



# **Ndatshana and Ohaleni Human Settlement Project**

(Molefe Traditional Authority- Res No. 18 of the farm 15838 – Nqutu Municipality)

## **Environmental Impact Assessment Report**

### **DESKTOP STUDY**

Report Date: October 2014



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## **1. INTRODUCTION**

Ludloko Developments have been appointed by ZD project Management as an independent environmental assessment consultant to undertake a desktop study for the proposed establishment of 100 units of houses in Ndatshana area within Nquthu local municipality part of uMzinyathi District Municipality. This document provides information on strategic environmental issues within Ndatshana area. Strategic environmental information comprises of high-level environmental aspects of the area.

Desktop study comprises of the collection of existing data primarily from biodiversity GIS maps and existing literature such as local environmental assessment reports. This report provides a description of the desktop study findings of broad potential impacts resulting from the proposed housing development. The desktop study is intended to inform the project planning studies and to determine the environments scope as described in section 24 of National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended, and associated regulation promulgated in 2010.

The aim of the desktop environmental study is to identify and predict existing broad based environmental impacts of the proposed above-mentioned housing within the identified area. The desktop study begins by consulting biodiversity GIS maps to determine if the project site falls within any site of conservation importance and if it also falls within environmental sensitive areas. Broad environmental data was used to determine the status and significance of environment.

### **1.1 Terms of reference**

- Determine the listing of the activity in terms of EIA regulations as promulgated in NEMA Act 107 of 1998.
- High level environmental impact assessment
- Liaising with Ezemvelo KZN Wildlife

### **1.2 Scope of work**

Environmental Analysis (Desktop; highlighting environmentally sensitive areas/zones within the project area that may affect the project negatively and recommendations)

### **1.3 Desktop review included review of:**

1. Nqutu Municipality IDP
2. uMzinyathi Biodiversity information from Ezemvelo Conservation plan
3. South African Biodiversity Institute GIS district information

### **1.4 Project Details**

1. Construction of 1000 units in Nquthu, Ndatshana area (Ndatshana, Mphazima, Mathambo and Ohaleni)
2. This is an in-fills project whereby the new houses will be built in an existing household infrastructure. Most of the beneficiaries have existing houses already, the new ones will be additional in their yard where possible.
3. House specs: 40m<sup>2</sup> house – see attached.
4. No bulk services needed. These will be taken care of by the department. (No Civil work required), however, recommendations on the report are needed.
5. The pre-feasibility contract is for 3 months, ending September 2014.

### **1.5 Purpose of environmental desktop analysis**

- To provide a broad environmental analysis
- To form a general view of the environment
- To identify sensitive environmental sites
- To inform terms of reference for further environmental studies
- To ascertain conservation and status of the area
- To determine applicable environmental regulation to the project
- To determine the environmental process and schedule for the project
- To determine environmental legal framework associated with the project
- To identify relevant strategic stakeholders to provide comments and guidance on the project
- To determine specialist studies, appropriate for the project
- Guide the project team on environmental requirements

### **1.6 Methodology**

Desktop environmental assessment involves high level environmental assessment of the study area, the local municipality. The following methodologies will be applied:

- Determine the listing of the project
- Determine the legal framework applicable to the project
- Review environmental management framework and strategic environmental assessment literature
- Review the South African Biodiversity Institute (SANBI) Biodiversity GIS (BGIS) information technology; Municipality Biodiversity information and LUDS interactive information
- Review Bioregional plans
  - Particularly no-go areas, protected areas, conservancies, buffer areas, wetlands systems
- Review the KZN Conservation Plan
  - Vegetation types
- Review municipality IDP
- Outline environmental assessment processes and timeframes
  - Type of environmental assessment
  - Environmental assessment as per EIA regulations
- Indicate environmental processes

### **1.7 Location**

The study area is located within ward 15 and 16 of Nquthu local municipality which is one of the four local municipalities within UMzinyathi District municipality. The area falls within tribal land. Nquthu local municipality is situated with uMzinyathi District Municipality with Ingonyama Trust land, Reserve No 18 15838.

### **1.8 Site description**

The topography of the area consists of hills which slope into valleys along low lying plains which are intercepted by rivers and wetlands. Site location map is attached. There is no spatial planning of the areas. Housing expansion is organic and is not done according to local municipality spatial plan. Arable areas are under cultivation. Open areas are left for grazing.

### 1.10 Desktop evaluation

The GPS latitude and longitude co-ordinates were plotted and viewed on Google Earth maps and a kml file was produced. Vegetation types and surrounding land uses were viewed in Spaceman GIS maps. Watercourses and landuse were also identified on Spaceman GIS maps. The local municipality cadastral map was superimposed onto the vegetation group base mapping, as identified by Acocks Vegetation Types and KZN vegetation Types Description 2011. The SANBI BGIS online tool was utilized, as well as Quantum GIS software to evaluate mapping data. Local EIA reports were reviewed.

### 1.11 Spatial Context

Nquthu Local Municipality (LM) lies north of KwaZulu Natal province. It is one of the four local municipalities under uMzinyathi District Municipality (DM). Nquthu LM lies north-east of uMzinyathi DM.

