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**DRAFT ENVIRONMENTAL FATAL FLAWS ANALYSIS REPORT:
AND
CEMETERY ESTABLISHMENT IN MANDENI LOCAL MUNICIPALITY**

PREPARED BY:



PREPARED FOR:



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LIST OF ACROYNMS

CBA	Critical Biodiversity Area
DAEARD	Department of Agriculture, Environmental Affairs and Rural Development
DM	District Municipality
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
LM	Local Municipality
NEMA	National Environmental Management Act
NGDB	National Groundwater Database
NWA	National Water Act
PDA	Planning and Development Act
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework

1. INTRODUCTION

1.1 Background

The Mandeni Local Municipality (LM) has identified a need for the establishment of a cemetery, if possible, and a crematorium within their area of jurisdiction. It is understood that the currently two existing cemeteries (Tugela and Sundumbili) have reached their maximum capacity, therefore, creating an urgent need for the establishment of new cemetery.

The Mandeni LM has requested expertise of a suitable service provider to carry out the necessary assessments, planning and investigations in order to obtain the necessary permits (Environmental Authorisation and Letter of Approval for change of land use) to establish a fully functional cemetery on the land that has already been identified by the municipality. This assignment also include preparation of preliminary layout design, land survey, operation and maintenance plan for the proposed cemetery.

It is understood that, in 2009, the Mandeni LM undertook a similar study (cemetery establishment) over Sub 1 of Sub 50 of the Farm Reserve No. 7A 15826. However, the project was never completed due to non-viability of the site based on the environmental concerns raised in the Environmental Impact Assessment (EIA). Some of the major issues /concerns raised in the previous study included the fact that:

- The identified site for cemetery establishment was contested by delegations led by the local Inkosi Mathaba who claimed that the identified land belonged to the Macambini Tribal Authority; however, they did not have the title deed to substantiate this claim. It is understood that Mr Coleman is the lawful owner of the identified land and has the relevant title deed.
- Mandeni LM aimed at establishing a cemetery that would have a lifespan of 10 – 15 years or more. However, after having delineated the buffer zones for a water course, wetland and no go-areas, the identified site proved to yield less gravesites than those anticipated by the Mandeni LM.

After the study for cemetery establishment was concluded and had proved not to be viable, Mandeni LM had to look for an alternative piece of land. Another piece of the land was identified which is adjacent to the site that was previously identified for cemetery establishment.

It is worth noting that the Previous Site 2009 (Sub 1 of Sub 50 of the Farm Reserve No. 7A 15826) investigated for cemetery establishment was 6.7ha and the Extension Site 2014 (Remainder of Sub 50 of the Farm Reserve No 15826) to be explored is also 6.7ha. Therefore, the current study area (Proposed Site 2014) is 13.5ha (combination of Previous Site 2009 and the Extension Site 2014).

For ease of reference, it is worth noting the following differentiations:

- Previous Site 2009 refers to the site (Sub 1 of Sub 50 of the Farm Reserve No. 7A 15826) that was identified and investigated in 2009.
- Extension Site 2014 (Reminder of Sub 50 of the Farm Reserve No 7A 15826) refers to the adjacent parcel of land that was acquired from Mr Coleman as an extension that will be further investigated for suitability for cemetery establishment in Mandeni LM
- Proposed Site 2014 (Sub 1 of Sub 50 and the Remainder of Sub 50 of the Farm Reserve No. 7A 15826) refers to the combination of the two site mentioned above.

1.2 A Fatal Flaws Analysis Report

In order to assess an environmental impact, it is important that one determines the baseline environmental conditions. This is done through pre-application screening to establish whether there are aspects of the proposed development that are either flawed or have the potential to give rise to significant or unacceptable environmental consequences - (identification of potential 'fatal flaws'.

The identification of fatal flaws should include an analysis of the following:

- Social Assessment
- Economic Assessment
- Biophysical Assessment

In addition to establishing whether the proposed development will be socially, economically or environmentally flawed, it should also be determined:

- Whether the proposed development needs to be authorized by a competent authority;
- Whether the proposed development should be subjected to Basic Assessment or full Environmental Impact Assessment process;
- The level of the environmental assessment i.e. does it need specialist studies; and
- Legal and other regulatory requirements.

