identified by communities that are required to meet their basic needs. Limited funding and exponential growth in the municipality has increased the levels of backlogs.

People living in informal settlements are the most vulnerable communities in the city and climate change is expected to impact these communities the most, especially with regards to increased flood risk. This requires that urgent attention be given to addressing the housing backlog and a key spatial challenge is to identify residential opportunities on land that is well located, serviced and with good access to public transport as well as social and economic opportunities.

The Greater Amaoti Housing Project has been identified as a key Catalytic Infrastructure Project in the region and one that will make a substantial impact in terms of the provision of housing in the eThekwini Municipal area.

A Catalytic Project is defined as a project of significant scale (i.e. its reach) and scope (i.e. impact on employment, services, economic and social investment, and/or rates), thereby displaying some or all of the following characteristics:

- It makes a substantial impact;
- It provides leverage and/or creates multiplier effects;
- It has the power to radically activate development (social, economic or both);
- It significantly impacts spatial form;
- It creates jobs, and increase land value; and
- Contributes to the achievement of the vision and goals of the Province.

The SDF identified the following characteristics in terms of housing catalytic projects:

- Create complete human settlements;
- Cater for people in various income bands;
- Aim at increased densities;
- Are very well connected to public transport;
- Are large, each over 5,000 housing opportunities (Amaoti has approximately 20 000 housing opportunities);
- Require major infrastructure investment;
- Require a mix of public funds;
- Aim to also leverage private investments including household investments;
- Require highly developed and multiple skills to conceptualise; and
- Have multiple stakeholders.

It is also acknowledged that projects cut across these goals and objectives and seldom only contributes to a single goal or objective. It is for this reason that it is imperative for prioritisation purposes, to give specific preference and attention to projects that impacts on as many as possible of the strategic goals of the Province.

The significance of a project being awarded “Catalytic” status is that it will confirm that such a project had been subjected to a screening and prioritisation process of the Provincial Planning Commission and the Infrastructure Coordination Work Group. As such, Catalytic Projects will receive preferential facilitation support and guidance, in recognition of the contribution such a project can make to achieve the growth targets of the Province.

9.4 National Development Plan 2030

The National Development Plan aims to eliminate poverty and reduce inequality by 2030. Included as one of the direct and immediate measures to combat poverty is the promotion of mixed housing strategies and more compact urban development to help people access public spaces and facilities, state agencies and work and business opportunities. Chapter 8 of the National Development Plan outlines the strategy for transforming human settlements. The housing issue is complex with tension between the need to address housing backlogs quickly and affordably, and the need to provide housing to create well-functioning, high quality human settlements that will offer greater opportunities for income generation and human development.

An approach to human settlement has been envisioned, in which the state properly fulfils its obligation to providing high-quality public infrastructure and environments, while also supporting and facilitating low-income households in acquiring shelter. Part of the challenge of providing housing is closely related to the need to provide access to basic services, and this therefore goes hand in hand with addressing the housing backlog.

The Greater Amaoti Housing development proposes to address both these issues with providing the following services: water supply, sewage, electrical, stormwater, roads and access while undertaking the in-situ upgrade of approximately 20 000 units.

10. NEED AND DESIRABILITY

Greater Amaoti, which is located within Inanda, is one of the largest informal settlements in eThekwini and South Africa. It compromises 12 sub-areas and is one of a series of communities forming the Greater Inanda area. There are approximately 20,000 households residing in informal structures. Seventy percent of Durban's street children originate from the area. The area is also characterised by low economic activity, inadequate infrastructure, high levels of unemployment, HIV/Aids, poverty and crime. The Inanda area is of great importance in the history of Durban and South Africa, with events of a global significance having taken place here and it remains a vibrant hub of cultural and spiritual activity.

The need and desirability for the Proposed Housing Development within the Greater Amaoti Area is evident in the IDP and SDF of the eThekwini Municipality, as it has identified the project area as an area for mega housing developments. The implementation of the housing development will assist in reducing the establishment of informal settlements. The proposed development upgrade plan includes electrical and civil infrastructure such as road Infrastructure, Stormwater Management Infrastructure, Water Reticulation and Sewer Reticulation. By providing water and sanitation services to the proposed development, it will indirectly assist in reducing surface water and groundwater pollution as well as providing a social benefit for people to have access to water and health facilities. This will be as a result of households using piped water in their daily activities instead of water from the nearby rivers and utilising proper sanitation methods.

The Greater Amaoti Housing Project has also been identified by the Province of KwaZulu-Natal as a Catalytic Project as its displays the following characteristics:

- It makes a substantial impact,
- It provides leverage and/or creates multiplier effects,
- It has the power to radically activate development (social, economic or both),
- It significantly impacts spatial form,
- It creates jobs, and increase land value; and
- It contributes to the achievement of the vision and goals of the Province.

In addition, the Greater Amaoti Housing Project is one of eight potential mega projects planned for implementation in the coming twenty to thirty years. Mega projects are endorsed by the National Department of

Human Settlements and the Housing Development Agency and are planned in alignment with eThekwini Municipality's Economic and Public Transport Catalytic Projects.

According to the Annual Performance Plan (2019/2020) prepared by the Department of Human Settlements, KwaZulu Natal has the second highest housing backlog in South Africa. The eThekwini Municipality has the highest need for housing compared to the other districts in KwaZulu Natal. Approximately 75% of the households in the eThekwini Municipality are informal and is it predicted that the increase in demand for housing in eThekwini will be one of the highest in the province.

A Socio-economic Survey was undertaken to provide information to support project planning and future needs of the area. The survey covered topics such as demographics, land ownership, household characteristics, education and skill level, access to social amenities and services, food security as well as environmental considerations. Of the 2000 households surveyed, 81% do not have a household member who is employed. Nineteen percent of households have a single person employed. The Greater Amaoti housing project as a catalytic project is therefore required to stimulate local industries and create work opportunities in the area.

The average household income in the community highlight the need for government intervention in the area to reduce poverty and improve household livelihoods. It was identified that the majority (76%) of the surveyed households earn a total monthly income of between R 0 and R1500. Approximately 19% of households earn between R 1500 and R 3500. The large proportion of families earning between R 0 and R 1500 is indicative of the higher number of households who will qualify for low cost housing opportunities that will be created by this project. With over 50% of the surveyed population being working class individuals, there is a great need to create an environment that drives economic opportunities. The high number of residents earning a very small amount of monthly income highlights the need for government intervention to ensure that residents are provided with adequate housing.

A Ward Needs Assessment was undertaken by Ganwa Consulting and Development in May 2020 to identify needs that are important to residents and to enable meaningful strategies to be implemented to address the identified needs. Focus group meetings were undertaken with community members where the needs of the various wards were discussed. The needs that arose from the community meetings were, amongst others, as follows:

- Housing,
- Upgrading stormwater drainage,
- Upgrading electricity supply,
- Upgrading of water pipes,
- Upgrading roads,
- Ablution facilities,
- Upgrading of old water infrastructure,
- Upgrading of Amaoti clinic,
- Sites for cemeteries.

A number of these needs can be met with the upgrades proposed as part of the Greater Amaoti Housing Project.

11. DETAILS OF THE BIOPHYSICAL ENVIRONMENT

11.1 Climate

The mean annual temperature for the municipal area ranges from 16°C - 20°C, with temperatures being highest along the coast and dropping towards the western area. This decrease is inversely proportional to the elevation levels, such that when elevation increases the temperature decreases. Most of the municipal area is frost free, although a number of areas do experience occasional frosts.

Mean annual rainfall figures for the municipality range from <550mm to >1200mm per annum. Annual rainfall drops towards the west with drier areas being located inland.

11.2 Topography

The overall topography of the study area is summarized in **Table 6** below and depicted on **Figure 4** below. The slope analysis study indicates that the majority of the project area (30.71%) is characterized by slopes that are between 1:5 - 1:3. Approximately 20,71% of the area's topography has a slope character steeper than 1:3 while 16,19% of the project area is characterised by slopes between 1:7.5 - 1:5. Appropriate planning and design principles suitable for the topography of the area and taking due cognizance of the characteristics of the area, will thus have to be applied during the detailed planning stages of the envisaged housing process.

Table 6: Slope Analysis

Slope Analysis	Area	Percentage of Total Area
Flatter than 1:20	144,58	11,58%
Between 1:20 – 1:10	153,8	12,32%
Between 1:10 – 1:7.5	106	8,49%
Between 1:7.5 – 1:5	202,03	16,19%
Between 1:5 – 1:3	383,29	30,71%
Steeper than 1:3	258,49	20,71%
Total Area	**1248,19**	**100%**

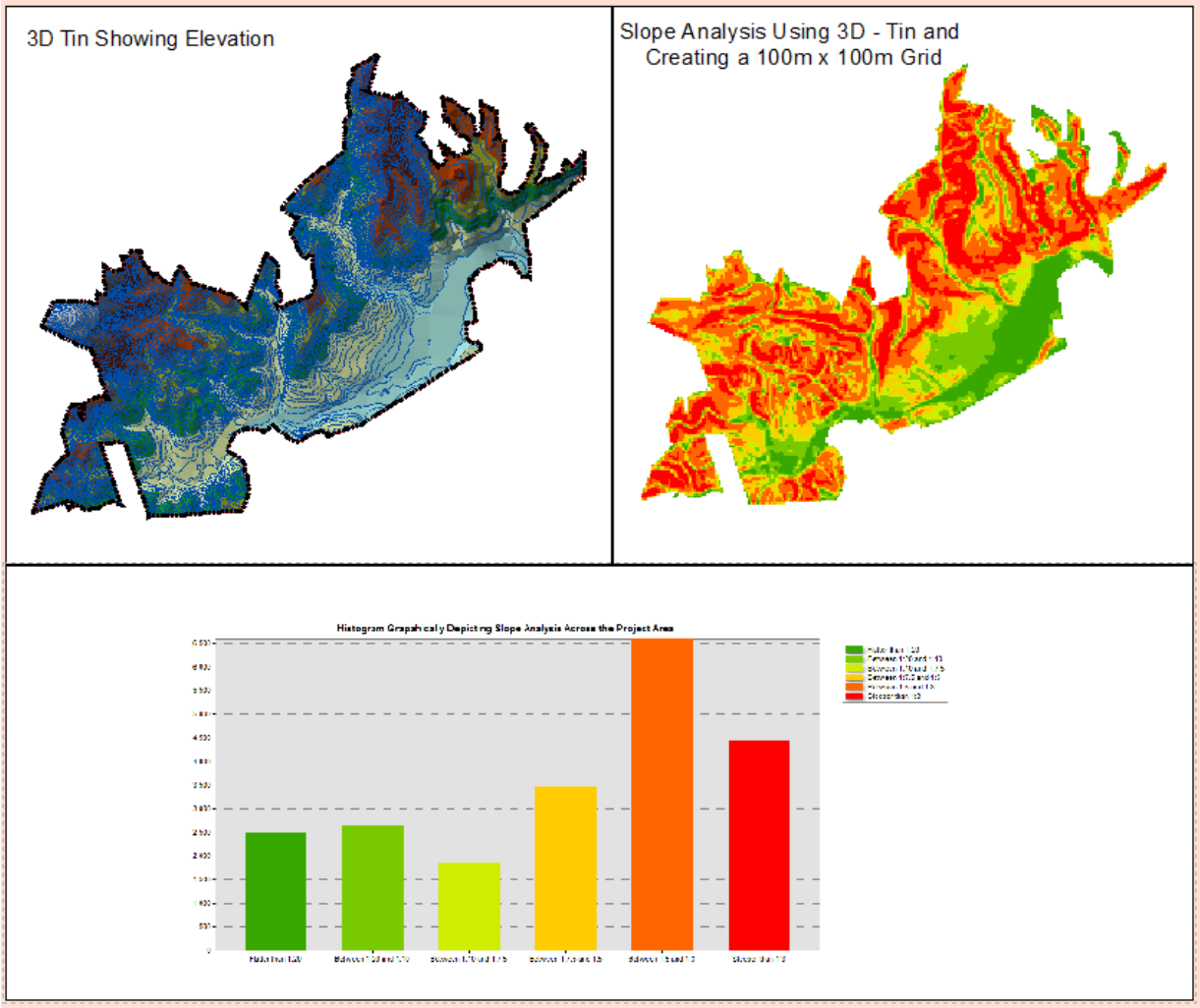

Figure 4: Slope Analysis (extracted from Agricultural Assessment)

11.3 Geology and Soils

A Geotechnical investigation has been undertaken for the Greater Amaoti project area by iLZ Consulting (May 2020). The investigation revealed that the site is underlain by imported, transported and residual soils overlying weathered sandstone bedrock. In addition, the investigation indicated that the proposed project area is suitable for the proposed in-situ upgrades. Test pits were excavated and penetrometer tests were undertaken. The test pits indicated a consistent soil profile across the site. However, the investigation noted that it is possible that the ground profile varies at other areas on site where these investigations were not performed. The specialist has recommended that an experienced engineering geologist or geotechnical engineer is engaged to assess the foundation conditions during construction to ensure that the ground conditions are as anticipated and to make recommendations if conditions change.

11.4 Drainage and Watercourses

11.4.1 Desktop Investigation

There are a number of perennial and non-perennial streams within the project area which may be subject to periodic flooding depending on the rainfall and subsequent runoff at any point in time, either within or upstream of the specific catchment area. Therefore, in terms of the National Water Act, as well as other developmental legislation which are applicable, the project area is subject to a 1:100-year flood line restriction and no development should occur within this area.

Refer **Figure 5** below for a map of the drainage lines and watercourses within the project area.