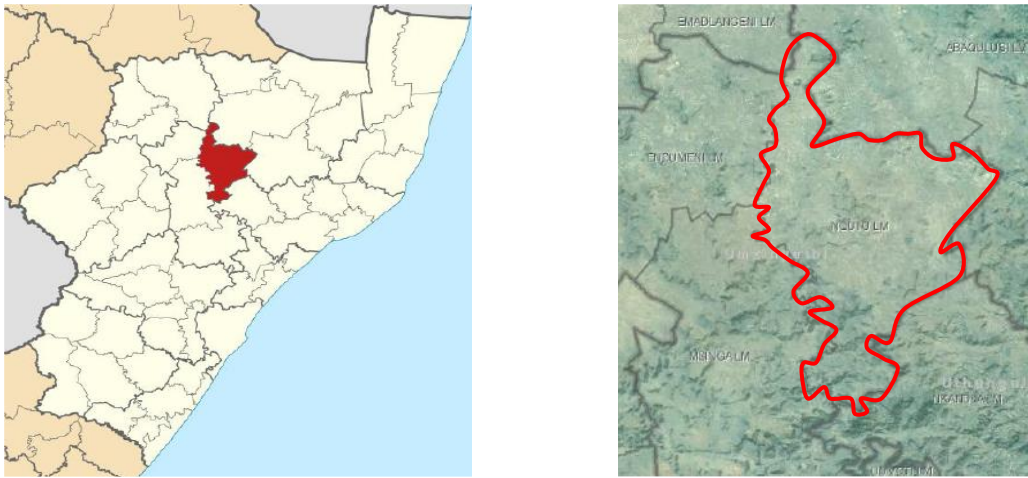


Fig 1 Map showing Nquthu municipality

The area is characterised by scattered dense settlements. Some of these settlements lie far from the main road corridor R68. This road corridor links Nquthu LM with Nkandla LM on the south-east, Ulundi LM which lies on the east and with eNdumeni LM on the west. The area is predominantly rural in character and evidently lacking in basic services.

## **2. APPLICABLE LEGISLATION**

### **2.1 The National Environmental Management Act (Act No 107 of 1998)**

The National Environmental Management Act (NEMA) came into effect in January 1999. The Act embraces all three fields of environmental concern namely resource conservation and exploitation, pollution control and waste management, and land use planning and development. NEMA's definition of sustainable development is as follows: "The integration of social, economic and environmental factors into planning; implementation and decision making so as to ensure that development serves present and future generations."

The "General Duty of Care" in the National Environmental Management Act states "every person who causes, has caused, or may cause significant pollution or degradation to the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing, or recurring. The National environmental Management act provides for the recovery of costs and damages for rehabilitation of the environment or for preventing damage to the environment (Section 34).

A further far-reaching provision provides for the application of liability to a director of a firm where the offence in question resulted from the failure of the Director or firm to take all reasonable steps that were necessary under the circumstances to prevent the commission of the offence "(Section 34 (7). The act is premised on environmental law norms such as the precautionary principle and the polluter pays principle. NEMA emphasizes the need for cooperative governance. Chapter 5 NEMA, entitled 'Integrated Environmental Management', complements the environmental assessment provisions of the environment conservation act (act 73 of 1989) and the environment impact assessment regulations promulgated under it, by providing broad terms for the Integrated environment management philosophy into be applied in the carrying out of EA's.

### **2.2 National Water Act (No. 36 of 1998) (NWA)**

The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA. The Department of Water Affairs (DWA) is the delegated custodian of water resources in South Africa. In terms of Section 21 (i.e. Chapter 4), the NWA identifies a suite of water uses that either require Registration or Licensing before proceeding.

Water uses include the abstraction or storage of water, as well as impeding or diverting the flow of a watercourse or discharging of waste into a watercourse. Based on potential water uses, the NWA requires that a water user must either register a water use in terms of the General Authorisation or alternatively undertake a full licensing process. In order to distinguish between the need for registration and licensing, the DWA have issued a General Authorisation (Government Notice 1199 of 2009) for water uses in terms of Section 21 (c) and (i) only (see below). However, this General Authorisation is applicable to these specific water uses and contains exclusionary clauses.

Should a water use activity fall outside of this General Authorisation or alternatively trigger any exclusionary clauses contained therein, a full license application process would need to be completed, prior to commencement of a water use.

**In terms of GNR704:**

Restrictions are imposed on the locality of certain infrastructure like residue deposits, dams, boreholes, sanitary conveniences, fuel deposits as well as the carrying out of mining or other activities within certain distances of water resources.

**2.3 The National Environmental Management: Biodiversity Act, 2008 (No. 10 of 2004) (NEMBA) and associated legislation**

The NEMBA serves to provide a framework for the management and conservation of South African biodiversity, under the auspices of the NEMA. This legislation promotes the sustainable use of natural biological resources, ensuring equitable access and sharing of benefits arising from the use of biological resources. In terms of Section 56(1) of NEM:BA a person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7.

These threatened and protected species have been listed in terms of GNR.151 of 2007: Publication of lists of critically endangered, endangered, vulnerable, and protected species. A restricted activity in relation to a specimen of a listed threatened or protected species, means hunting, catching, capturing or killing any living specimen of a listed threatened or protected species by any means, method or device whatsoever, including searching, pursuing, driving, lying in wait, luring, alluring, discharging a missile or injuring with intent to hunt, catch, capture or kill any such specimen;

- gathering, collecting or plucking any specimen of a listed threatened or protected species;
- picking parts of, or cutting, chopping off, uprooting, damaging or
- destroying, any specimen of a listed threatened or protected species;
- importing into the Republic, including introducing from the sea, any
- specimen of a listed threatened or protected species;
- exporting from the Republic, including re-exporting from the Republic, any specimen of a listed threatened or protected species;
- having in possession or exercising physical control over any specimen of a
- listed threatened or protected species;
- growing, breeding or in any other way propagating any specimen of a listed threatened or protected species, or causing it to multiply;
- conveying, moving or otherwise trans-locating any specimen of a listed threatened or protected species;
- selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of a listed threatened or protected species; or any other prescribed activity which involves a specimen of a listed threatened or protected species.

