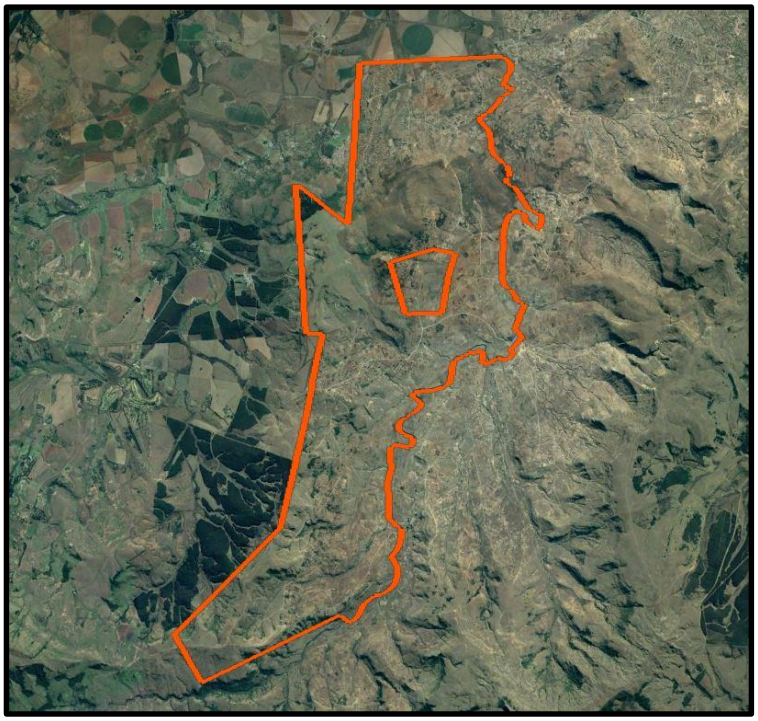
KWAVALA/ EMANDABENI RURAL SUBSIDISED HOUSING DEVELOPMENT



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1 INTRODUCTION

1.1 PROJECT BACKGROUND

The Inkosi Langalibalele Local Municipality has, through its IDP process, and extensive consultation with respective beneficiary communities residing within the municipality identified the need to provide low cost rural subsidised housing throughout its entire area of jurisdiction. This process was initiated as a means to address the municipality's predominantly traditional/informal housing profile, and in doing so improve the living conditions and quality of life of its rural communities. The proposed KwaVala/ Emandabeni Rural Subsidised Housing Project is aimed at providing suitable housing to beneficiaries residing on a portion of Ward 2 and 1 of the Inkosi Langalibalele Local Municipality and includes land falling under the rule of the Amangwe Tribal Authority. The proposed Rural Subsidised Housing project will entail the construction of approximately 2 000 new top structures within the project area, and will therefore service approximately 2 000 beneficiaries and their associated families.