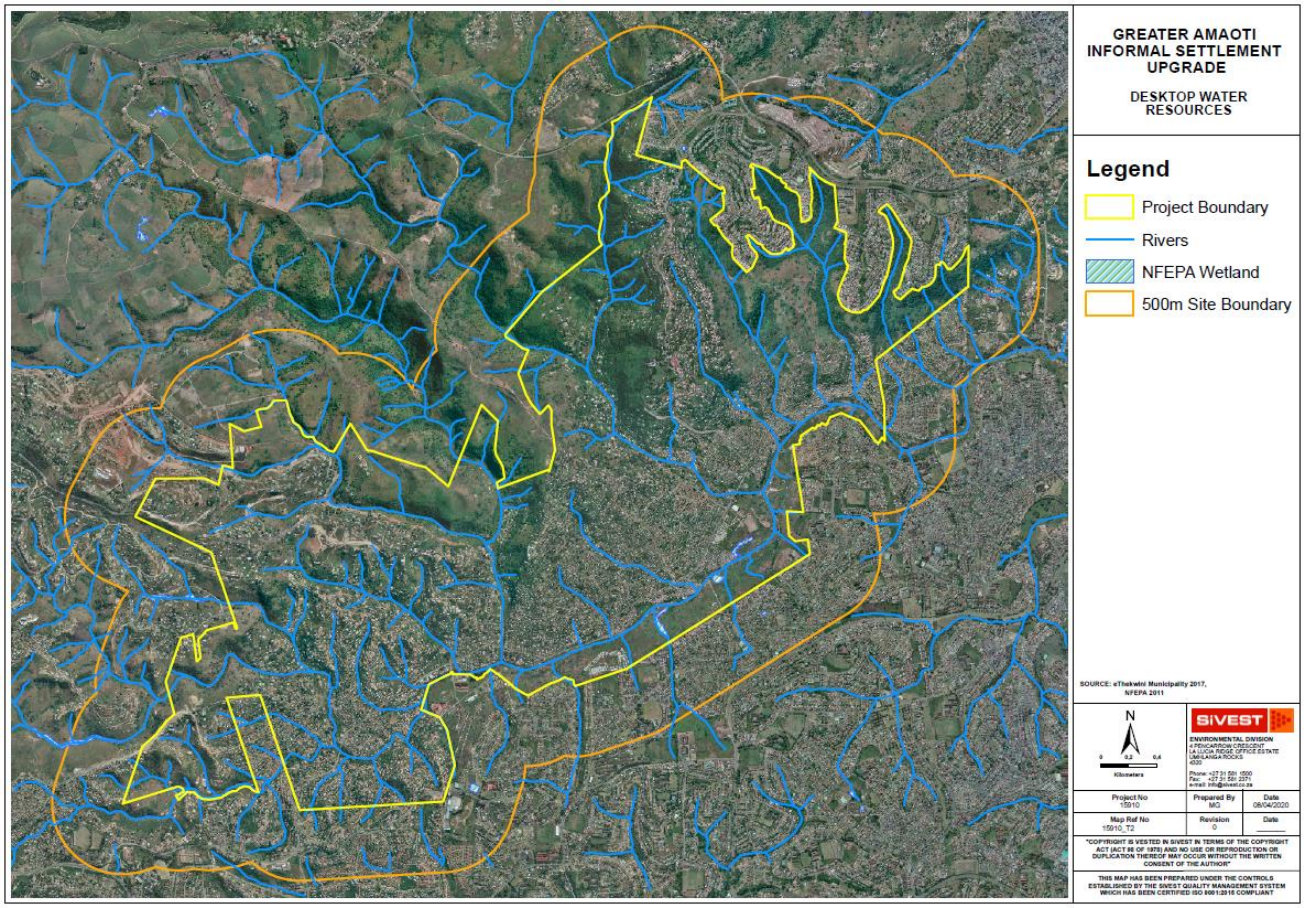

Figure 5: Drainage lines and watercourses

11.4.2 In-field Investigation

A Wetland Assessment was undertaken by The Biodiversity Company in April 2017, updated in April 2019 and reviewed in September 2020. The report has been included in **Appendix F**. The findings from the assessment are included below.

According to the assessment undertaken by The Biodiversity Company, twenty-five (25) HGM units were identified within the project boundary which were grouped into the following:

- Channelled Valley Bottom – Upper Catchment (HGM A);
- Channelled Valley Bottom – Lower Catchment (HGM B);
- Unchanelled Valley Bottom (HGM C);
- Floodplain (HGM D); and
- Hillslope (HGM E).

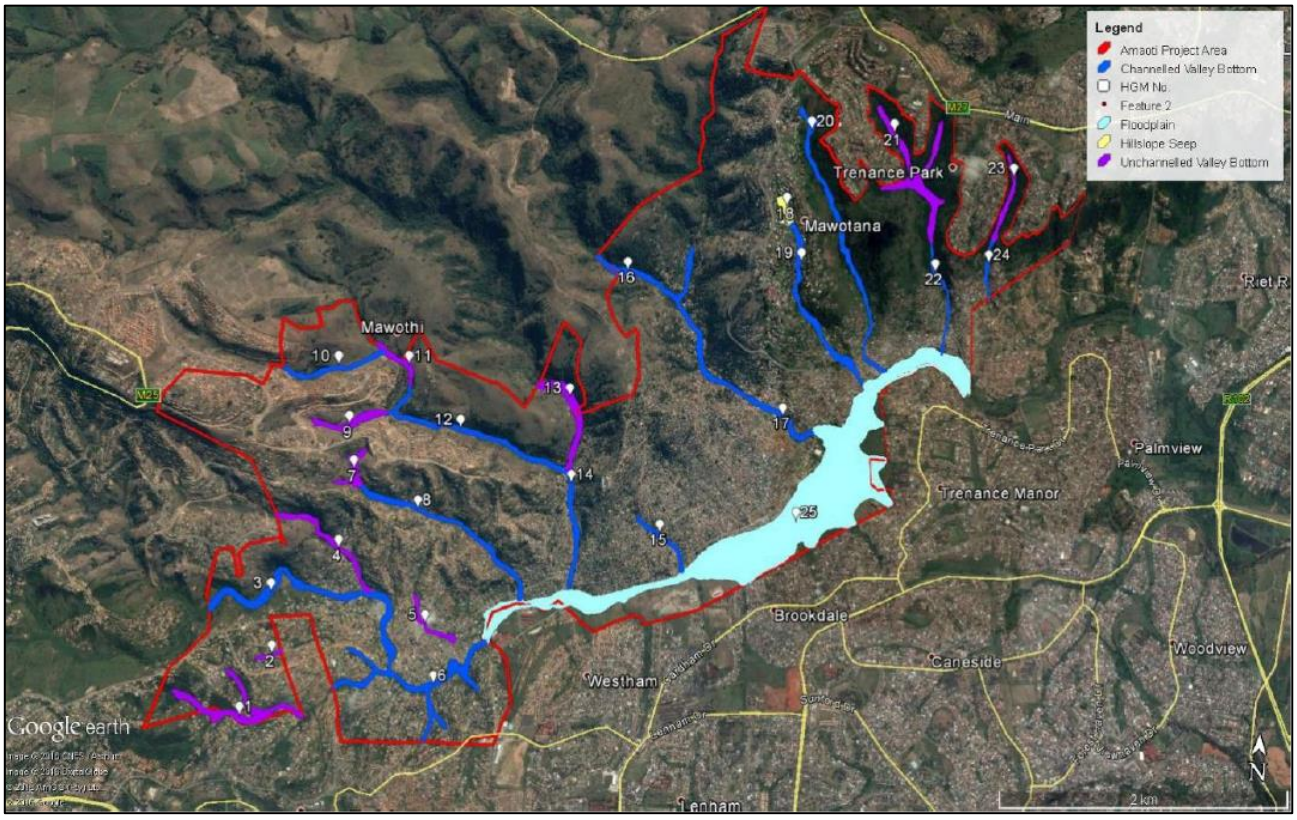

Figure 6: Wetland units identified in the 2017 wetland assessment

For the wetland assessment, the HGM units were collectively assessed for the study. The specialist identified that the channelled valley bottom wetlands identified in the upper catchment were in relatively good condition, not having been impacted upon significantly by the surrounding developments. However, the channelled valley bottom wetlands in the lower catchment were identified to be engulfed by the information settlements and significant impact were recorded with regards to waste (i.e. construction, general and organic waste dumped into the wetlands). Erosion was also identified as well as vegetation that is dominated by alien species.

In terms of the Present Ecological State (PES), the hydrological components for the HGM units were mainly affected by increased water inputs through impervious areas and alien vegetation especially for the lower

catchment channelled valley bottom wetlands (HGM B). The floodplain (HGM D) was seriously modified by increased hydrological inputs.

The geomorphological components were mainly affected by erosion and the increased hydrological inputs especially in HGM B.

The vegetation in all HGM units were impacted on most significantly by alien vegetation with minor influences from infrastructure and erosion. The floodplain was used for agriculture by the community.

Table 7: PES results for wetlands within the project area

HGM A	Channelled valley bottom	Overall PES Class	C: Moderately Modified
HGM B	Channelled valley bottom	Overall PES Class	E: Seriously Modified
HGM C	Unchannelled valley bottom	Overall PES Class	C: Moderately Modified
HGM D	Floodplain	Overall PES Class	D: Largely Modified
HGM E	Hillslope Seep	Overall PES Class	C: Moderately Modified

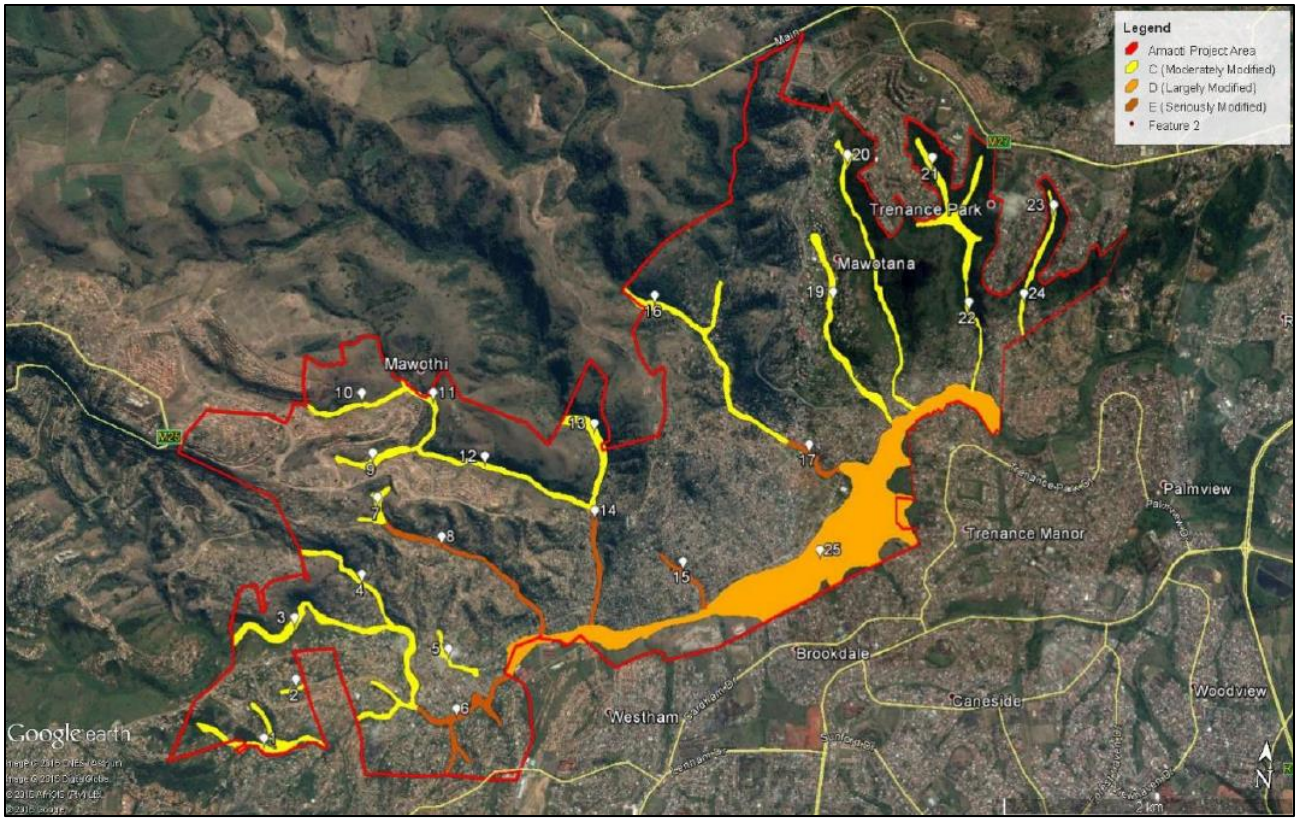

Figure 7: PES ratings of the wetlands within the Amaoti project area

In terms of ecosystem services, the following was identified:

Table 8: Ecosystems services identified

HGM A	HGM B	HGM C	HGM D	HGM E
Overall intermediate level of service.	Overall intermediate level of service.	Overall intermediate level of service	Overall moderately high level of service	Overall intermediate level of service
Moderately high level of services in the following: • Flood attenuation; • Phosphate assimilation; • Erosion control; • Provision of harvestable resources.	Moderately high level of services in the following: • Flood attention; • Sediment trapping; • Phosphate & Toxicant assimilation;	Moderately high levels of services in the following: • Flood attenuation • Phosphate, nitrate and toxicant assimilation; • Erosion control; • Provision of harvestable	Moderately high levels of services in the following: • Flood attenuation; • Sediment trapping • Phosphate, nitrate and toxicant assimilation;	Moderately high levels of service in the following: • Sediment trapping; • Phosphate, nitrate and toxicant assimilation; • Erosion control;

HGM A	HGM B	HGM C	HGM D	HGM E
	• Provision of harvestable resources.	resources and cultivated foods.	• Provision of harvestable resources and cultivated foods.	• Provision of harvestable resources.

In terms of the Ecological Importance and Sensitivity (EIS), the channelled valley bottom wetlands were rated as having moderate importance (C) for all indicators. The unchannelled valley bottom wetlands showed a high (B) level of importance for its hydrological functionality, however the EIS and human benefits were rated as having moderate (C) level of importance. The results show that the floodplain wetland has high (B) levels of importance for Ecological and Hydrological Functioning even though it has been impacted on by the community. The hillslope seep showed a high (B) level of importance for its hydrological functionality, however the EIS and human benefits were rated as having a low (D) level of importance.

The results of the Ecological Importance and Sensitivity (EIS) assessment are summarized in the table below:

Table 9: EIS results for Amaoti

WETLAND IMPORTANCE AND SENSITIVITY					
	HGM A	HGM B	HGM C	HGM D	HGM E
ECOLOGICAL IMPORTANCE & SENSITIVITY	1.7	1.7	2.0	2.7	1.0
HYDROLOGICAL/FUNCTIONAL IMPORTANCE	1.9	1.9	2.1	2.3	2.1
DIRECT HUMAN BENEFITS	1.2	1.2	1.2	1.7	1.1

Buffer zones were suggested for the various HGM units to address the vulnerability of the wetlands to impacts. A buffer zone of between 31m during the construction and operation phase of the project was determined for HGM A, HGM B, and HGM C. HGM D requires a 28m Buffer in both phases with HGM E requiring a 34m buffer. The following buffers were recommended in terms of the development:

Table 10: Buffer Model

Buffer	HGM A	HGM B	HGM C	HGM D	HGM E
Construction	31m	31m	31m	28m	34m
Operational	31m	31m	31m	28m	34m

The specialist concluded that the project has the potential to address a number of aspects that may be improved upon by the development. This includes improving the stormwater management to prevent sedimentation of the receiving environment, which will also in turn address the formation of gullies and head cuts in the catchment area and reduce erosion of the wetland systems. Improved services will provide a formal means for the dumping and disposal of waste for the area and potentially reduce the waste in the wetland systems. Drains and channels that have been dug within the wetlands and catchment to divert flows can be backfilled to restore the hydrology of the systems.