Should a project result in the loss of biodiversity identified in terms of GN 151 of 2010, a permit application will need to be submitted to the Provincial Department of Environment and Nature Conservation for approval, before proceeding with the activity. A specialist botanical impacts assessment will be undertaken as part of the ESIA phase of the proposed project.

The applicability of the NEM:BA will be confirmed upon completion of the botanical investigation (i.e. removal of a listed species), and if required, a permit will be submitted to the provincial authorities for review and decision making. Section 52 of NEM:BA provides for the publication of a national list of ecosystems that are threatened and in need of protection. A list of threatened ecosystems in the terrestrial environment was published on

9 December 2011 in GN 1002 GG 34809. The list, which provides that only 9.5% of natural areas remain in threatened terrestrial ecosystems in South Africa aims to reduce the rate of ecosystem and species extinction in these areas. 53 critically endangered ecosystems, 53 endangered and 107 vulnerable ecosystems have been listed.

Detail of the location and description of each listed threatened terrestrial ecosystem is provided, including the province(s) and municipality (ies) in which the ecosystem is located. Reference is also made to protection status of the ecosystem (i.e. if it falls within a Nature Reserve, World Heritage Site etc.) and (where possible) the known number of species of special concern found in the ecosystem (i.e. red data animal and plant species).

Activity 12 of GNR546 of the NEMA listed activities requires basic assessment for the clearance of 300m<sup>2</sup> or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation within any listed critically endangered or endangered ecosystem. Should this activity be triggered by the Gamsberg mine, authorisation therefore will be sought in the NEMA environmental authorisation application which has been submitted.

#### **2.4 National Forests Act, No. 84 of 1998 (NFA)**

NFA deals with the protection of trees. The Minister is required to annually publish a list of all species protected under Section 12. No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. To the extent that protected tree licences are required for the Gamsberg mine these will be obtained.



### 3 GENERAL ENVIRONMENTAL CONDITION

#### 3.1 Biomes

The areas fall within a grassland biome covering an area of approximately 161617ha (82.38% of municipality area) and Savanna biome with an area of 34563.9ha (17.62% of municipality area). Within this Grassland Biome, however, are numerous bird micro habitats which are influenced by non- vegetation factors eg. land use, topography, the distribution of food and anthropogenic habitats.

#### 3.2 Climate

Nquthu LM has a subtropical climate. Summer days can range from warm to hot and winter days can be cold. The average monthly temperatures range from high of 28°C in February to low of 10.5 °C in July. Rains typically occur during summer months. Mean monthly rainfall for the area ranges from a high of 127mm in February to a low 26mm in July (Institute of Natural resources, 1998).

#### 3.3 Topography and landform

The area is characterized by hilltops and adjoining cascading valleys. When viewing the contour map the hilltops appear rounded and steep. Rivers descend from higher altitudes and meander across valleys flowing easterly and flowing in between randomly located steep escarpment which extend south of the area. River valleys are deeply incised and flow in a south-easterly direction. The topography of ward 15 and 16 is gentle and flatter. Figure shows contour lines and gentle lands occurring central, southern and western parts of the area. East side of the municipality area has steep terrain.