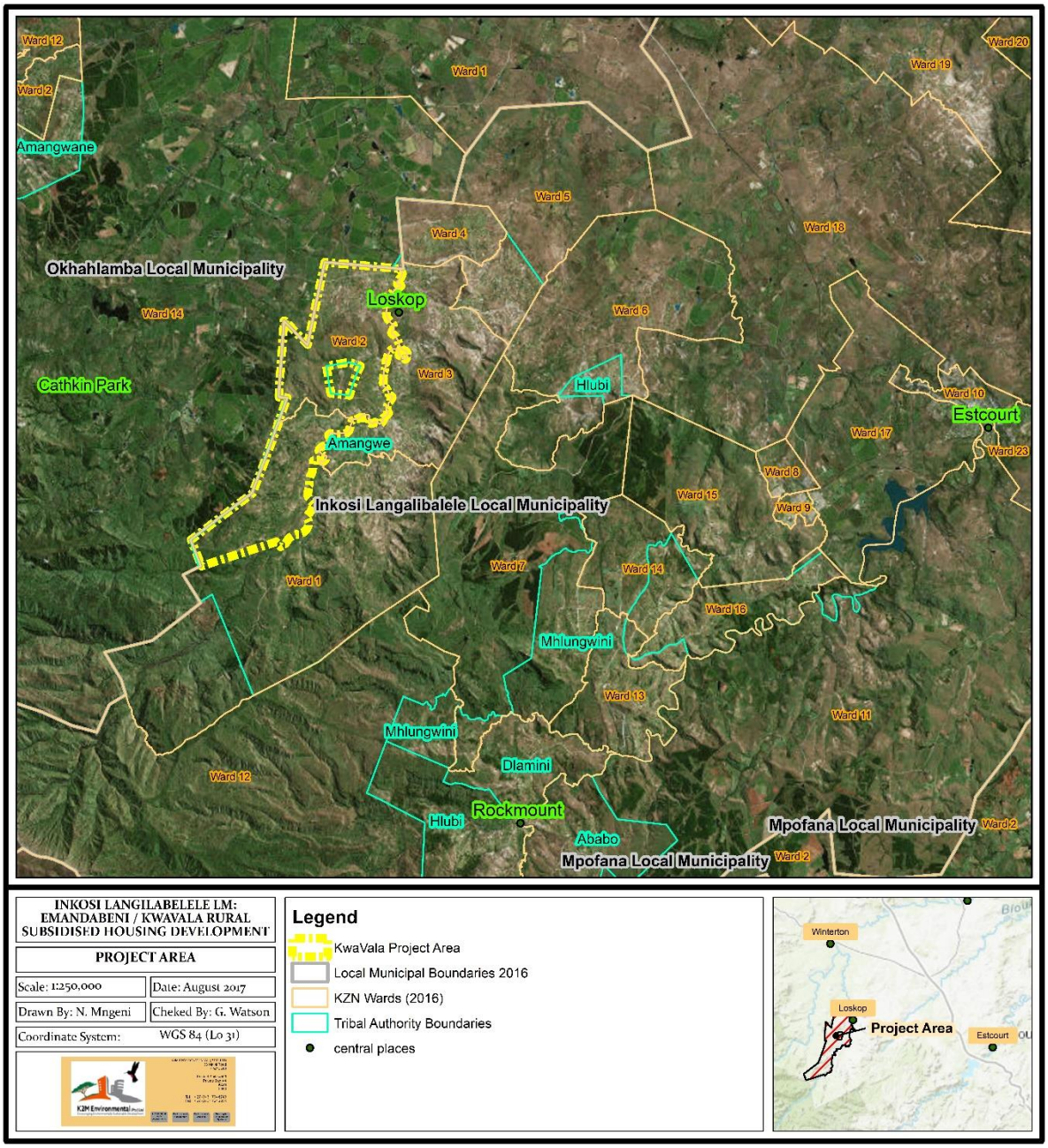
1.2 SITE DESCRIPTION

The total population of the Inkosi Langalibalele Local Municipality, as recorded in the Census 2011 is estimated at 113 047 persons while the overall population of the KwaVala/ Emandabeni Rural Housing project area is approximately 12 448 persons which resides in approximately 2 278 households within the project area.

The KwaVala/ Emandabeni project area is approximately 5 836.86Ha in extent and is located within the western section of the Inkosi Langalibalele Municipality approximately 17km west of Estcourt, 13km west of Wembezi and 4km east of the Cathkin Park as depicted in Map 1. The project area consists of low to medium density rural settlements (scattered), with homesteads incorporating a mix of round and rectangular structures constructed of both traditional (mud brick, wattle and daub, thatch roof) and more modern or urban (cement blocks and corrugated iron roof) materials and techniques.

The current land use is predominantly agriculture together with low to medium dense households as well as cattle grazing. There are no protected areas within the project area. The closest protected area is the Ukhahlamba Drakensberg Park which is approximately 4km south of the project area as depicted in Map 2.