11.5 Fauna and Flora

11.5.1 Desktop Investigation

From a desktop perspective, the majority (71.28%) of the project area is categorised as KwaZulu-Natal Coastal Belt Grassland and is found throughout the project area. The second most dominant vegetation type is the KwaZulu-Natal Coastal Belt Thornveld which covers approximately 20.50% of the project area and is located on the western portions of the project area. Refer **Figure 8** below.

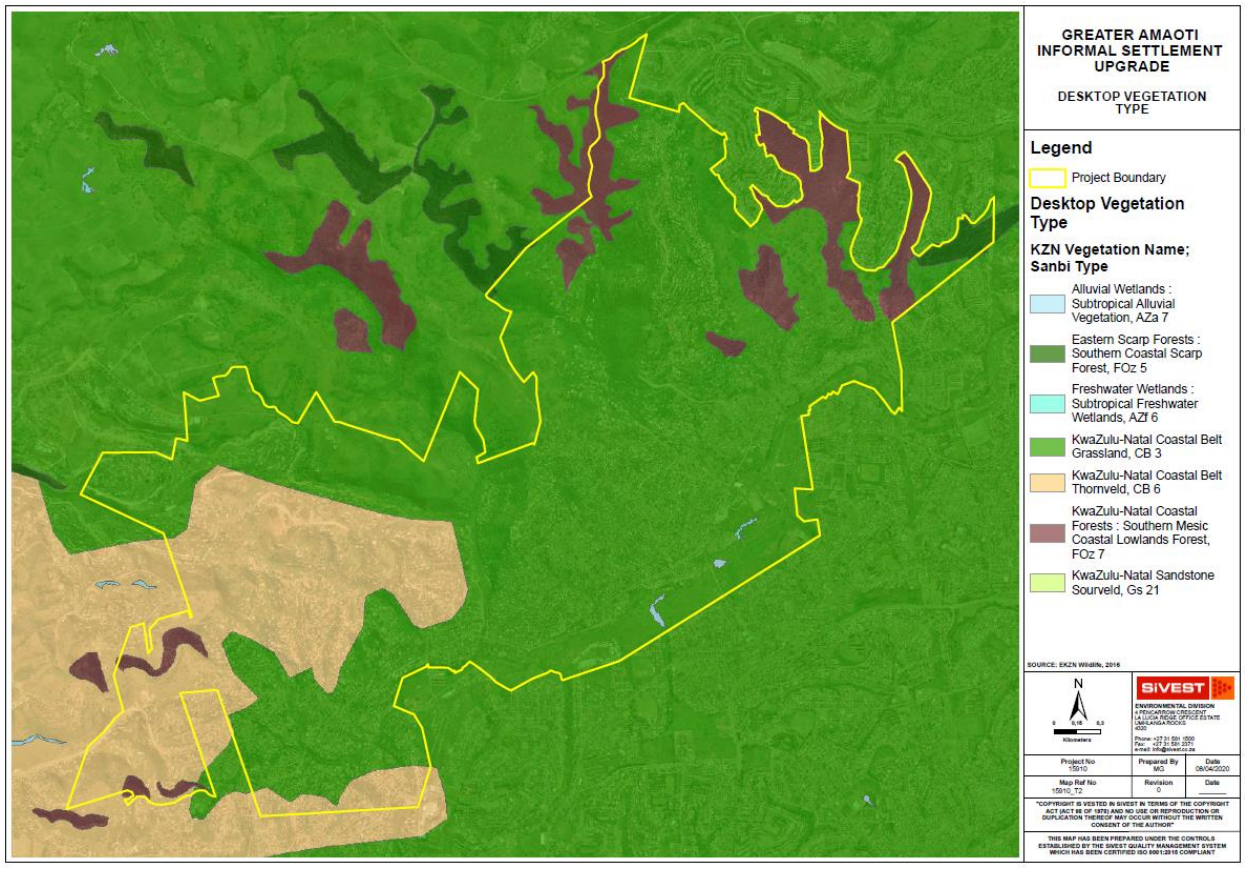

Figure 8: Vegetation Type

A description of the two main vegetation types is provided below.

- **KwaZulu-Natal Coastal Belt Grassland (CB 3)**

Biome: Indian Ocean Coastal Belt
Conservation Status: Critically Endangered
Veld type: Sourveld

The KwaZulu-Natal Coastal Belt is a long and broad coastal strip along the KwaZulu-Natal coast, from near Mtunzini in the north, via Durban to Margate and just short of Port Edward in the south. The altitude of this vegetation unit ranges from about 20 – 450 m above sea level.

The landscape features are described as highly dissected undulating coastal plains which presumably used to be covered to a great extent with various types of subtropical coastal forest (or remnants) thereof.

Some primary grassland dominated by Themeda triandra still occurs in hilly, high rainfall areas where pressure from natural fire and grazing regimes prevailed. At present the KwaZulu – Natal Coastal belt is affected by an intricate mosaic of very extensive sugarcane fields, timber plantations and coastal holiday resorts, with interspersed secondary Aristida grasslands, thickets and patches of coastal thornveld (Camp, 1999, Mucina & Rutherford, 2006; Scott-Shaw & Escott, 2011).

- **KwaZulu-Natal Coastal Belt Thornveld (CB 6)**

Biome: Indian Ocean Coastal Belt
Conservation Status: Vulnerable
Veld type: Sourveld

The KwaZulu-Natal Coastal Belt Thornveld distribution is from Mandini in the north to Oribi Gorge in the south. The altitude of the vegetation unit ranges from 30-500m above sea level (Camp, 1999, Mucina & Rutherford, 2006; Scott-Shaw & Escott, 2011).

The vegetation and landscape features consists of steep valley sides and hilly landscapes mainly associated with drier larger river valleys in the rain shadow of the rain bearing frontal weather systems from the east coast. The vegetation consists of bushed grassland, bushland and bushland thicket and open woodland.

- **DMOSS and CBA**

In terms of DMOSS and CBA, small areas of both were identified within the boundary of the Amaoti site. These areas were mainly associated with the drainage lines and the steeper areas of the site. Refer Figure below.

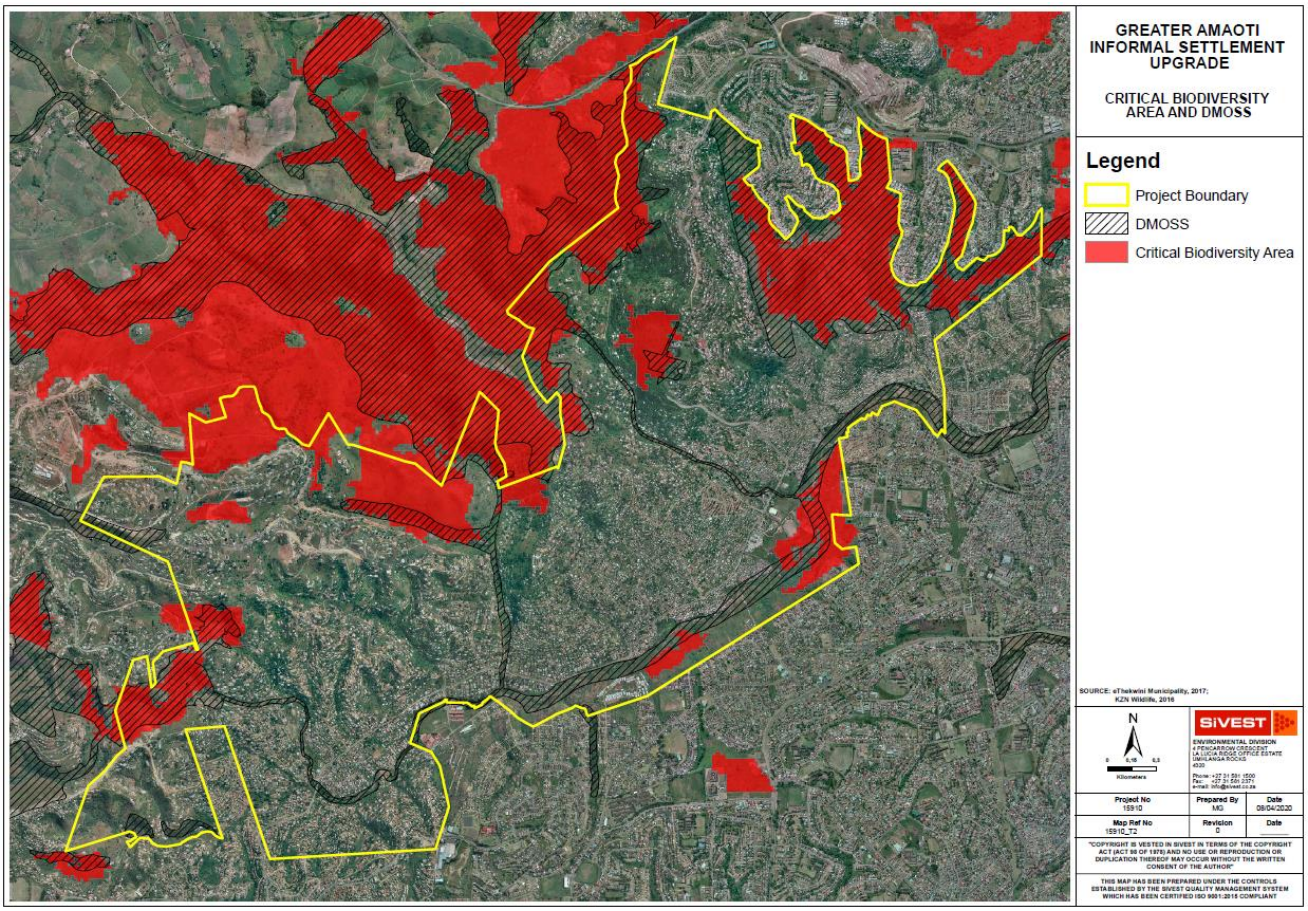

Figure 9: DMOSS and CBA

11.5.2 In-field investigation

A Biodiversity Assessment was undertaken by The Biodiversity Company in April 2017, updated in April 2019 and reviewed in September 2020. According to the assessment undertaken by The Biodiversity Company, the sensitivities relating to the proposed development are as follows:

- The presence of *Hypoxis hemerocallidea* (Red Listed as DECLINING) and the Provincially protected *Scadoxus puniceus Protorhus longifolia, Strelitzia nicolai, Burchellia bubalina* and *Hippobromus pauciflorus* will require permits from eKZN Wildlife before they can be translocated or destroyed.
- Closed-canopy forest over certain parts of the site (especially those designated as part of the D'MOSS) would require permit authorization from DAFF if clearing is required.
- The presence of several Red Listed, Protected and endemic fauna species, specifically in the grasslands and forests on the D'MOSS areas.
- The siting of the proposed development in areas designated as part of the D'MOSS;

- The siting of the proposed development in a vegetation type broadly categorized as a Critically Endangered habitat, although one must concede that the area is already (for the most part) 100% transformed. Only those areas within the D'MOSS remain in a relatively natural state;
- The siting of part of the proposed development in an area where slopes can be characterised as moderate to steep and which will affect runoff and result in a potential erosion risk and contamination of down-slope habitats.

- **Nationally threatened ecosystems**

The study area falls within the 'Critically Endangered' Interior North Coast Grassland ecosystem, with a small area on Ward 55 falling in the 'Vulnerable' KwaZulu-Natal Coastal Belt ecosystem (**Figure 10**). The Interior North Coast Grassland ecosystem is located primarily within the KwaZulu-Natal Coastal Belt biome. Although only about 8% of the original extent of the ecosystem remains, this ecosystem is not protected despite the presence of several threatened and endemic plant of animal species.

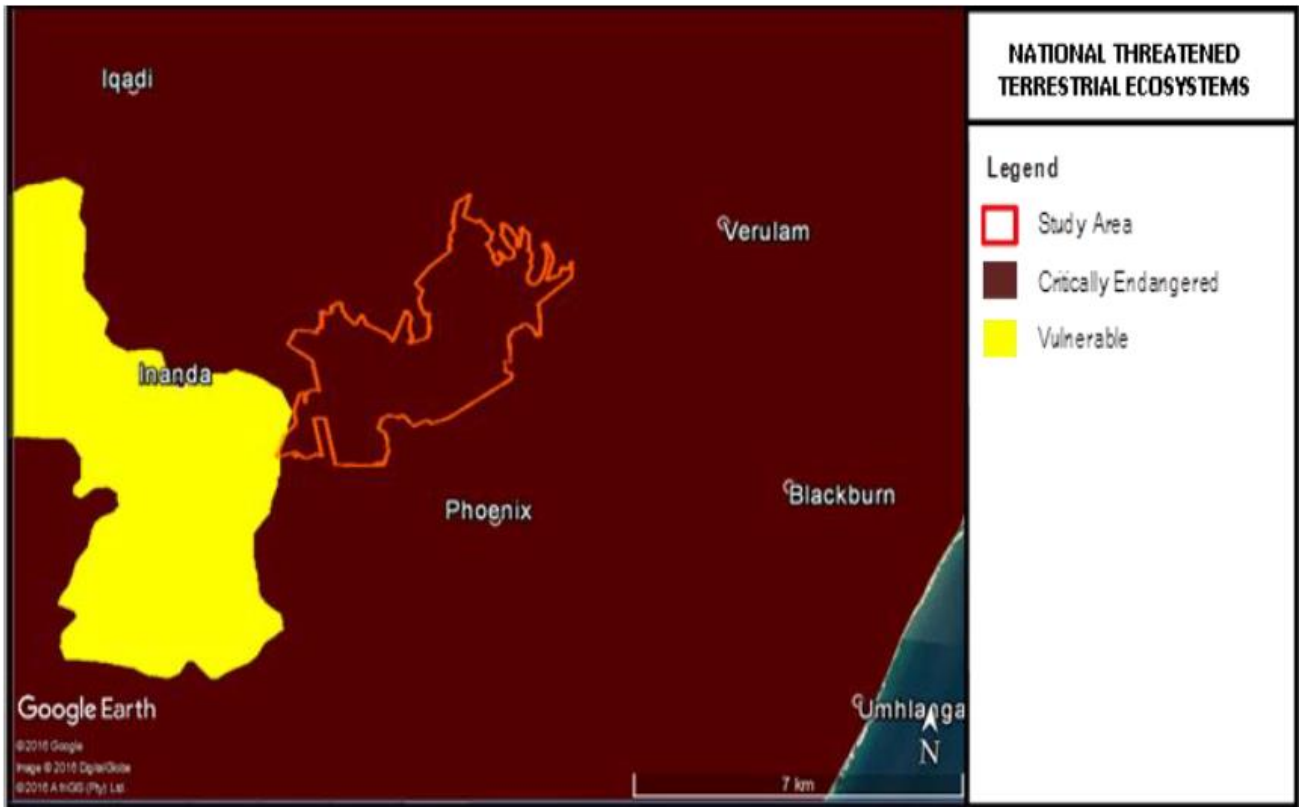

Figure 10: Nationally threatened ecosystems

- **Provincial and District Level Conservation Priorities (KZN SCP, 2012 and KZN BSP, 2014)**

The proposed development will take place predominantly within an area designated as a Critical Biodiversity Area (CBA) type 1 (**Figure 11**). This rating is due to the potential presence of a number of invertebrates such as molluscs, millipedes and orthopterans and the potential presence of Eastern Scarp Forest, North Coast Grassland, Subtropical Freshwater Wetlands, North Coast Bushland and Subtropical Alluvial Vegetation. Furthermore, the presumed extinct taxa Vernonella africana and Barleria natalensis may once have occurred here and might still persist by some remote chance. Gerrardanthis tomentosus (Red Listed as Vulnerable) may well occur in the forests on the site. On a municipal level, several CBA: Irreplaceable areas are located on sections of Wards 53, 56, 57 and 102 (**Figure 11**). Land-use management objectives for these areas include limited to no biodiversity loss in order to maintain these areas in a natural state, thus the proposed land-use activities are not compatible with the aims of the land-use objectives of CBA: Irreplaceable areas.