It should be noted that this Fatal Flaws Analysis Report is not a detailed review of all the social, economic and biophysical issues associated with the proposed development (cemetery establishment in Mandeni). It is rather a high-level identification and assessment of significant issues to determine any fatal flaws concerning the likely success of the proposed project.

1.3 Aim of the study

The aim of the study is to assess the suitability of the Extension Site 2014 for the establishment as a cemetery. It is worth noting that in the previous site 2009, specialist studies (Geotechnical Investigation, Geohydrological Investigation, as well as Wetland Delineation and Functional Assessment) were conducted. The current study will therefore build on the findings of the previous study conducted in 2009. This means that similar specialist studies (Geotechnical Investigation, Geohydrological Investigation, as well as Wetland Delineation and Functional Assessment) will be conducted on the Extension Site 2014 so that it will be easy for the Project Team to combine findings from the previous study and the findings that will come out of the specialist studies to be conducted on the Extension Site 2014. Although with the 2009 study, no Heritage Impact Assessment (HIA) was conducted, it was concluded, from the Project Teams' engagement with Amafa-AkwaZulu-Natali that the Project Team should submit, to Amafa-AKwaZulu-Natali, a Background Information Document for the project so that Amafa-AKwaZulu-Natali could provide a decision on whether the current project need to conduct a HIA or the Project Team should apply to be exempted from conducting a HIA. Therefore either the HIA will be conducted for the Proposed Site 2014 or an application for being exempted from conducting the HIA will be lodged with Amafa AkwaZulu-Natali.

In the event that the Extension Site 2014 prove to be suitable for cemetery establishment, then the Project Team will lodge one application for an Environmental Authorization from the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEARD), as well as lodge one Planning and Development Act (PDA) Application to Mandeni LM for the approval of change in land use. In the event that the Extension Site 2014 proves not suitable for cemetery establishment, the Project Team understands that the Mandeni LM

does not have other pre-identified alternative pieces of land that could be further explored or investigated.

It is worth noting that by Extension Site 2014 being suitable; it means that after the Project Team has done relevant specialist studies, the Extension Site 2014 should be able to yield more gravesites than those yielded in the previous site. Then the Project Team will combine gravesites from both sites (Previous Site 2014 and Extension Site 2014) to end-up with a yield that will meet the main objective of Mandeni LM which is to have a regional cemetery which would last for at least 10 – 15 years and beyond.

1.4 Need and desirability

In this context the analysis of need and desirability has been done in accordance with the Need and Desirability Guideline in Terms of the EIA Regulation 2010.

While the concept of need and desirability relates to the type of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which *need* refers to *time* and *desirability* to *place* – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to *wise use of land* – i.e. the question of what is the most sustainable use of land.

For the purpose of this project need and desirability are going to be discussed separately:

- **Need (timing)**

The need for the identification of the land suitable for cemetery establishment has been identified in the Mandeni 2013/14 Integrated Development Plan (IDP). According to Mandeni IDP (2012/17), in the 2010/11 financial year, Mandeni LM appointed a consultant to undertake a feasibility study on the establishment of cemetery in Mandeni LM. The application for Environmental Authorisation was withdrawn due to the fact that the study proved not to be viable for Mandeni LM. The current study is a continuation/extension from the previous study.

It is understood that the currently two existing cemeteries (Tugela and Sundumbili), in Mandeni area, have reached their maximum capacity thus creating an urgent need/demand for the establishment of new cemetery. It is understood that the proposed cemetery development is a regional priority since the local communities are in urgent need of a designated area to bury their loved ones.

- **Desirability (placing)**

The proposed cemetery will be located in the Mangethe area within the Mandeni LM. It is situated near the N2/Mandeni interchange, approximately 8km from the Mandeni town centre. This will provide an improve convenience, in terms of proximity, to local communities who are the intended users of the proposed development. Furthermore, the proposed cemetery development will contribute to temporary jobs to be created during construction and permanent jobs during the operational phase

The proposed cemetery development will not compromise the integrity of the Mandeni IDP and SDF since such development is has need identified as one of the priority projects in the IDP. Although the study area appears to fall under the Terrestrial Biodiversity Management Zone in the ILembe District Environmental Management Framework (EMF), it is anticipated

that the proposed cemetery development will also not compromise the integrity of the existing environmental management priorities for the areas as defined in the iLembe EMF. The Environmental Authorisation will be in place to guide construction and operation phases of the proposed development.