Map 1: Project Area



Map 2: Protected Areas

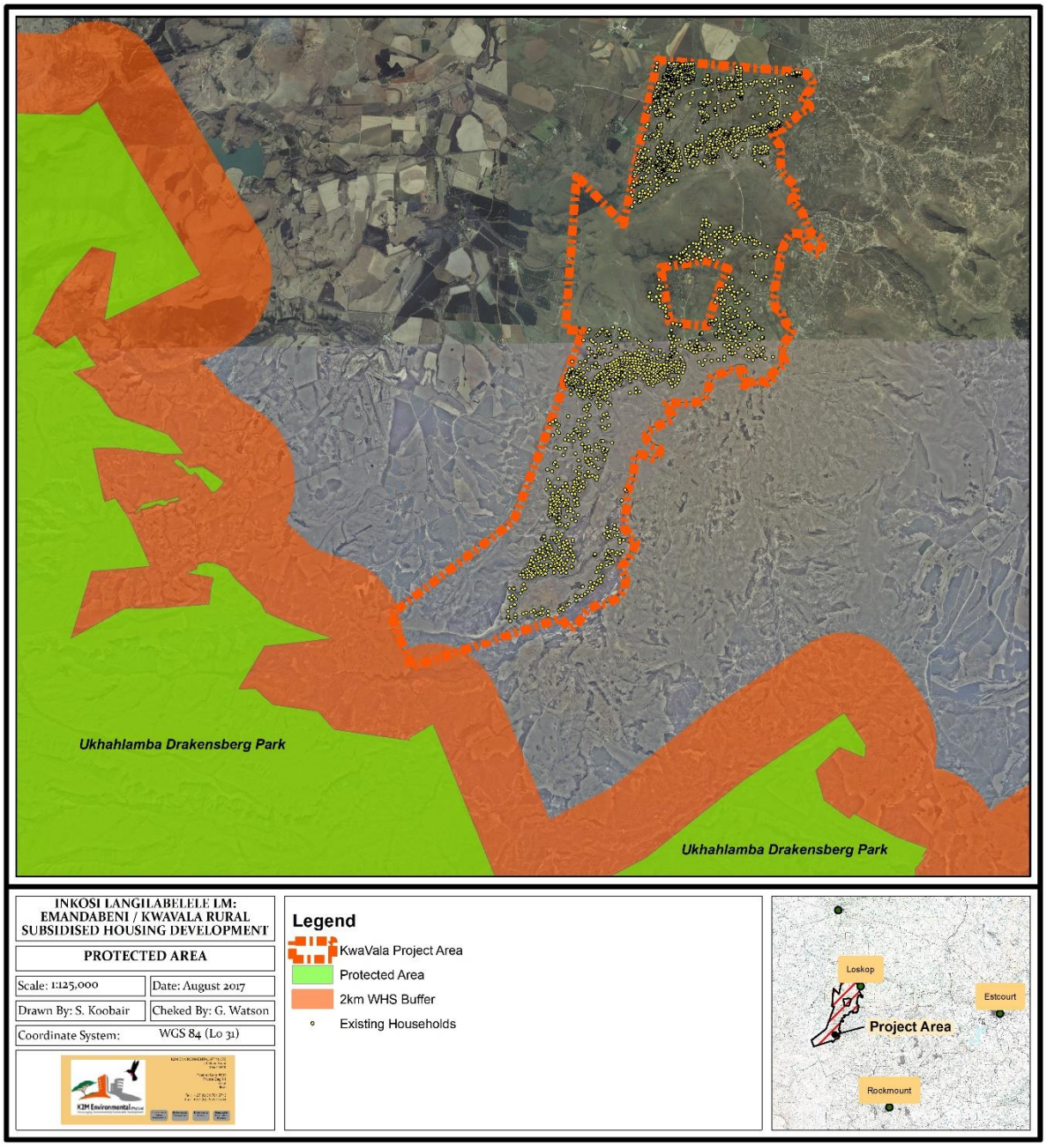
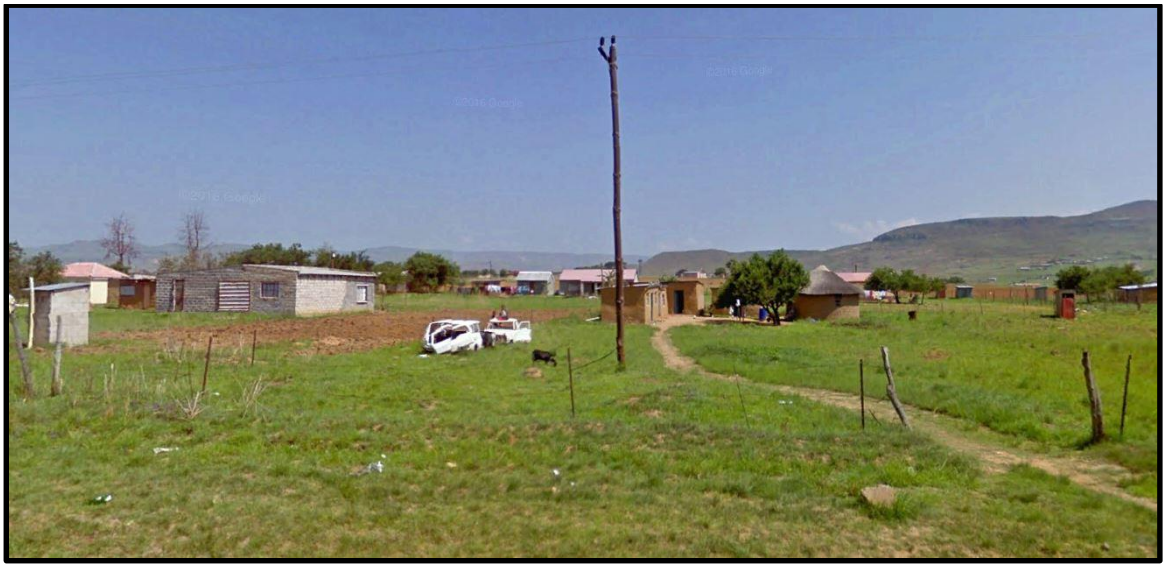