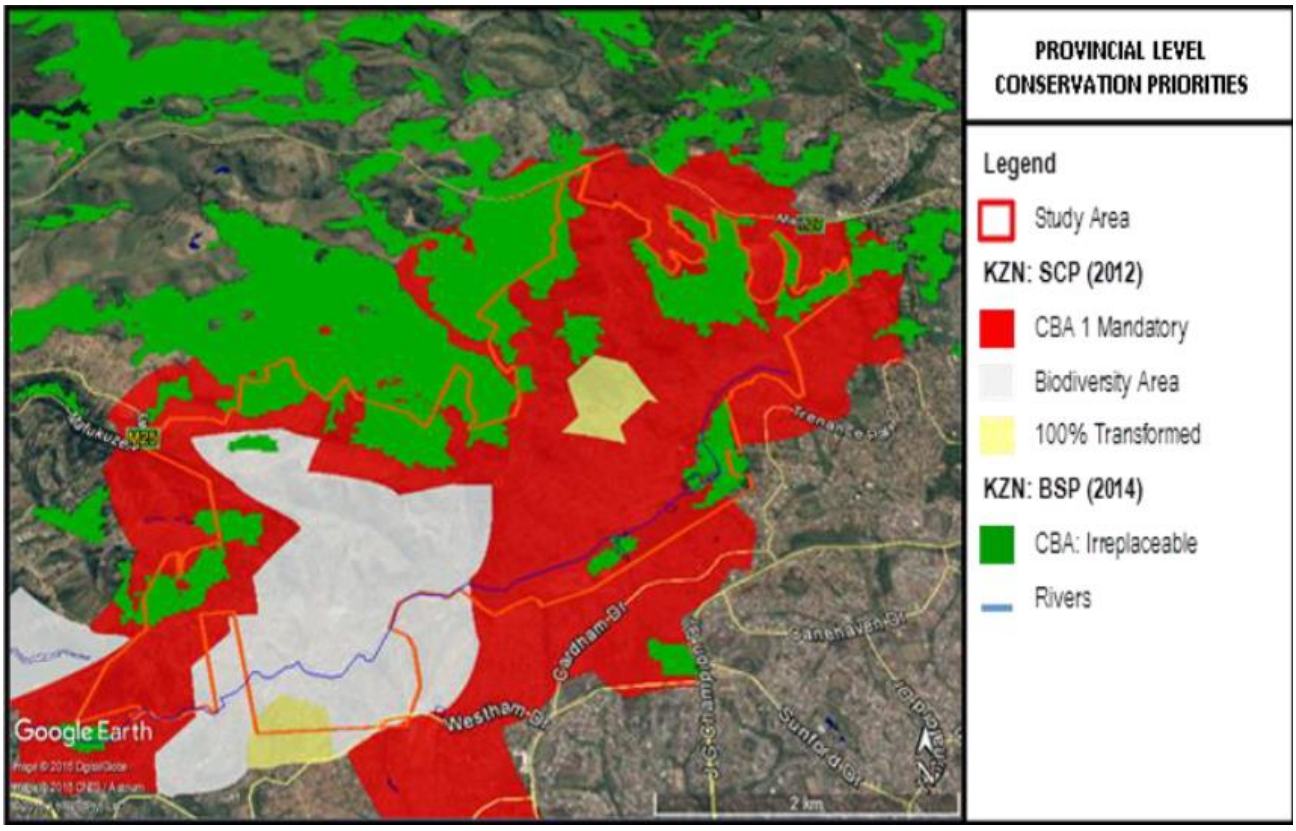

Figure 11: Provincial level conservation priorities

- **Municipal Level Conservation Priorities**

Several D'MOSS areas are present on the study area. Areas such as some of the forested valleys and the Ohlanga River with associated floodplain and wetlands are currently designated as part of the D'MOSS system and are still fairly un-impacted, and make a valuable contribution to the D'MOSS, since they constitute the last remaining near-natural habitats in the study area (**Figure 12**). It would seem prudent to refrain from planning

any development in these areas and to buffer them from the impacts of the general development to retain their integrity which has fortunately remained intact to date despite obvious pressure from informal settlement. While the location of the study area in D'MOSS designated zones does not preclude development, it adds an additional responsibility on the development to be sensitive to the ecological and biodiversity value of the site.

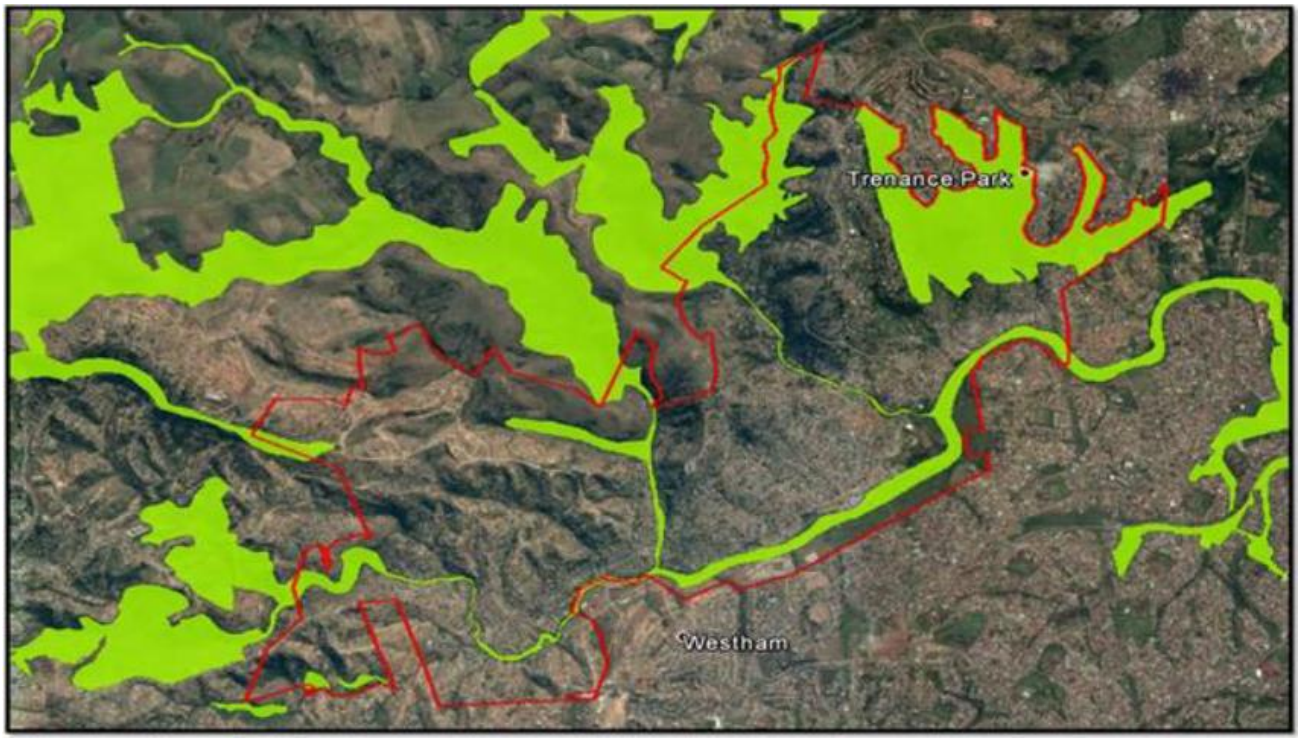

Figure 12: Google Earth view of the extent of the D'MOSS designated zones in relation to the study area

The assessment undertaken revealed that the majority of the study area has been highly-transformed as a result of urbanization. The small amount of remaining vegetation is highly disturbed and invaded by alien species. It has also been heavily impacted on by over-grazing and over-burning in the grassland areas. This is evident from the low species diversity and almost complete absence of geophytes which have presumably been excluded by repeated/prolonged exposure to grazing and burning pressure.

The assessment also identified forested areas on the steeper slopes which for most part is free from disturbance from informal settlements. However, other areas showed evidence of chopping within the forests and numerous examples of dumping of household and garden refuse which has migrated extensively into the forested areas. The specialist recommended that these forested areas be excluded from the proposed development footprint with a 30m buffer in order to preserve the integrity of the D'MOSS.

11.5.3 Summary of biodiversity assessment

The findings of the biodiversity assessment for the proposed Amaoti Housing development project are summarized in **Table 11** below.

Table 11: Summary of Biodiversity Assessment

ECOLOGICAL VALUE	APPLICABILITY TO STUDY AREA
Species aspect of biodiversity	
Protected species of fauna/flora	The presence of Provincially protected plant species in the D'MOSS areas on Wards 56 and 102 was confirmed during field assessments. The presence of Vervet monkeys was confirmed. The presence of a Provincially protected bird species in the D'MOSS area on Ward 102 was confirmed during field assessments.
Threatened species	Several specimens of *H. hemerocallidea* (Declining) are present in grassland on Ward 56. The presence of the African Broadbill (Vulnerable) was confirmed on Ward 102 in the D'MOSS area. The forest and grassland areas on the D'MOSS areas offer sufficient and suitable habitat for several mammal, herpetofauna and avifaunal species of conservation concern.
Keystone species performing a key ecological role (e.g. key predator, primary producer)	None
Endemic species or species with restricted ranges	Several endemic birds are present or expected to occur in the forest and grassland areas of the D'MOSS areas. Similarly, the forest and grassland areas provide sufficient habitat for several endemic reptile species (Appendix 3).
Previously unknown species	None
Community and ecosystem aspects of biodiversity	
Distinct or diverse communities or ecosystems	The largest portion of the study areas fall within the 'Critically Endangered' KZN Coastal Belt Grassland, with
Unique ecosystems	
Locally adapted communities or assemblages	

ECOLOGICAL VALUE	APPLICABILITY TO STUDY AREA
Communities with a high proportion of endemic species or species with restricted ranges	smaller portions on Wards 55 and 57 falling into the VU KZN Coastal Belt Thornveld
Communities with a high proportion of threatened and/or declining species.	
The main uses and users of the area and its ecosystem goods and services: important ecosystem services (e.g. important water area, buffer zone), valued ecosystem goods (e.g. harvestable goods important for lives and/or livelihoods), valued cultural areas.	Harvestable resources/medicinal plants for local community. Several D'MOSS areas are present on the study area
Landscape level aspects of biodiversity	
Key ecological processes (e.g. seed dispersal, pollination, primary production, carbon sequestration).	Several D'MOSS areas are present on the study area and are important for climate change regulation
Areas with large congregations of species and/or breeding grounds.	None observed
Importance as a link or corridor to other fragments of the same habitat, to protected or threatened or valued biodiversity areas.	Several D'MOSS areas are present on the study area. D'MOSS plays a substantial role in climate change mitigation.
Importance and role in the landscape with regard to a range of spatial components or ecological processes; comprising processes tied to fixed physical features (e.g. soil or vegetation interfaces, river or sand movement corridors, upland-lowland interfaces) and flexible processes (e.g. upland-lowland gradients and macro-climatic gradients) as well as important movement or migration corridors for species.	

- **Habitat Sensitivity**

The extent of transformation of terrestrial habitat on the study area has led to the large-scale fragmentation of habitat and loss of terrestrial ecological linkages. The remaining patches of largely untransformed grassland and forest are considered important refugia and potential linkage areas between terrestrial and aquatic

environments. It is considered critical that the remaining intact natural habitat be preserved wherever possible (**Figure 13**). Much of the study area is characterized by steep slopes and poses a relatively high risk of slope instability and erosion during the construction phase.

From a vegetation perspective, the sensitivities relating to the proposed development site are the presence of:

- *Hypoxis hemerocallidea* (Red Listed as DECLINING) and *Scadoxus puniceus* (KZN Specially Protected – All *Amaryllidaceae*) will require permits from eKZN Wildlife before they can be translocated or destroyed; and
- Closed-canopy forest over certain parts of the site (especially those designated as part of the D'MOSS) would require permit authorization from DAFF if clearing was required.

From a fauna perspective, the sensitivities relating to the proposed development site are the presence of:

- The presence of several Red Listed, Protected and endemic fauna species, specifically in the grasslands and forests on the D'MOSS areas.

From a conservation planning perspective, the sensitivities include:

- The siting of the proposed development in areas designated as part of the D'MOSS;
- The siting of the proposed development in a vegetation type broadly categorized as a Critically Endangered habitat, although one must concede that the area is already (for the most part) 100% transformed. Only those areas within the D'MOSS remain in a relatively natural state; and
- The siting of part of the proposed development in an area where slopes can be characterised as moderate to steep and which will affect runoff and result in a potential erosion risk and contamination of down-slope habitats.