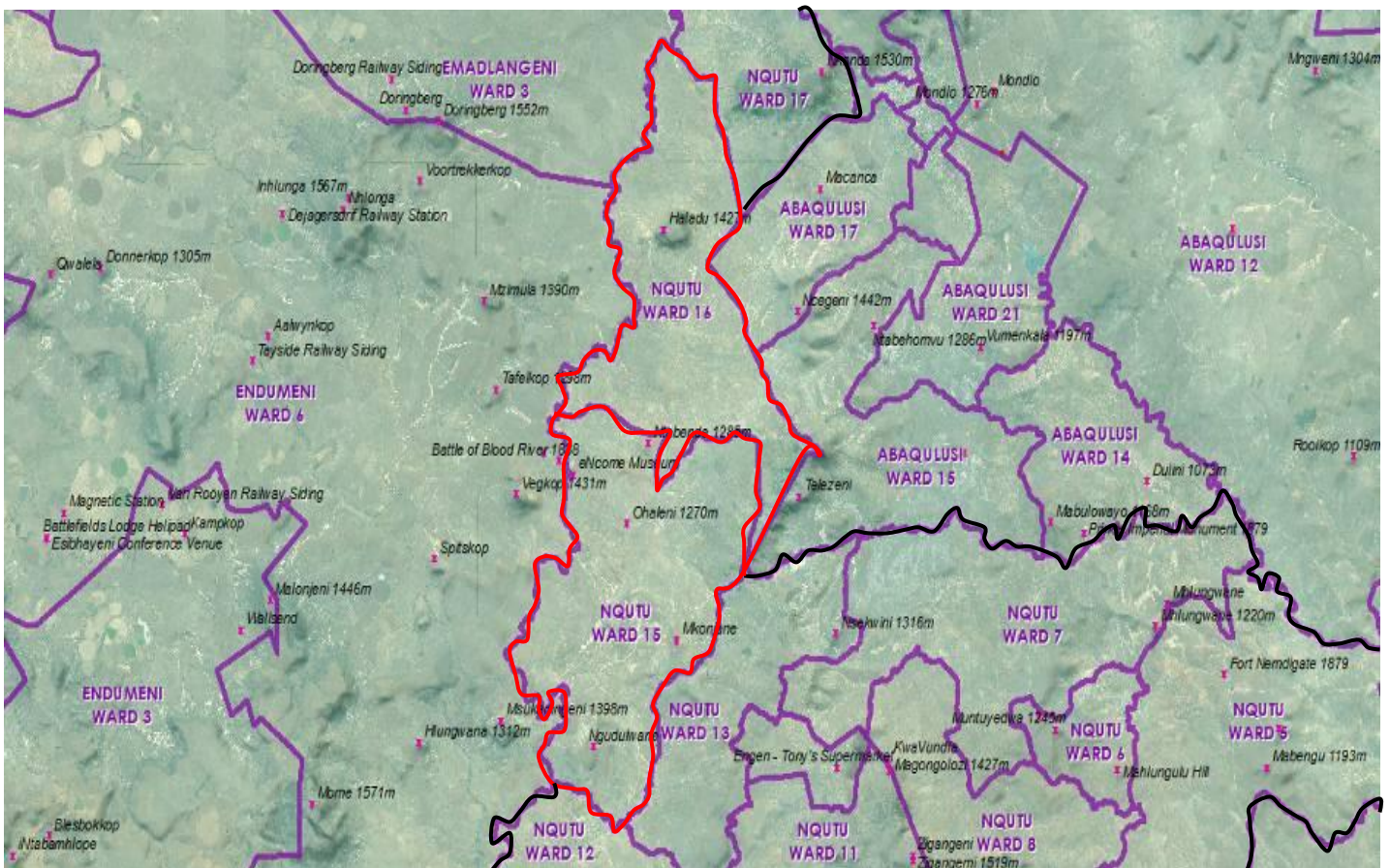


Fig 2 Map showing Ward 15 and 16 boundaries

### 3.4 Vegetation

#### Flora

The site falls predominantly within vegetation groups of the Grassland Biome namely, Low Escarpment Moist Grassland (Gs 3), Northern Kwazulu-Natal Moist Grassland (Gs 4) and Kwazulu-Natal Highland Thornveld (Gs 6) as defined by Muchina and Rutherford (2006). Four particular veld types exist within the study area.

#### *Low Escarpment Moist Grassland (Gs 3):*

The topography can be described as generally “steep” with east and south facing slopes dominating. Ecca and Beaufort mudstone and shales form the dominant geology. The vegetation community typically consists of a closed grassland dominated by *Hyparrhenia hirta* and *Themeda triandra* with patches of *Protea caffra* and *Leucosidea* scrub occurring at higher altitudes.

#### *Northern Kwazulu-Natal Moist Grassland (Gs 4):*

The topography associated with this habitat form usually consists of rolling hills. The dominant geology is mudstone, sandstone and shales of the Ecca and Beaufort groups. In contrast to the neighbouring Gs 3 grasslands, grasslands of this vegetation type can be described as tall tussock grasslands dominated by *T. triandra* and *H. Hirta* with open *Acacia sieberiana* woodlands encroaching up the numerous valleys.

#### *Kwazulu-Natal Highland Thornveld (Gs 6):*

The prevailing topography is generally similar to Gs 4 but with large broad valleys present. The geology within this habitat form is variable and includes Dwyka, Ecca and Beaufort Groups as well as dolerite intrusions. The tall tussock grassland of this vegetation type is dominated by *H. hirta* and often blends with Acacia dominated woodland comprising *A. sieberiana*, *A. karroo* and *A. nilotica*. The main difference between this and the other grassland types present along the route is the dominance of woody species within the grassland.

### 3.5 Vegetation types

Nquthu LM has 11 vegetation types dominated by Income Sandy Grassland covering an approximate area of 62464.1ha (31.84% of municipality and KwaZulu-Natal Highland Thornveld 72346.9ha (36.88% of municipality). According to Conservation Targets and Status for Vegetation Types in KZN Income Sandy is considered to be vulnerable due to habitat destruction by mines and expansion of rural settlements. The vegetation of the study area has been significantly disturbed through a variety of human activities such as clearing land for human settlements, subsistence farming, for access roads and tracks, through overgrazing and uncontrolled burning of grass cover. These human activities reduce basal cover on the ground creating bare areas for alien plant invasion and exposing underlying grounds bare leading to erosion during heavy down pour.

Small patches of undisturbed grasslands are found along the slopes within the river valleys and contain small areas of species such as *Themeda triandra* (red grass), which are an indication of well-developed or undisturbed grassland. Species that commonly grow along disturbed areas are Ngongoni Bristle grass (*Aristida Junciformis*). This grass is hard and unpalatable. Tree encroachment is evident along catchment slopes. This is due to disturbance to grasslands, mostly Acacia species such as *Acacia karroo*, as well as by alien invasive species such as *Lantana camara* and *chromolaena odorata*. The scrub forest observed along steep slopes and drainage lines is seen to be spreading into grasslands in the valley bottoms.

### **3.6 Trees**

Very flat extensive areas with generally shallow, poorly drained, sandy soils supporting low, tussock-dominated sourveld forming a mosaic with wooded grasslands (with *Acacia sieberiana* var *woodii*) and on well-drained sites with the trees *A. karroo*, *A. nilotica*, *A. caffra* and *Diospyros lycoides*. On disturbed sites *A. sieberiana* var *woodii* can form sparse woodlands. *Aristida congesta*, *Cynodon dactylon* and *Microchloa caffra* are common on shallow soils (Camp 1999b).