The cumulative impacts anticipated from the proposed development include an increase in traffic, noise disturbance, as well as disturbance that may result in the site being prone to erosion during construction (due to clearing of vegetation).

1.5 Location of the study area

The study area (Proposed Site 2014) is Sub 1 of Sub 50 and the Remainder of Sub 50 of the Farm Reserve No. 7A No 15826. It is located in the Mangethe area within the Mandeni LM. It is situated near the N2/Mandeni interchange, approximately 8km from the Mandeni town centre. Mandeni LM falls under iLembe District Municipality. The Figure 1.1 and 1.2, below, show the study area (Proposed Site 2014) and its surroundings, as well as an Aerial view of study area, respectively.

The geographical coordinates for the Proposed Site 2014 are:
31° 29' 04" E 29° 10' 715" S

Figure 1.1: Study Area and its surroundings (see also Annexure 1)

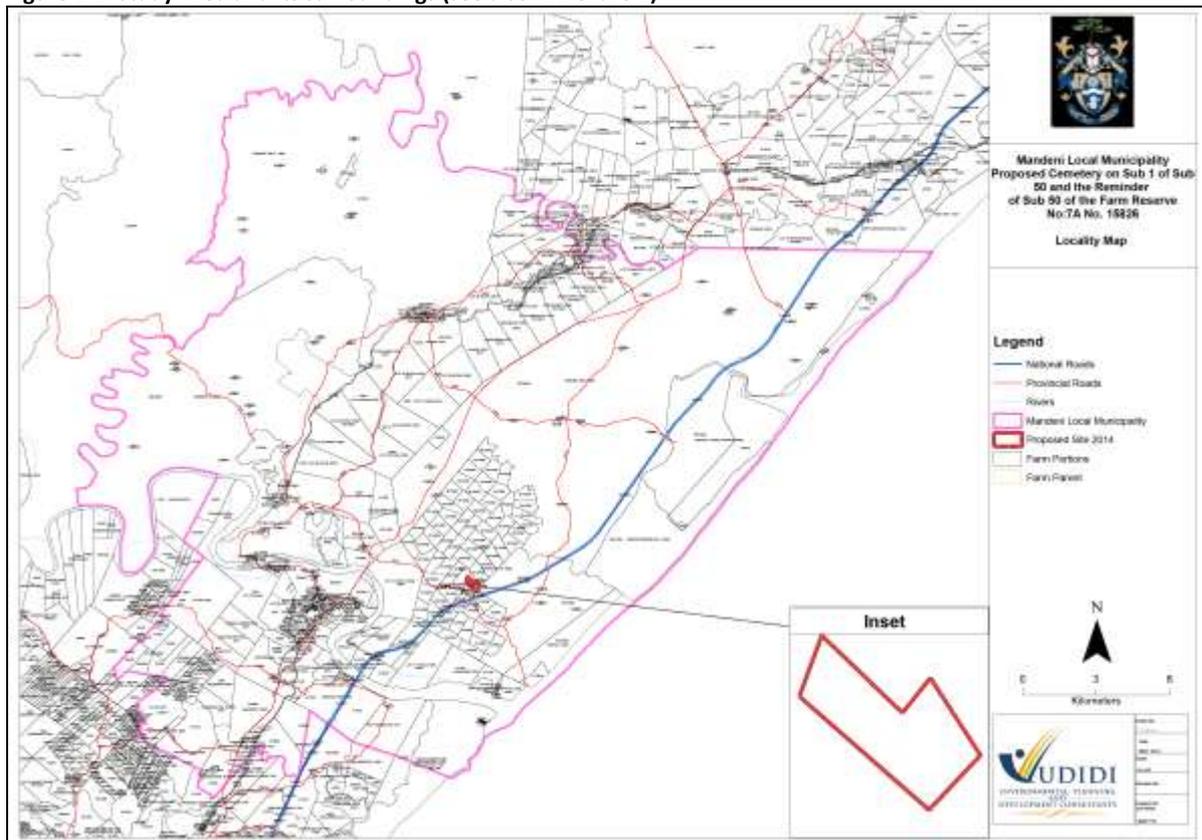


Figure 1.2: Aerial base map for the Proposed Site 2014 (see also Annexure 1)



1.6 Site Inspection

A site inspection of the pre-identified site was conducted on the 26th March 2014.