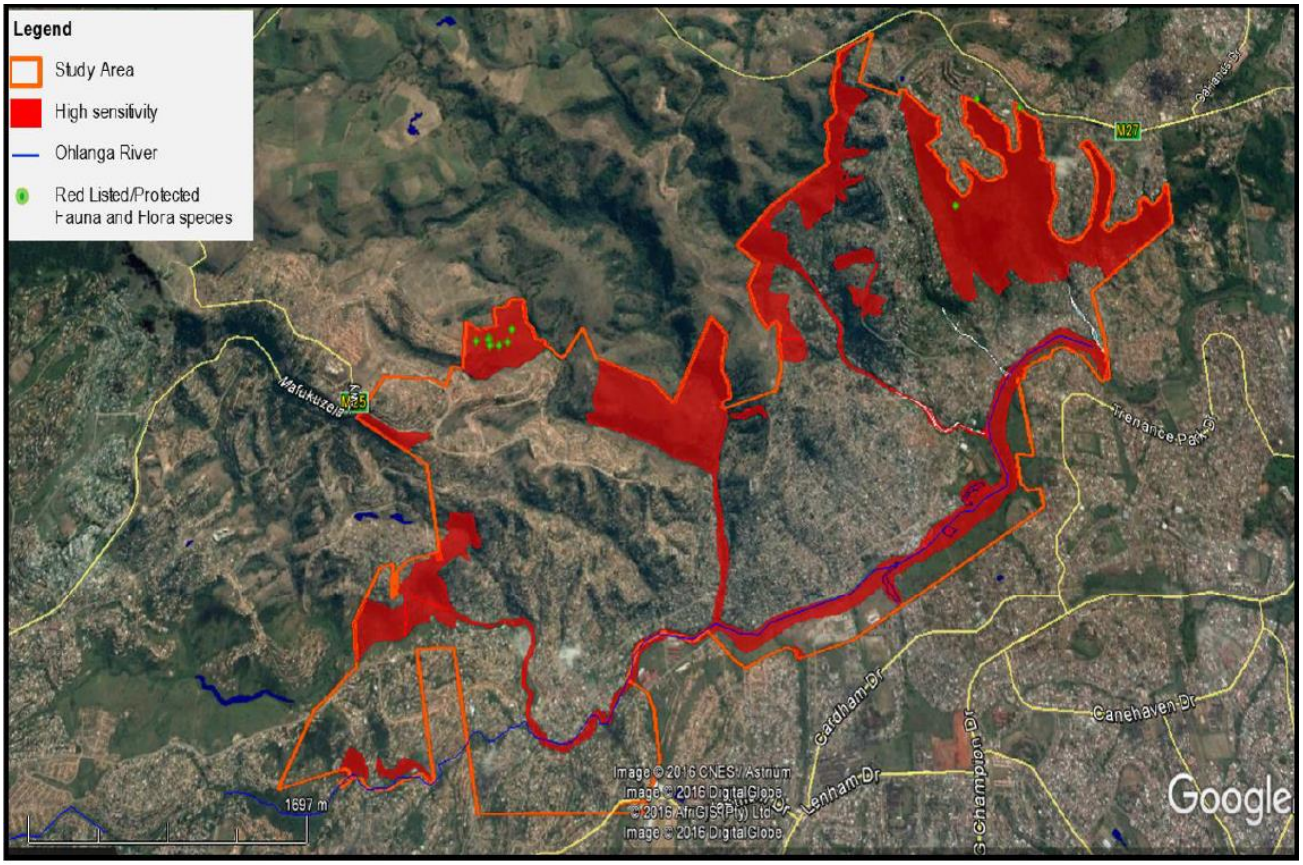

Figure 13: The extent and location of highly sensitive areas in relation to the study area is indicated in red. Development on these areas should be avoided.

An Indigenous Vegetation Delineation of vegetation within the project boundary was undertaken by The Biodiversity Company in February 2021 to determine the level of indigenous vegetation that would need to be cleared as a result of the proposed development. Based on the findings of the survey, there is 336,23 ha of indigenous vegetation within the Amaoti proposed development boundary. Based on the layout design provided, a total of 46,39 ha of indigenous vegetation will need to be removed.

11.6 Agriculture

An Agricultural Assessment was undertaken by K2M Environmental (Pty) Ltd for the project area and reviewed in September 2020. Refer to **Table 12** below for a description of the Agricultural potential of the study area.

Table 12: Agricultural Potential Area (Ha) Percentage of Total Area

Agricultural Potential	Area (Ha)	Percentage of Total Area
Category B:High Agricultural	53,78	4,3%
Category C: Moderate Agricultural	298,74	24,18%

Category D: Low Agricultural Potential	39,74	3,22%
Permanently Transformed	843,32	68,25%
Total Area	**1235,58**	**100%**

Approximately 4.35% of the project area is categorised as Category B: High Agricultural and is located in the south eastern portion, along the Ohlange river (**Table 12**). Due to the limited amount of high potential agricultural land in the municipality, all efforts should be focused on retaining land within this Category for predominantly agricultural use. Land within this category has the potential to be used sustainably, with very few limitations to agricultural production.

Approximately 24.18% of the project area is categorised as Category C: Moderate Agricultural and is located in the northern sections of the project area (**Table 12**). Land with moderate agricultural potential would be required to achieve viable and sustainable food production, although agriculture is the majority land use in the rural landscape. This Category is more limited in the extent of arable land available for cultivation. These areas are more suitable for extensive grazing, the production of fodder crops in support of livestock production, and, from a natural rangeland grazing perspective, additional feed may be required during winter months to supplement the seasonal grazing provided by existing rangeland (Collett and Mitchell, 2013).

There is approximately 3.22% of Category D: Low Agricultural in the western section of the project area (**Table 12**). This land requires significant interventions to enable sustainable agricultural production which could include terracing, contours, high levels of fertility correction, lower stocking rate, supplementary feed, etc.

The assessment revealed that majority (68.25%) of the project area is categorised as Permanently Transformed and is distributed throughout the project area. Areas demarcated as Permanently Transformed, applies to land that has been converted irreversibly to non-agricultural land uses. This includes urban/built up areas, roads, mines and quarries and which can therefore no longer be utilized for agricultural production purposes. This Category will also require regular updates due to on-going non-agricultural development. This may also include previously mined areas which are polluted and/or degraded to the point that safe utilization of the land for food production is not possible.

The assessment noted that change of land use may be supported from agriculture to other land uses as long as this change does not conflict with the surrounding agricultural activity. In addition, the activity must also not interfere with existing agricultural activities, especially where agricultural practices are still the main source of income.

The assessment concluded that the proposed development is not expected to have an impact on agricultural production in the area due to the agricultural limitations of the site including steepness and the level of transformation by human inhabitants. The Department of Agriculture and Rural Development had no objection to the proposed development when the project documentation was submitted to them in November 2016.

12. DETAILS OF THE SOCIO-ECONOMIC ENVIRONMENT

12.1 Current Land Use

The study area is characterized by formal and informal settlements, with a network of various tarred and gravel roads providing access to the settlements. Housing density is high to very high with few natural/untransformed habitats remaining in the area. Several agricultural fields (subsistence farming) are present along the banks of the Ohlanga River towards the south and in the northern section of the project area. Small fragmented pockets of natural and/or semi natural habitat are present on several areas, and are generally restricted to valleys with steep slopes.

12.2 Socio economic characteristics

The Greater Amaoti Housing Project Socio-Economic Survey was conducted in June of 2020. The survey area included the six eThekwini Municipal Wards which forms the project area and these are: - Wards 52, 53,56,57,59 and 102. The area is estimated to contain 20 000 households and the population is estimated to be 193 448. The characteristics of the population in the project area consist of:

- 37% of persons 18years and younger;
- 59% of persons in the age group 19-59;
- 4% of persons 60 years and older.

The survey revealed that, the education levels in the households surveyed is low. Only 3% of the respondents has a tertiary level education, and 68% have high school education level. The survey has established that, of the households surveyed, 8.6% have a member(s) of the family who are disabled. 63.6% of the household have a member(s) who is a social grant recipient. The majority of these households have a child welfare grant beneficiary (ies) 73% followed by old age pensions at 21%. Only nineteen percent of the respondents in the economically active age cohort (18-64 years) are employed. Of the persons, employed 48% are in fulltime employment and 8 percent does piece jobs. The average distance travelled to and from work is 32Km and a large majority of residents in the project area uses taxi (75%) to travel to and from work and to nearest town. It was also found that 8% of respondents use their own car.

The proportion of households with a total monthly income of R 0-R1500 is 76.30 %. Eighteen percent of households earn between R 1501-R3 501 per month while 0.5% of the households surveyed have a combined income R 7000 and above. On average, across the project area, 22% of dwellings have 4 or more households. The majority of the households 42.4% have five or more people living in each household across the project area.

There is a serious dearth of recreational and social facilities across the project area. Only ward 53 has a community hall, and generally the sporting amenities are open spaces. The community uses school sporting fields. All wards have netball fields.

The survey has established that 91% of the households in the project area have access to electricity. Of these 9% that do not have access to electricity, 30% use firewood for cooking and 13% use paraffin. The lack of access to electricity in the area poses a serious safety threat especially in winter, as open fires tend to result in fatalities. Of the 2000 surveyed respondents, 13.8% indicated that there are no roads (including access road) in areas leading to and from their dwelling. The survey also established that 6,6% of households in the project area do not have access to water, and rely on neighbours and other sources to access water. It is also worth noting that 8.5% of households surveyed rely on water tank as a source for potable water. The survey has also established that flush toilets that are connected to public sewerage systems were least common in all the wards and slightly higher in ward 52 (26%). Approximately 20% of households in Ward 59 have no access to any type of sanitation. Across the project area 41% of households use public ablutions facilities.

In the greater Amaoti Housing Project Area 6% of households have a food garden and a 79% (of the 120) grow their food at a homestead plot as opposed to 21% who are part of a community garden. There is a potential challenge in ward 56 where 12% of the respondents indicated that open spaces are used by the community as illegal dumping sites.

- **Environmental responses gathered as part of the socio-economic survey**

As part of the Socio-economic survey that was undertaken, residents were asked a few questions on the importance of environmental resources. Due to the inward migration of people into the area, sensitive habitats such as wetlands and forests have been inhabited as space for housing is very limited. Residents were asked whether they deemed environmental resources important and if they should be protected. Of the respondents, 57% indicated that it is very important for environmental and related resources to be protected, while 15,5% indicated that it is not important to protect the environment.

When looking at open space within the various wards, 100% and 80% of respondents indicated that open spaces in Wards 53 and Ward 102 were used for religious purposes. In one ward (ward 56) 12% of respondents indicated that the open spaces are used by the community as illegal dumping grounds. Open spaces are important in settlements, both through social importance as they add to a healthy lifestyle as well as aesthetically as they determine the characteristic of an area. It is therefore important in the planning of this project that open spaces are preserved to promote a healthy life style and an aesthetic environment. This may be a challenge for this project as the area is prone to illegal land invasions. This may be especially challenging in wards 52, 56 and 59.

12.3 Heritage Assessment

A Heritage Assessment was undertaken by Umlando Consulting in November 2021. The desktop study involved the analysis of various maps for evidence or prior habitation in the study area, as well as previous archaeological surveys. One provincial heritage site (Amafa3475) is listed on the SAHRIS database. However, there is no information on the site on the KZNARI list of heritage sites. There are no listed buildings or heritage sites within the study area.

The 1937 aerial photograph indicates that there are settlements and buildings in the study area. The rest of the study area is grassland or farmland in the north. The settlements are wattle and daub constructions and no longer exist. The rest of the study area is grassland or farmland in the north.

The 1942 Inanda and Verulam topographical maps indicate that there are settlements in the general area as well as buildings.The map is probably based on the 1937 aerial photographs. These buildings would be older than 60 years in age and thus are protected by the heritage legislation. The locations of the buildings are identified in **Figure 14**.

These buildings were reviewed with the latest Google Earth imagery to see if they still exist. The image below shows these buildings where yellow refers to those buildings that could be older than 60 years and green to buildings that have been destroyed, replaced or outside of the planned area. No known buildings older than 60 years have been officially noted on SAHRIS. The buildings that still exist will require some form of management plan.

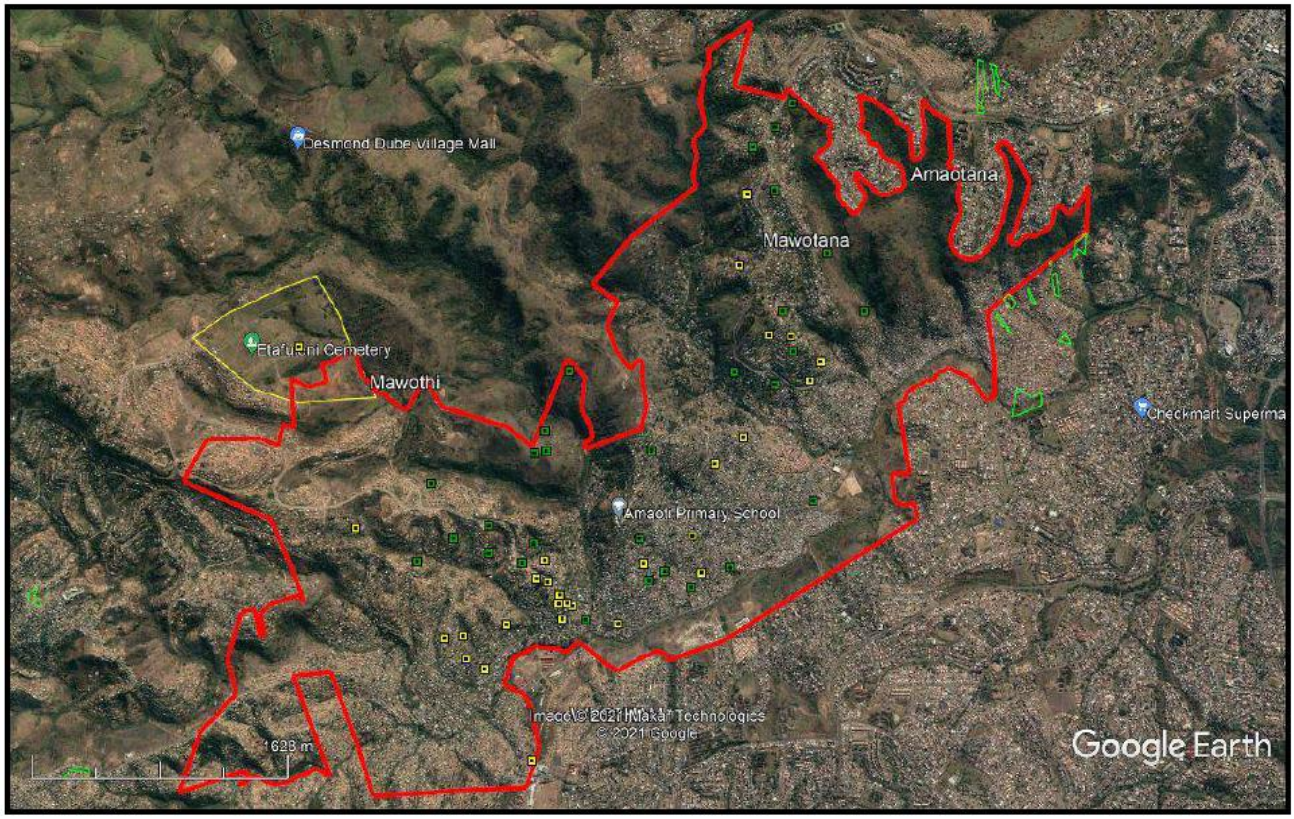

Figure 14: Location of buildings on the 1942 topographical maps (yellow could still exist, green no longer exists)

12.3.1 Palaeontological Sensitivity

Dr Alan Smith undertook the desktop Palaeontological Assessment for the project. Amaoti is in an area of no and medium palaeontological sensitivity. The area is made up of the Natal and Dwyka Groups and the

Pietermaritzburg Formation. The natal Group does not contain fossil remains. The Dwyka Group will contain trace fossils and these are of low significance. The Pietermaritzburg Formation will contain fragmentary plant fossils and invertebrate trace fossils. The chance of significant fossils being found on this site is Low, but not Zero. A “Chance Find Protocol” has been included.