### **3.7 Endangered and Vulnerable Systems**

There is one identified endangered ecological system, the Qudeni Mountain Mistbelt Forest and Grassland. The housing area is located away from forest and grasslands. There are no critically endangered ecological systems in the area. Grasslands occurring within the housing area has over the years been transformed into secondary grass and bush encroachment. A number of wetland systems occur randomly along the valley. Some of the houses maybe located along dry wetland systems. A wetland assessment study is essential. This will prevent location of houses along wetlands.

### **3.8 Soils**

Ortho-photo imagery shows vast areas susceptible to erosion. According to the IDP the area comprises of shallow duplex soils with moderate to poor drainage making them prone to erosion. Assessment of soil stability and underlying material is essential to determine suitable designs for houses. Some areas show stable well draining soils. Such areas can be used for housing.

### **3.9 Basal cover and erosion**

Areas of lowest basal cover are susceptible to erosion. These areas can be observed along steep slopes and some river valleys. The effect of erosion is compounded by erodibility of the local soils. This could be caused by poor soil cohesion and hence loss of soil.

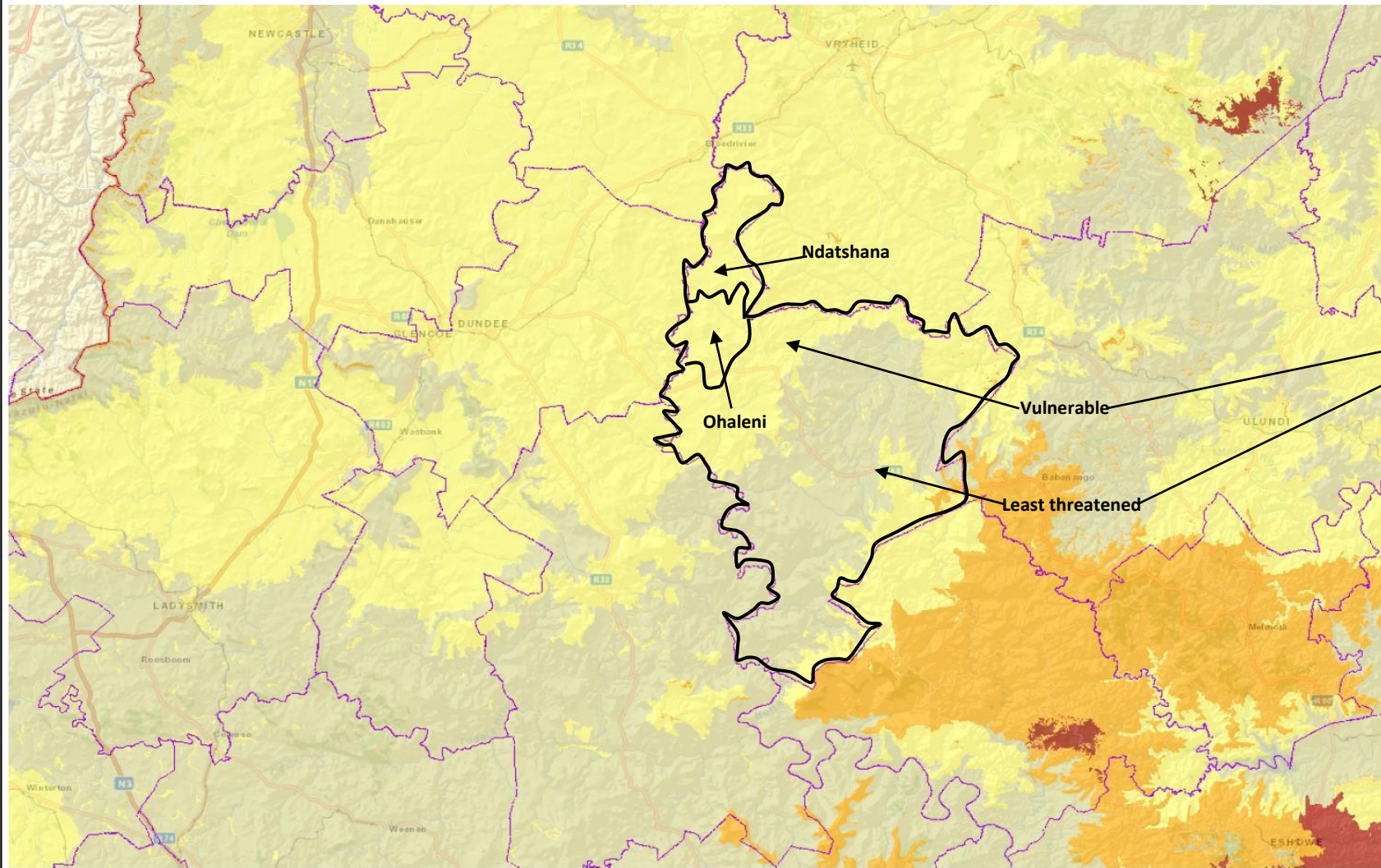
Enter the envisage development name or type (up to 50 letters)

**Description**

Enter a description of the envisaged development (up to 100 words)

**Legend**

- KwaZulu-Natal Systematic conservation Plan
- KZN vegetation types conservation status
- Critically Endangered
- Endangered
- Vulnerable
- Least Threatened
- World Street Map



1: 678 268



34.5 0 17.23 34.5 Kilometers

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© Latitude Geographics Group Ltd.

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

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**Fig 3 Map showing Nquthu LM conservation status**

### 3.10 Conservation Status

The conservation status of the vegetation types present ranged from “Vulnerable” to “Least Threatened” (EKZN Wildlife 2011). The identified CBA falls within Gs 3 and contains areas of freshwater wetland, grassland associated with low escarpments and riparian habitat. The area is however, heavily settled and apart from the escarpment areas, can be considered generally degraded.