Photo 1: Overview of the Project Area

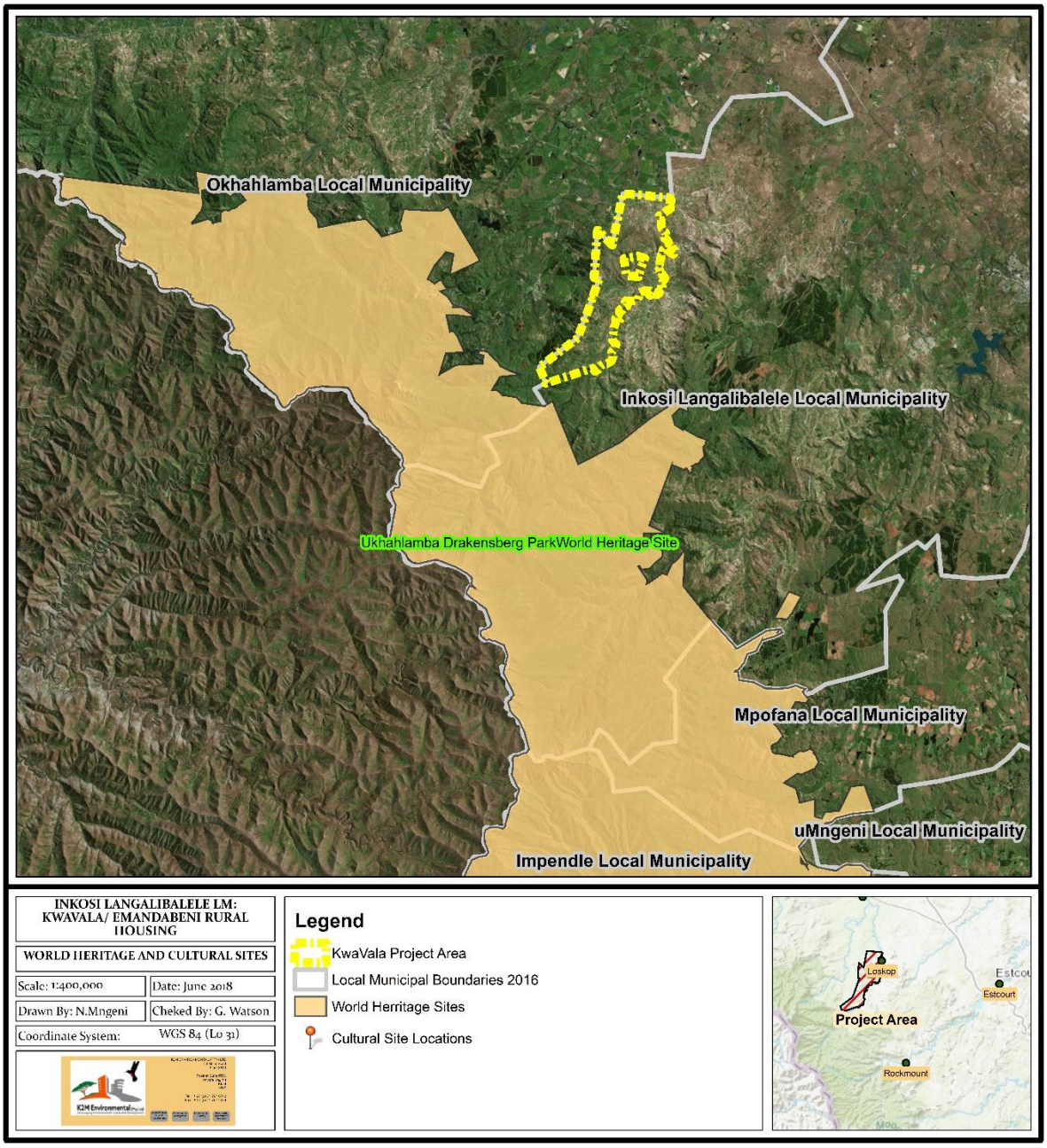


2 CULTURAL HERITAGE

There are no known or declared archaeological, cultural or historical sites or artefacts located within the KwaVala/ Emandabeni Rural Housing project area. The closest is the Ukhahlamaba Drakensberg Park which was declared as a World Heritage Site with cultural importance in 2000. This cultural heritage site centres on the vast quantity of rock art that is renowned for its quality and diversity of subject. While there is evidence of Early Stone Age and Middle Stone Age archaeology within the Park, it is mainly the activities of Late Stone Age communities that have contributed to its nomination as a World Heritage Site on cultural criteria. Archaeological excavations indicate that humans occupied the Drakensberg region over a period of 20 000 years ago until to Colonial times. The oldest dates obtained from excavations focusing on the Stone Age for the Southern Drakensberg are around 8 000 years before present (Good Hope Shelter) and 5000 years before present for the Northern Berg.

The proposed development is an in-situ upgrade and entails the construction of houses within the existing iMizi. The owners of the iMizi are fully aware of grave sites and areas of heritage importance, and will therefore ensure that no development will occur within these areas. Due to the “in-situ” type nature of the proposed project, should any sites or artefacts of archeological, cultural or historical significance be located within the project area, it is not expected or anticipated that these will be impacted upon as a result of the proposed development. The trenches for each house will not be more than 1.5m and it is therefore unlikely that fossils will be found during trenching. The Developer is however aware of his responsibilities with regards to the Amafa Heritage Act. Should there be any Greenfield Development, larger than 10 000m², a Heritage Impact Assessment will be required.

Map 3: World Heritage and Cultural Sites



The table below provides a list of protected heritage resources within the Inkosi Langalibalele Local Municipality. The project area is located on Portion 15 of the Farm Drakensberg Location No. 2 No. 9605, Portion 14 of the Farm Drakensberg Location No. 2 No. 9605, Portion 13 of the Farm Drakensberg Location No. 2 No. 9605, Portion 12 of the Farm Drakensberg Location No. 2 No. 9605, the Remaining Extent of the Farm Drakensberg Location No. 2 No. 9605, Portion 7 of the Farm Maritz Dam No. 1256, Portion 3 of the Farm Maritz Dam No. 1256, Portion 1 of the Farm Maritz Dam No. 1256, Portion 6 of the Farm Maritz Dam No. 1256, Portion 5 of the Farm Maritz Dam No. 1256 and

the Remaining Extent of the Farm Maritz Dam No. 1256 which are not listed as comprising of any heritage resources according to the table below.

Table 2.1: Heritage Resources within Inkosi Langalibalele Local Municipality

Heritage Resource	Landmark Status ***Heritage*** *(section 38)* ***Provincial*** *(section 39)*	Erf / Farm No.	Title Deed Description	GPS coordinates
1. Bulwer Bridge and Old Toll House, Colenso, ***Estcourt District***	Provincial	Sub. 1 of Lot 116 Colenso Township	G45/1963 12 June 1963	S28 44.177 E29 49.261
2. Fort Durnford, Kemps Road, ***Estcourt***	Provincial	Sub. 1 of Lot 1081 Estcourt Township	G89/1966 Dated 15 August 1966	S29 00.882 E29 53.302 29° 0' 56.394" S, 29° 53' 19.136 4" E
3. Old Agricultural Hall, Harding Street, ***Estcourt***	Provincial	Lot 149 Estcourt	T5388/1895 26 March 1895	S29 00.540 E29 52.389 28° 59' 41.874" S, 29° 52' 13.206" E
4.Bloukrans Battlefield, farm Rama 929, ***Estcourt District***: Bloukrans Memorial	Heritage	Sub. 20 (of 6) of the farm Rama No. 929	T54685/2006	S28 51.021 E29 50.528 28° 51' 1.4976" S, 29° 50' 34.53" E
5.Saailaer, farm Zaay Lager 1199, ***Estcourt District***	Heritage	farm Saay Lager No. 1199, District Estcourt	T8467/1989	S29 00.487 E29 53.267