12.3.2 Built Environment

The Built Environment desktop was undertaken by Lindsay Napier. It is noted that most of the structures in the Amaoti area were of the wattle and daub type, of which some would have tin roofs. The area was unserviced up to the 1980s and thus there would not have been any formal architecture, while the traditional vernacular architecture would not have preserved. These houses are thus unlikely to exist.

Larger buildings such as schools, clinics, general grocers, could still exist and these need to be assessed if they are to be upgraded. The farm building Groenberg is unlikely to exist, especially where it is located on the 1942 map, as it is halfway down a steep hill.

12.3.3 Summary, conclusion and/or recommendations

- No known archaeological sites occur within the study area. If any did, they would be severely damaged and out of context.
- No further mitigation is required for archaeological sites. No further mitigation is required for archaeological sites
- The chances of finding paleontological material are very low. A Chance Find Protocol was initiated.
- The occurrence of buildings possibly older than 60 years in age required further mitigation in terms of a Built Environment Desktop. The Desktop noted that most of the houses would have been wattle and daub type constructions and would not have preserved well.
- Only formal buildings such as schools, clinics or general stores would require further assessment if refurbished. Should they require alteration or demolition, a permit will be required.

13. DESCRIPTION OF PROCESS FOLLOWED TO REACH THE PREFERRED OPTION

13.1 Details of alternatives

13.1.1 Introduction

The EIA Regulations, 2010 guideline document stipulates that the environmental investigation needs to consider feasible alternatives for the proposed development. The developer should be encouraged to consider alternatives that would meet the objective of the original proposal and which could have an acceptable impact on the environment. The role of alternatives in the EIA process is therefore to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and/or through reducing or avoiding potentially significant negative impacts.

13.1.2 Activity alternatives

Activity alternatives refer to the consideration of alternatives requiring a change in the nature of the proposed activity to be undertaken. No additional activity alternatives have been identified as the area has for the most part already been settled on through informal housing. The project proposes the in-situ upgrade of an already existing housing area.

The IDP of the eThekwini MM identifies the Amaoti area as an area that requires improved economic and social infrastructure, which is in line with the proposed project. The proposed development is aligned with the eThekwini Municipality SDF as the Amaoti area has been identified as a Mega Housing Project/Catalytic project.

A Ward Needs Assessment was also undertaken to identify needs that are important to residents and to enable meaningful strategies to be implemented to address the identified needs. Key priorities that were identified across all wards were, amongst others, the eradication of informal housing, access to basic quality services and the improvement of road infrastructure. All of these needs should be fulfilled with the implementation of the Amaoti Housing Project.

13.1.3 Location/Site alternatives

No location alternatives where considered as the development involves the insitu upgrade or formalisation of a settlement that has been in existence for many years.

While the area is an existing settlement, it is strategically located near key economic centres as well as the Integrated Rapid Public Transport Network (IRPTN). The establishment of the Durban IRPTN has introduced a series of opportunities by connecting a number of previously segregated parts of Durban with a regional public transport service. Areas in close proximity to the IRPTN (like Amaoti) will enjoy convenient access to a scheduled bus service that will allow people to access opportunities across the city of Durban.

13.1.4 Layout alternatives

No layout alternatives have been assessed as this is an in-situ upgrade with the layout being constrained by natural features as well as human settlement patterns. The area is currently informally developed and the project aims to formalize housing on existing stands. The layout has stayed outside of the environmental sensitive areas as far as possible.

13.1.5 Infrastructure alternatives

- **Housing typologies**

Different housing typologies (e.g. high-rise, standalone units etc.) are being discussed with the community. The discussion on housing typologies was introduced to the community as part of the Wards Needs Assessment so as to desensitize them about the process to be followed to determine the various housing options. While a brief discussion was held about each typology, it was decided amongst the various stakeholders that separate sessions on the housing typologies was required. This exercise still needs to be undertaken and will be discussed further as part of the EIA Phase.

- **Sanitation alternatives**

A waterborne sewage system has been proposed for this project

Waterborne Sewage System

Just as the in-home connection is viewed as the ultimate goal for water supply planners, utilities and households, the private sewer connection represents the highest level of service for household sanitation.
Waste moves from the household toilet into sewers laid underground, then is discharged into a treatment facility and thereafter to the environment and classified as stream save. Convenient, private, with a high degree of user satisfaction, conventional household sewer connections are also costly and require substantial volumes of water for proper use (approximately 6 - 15 litres per flush). For these reasons, conventional sewerage is often beyond the reach of low-income urban neighbourhoods in developing areas.

13.1.6 No – go option

The “no-go” alternative should in all instances be considered as part of the EIA process. It assumes that the activity does not proceed, implying a continuation of the current status quo. The no-go option is, however, not a feasible option in terms of this development and would go against the constitution of South Africa and infringe upon the basic human rights of access to adequate housing. Residents in this area are living in very poor conditions, some without access to running water and electricity, and simply cannot afford for the interventions proposed as part of this development to not be approved.

As stated above, the socio-economic survey undertaken for the project area confirmed that there are people within the project area that do not have access to basic services. Should the project not go ahead, this lack of basic services in the Amaoti area is likely to remain and people would continue to live without these basic services. Pollution will also likely continue to increase coupled with health issues that arise from living in unsanitary conditions.

In addition, the lack of electricity results in the use of firewood and paraffin for cooking, which poses a safety threat especially in winter, as open fires tend to result in fatalities. Should the project not go ahead, these safety threats are likely to continue. A knock on effect of this is that the firewood used for cooking is obtained by cutting down trees in the forest around the project area which is leading to a reduction in the natural resources and biodiversity surrounding the site.

Currently the informal settlements encroach into floodplain and wetland areas. This is both dangerous in terms of flood risks to the community and is also leading to a loss of wetland habitat. By formalising the settlement patterns, and planning the development with wetland buffers in mind, the wetland areas will not be further impacted upon.

13.2 Details of PPP Process undertaken

Public participation is the cornerstone of any EIA. The principles of the National Environmental Management Act (NEMA) as well as the EIA Regulations (2010) govern the EIA process, including public participation. These

include provision of sufficient and transparent information on an ongoing basis to stakeholders to allow them to comment, and ensuring the participation of previously disadvantaged people, women and the youth.

The aim of the Scoping phase is to collect the issues, concerns and queries of interested and affected parties (I&APs) and determine the scope of the following phase of the EIA. The main objective of the Scoping phase is to:

- Inform the stakeholders about the proposed project and the environmental assessment process to be followed;
- Provide opportunity to all parties to exchange information and express their views and concerns;
- Obtain contributions from stakeholders (including the client, consultants, relevant authorities and the public) and ensure that all issues, concerns and queries raised are fully documented;
- Evaluate the issues raised and identify the significant issues; and
- Provide comment on how these issues are to be assessed as part of the Environmental Impact Assessment Process.

The public scoping processes undertaken are in accordance with the required EIA procedures prescribed within national legislation.

13.2.1 Identification of Key Stakeholder and I&AP's

Liaison with the relevant authorities plays a crucial role in the successful completion of any environmental assessment process. In addition to the competent authority, EDTED, key stakeholders, the local municipality as well as other potentially affected I&APs, including adjacent property owners and dwellers, were identified.

The following key stakeholders were identified for this project:

- eThekwini Municipality;
- Department of Human Settlements.
- Department of Water and Sanitation;
- Department of Agriculture, Forestry and Fisheries;
- Department of Transport;
- AMAFA
- Ezemvelo KZN Wildlife;
- Amaoti Project Steering Committee

This list will be updated as the project progresses.

13.2.2 Responsibilities of interested and affected parties (I&AP's)

Members of the public who want to participate in the assessment process need to register and are referred as I&AP's. Registered I&AP's are entitled to comment, in writing, on all written submissions to the authority and to raise any issues that they believe may be significant, provided that:

- Comments are submitted within the timeframes set by the competent authority or extensions of timeframes agreed to by the applicant, Environmental Assessment Practitioner (EAP) and competent authority.
- A copy of the comments submitted directly to the competent authority is served on the applicant or EAP.
- The I&AP discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

13.2.3 Steps taken to notify key stakeholders and potential I&APs

The following process will be followed to notify potential I&APs of the proposed development:

- Fixing a notice board/placement of site notices at intervals around the site.
- Giving written notice as follows:
  - Distribution of Background information documents to the surrounding community by hand delivery (with an opportunity to provide comment should they wish to do so).
  - Distribution of Background information documents to Identified stakeholders by Fax, Email and delivery.
- Placement of adverts in local and regional newspapers as well as the eThekwini Metro
- Meetings will be held with the Project Steering Committee (including Ward Councillors) in each affected ward to understand their requirements/comments/concerns with the proposed development.

13.2.4 Summary of issues raised

To be updated following the 30-day comment period.

13.3 Impact Assessment

The following impacts have been identified:

Table 13: Construction related impacts and associated mitigation measures

Environmental Aspect	Potential Impact	Mitigation
Agricultural	Soil compaction and erosion.	▪ Demarcate all sensitive ecological areas outside of the construction servitude and ensure that these areas remain off-limits during construction. ▪ The creation of any new roads in the site must take into account all sensitive areas and must work around these areas. ▪ Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred such as edges of slopes, exposed soil etc. These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes. ▪ Do not allow surface water or storm water to be concentrated, or to flow down slopes without erosion protection measures being in place. ▪ Vegetation clearing must not be undertaken more than 10 days in advance of the work front. The entire construction area must not be stripped of vegetation prior to commencing construction activities. ▪ All disturbed areas must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated. ▪ Where any construction will take place adjacent to any wetlands, drainage channels or the river, install sediment barriers along the edge of the construction servitude to contain sediment and spoil within the construction area.
	Soil pollution as a result of construction activities.	▪ All waste generated during construction is to be disposed of as per an Environmental Management Programme (EMPr) and no washing of containers, wheelbarrows, spades, picks or any other equipment

Environmental Aspect	Potential Impact	Mitigation
		adjacent to or in any of the channels including the Mvoti River is permitted. ▪ Proper management and disposal of construction waste must occur during the lifespan of the project, including during the operational phase of the project. ▪ No release of any substance i.e. cement, oil, that could be toxic. ▪ Place the construction camp or any depot for any substance which causes or is likely to cause pollution outside of sensitive areas including the steep slopes. ▪ Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using correct solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately.
	Continued spread of alien invasive species as a result of the disturbance.	▪ Protect as much indigenous vegetation as possible. ▪ Rehabilitate disturbed areas as soon as construction in this area has ended. ▪ Ongoing alien plant control must be undertaken during the operational phase after the construction phase and particularly in the disturbed areas. Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species. ▪ The following guidelines apply to re-vegetation: – Utilise erosion and sediment control techniques where needed. – Grade the disturbed area to a stable uniform slope. Vegetative cover will not develop on an unstable slope. – Loosen the soil by hand.