1.7 Consultations

The following people were consulted as part of the pre-feasibility analysis:

- Mandeni Local Municipality – Provided background to the project and GIS related information
- Amafa AkwaZulu-Natal - Heritage Impact Assessment Input
- Ingonyama Trust Board - Land ownership
- Surveyor General – Land ownership
- Deeds Office – Land ownership
- Department of Transport, KZN – Traffic Impact Input
- Department of Water Affairs – Information related to Water Use licensing

2. LEGISLATION OVERVIEW

2.1 The Constitution of the Republic of South Africa

The Constitution (Act No.108 of 1996) is the supreme law of the Republic and all laws and conduct must be consistent with the Constitution (section 2). Section 155 and 156 of the Constitution assigns the management and administration of cemeteries to municipalities, while provinces are responsible for providing monitoring and support role in respect of this function. Where the municipality fails to fulfil its executive function, Section 139 provides that the relevant provincial executive may intervene and take appropriate steps to ensure fulfilment of the obligation.

Implications for the proposed cemetery

The Mandeni LM has an obligation to provide cemeteries for the communities within the municipal jurisdiction, as per the stipulation in the South African Constitution. Hence the Mandeni LM has issued a tender for this project.

2.2 The KwaZulu-Natal Cemeteries and Crematoria Act (No.12 of 1996)

The KwaZulu-Natal Cemeteries and Crematoria Act (No 12 of 1996) provides for establishment, control, management maintenance, operation, closure, reopening and regulation of cemeteries and crematoria, and the exhumation, re-internment or disposal or cremation of human remains.

This Act defines a cemetery as any place:

- (a) Where human remains are buried in an orderly, systematic and pre-planned manner in identifiable burial plots;
- (b) Which is intended to be permanently set aside for and used only for the purposes of the burial of humans.

In terms of establishment of cemeteries and crematories, this Act indicates that:

A Regional Council, local council or tribal authority may, in the manner prescribed, establish and operate one or more cemetery or crematorium and cemetery and crematorium: Provided that:

- (a) such cemeteries and crematoria may be established within and without the of jurisdiction of such Regional or local council or tribal authority;
- (b) no cemetery or crematorium shall be established in the area of jurisdiction of a tribal authority without the prior consent of the appropriate tribal authority;
- (c) no cemetery or crematorium shall be established by a Regional or local council or a tribal authority in the area of jurisdiction of another Regional or local council or a tribal authority without the prior consent of such other Regional or local council or tribal authority.

Implications for the proposed cemetery

This Act prohibits the burial of human remains elsewhere but it stipulates that human remains should either be buried in a cemetery or be cremated.

The proposed cemetery is responding to the Act by providing the local communities with an opportunity of having access to a formal burial space / cemetery.

Therefore, the proposed cemetery should adhere to the regulations stipulated in this Act by:

- Providing a development that will not pose any danger to public health or nuisance to the owners or occupiers of nearby properties.

2.3 The KwaZulu-Natal Cemeteries and Crematoria Amendment Act (No. 2 of 2005)

This Act aims at amending the KwaZulu-Natal Cemeteries and Crematoria Act, 1996, to make provision for burials other than at the established cemeteries, and to provide for matters connected therewith.

Amendment of section 3 of Act 12 of 1996

The following section is hereby substituted for section 3 of the principal Act:

“Prohibition against burial or cremation elsewhere than at established cemeteries and crematoria. (1) Subject to the provisions of section 2, no human remains shall be –

- (a) Buried except in a cemetery; or
- (b) cremated except at a crematorium,

Established and operated in terms of this Act and the regulations made thereunder.