6. Marianne Church Ruins, Farm Doveton,***Estcourt District***	Heritage	Rem. of Wilde PerdeVlei 1004 (now known as Doveton), County of Weenen	T68188/2004 T6019/1940 19 December 1940	S28 47.954 E29 30.379 28° 47' 57.228" S, 29° 30' 23.839 2" E
7.Greystone, Farm Vegt Lager 801, ***Estcourt District***	Heritage	Sub. 19 (a Sub of A) of the farm Vegt Lager 801, county of Weenen	T6212/1995 9008/ 1968. 2 July 1968	S29 04.306 E29 47.907
8.Brynbella Battlefield Stone Wall, farms Glenbello and Stockton, ***Estcourt District***	Heritage	"along boundary line of farms Glenello (prev. Tamboekies Kraal) and Stockton	T9331/1996 T2623/1975 dated 25 February 1975	S29 04.471 E29 57.410
		(prevZuurbraak), County of Weenen"	T7586/1957 dated 3 September 1957 T14571/2004	
9. Settler Cottage, 87 Lorne Street, ***Estcourt***	Heritage	Lot 126 Estcourt Township	T44964/2001 T5737/1951 dated 18 July 1951 and 4191/1969 dated March 1969 (par.2)	S29 00.681 E29 52.639
10. Bartle House, St Gregory College, ***Estcourt District***	Heritage	Erf 139 Frere	T40169/2004 T15232/1990 Dated 13 June 1990	S28 53.575 E29 46.549

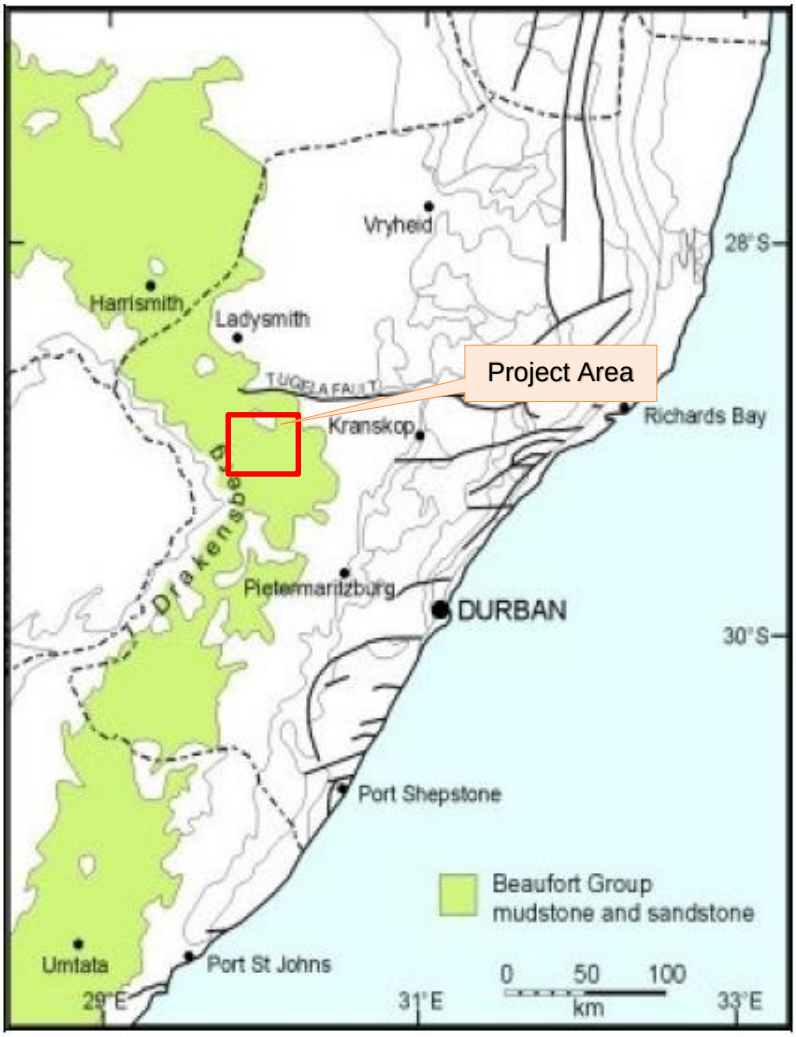
11.Hattingsvlakte 2829DD19 and 22, farm Hatting Vlakte 5865,***Estcourt District***	Heritage	Rem. of farm HattingsVlakte 5865, County of Weenen	T66910/2002 T9335/1969 dated 30 May 1969	S28 50.833 E29 46.795
12. Ambleside Military Cemetery / National Garden of Remembrance	Heritage	Sub. 18 (of 6) of the farm VarkensFontein 1138, County of Weenen	T3644/1997 T9572/1966 Dated 5 August 1966	S28 44.495 E29 47.494
13.Coolamgause Building, Retief Street, ***Weenen***	Heritage	(a) Sub. 1 of Lot 66 (b) Sub. 2 of Lot 66, Township of Weenen	T16792/1995 and T16791/1995 T4743/1952 dated 16 June 1952	S28 51.157 E30 05.091
14.Abdoolgafoor Goolamsahib Arabian Merchant Retief Street, ***Weenen***	Heritage	(a) Sub. 1 of Lot 66 (b) Sub. 2 of Lot 66, Township of Weenen	T16792/1995 and T16791/1995	S28 51.157 E30 05.105