Environmental Aspect	Potential Impact	Mitigation
		– Plant when the weather will permit e.g. suitable temperatures and moisture for plant growth. Spring plantings give the best results. – On unstable soils use a soil saver as described above to protect the bare soil before the planted vegetation has become established.
Biodiversity – Geology	▪ The excavation of rocks creates a void with steep gradient or high stepped walls and can create naturally unstable slope conditions. ▪ Drilling and blasting can create airblast shockwaves and flying rocks. ▪ Dust generation from earthworks.	▪ Geotechnical investigations must be undertaken to identify unstable rock conditions, and slopes that require support in the short-, medium- and long-term. ▪ Plan any new access roads taking contour lines into consideration to minimize cutting and filling operations. ▪ Restrict zones of disturbance and plan excavations carefully. ▪ Optimal fragmentation blast design and correct explosives will reduce fly rock. No blasting on very overcast days.
Biodiversity - Soil	▪ Disturbance or burial of soils as a result of the construction of access roads, infrastructure or stockpiles ▪ Degradation of soil characteristics during medium to long-term stockpiling ▪ Chemical spillages contaminate the soil profile ▪ Concentrated storm runoff from the infrastructure areas is erosive, causing sheet, rill and donga erosion features Inadequate topsoil restoration or creation of unnatural surface topography or slope form which could impact lower or	▪ Adequate characterization of the natural soil catena through detailed mapping, soil classification and profile descriptions are necessary to provide background data required for restoration of ecological gradients and surface drainage characteristics. ▪ Design of contour banks or terraces intended to slow or divert surface runoff and reduce soil erosion requires calculation based on slope gradient, soil type and rainfall conditions. ▪ Topsoil, leaf and plant litter as well as subsoil removed during the construction of roads and building platforms must be stockpiled separately in low heaps, less than 1.5 m high. Microbial activity, seed viability and soil fertility are adversely affected by long periods of stockpiling when high temperatures can be generated in thick deposits, therefore the topsoil should be restored as soon as possible. An alternative is to aerate the stockpiled topsoil regularly (as a minimum every six months). Vegetate with a grass mix natural to

Environmental Aspect	Potential Impact	Mitigation
	adjacent slopes due to increased runoff velocity; ▪ Erosion of restored topsoil due to inadequate erosion control measures; ▪ Low productivity of rehabilitated soils due to inadequate soil fertility or high erosion rates	the area to control erosion. Do not use these stockpiles as storm water control features. ▪ Stockpiling of material on hilly locations are to be avoided, unless appropriate erosion control and management measures are implemented ▪ Storm water diversion and erosion control contour berms are required to separate clean and contaminated water systems around the infrastructure areas. ▪ In the case of petrochemical spillages, the spill should be collected immediately and stored in a designated area until it can be disposed of at a registered facility. ▪ Roads should be routed to avoid water bodies and wildlife habitat where possible, and should be designed to avoid sharp turns to minimize the risk of spills and accidents. Site-specific plans for site erosion and sediment control should be developed and implemented. Measures that should be considered during the construction and operational phases include: ▪ Determining site erosion potential and identifying water bodies at risk; ▪ Establishing to the extent possible buffer zones of at least 100 m around water bodies that are at risk of sedimentation; ▪ Revegetation and maintaining vegetated buffer zones adjacent to any water body for erosion control; ▪ Diverting site drainage away from cleared, graded, or excavated areas; ▪ Using and maintaining sediment barriers or sediment traps to prevent or control sedimentation;

Environmental Aspect	Potential Impact	Mitigation
		▪ Monitoring and maintaining the measures once they are in place to ensure they are effective.
Biodiversity – Indigenous Flora	▪ Loss of Red Listed/Protected species ▪ Loss of genetic variation within a species ▪ Illegal collection of protected species ▪ Negative change in the threat status of a species ▪ Disturbance of indigenous vegetation types and negative impacts of dust or polluted runoff beyond the project area boundaries. ▪ Fragmentation of habitats or isolation of small areas that results in degradation or changes in populations reliant on movement or interchange between habitats or scattered populations. ▪ Cumulative impact of illegal collecting or land use during long-term or life of development can degrade areas and reduce the viability of adjacent areas. ▪ Inadequate control of alien species can result in establishment of	▪ Prior to vegetation clearance, the entire site and the 500 m of adjoining areas must be scanned for the presence of Red Listed/Protected flora species. ▪ Where feasible, buffer zones must be implemented and maintained on areas surrounding Red Listed/Protected plant species. Guidelines as described by SANBI should be followed. ▪ Clearing of vegetation in preparation for construction should be carried out in such a way that: o The area cleared is minimized; o Buffer zones of natural vegetative cover of at least 100 m are retained wherever possible between cleared areas and adjacent bodies of water; o The timing between clearing of an area and subsequent development is minimized. o Where feasible, vegetation from cleared areas may be replanted in nearby habitats for future relocation. ▪ The removal of vegetation will result in the disturbance of soil surfaces. The exposed soil surfaces will potentially be open to invasion by alien plant species. Therefore, a detailed alien invasive species management plan will have to be implemented and maintained. ▪ Effective air pollution control measures are to be implemented to reduce the spread of impacts.

Environmental Aspect	Potential Impact	Mitigation
	populations or seed sources that threaten adjacent areas.	
Biodiversity – Fauna	▪ Loss of Red Listed/Protected fauna species ▪ Loss of local fauna populations ▪ Loss of genetic variation within species ▪ Isolation of local populations ▪ Disturbance of remnant terrestrial wild mammal, avian, amphibian and insect fauna through physical habitat destruction, noise, traffic and movement of people ▪ Large developments can threaten migration routes or flight paths. Cumulative impact of illegal collecting, road kills or power line related deaths reduce population viability in the long-term ▪ Inadvertent killing of slow-moving animals during earthworks ▪ Potential increase in feral animals and impact on indigenous fauna e.g. cats, rats ▪ Illegal hunting or disturbance ▪ Disturbance during breeding season can precipitate long-term cumulative effect on populations	▪ Prior to construction and vegetation clearance a suitably qualified Zoologist should closely examine the project area for the presence of any animal burrows, rock crevices, under logs/stumps and in trees, and relocate any affected animals in appropriate habitat away from the study area; ▪ No more than two weeks in advance of vegetation clearance that will commence during the breeding season (1 September – 1 March) a qualified Zoologist must conduct a pre-construction survey of all potential special-status bird nesting habitat in the vicinity of the study area, and on the study areas. If pre-construction surveys indicate that no nests of special-status birds are present or that nests are inactive or potential habitat is unoccupied, no further mitigation is required; ▪ If active nests are found, avoidance procedures must be implemented on a case-by-case basis. Avoidance procedures may include the implementation of buffer zones, relocation of birds, or seasonal avoidance. If buffers are created, a no disturbance zone muse created around active nests during the breeding season by a suitably qualified Zoologist; ▪ During vegetation clearance, methods should be employed to minimize potential harm to fauna species. Clearing must take place in a phased and slow manner, commencing from the interior of the study area progressing outwards towards the boundary to maximize potential for mobile species to move to adjacent areas; ▪ Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery;

Environmental Aspect	Potential Impact	Mitigation
	▪ Potential permanent change in habitats due to inadequate monitoring and degradation of rehabilitated areas due to inadequate maintenance.	▪ Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals; ▪ All storm water structures should be designed so as to block amphibian and reptile access to the road surface; ▪ Areas beyond the development footprint should be expressly off limits to construction personnel and construction vehicles and this should be communicated to them; and ▪ Control vermin and reduce poaching through staff education and law enforcement ▪ Institute a regular monitoring program to remove road kill carcasses from the road to mitigate impacts on wildlife scavengers. **Specific mitigation measures for bats** Mitigation measures to offset the loss of roosts are detailed below: <u>Trees:</u> ▪ All retained trees will be subject to assessment by means of walk-through surveys for the location of potential bat roosts prior to the commencement of vegetation clearance and construction. This will be done by a bat specialist and/or the Bat Interest Group of KwaZulu-Natal (hereafter referred to as BIG). A bat box scheme must be erected in suitable locations within close proximity to those trees scheduled for removal that have the potential to support roosting bats. Bat boxes must match existing roosts as closely in terms of size, height and aspect as possible.

Environmental Aspect	Potential Impact	Mitigation
		▪ A variety of box types must be provided and the types to be used and their locations for erection will depend on the species and must be decided by a bat specialist and/or BIG and erected under their supervision. These works must be done a minimum of 6 months in advance of planned tree felling to allow bats to become accustomed to new roosting opportunities in the area. ▪ Immediately prior to felling, trees should be examined for the presence of bats or bat activity. This survey could be carried out by a suitable bat specialist or member/s of the BIG. Where bats are still present within an identified roost, it will be necessary to undertake exclusion procedures. The bat specialist/BIG member will advise on the steps necessary for exclusion and the likely time period. If a tree containing a confirmed bat roost must be felled outside the optimum time period, a bat specialist must remove any bats to safety. <u>Tree felling procedures</u> ▪ In order to ensure the optimum warning for bats in any unconfirmed bat roosts that may be present, the trees should be pushed lightly two or three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should be left intact on the ground for at least 24 hours to allow any bats within the tree to escape. <u>Post-development site maintenance and population monitoring</u> ▪ Consideration should be given to the maintenance requirements of the bat boxes. A design life, including essential maintenance, of about 10 years would be appropriate for bat boxes, as this would be comparable

Environmental Aspect	Potential Impact	Mitigation
		to the life span of tree roosts that bat boxes mimic. This life span can be achieved with good quality wooden boxes. ▪ A monitoring plan should be put in place to assess whether the bat populations has responded favourably to the mitigation. If consistent methods (i.e. passive acoustic monitoring) are used pre- and post-development, it will be easier to compare trends.
Biodiversity – Sensitive Terrestrial Ecosystems	▪ Loss of ecological functionality ▪ Loss of biodiversity ▪ Environmental degradation ▪ Loss of habitat for fauna and flora species ▪ Alteration of population dynamics and biotic interactions of species ▪ Loss of refuge areas for climate protection sensitive species and corridors that allow these species to migrate to refuge areas as the temperature and rainfall change	▪ Exclusion of the D'MOSS areas from the development footprint.
Biodiversity – Surface Water	▪ Permanent impact on catchment by capturing surface runoff and/or diverting drainage systems. Degradation of stream channels through long-term reduced runoff and periodic discharge of very high volumes destabilizes the system ▪ Altered storm water runoff response due to large impervious	▪ A comprehensive surface runoff and storm water management plan, indicating how all surface runoff generated as a result of the development will be managed prior to entering any natural drainage system, and subsequently released to simulate natural hydrological conditions; and ▪ Optimize residue stockpile and deposit slope length and gradient to reduce erosional effect of storm runoff.

Environmental Aspect	Potential Impact	Mitigation
	areas and concentrated runoff in drainage systems ▪ Loss of habitat for fauna and flora species ▪ Displacement of fauna species <u>Storm water runoff and drainage</u> ▪ Increased erosion, dust generation and potential chemical contaminants reduce surface water quality or result in discharge that exceeds the maximum concentrations permitted by the National Water Act ▪ Vehicle wash bays and workshop facilities produce petrochemical and solvent which contaminated surface runoff; ▪ Sanitary conveniences, fuel depots or storage facilities of potentially polluting substances can contaminate surface water. ▪ Permanent impact on catchment by capturing surface runoff and/or diverting drainage systems. Degradation of stream channels through long-term reduced runoff	

Environmental Aspect	Potential Impact	Mitigation
	and periodic discharge of very high volumes destabilizes the system ▪ Altered storm water runoff response due to large impervious areas and concentrated runoff in drainage systems	
Biodiversity – Noise	▪ Noise from construction machinery disrupting fauna movement and may cause displacement	▪ Prepare a noise reduction plan to cover all significant impacts at source and implement noise reduction and screening to limit exposure. ▪ Blasting should not be carried out under very overcast conditions or low level cloud cover as this increases the noise and vibration transmission. This impact can be reduced through selection of explosives, sequencing the blasts, deflection by structures and timing of the blast to coincide with periods of high activity or increased ambient noise levels. Drilling and blasting contractors must monitor the blast noise, shock and vibration felt at the boundary of the mine. ▪ To reduce low intensity noise levels, work areas need to be effectively screened to reduce or deflect noise. Engineering controls such as modifications to equipment or work areas to make it quieter, the acquisition of equipment designed to emit low noise and vibration, creation of noise barriers, proper maintenance of tools and equipment must be considered.
Biodiversity – Artificial Lighting	▪ Disruption of the physiological and behavioral patterns of fauna species	▪ Outside lighting should be designed to minimize impacts on fauna; ▪ All outside lighting should be directed into the proposed development as opposed to away from the development, and also not in the direction of sensitive areas, including sensitive areas on neighbouring properties; and ▪ Fluorescent and mercury vapor lighting should be avoided and sodium vapor (yellow) lights should be used wherever possible.

Environmental Aspect	Potential Impact	Mitigation
Wetland ▪ Clearing of areas for development ▪ Compaction of soils & sedimentation Drainage patterns change due to increased hardened surfaces ▪ Drainage patterns change due to crossing Stormwater management ▪ Construction and upgrade of the roads Bridge constructions ▪ Additional Associated Infrastructure Borrow Pits ▪ Cutting/reshaping of embankments	▪ Impeding the flow of water. ▪ Loss of aquatic habitat ▪ Siltation of watercourse. ▪ Erosion of watercourse. ▪ Sedimentation of the watercourse. ▪ Flow sediment equilibrium change ▪ Water quality impairment	<u>Road construction mitigation measures</u> The following road construction specific mitigation measures are provided: ▪ To minimise the impact on both surface water flow and interflow, portions of the road must include a coarse rock layer that has been specifically incorporated to increase the porosity and permeability of the sub-layers of the road; ▪ Concrete pipes must be strategically positioned under the road to drain surface water; this will ensure the road prism does not act as a barrier to water flow; ▪ The footprint area of the road should be kept a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas; ▪ All construction activities and access must make use of the existing road; ▪ Exposed road surfaces awaiting grading must be stabilised to prevent the erosion of these surfaces. Signs of erosion must be addressed immediately to prevent further erosion of the road; ▪ Silt traps and fences must be placed in the preferential flow paths along the road to prevent sedimentation of the watercourse; ▪ Temporary storm water channels should be filled with aggregate and/or logs (branches included) to dissipate flows; ▪ The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; and ▪ A suitable storm water plan must be compiled for the road. This plan must attempt to displace and divert storm water from the road, and discharge the water into adjacent areas without eroding the receiving

Environmental Aspect	Potential Impact	Mitigation
Traffic / vehicle activity		areas. It is preferable that run-off velocities be reduced with energy dissipaters and flows discharged into the local watercourses. <u>Bridge upgrade mitigation measures</u> The following bridge upgrade specific mitigation measures are provided: ▪ The footprint area of the bridge must be kept to a minimum. The designated area should be demarcated to avoid unnecessary disturbances and encroachment into adjacent areas. ▪ Portions of the entry/exit road for the bridge must include a coarse rock layer that has been specifically incorporated to increase the porosity and permeability to accommodate flooding. ▪ The crossing should make use of a spanned piers with minimal instream piers. No structures must be placed within preferential flow paths. ▪ Piers should be constructed on the bedrock (if possible) and not within the channel bed, nor within the preferential flow path of the systems to avoid obstructing flows. ▪ The height of the bridge should accommodate the 1:100yr flood events. ▪ The bridge crossing must be aligned along the existing routes of disturbance i.e. where river bed and banks have already been modified. ▪ Embankments should be stabilised with gabions and mattresses to secure these areas and prevent further erosion. <u>General mitigation measures</u> The following general mitigation measures are provided: ▪ The wetland areas outside of the specific project site area must be avoided where possible;

Environmental Aspect	Potential Impact	Mitigation
		▪ The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access; ▪ Laydown yards, camps and storage areas must be beyond the aquatic areas. Where possible, the construction of the road and crossings must take place from the existing footpath and not from within the aquatic systems; ▪ The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; ▪ It is preferable that construction takes place during the dry season to reduce the erosion potential of the exposed surfaces; ▪ Temporary storm water channels and preferential flow paths should be filled with aggregate and/or logs (branches included) to dissipate and slow flows limiting erosion; ▪ Prevent uncontrolled access of vehicles through the river system that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas; ▪ All chemicals and toxicants to be used for the construction must be stored outside the channel system and in a bunded area; ▪ All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site; ▪ All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”; ▪ Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);