(2) Despite the provisions of subsection (1) (a), but otherwise subject to this Act, an occupier may bury a deceased member of the family of the occupier, who at the time of the death of the deceased, was residing on land on which the occupier resides.

(3) A burial contemplated in subsection (2) –

- (a) may take place only if there exists an established practice in respect of the land on which the occupier resides; and
- (b) may be conducted in accordance with the religion or cultural belief of the occupier”.

Implications for the proposed cemetery

This Act is an amendment of the KwaZulu-Natal Cemeteries and Crematoria Act, 1996, it provides for burial of occupier, after the notification of the owner of land has been undertaken, in a land that he / she was residing at the time of death.

The said burials should also conform to stipulations of the 1996 Act such as that the cemeteries / graves catered for under the 2005 Amendment Act should also not pose any environmental and / health danger to the communities.

Since, there is this Amendment Act, which caters for people who prefers to be buried on the land they residing by the time of their death, when making projections for the proposed cemetery, consideration should be given to the fact that some of Mandeni community members may choose to be buried in the land they were residing in, during their time of death.

2.4 The Health Act (No 63 of 1977)

In terms of the Health Act proposed Regulations for the control of environmental conditions constituting a danger to health or a nuisance are as follows:

In terms of Regulation 4(1), no person shall bury a corpse in or on any premises, which have not been registered by the local authority for that purpose. This regulation does not apply to areas where the burials or the establishment or maintenance of cemeteries are regulated in terms of any other law.

In terms of Regulation 5(1), any person seeking registration of any premises for the purpose of conducting thereon an activity referred to in regulation 4, shall give notice of such intention substantially as stipulated in Annexure 2 of the regulations. After consideration of any objections, the local authority will register the premises if it is satisfied that no danger to health or that any nuisance will be caused, subject to any conditions as it may determine.

Implications for the proposed cemetery

The proposed cemetery extension should conform to this Act by taking into consideration that the proposed cemetery development should not pose any danger to health or nuisance to the nearby residents.

2.5 National Environmental Management Act (No 107 of 1998)

The National Environmental Management Act (No. 27 of 1998) was drawn up 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 co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

Section 28 of the Act that falls within Chapter 7 – Compliance, Enforcement and Protection can be related to future developments. Part 1 of the Chapter focuses on environmental hazards and Section 28 relates to the duty care and redemption of environmental damage. Section 28 provides that every person who causes, has caused, or may cause, significant pollution or degradation of the environment, must take reasonable measures to prevent such pollution or degradation from occurring, continuing or reoccurring or, insofar as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

Implications for the proposed cemetery

The proposed development should adhere to this Act by considering that the development of cemetery should significantly minimise environmental pollution or degradation.

2.6 KwaZulu-Natal Planning and Development Act (No. 6 of 2008)

The KwaZulu-Natal Planning and Development Act 2008 (Act No.6 of 2008) directs and regulates planning and development in the Province. The PDA applies to the whole Province including the Ingonyama Trust Land.

A municipal planning scheme is used to manage development; it is formally approved and consists of a map and regulations to manage land use and development. All developments

need to be in accordance with the scheme, which can be obtained from the local or metropolitan municipality.

The Act must:-

Promote a uniform planning and development system that treats all citizens of the Province equitably;

- a) Provide a fair and equitable standard of planning and development to everyone in the Province, while accommodating diversity such as urban and rural needs;
- b) Incorporate and build on good practices and approaches to planning and development which have evolved outside of the formal planning and development system;
- c) Promote a planning and development system that redresses the historic injustices perpetuated by a fragmented planning and development system;
- d) Favour lawful development;
- e) Be clear, including the relationship between different laws;
- f) Be practical;
- g) Promote certainty;
- h) require timeous action by decision makers; guide decision makers;
- i) Require decision makers to obtain expert advice before making a decision; and
- j) be enforceable; and

WHEREAS planning and development decisions must be taken by local government, with appeals being resolved by an independent tribunal of experts appointed by the responsible Member of the Executive Council in consultation with the Executive Council of the Province.

Implications for the proposed cemetery

The act regulates planning development within the KwaZulu-Natal Province. It aims at promoting environmental sustainability-cemetery development requires that the ecological interdependencies and ecological impact on human living environment to be taken into account. It further promotes public participation.