3 GEOLOGY AND PALAEONTOLOGY

3.1 GEOLOGICAL HERITAGE AND VEGEATATION TYPE

The KwaVala/ Emandabeni Rural Housing project area is characterised by five vegetation types. Prior to the informal structures, the most predominant type was the “Northern KwaZulu-Natal Moist Grassland” which covers approximately 90.47% of the project area. This vegetation could be found throughout the project area. The second type of vegetation was “Drakensberg Foothill Moist Grassland” and covers approximately 6.10% of the project area and could be found in the south western section of the project area. The Northern KwaZulu Natal Moist Grassland is usually dominated by Themeda triandra and Hyparrhenia hirta. Open Acacia sieben'anavar. woodi; savannoid woodlands encroach up the valleys, usually on disturbed (strongly eroded) sites. Sandstones and shales of the Beaufort and Ecca Groups of the Karoo Supergroup predominate and are intruded by dolerites of Jurassic age.

Figure 1: Outcrop of Beaufort Group sediments in KwaZulu Natal



Source: Amafa Palaeontological Technical Report for KZN, 2012

The Beaufort Group (Groenwald, 2012)

Beaufort Group mudstones and sandstones form the foothills of the Drakensberg Escarpment as well as isolated outcrops in eastern Kwazulu-Natal along the Lebombo Mountains. The red, green and purple coloured mudstones which characterize this group were deposited in a steadily drying swampland (MacRae, 1999; Rubidge, 1995; Johnson et al. 2006; McCarthy and Rubidge, 2005).

- **Geology of the Beaufort Group along the Drakensberg Escarpment**
  SACS (South African Committee for Stratigraphy) still needs to publish a formal note on the lithostratigraphy of the Escarpment at Harrismith. The most recent formal academic study of the complete section was done by Groenewald (1984, 1989).

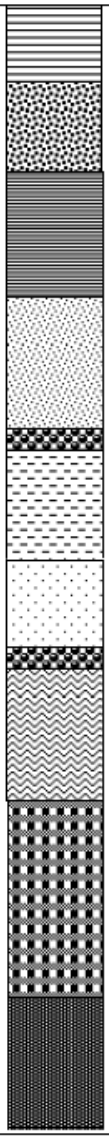
The Beaufort Group is subdivided into a lower Adelaide Subgroup and upper Tarkastad Subgroup.

Correlation of these units from the Southern Karoo Basin into this northern part of the basin is contained in a comprehensive regional study of the Upper Karoo Supergroup (Groenewald, 1996).

a) The Adelaide Subgroup/Formation

The Adelaide Subgroup comprises the lower part of the Beaufort Group along the Drakensberg Escarpment and on some 1:250 000 sheets are referred to as the Adelaide Formation. In most of the outcrop areas in KwaZulu-Natal the Adelaide Subgroup consists primarily of a lower deltaic facies, mostly referred to as the Estcourt Formation and an upper fluvial facies referred to as the Normandien Formation (Groenewald, 1984; Johnson et al 2006).

Table 3.1: Summary of the Geology of the Beaufort Group at the Drakensberg Escarpment

	Burgersdorp/Driekoppen Formation. Red mudstone and thin yellow-brown sandstone. Cynognathus Assemblage Zone vertebrate fossils and trace fossils.
	Katberg/Verkykerskop Formation. Coarse-grained sandstone with manganese enriched conglomerates – Braided River Fluvial deposit. No record of fossil finds to date.
	Harrismith Member – Normandien Formation. Brightly coloured siltstone – highly dissipating and expansive. Concretions with numerous fossils of Lystrosaurus Assemblage Zone material and vertebrate burrows
	Schoondraai Member – Normandien Formation. Fine to medium-grained sandstone with prominent conglomerate of granitic pebbles at the base. Large scale petrified tree fossils of Glossopteris and very thin coal beds.
	Green and grey mudstone and siltstone with prominent concretions of Calcium and Gypsum. Fossils of plants and coal beds in upper layers and very productive vertebrate fossil layers of the Dicynodon Assemblage Zone.
	Rooinek Member – Normandien Formation. Coarse-grained fluvial feldspathic sandstone with basal conglomerates, fossil trees of Glossopteris and coal beds.
	Green and grey mudstone and siltstone with thin coal beds. Fluvial crevasse splay deposits with micro cross-bedding in silt deposits. Trace fossils abundant on sandstone bedding planes. (Fossil remains of Rhachiocephalus recorded towards the west where weathering is not as severe as along the escarpment).
	Frankfort Member – Normandien Formation - Dark grey shale and siltstone, interbedded with lenses of deltaic very coarse-grained feldspathic sandstone deposits of up to 20 m thick. Lenses of sandstone discontinuous over 500 m. Plant fossils of Glossopteris abundant. Prominent but discontinuous coal beds and abundant trace fossils on bedding planes of sandstones, siltstones and mudstones. No vertebrate remains recorded to date.
	Volksrust Formation – Ecca Group. Dark grey shale – deep water sedimentary deposits with very little recorded evidence of vertebrate life. Trace fossils recorded in the upper part of the formation.