Environmental Aspect	Potential Impact	Mitigation
		▪ Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the aquatic systems; ▪ All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the watercourse. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; ▪ Erosion and sedimentation into the channel must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed banks; ▪ Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching; ▪ Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; ▪ Large trees and other debris often collect upstream against the culverts, damming up the channel with risk of flooding and damaging the river crossing and its banks. This debris should be cleared routinely with appropriate disposal of the debris. Timber can be sold or donated to local communities; ▪ No dumping of construction material on-site may take place; and ▪ All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.
Socio-economic	▪ Provision of housing ▪ Provision of basic services ▪ Improvement in quality of life ▪ Access to opportunities	n/a

Environmental Aspect	Potential Impact	Mitigation
	▪ Potential employment opportunities/skills transfer	
Heritage	Impact to heritage resources (buildings older than 60 years old)	▪ Only formal buildings such as schools, clinics or general stores would require further assessment if refurbished. Should they require alteration or demolition, a permit will be required.
	Impact to palaeontological resources	▪ A Chance Finds Protocol has been included in the Heritage Assessment and must be adhered to should any palaeontological resources be identified during construction. ▪ If any fossils are found, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist. ▪ In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeo-material: o The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues. o Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labelled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers. <u>Functional Responsibility of Developer</u> ▪ At full cost to the project, and guided by the appointed Palaeontological Specialist, ensure that a representative archive of palaeontological

Environmental Aspect	Potential Impact	Mitigation
		samples and other records is assembled to characterize the palaeontological occurrences affected by the excavation operation. ▪ Provide field aid, if necessary, in the supply of materials, labour and machinery to excavate, load and transport sampled material from the excavation areas to the sorting areas, removal of overburden if necessary, and the return of discarded material to the disposal areas. ▪ Facilitate systematic recording of the stratigraphic and palaeo-environmental features in exposures in the fossil-bearing excavations, by described and measured geological sections, and by providing aid in the surveying of positions where significant fossils are found. ▪ Provide safe storage for fossil material found routinely during excavation operations by construction personnel. In this context, isolated fossil finds in disturbed material qualify as “normal” fossil finds. ▪ Provide covered, dry storage for samples and facilities for a work area for sorting, labelling, and boxing/bagging samples. Costs of basic curation and storage until collected. Documentary record of palaeontological occurrences must be done. ▪ The contractor will, in collaboration with the Palaeontologist, make the excavation plan available to the appointed specialist, in which appropriate information regarding plans for excavations and work schedules must be indicated on the plan of the excavation sites. This must be done in conjunction with the appointed specialist. ▪ Initially, all known specific palaeontological information will be indicated on the plan. This will be updated throughout the excavation period. ▪ Locations of samples and measured sections are to be pegged, and routinely and accurately surveyed. Sample locations, measured sections, etc., must be recorded three dimensionally if any “significant fossils” are recorded during the time of excavation.

13.4 Concluding statement for preferred alternative

The preferred alternative, and only feasible option for the housing project, is the in-situ upgrade and formalisation of services in the Amaoti area.

No location alternatives have been considered as the area is already developed with housing both formal and informal. The project entails the construction of formal housing on stands in an area already mostly developed for the same purpose.

No layout alternatives will be considered as part of the EIA process. The proposed development is for an in-situ upgrade with the layout being constrained by natural features as well as human settlement patterns. The area is currently informally developed, and the project aims to formalize housing on existing stands. Impact assessments will be undertaken on the current proposed layout.

14. PLAN OF STUDY FOR EIA

This Plan of Study, which explains the approach to be adopted to conduct the EIA for the proposed Amaoti Housing Development was prepared in accordance with Appendix 2 of GN No. 326 (7 April 2017).

The purpose of the EIA Phase is to:

- Address issues that have been identified through the Scoping Process;
- Assess all identified impacts associated with the proposed layout and determine the significance of each impact; and
- Recommend actions to avoid/mitigate negative impacts and enhance benefits.

The EIA Phase consists of the following processes:

- Undertaking of specialist studies that provide additional information/assessments required to address the key issues raised in the Scoping Phase.
- An assessment process whereby inputs are presented in an EIA Report that is submitted for approval to EDTEA and other authorities.
- Undertaking of a PPP process where findings of the EIA Phase are communicated and discussed with I&APs and responses are documented.

14.1 Tasks to be undertaken

The EIA report will be informed by the scoping phase. The following steps will be undertaken as part of the EIA phase:

- The proposed layout will be further investigated in order to avoid or minimize negative impacts and maximize potential benefits;

- Environmental impact statements regarding the potential significance of residual impacts, taking into account proposed mitigation measures will be provided in the EIA;
- An Environmental Management Programme (EMPr) covering construction and decommissioning phases of the proposed development will be prepared. The EMPr will include input from specialists and will incorporate recommendations for mitigation and monitoring.
- The Draft Relocation Plan will be investigated further during the EIA Phase to ensure that the site chosen is suitable and environmental considerations have been taken into account.

14.2 Description of alternatives to be considered and assessed

The EIA phase will include a detailed analysis of the proposed layout for the project which will include environmental (with specialist input) and technical evaluations. Any additional alternatives identified through this process will be reported on in the EIA report.

14.3 Specialist Studies

The following specialist studies have been undertaken for the project:

- Agricultural (September 2020);
- Biodiversity (April 2017, updated April 2019, reviewed 2020);
- Geotechnical (October 2020);
- Socio-economic (July 2020);
- Heritage (November 2021);
- Water Resources (April 2017, updated April 2019, reviewed 2020);
- Stormwater, Roads, Water status quo reports (April 2020) and engineering details (March 2021).

Biodiversity and Water Resource Specialist studies were undertaken in April 2017 as part of an initial approval process however the project was put on hold and the approval process was halted. The specialist studies undertaken in 2017 were updated in April 2019 and have since been reviewed and updated in September 2020 to confirm that the status quo on site remains the same and no changes have taken place.

The findings of the specialist studies have been included in the Scoping Phase of this project. The associated Impact Assessment tables will be including in the draft EIA report. Should the need for additional specialist studies be identified through the consultation process, these studies will be commissioned in the EIA Phase to further advise on the potential impacts that may arise from the proposed development. The specialist studies may identify opportunities and constraints as associated with the site and the proposed development.

The specialists have undertaken the following scope of work:

Table 14: Specialist Scope of Work

Type of Assessment	Scope of Work
Wetland Assessment	▪ Characterise the baseline status of wetland ecosystems associated with the proposed development;

Type of Assessment	Scope of Work
	▪ Identify sensitive features, i.e. habitats, species of conservation concern, unique features that may be negatively impacted upon by the proposed development; ▪ Assess the significance of potential impacts on wetland ecosystems associated with the development; ▪ Identify potential mitigation measures that can be implemented in order to reduce the significance of impacts; ▪ Reassess the significance after implementation of mitigation measures; and ▪ Comment on the ecological sustainability and viability of the proposed development from the perspective of wetland ecosystems.
Biodiversity Assessment	▪ To qualitatively and quantitatively assess the significance of the fauna and flora habitat components and the current general conservation status of the study area; ▪ Identify and comment on ecological sensitive areas and ecological service(s); ▪ Provide an inventory of the dominant flora species at the site; ▪ To provide a list of fauna and flora species that may occur, and to identify species of conservation importance; ▪ To highlight the potential impacts of the proposed development on the fauna and flora species deemed present on the study area; ▪ Identification of sensitive habitats within the site; ▪ Identify impacts upon habitat in terms of floral significance; ▪ Identification of conservation significant habitats around the site which might be impacted by the proposed development; ▪ To provide management recommendations to mitigate negative and enhance positive impacts should the proposed development be approved; and ▪ To identify any environmental fatal flaws or red flag issues.
Agricultural Assessment	▪ Desktop assessment of aerial imagery, GIS databases and literature reviews; ▪ Field investigation; ▪ Information on socio-economic characteristics, biophysical characteristics, agricultural potential and mitigation measures.
Geotechnical Assessment	▪ Excavation of test pits at selected locations across the various regions. Test pits to be logged by an engineering geologist in accordance with Guidelines for Soil and Rock Logging in SA by SANS 633 (2012). Excavation were done randomly around the site and spread such that they are representative of the study area. ▪ Obtaining of soil samples from the test pits for testing at a SANAS accredited laboratory. ▪ Presentation of field data and laboratory data. This should include photos, profiles, penetrometer results and laboratory test results. ▪ Analysis of results and production of the Geotechnical Investigation Report.

Type of Assessment	Scope of Work
Socio-economic Survey	To provide information to support project planning and future needs of the area through the following: ▪ Develop a questionnaire; ▪ Appoint field workers; ▪ Conduct door to door field survey of randomly selected households; ▪ Cleaning and capturing of data collected by fieldworkers; ▪ Data analysis; ▪ Use of IDP and other secondary data sources; and ▪ Report writing.
Engineering Services	To provide a holistic overview of completed designs, installed infrastructure, and their condition to date. The following aspects are included: ▪ Key challenges relative to the present population and topography; ▪ Discussion on natural water resources within the development; ▪ Discussion on existing services surrounding and within the development area; and ▪ Discussion on already designed services surrounding and within the development area.
Heritage Assessment	To provide a Heritage Impact Assessment for Amaoti Housing Development. ▪ Desktop assessment of all relevant databases, archaeological site locations and basic information from several provinces. ▪ Survey (if required) of each recorded site as well as a management plan ▪ Impact assessment of proposed project on heritage resources

14.4 Consultation with Competent Authority

SiVEST will consult with EDTEA as follows:

- Pre-application meeting with EDTEA.
- Submission of application form to obtain EIA reference number.
- The Draft Scoping report will be made available for comment to I&Aps, key stakeholders and the authorizing authority.
- After the Draft Scoping Report has been made available for comment within the public domain, comments will be incorporated into the Issues and Response Report and Final Scoping Report.
- The Final Scoping Report will then be submitted to EDTEA for approval.
- A site visit with EDTEA is proposed once the Final Scoping Report has been submitted.
- The Draft EIA report will be made available for comment to I&Aps, key stakeholders and the authorizing authority.
- After the Draft EIA report has been made available for comment within the public domain, comments will be incorporated into the Issues and Response Report and Final EIA Report for submission to EDTEA.

- Apart from the above-mentioned occasions, further consultation with authorities will occur whenever necessary.

14.5 EIA methodology

The EIA Methodology (prepared by SiVEST, dated 2019, Version 1) assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

The determination of the effect of an environmental impact on an environmental parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the environmental practitioner through the process of the environmental impact assessment. The impact evaluation of predicted impacts is undertaken through an assessment of the significance of the impacts.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

In order to classify the potential impacts of a development, a rating system has been developed. The following criteria is used for the rating of impacts:

Table 15: Rating System Criteria

Criteria	Description
Extent (Defined as the area over which the impact will be expressed spatially)	• Site • Local/district • Province/region • International/national
Probability (This describes the chance of occurrence of an impact)	• Unlikely • Possible • Probable • Definite
Reversibility (Degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity)	• Completely reversible • Partly reversible • Barely reversible • Irreversible
Irreplaceability (Degree to which resources will be irreplaceably lost as a result of a proposed activity)	• No loss of resource • Marginal loss of resource • Significant loss of resource • Complete loss of resource
Duration (Description on the duration of the impacts on the environmental parameter. Duration indicates the	• Short term • Medium term • Long term

Criteria	Description
lifetime of the impact as a result of the proposed activity)	• Permanent
Magnitude/Intensity (Describes the severity of an impact)	• Low • Medium • High • Very high

The criteria listed above are scored and thereafter the significance of an impact is determined as follows:

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:

(Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

The summation of the different criteria above will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which must be measured and assigned a significance rating.

Below is a table outlining the impact significance ratings that will be used and a description of the anticipated impacts:

Table 16: Impact significance and description

5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

The full rating methodology is attached in **Appendix G**.

14.6 Public Participation Process to be undertaken for the EIA Phase

Public participation forms a critical component of the EIA process, as it provides all interested and affected parties with an opportunity to learn about a project, but more importantly to understand how a project will impact on them. The following will be undertaken during the EIA Phase.

14.6.1 Updating of IAP Database

The I&AP database will be updated as and when necessary during the execution of the EIA.

14.6.2 Review of Draft EIA Report

A 30-day period will be provided to IAPs to review the Draft EIA Report. Copies of the Draft EIA Report will be provided to the regulatory and commenting authorities as well. The Draft EIA Report will also be placed on the following website - http://www.sivest.co.za/Download

All parties on the IA&P database will be notified via email or fax of the opportunity to review the Draft EIA Report, the review period and the process for submitting comments on the report.

All comments received from I&APs and the responses thereto will be included in the final EIA Report, which will be submitted to EDTEA.

14.6.3 Public meetings/consultation

While no public meeting is envisaged for this project, the project will be presented to the Project Steering Committee including ward councillors for comment.

14.6.4 Inclusion of comments into the Final EIA

A Comments and Responses Report will be compiled and included in the EIA Report, which will record the date that issues were raised, a summary of each issue, and the response of the team to address the issue. The Final EIA report with all comments included will be submitted to EDTEA for review and approval.

14.6.5 Notification of Environmental Authorisation

All I&APs will be notified via email or fax after having received written notice from EDTEA on the final decision on the application. An advertisement will also be included in the relevant newspapers. These notifications will include the process required to lodge an appeal, as well as the prescribed timeframes in which documentation should be submitted.

15. EAP DECLARATION

The EAP declarations, CV's and qualifications for the EAP's responsible for the preparation of this report have been attached in **Appendix A**.

16. INFORMATION REQUIRED BY CA (IF APPLICABLE)

n/a

17. CONCLUSION

This Scoping Report has covered activities and findings related to the scoping process for the proposed Greater Amaoti Housing Development. Professional experience, specialist knowledge, relevant literature and local knowledge of the area have all been used to identify the potential issues associated with the housing projects. There is no guarantee that all the potential impacts arising from the proposed housing projects have been identified within the scoping phase, however the report provides an outline of the established measures that were taken to best identify all the potential impacts.

The circulation of this report for public comment aims to give the public a chance to see the outcomes of the scoping process and identify possible issues that were not initially identified. This will further enhance the rigour of the scoping process.

Appendix A:

EAP CV and Declaration

Appendix B:

Locality Map

Appendix C:

Site Development Plan

Appendix D:

Photographs

Appendix E:

Proof of public participation process

(To be included in Final Scoping Report)

Appendix F:

Specialist Studies

Appendix F1:

Agricultural

Appendix F2:

Biodiversity

Appendix F3:

Engineering Status Quo

Appendix F4:

Geotech

(can be provided on request)

Appendix F5:

Heritage

Appendix F6:

Socio-Economic

Appendix F7:

Water Resources

Appendix G:

SiVEST Impact Ratings Methodology

Appendix H:

Other

(Relocation Plan)

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