The BGIS shows south of the local municipality is least threatened due to more natural environment occurring. Vegetation on the north of the study area has been transformed by town and development and hence it is considered vulnerable. The study area, Ndatshana and Ohaleni are found north of the local municipalities along vulnerable vegetation status. Construction of houses will add cumulative pressure on the area such as more people, more traffic and increased need on natural resources such as water and other infrastructure.

### 3.11 Findings:

- Much of the landscape has been transformed by expansion of rural settlement
- The South African National Biodiversity Institute (SANBI), Ezemvelo KZN and literature indicate endemic plant species that may occur in the area. Species identification study needs to be undertaken
- There has already been an adverse effect on the fauna and flora in the study area due to human inhabitation resulting in a reduction in species diversity and expected impact of low significance.

### 3.12 Management:

- Prevent encroachment and spreading of invasive and exotic species as per requirements of CARA. This is done by limiting disturbance to demarcated work area and levelling disturbed areas when construction has been completed.
- Prevent destruction of Red Data flora and fauna species if such species are identified during ecological study. Identified species must be identified, removed and planted in area away from disturbance. Specialist ecologist must be appointed to identify these plants and seek relevant permits for relocating them
- Prevent destruction of natural, undisturbed vegetation of surrounding areas that will not be directly impacted on. This can be achieved by limiting disturbance to demarcated areas.
- A post construction audit is necessary. The audit will observe the status of the area when construction has been completed. As soon as possible after topsoil has been replaced re-vegetate all areas that were disturbed.
- Planting of indigenous trees to green the area will improve vegetation cover of the area, improve the scenery, and provide shading.

### 3.13 River and wetland systems

The area has a number of perennial rivers. Six rivers occur in the Nquthu Municipality *viz.* the Bloed, Buffels, Mvunyane, Nondweni, Nsongeni and White Mfolozi Rivers. There are 550 wetlands covering 9508.8ha (4.8%) of Nquthu Municipality Rivers that traverse the study area are Bloed and Hoqo rivers. These systems ranged in morphology from incised erosion gullies to extensive wetland areas. Wetland types present on the study area included “unchanneled valley bottom” type wetlands and “hillslope seep” type wetlands.

Unchanneled valley bottom wetland type is characterised by valley bottom depression. Hillslope wetland types may or may not have outflows. Hilltops are areas at the top of a mountain or hill flanked by down-slopes in all directions. Open water ecosystems included man made dams and disused flooded borrow pits and quarries. Severely eroded gullies are often associated with the smaller drainage lines, while narrow riparian zones are associated with the larger watercourses.