2.7 National Heritage Resources Act (No.25 of 1999)

According to the System for Management of National Heritage Resources Chapter 2 Part 2: General Protection; Burial grounds and graves

36.(1) where it is not the responsibility of any other authority, South African Heritage Resources Agency (SAHRA) must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- (4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3) (a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant in accordance with any regulations made by the responsible heritage resources authority.
- (5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3) (b) unless it is satisfied that the applicant has, in accordance with regulations.

Implications for the proposed cemetery

Should there be a grave laid in the proposed cemetery site which is deemed as being of cultural significance, that grave can be, at the discretion of SAHRA, be conserved and maintained under this Act

2.8 National Water Act (No. 36 of 1998)

The National Water Act (NWA) preamble states that the aim of the act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply for human consumption and for ecological systems through the determination of the Reserve. The NWA further provides for the protection of water resources through preventative and corrective measures.

Specific to the cemeteries, Section 19 is worth quoting under: Prevention and remedying effects of pollution

s19. (1) An owner of land, a person in control of land or a person who occupies or uses the land on which—

(a) any activity or process is or was performed to undertaken; or

(b) any other situation exists which causes, has caused 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.

Implications for the proposed cemetery

The proposed cemetery development should ensure that no seepage from cemetery which contaminate any nearby water resources.

2.9 Mandeni Cemetery and Crematoria By-Laws (2005)

The Mandeni Cemetery and Crematoria By-Laws (2005) came into operational in 1 April 2009. The By-Laws provides general principles relating to cemetery and crematoria. These include the following:

- Care and maintenance of cemeteries including acceptable conduct within cemeteries.
- Keeping of records (register).
- Interment which includes depth of graves, number of graves, burial practices, etc.
- Exhumation and reopening of graves.

Implications for the proposed cemetery

The Mandeni Cemetery and Crematoria By-Laws should be taken into consideration when preparing for the establishment the proposed cemetery. These By-Laws will also inform the proposed Mandeni Cemetery Management Plan

2.10 Department of Water Affairs (DWA) cemetery requirements

Department of Water Affairs (DWA) requires the following information with regard to the development of cemeteries.

- The proximity, and the distances to all surface water bodies in the vicinity of the proposed cemetery must be established.
- The soil types, depths and permeability must be established
- A borehole and springs census must be carried out within a one kilometre radius or on the site and where possible, the yields of each borehole, their logs and water quality must be supplied.
- The geohydrology of the proposed site must be assessed by surface mapping, accessing existing information and geo hydrological maps of the area, together with appropriate subsurface investigative measures.

In addition to the above requirements, the cemetery should not be:

- Located below the 1 in 50 year Floodline of a river.
- Situated in or near sensitive ecological areas
- Situated in areas characterised by steep gradients, or shallow bedrock with little soil cover, where stability of slopes will be a problem.
- Situated on unstable areas, like fault zones, seismic zones, dolomitic or karst areas where sinkholes and subsidence are unlikely
- Situated in areas of ground water recharge on account of topography and/or highly permeable soils; and
- Situated on areas overlaying or adjacent to important or potentially important aquifers (Parsons Aquifer classification), where such aquifers are to be **used** for water supply purposes.

Wetland Buffer Requirements:

- It is a requirement of the department that there must be a buffer of at least 20m from the edge of the temporary zone of any wetland to the edge of any structural development.

Should the developer not be in agreement with the 20m buffer zone, a functional assessment must be carried out to determine an appropriate buffer zone so that the wetland is not impacted on.