Source: Amafa Palaeontological Technical Report for KZN, 2012

b) Estcourt/Normandien Formation

Referring to Table 4.1, the geological history of the Drakensberg Escarpment region represents the final sedimentation into the Ecca Sea about 260 million years ago. Deltaic deposits of the Estcourt Formation contain evidence of an abundance of marine and probably estuarine invertebrates that left a wealth of trace fossils in the rock record (MacRae, 1999; McCarthy and Rubidge, 2005). The overlying fluvial deposits of the Normandien Formation (Groenewald, 1989; Johnson et al 2006) with prominent sandstone members (Rooinek and

Schoondraai Members) represent a progressive basin ward migration of the depositional system.

3.2 PALAEONTOLOGY AND SIGNIFICANT GEOLOGICAL FORMATIONS

According to the Amafa Palaeontological Technical Report for KwaZulu Natal, the 250 million year old rocks of the Beaufort Group record the largest known extinction event, the end-Permian mass extinction, in which most of the known species died out. The Beaufort Group is well-known for its richness in fossils of vertebrates and also includes several recordings of unique vertebrate burrows.

The impact of the proposed development on local fossil heritage is determined on the basis of the palaeontological sensitivity of the rock units concerned and the nature and scale of the proposed development, specifically with regards to the extent of fresh bedrock excavation. It should be noted that the proposed housing development will not result in the excavation of more than 1.5m of bedrock. The corresponding colour notation for the various palaeontological sensitivity classes tabulated below is adapted from Almond et al (2008) and Groenewald et al (2014).

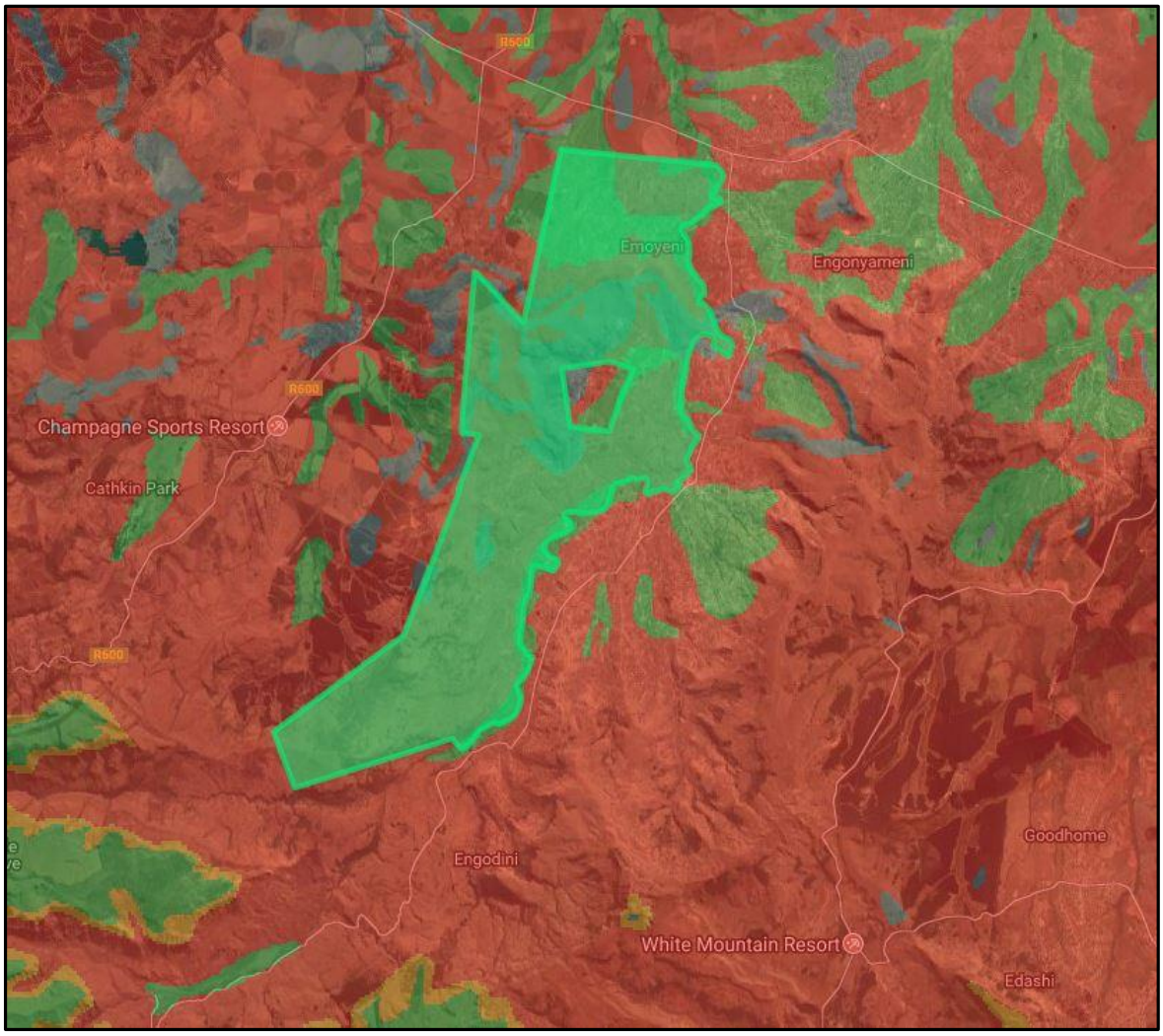
Table 3.2: Palaeontological Sensitivity Colour Notation and Significance