# SANBI Wetland systems for Nquthu Local Municipality

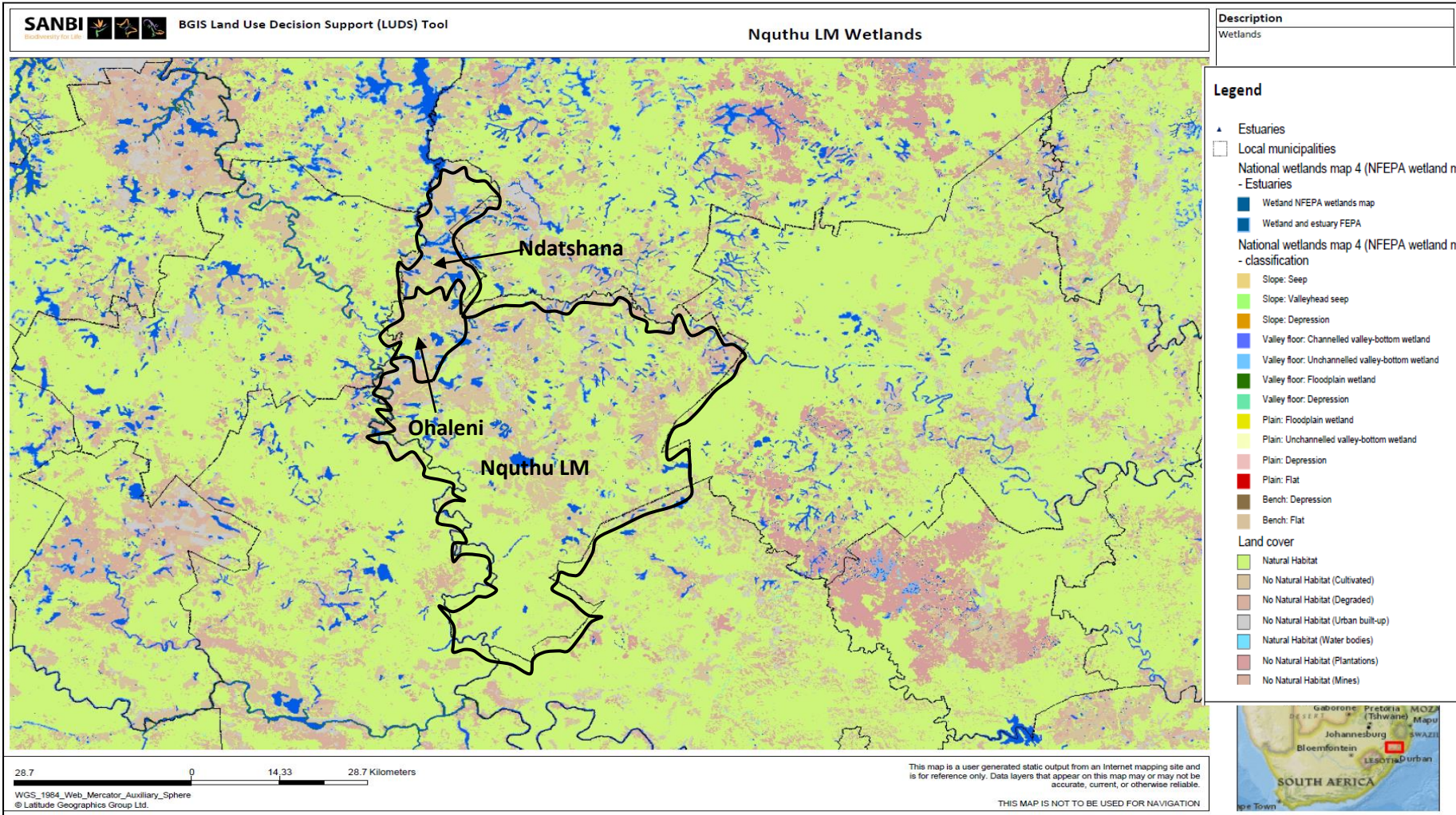


Fig 4 Map showing wetlands

### **3.14 Land use:**

The land use in the area of the proposed development ranges from low density residential to farming. Near Nquthu, the land use is commercial and has residential developments with associated utilities. As one moves away from Nquthu, the area becomes more rural, and the landscape is criss-crossed by informal roads and paths between sprawling rural habitation. Frequent fire is obvious in the landscape and fairly intensive cattle grazing can be seen. These disturbances have led to invasion by woody alien plant species in places.

## **4. PRELIMINARY FINDINGS OF THE DESKTOP REVIEW**

### **Conservation status**

The study area has low conservation status. According to the BGIS map the area from the north of the area is marked as vulnerable due to extensive landuse. The town and housing development occurs north the local municipality. The area has over the years been transformed by anthropogenic factors such as human settlement, grazing, fires, cultivated fields etc. The natural character of the areas has been changed and is progressively changed by increase in constructed houses. According to BGIS maps there is little natural vegetation left in the area.

The area is predominantly rural and is characterised by valley bottoms which are surrounded by mountain. These mountains form catchments that drain into the valley. Presence of wetlands will require wetland assessment and wetland delineation of buffer areas as well as wetland delineation of wetlands near housing settlement within the delineated study area. Delineation of the buffer area will help prevent locating houses along wet areas or natural drainage lines. Locating of houses within wetland areas will undermine foundations in the long term. Encroachment into wetland buffer areas will require application for water licence authorisation.

This will therefore require an assessment of wetlands within the stud area. Soils in the area are prone to erosion. Poor rehabilitation of disturbed areas can lead to erosion. Bare areas are susceptible to erosion. Erosion may also be exacerbated by overgrazing. Additional stress may lead to formation of gullies. Archaeological assessment will determine location and existence of graves and other archaeological artefacts. Formal land-based protected areas include Isandlwana Nature Reserve which covers an area of 780ha and Ntinini Nature Reserve covering 747ha. The proposed development will not impact on these sites. No protected area will be impacted by the project.

Figure 1 shows protected areas occurring outside the study area ward 15 and ward 16.

SANBI Conservation status of Nquthu

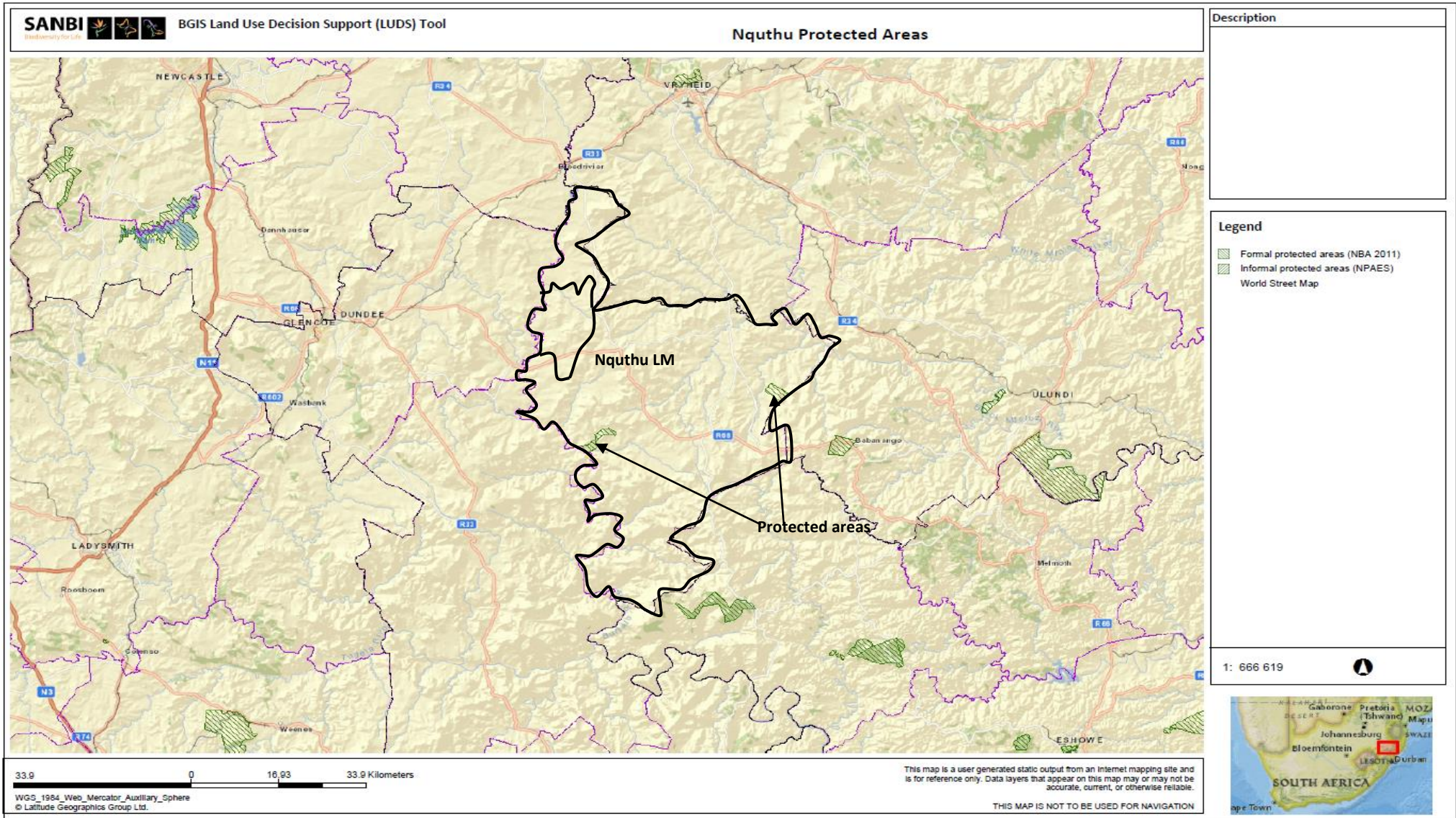


Fig 5 Nquthu LM Protected areas



**Table 1 list of environmental issues**

Environmental aspect	Status	Significance	Impact of Proposed Development on environmental aspect	Comments
Grasslands	Transformed	Low	Low	Remaining grassland habitats are left for cultivation and grazing.
<b>Soils</b>	Stable in some areas and eroding in some areas	Medium – high	Medium impact	Cause of erosion need to be determined
<b>Erosion</b>	Exists in the area	Medium – High	Low – Medium	Soils in the area are susceptible to erosion. All disturbed areas need to be rehabilitated to prevent erosion
Biodiversity	Transformed	Low	Low	Habitat destruction and other anthropogenic factors have led to low species diversity
<b>Wetland</b>	Functional. Some seasonal	High	Medium - high	Wetlands in the area are part of the watercourse system. Wetland identification and delineation will prevent potential damages to the wetlands and placing houses near wetlands Consultation with DWA is recommended with regards to close proximity to wetlands
Protected areas	Heritage places	High	None	Development occurs away from heritage and protected areas
Rivers	Good	High	None	Development is far from river systems and is limited along housing area
Landuse	Housing, fields	High	Low	Location of houses will be within existing housing sites
Terrain	Housing on higher slopes and low lying areas	High	High	Higher slopes will require cut and fill which may exacerbate erosion and along low-lying areas are prone to floods
Alien species invasion	Low	Low	Low	Weed expansion and prominence is low due to fires and grazing
Bush encroachment	Medium – high	High	Low	Bush encroachment is prevalent along open areas away from housing area however it is threatening habitat loss
Run-off	Normal	High	Low – medium	Run-off flows into rivers and wetlands. Development will not block movement of run-off
Relocation of people	None	High	None	No people or houses will be relocated

**Table 2 Environmental processes and way forward**

Processes	Activity	Comment
Environmental process	Consultation with Department of Environmental Affairs	To comment on activity listing and other applicable listings for the project
Environmental timeframe	Longer	About 12 – 16 months Need to filter into the project schedule
Geotechnical assessment	Undertake a geotechnical survey of the study area	To determine soil stability and underlying material and water table
Wetland delineation and proximity	In consultation with DWA and appointment of wetland specialist to undertake wetland assessment study	To determine wetland buffer and no-go areas
Heritage artefacts and historical features	Appointment of a heritage specialist to investigate heritage artefacts	The area has a rich history of Isandlwana battle between the British and Zulu army

### Conclusion and recommendations

The area has a low environmental significance value due to lack of sensitive habitats existing within the area. The area has over the years been transformed by human habitation. Development will take place within designated property areas. No critical, endangered or vulnerable habitats exist within the housing areas. Wetlands intercept the area and are part of the water system and they provide important ecological services. Wetland assessment study is important and is a requirement under Water Act and will also help in locating houses away from wet areas. Construction of houses within a rural area is a listed activity number 23 in GNR 544 under EIA regulations as promulgated under section 24 of NEMA Act 107 of 1998 and it thus triggers application for authorisation to KZN Department of Environmental Affairs.

Another environmental issue that needs to be addressed in the Scheme is the protection of wetlands. The area is intercepted by wetlands. Wetland identification and delineation is important. Houses need to be located away from wet areas. Wetland buffer encroachment requires application for water use licence. In addition, meaningful conservation of wetland areas will assist in minimizing soil erosion and land degradation, two of the major environmental problems in Nquthu. Encounter with any ecological artefacts will require the work to stop immediately and project manager be informed and subsequently a heritage specialist be consulted for decision making.

**Table 3 Activity Listing as per EIA Regulation Section 24 of NEMA**

Number and date of the relevant notice	Activity No (s) (in terms of the relevant notice)	Description of each listed activity as per project description
23.		<p>The transformation of undeveloped, vacant or derelict land to –</p> <p>(i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or</p> <p>(ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; -</p> <p>except where such transformation takes place for linear activities.</p>

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