COLOUR NOTATION	PALAEONTOLOGICAL SIGNIFICANCE
Red	Very High Palaeontological sensitivity/vulnerability. Development will most likely have a very significant impact on the Palaeontological Heritage of the region. Very high possibility that significant fossil assemblages will be present in all outcrops of the unit. Appointment of professional palaeontologist, desktop survey, phase I Palaeontological Impact Assessment (PIA) (field survey and recording of fossils) and phase II PIA (rescue of fossils during construction) as well as application for collection and destruction permit compulsory.
Orange	High Palaeontological sensitivity/vulnerability. High possibility that significant fossil assemblages will be present in most of the outcrop areas of the unit. Fossils most likely to occur in associated sediments or underlying units, for example in the areas underlain by Transvaal Supergroup dolomite where Cenozoic cave deposits are likely to occur. Appointment of professional palaeontologist, desktop survey and phase I Palaeontological Impact Assessment (field survey and collection of fossils) compulsory. Early application for collection permit

	recommended. Highly likely that a Phase II PIA will be applicable during the construction phase of projects.
Green	Moderate Palaeontological sensitivity/vulnerability. High possibility that fossils will be present in the outcrop areas of the unit or in associated sediments that underlie the unit. For example, areas underlain by the Gordonia Formation or undifferentiated soils and alluvium. Fossils described in the literature are visible with the naked eye and development can have a significant impact on the Palaeontological Heritage of the area. Recording of fossils will contribute significantly to the present knowledge of the development of life in the geological record of the region. Appointment of a professional palaeontologist, desktop survey and phase I PIA (ground proofing of desktop survey) compulsory.
Blue	Low Palaeontological sensitivity/vulnerability. Low possibility that fossils that are described in the literature will be visible to the naked eye or be recognized as fossils by untrained persons. Fossils of for example small domal Stromatolites as well as micro-bacteria are associated with these rock units. Fossils of micro-bacteria are extremely important for our understanding of the development of Life, but are only visible under large magnification. Recording of the fossils will contribute significantly to the present knowledge and understanding of the development of Life in the region. Where geological units are allocated a blue colour of significance, and the geological unit is surrounded by highly significant geological units (red or orange coloured units), a palaeontologist must be appointed to do a desktop survey and to make professional recommendations on the impact of development on significant palaeontological finds that might occur in the unit that is allocated a blue colour. An example of this scenario will be where the scale of mapping on the 1:250 000 scale maps excludes small outcrops of highly significant sedimentary rock units occurring in dolerite sill outcrops. Collection of a representative sample of potential fossiliferous material recommended. At least a Desktop Survey and “Chance Find Protocol” is compulsory. The Chance Find Protocol must be included in the EMPr for the project.
Grey	Very Low Palaeontological sensitivity/vulnerability. Very low possibility that significant fossils will be present in the bedrock of these geological units. The rock units are associated with intrusive igneous

	activities and no life would have been possible during implacement of the rocks. It is however essential to note that the geological units mapped out on the geological maps are invariably overlain by Cenozoic aged sediments that might contain significant fossil assemblages and archaeological material. Examples of significant finds occur in areas underlain by granite, just to the west of Hoedspruit in the Limpopo Province, where significant assemblages of fossils and clay-pot fragments are associated with large termite mounds. Where geological units are allocated a grey colour of significance, and the geological unit is surrounded by very high and highly significant geological units (red or orange coloured units), a palaeontologist must be appointed to do a desktop survey and to make professional recommendations on the impact of development on significant palaeontological finds that might occur in the unit that is allocated a grey colour. An example of this scenario will be where the scale of mapping on the 1:250 000 scale maps excludes small outcrops of highly significant sedimentary rock units occurring in dolerite sill outcrops. It is important that the report should also refer to archaeological reports and possible descriptions of palaeontological finds in Cenozoic aged surface deposits. At least a Desktop Survey and "Chance Find Protocol" document is compulsory. The Chance Find Protocol must be included in the EMPr of the project.
White/ Clear	Unkown Palaeontological sensitivity/vulnerability.

Map 4: Palaentological Sensitivity



Source: SAHRA Palaeontology Sensitivity Interactive Map

As depicted in the map above, majority of the project area falls on geology with a Very High Sensitivity for Palaeontology. Despite the fact that some of the settlements within the project area fall on geology with a Very High Sensitivity for Palaeontology, the actual trenching development will be limited to existing disturbed areas where houses have been built over many years already and the foundation of the proposed new top structures will not be deeper than 1.5m.

4 CONCLUSION AND RECOMMENDATIONS

As indicated in the previous sections, the current land use is predominantly agriculture together with low to medium dense households as well as cattle grazing. There are no protected areas or archaeological, historical or cultural sites within the boundaries of the study area and no significant fossils are expected when excavation (less than 1.5m) is done. The proposed development is in-situ with no greenfield development. The owners of the iMizi are fully aware of grave sites and areas of heritage importance, and will therefore ensure that no development will occur within these areas. It is therefore not expected that the implementation and operation of the proposed project will result in any new adverse impacts on any archaeological, historical or cultural sites which may be present within the project area and for this reason exemption from Amafa is applied for as very few if any fossils will be disturbed during the construction phase.

It is recommended that the Environmental Assessment Practitioner and ECO must be informed of the fact that the majority of the project area has a Very High Palaeontological Sensitivity, but no recording of significant fossils are foreseen.

It is recommended that SAHRA issue the developer with an “Exemption” letter with the proviso that if any fossils are observed, that the HIA specialist will be informed immediately for appropriate actions according to the Law.

These recommendations must be included in the EMPr of this project.