3. EVALUATION OF THE PROPOSED SITE

3.1 Need for the proposed site evaluation

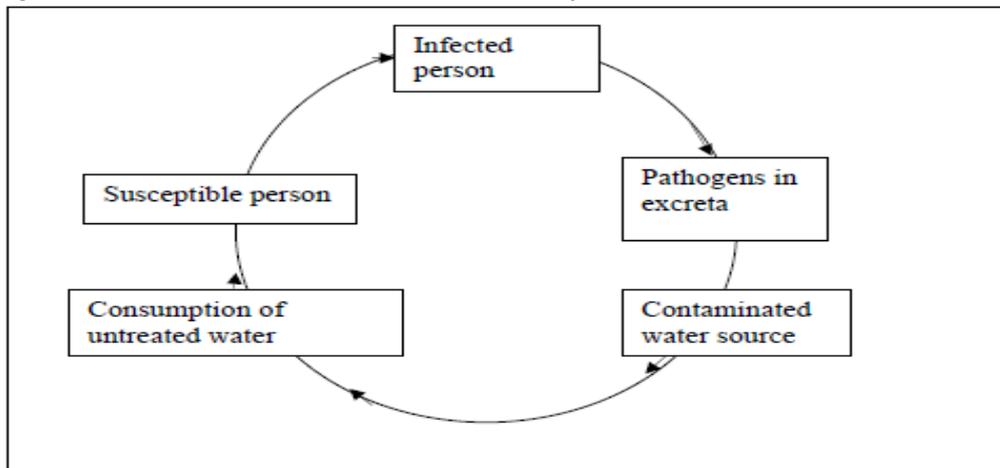
The Mandeni LM has identified a need for the establishment of the cemetery within its area of jurisdiction. The municipality has identified a parcel of land, spanning 13.5 hectares, for the establishment of the proposed cemetery.

The proposed cemetery establishment will be subjected to an EIA processes in order to determine whether the identified study area is indeed suitable for a cemetery establishment. Research shows that a poorly sited cemetery can contribute to pollution and create a health hazard to the local community. This can lead to severe health hazards of epidemic proportions, ignorance of this potential pollution hazard among community members at risk is an on-going cause for concern in South Africa and thus it has become necessary to investigate the impact of a poorly placed cemetery site. Investigating potential impact of degradation products from seepage waters from cemeteries is essential in order to provide understanding on the fate of decomposition products from human corpses as they pass through the soil and into groundwater.

During putrefication¹ of the human corpse, there is seepage of decay products into percolating water². This seepage contains bacteria, viruses and organic and inorganic chemical decomposition products.

If the cemetery is located in a porous soil type, such as sand or gravel, movement of seepage can be rapid and mix easily with the groundwater beneath the site. This could conceivably be a cause of local epidemics from waterborne diseases where the groundwater is used as a water source as shown on figure 3.1 below.

Figure 3.1: The Classical Water-Borne Disease Infection Cycle



To mitigate such risks, the Project Team has visited the study area and has conducted a preliminary assessment of the study area which will be followed by the detailed Specialist Studies. Such an exercise will assist in determining the suitability of the study area for being established as a cemetery.

¹ The breakdown or decay of organic materials, separation into constituents by chemical reaction

² Water which seeps or filters through the ground without any definite channel and not part of the flow of any waterway

3.2 Criteria used for evaluating site suitability

Some of the factors that will be considered when evaluating suitability of Proposed Site 2014 as a site for cemetery establishment included taking into consideration the following factors:

Table 3.1: Criteria used for evaluating site suitability

Social Assessment	Economic Assessment	Biophysical Assessment
Accessibility to the proposed site	Access to Basic Services and Facilities	Irreplaceability Analysis
Community Acceptability	Socio-economic Value of the Proposed Development	Slope
Socio-Economic Considerations		Geological and Geotechnical Considerations
Land Ownership and Size		Hydrological Suitability
Proximity to unregistered gravesites		Surrounding Land Uses
		Agricultural Potential
		Other Environmental Consideration: <ul style="list-style-type: none"> • Scope of Environmental Impact Assessment • Regulatory Assessment • Alternatives • Wetland Delineation • Heavily Wooded Areas • Air Quality • Noise Pollution

4. THE PROPOSED SITE 2014

4.1 Social Assessment

It is understood that the social impact assessment is a prerequisite in terms of the principles of sustainable development. The social sustainability and local buy-in to the proposed Mandeni Cemetery establishment is very critical since it is the community who will be using the proposed cemetery. The Project Team has looked at some of the criteria that could be used to determine the suitability of the cemetery site from a social perspective. It should also be noted that local communities, as well as interested and affected parties (I&APs) will be engaged at a Public Participation Stage of the project. At this stage, it is anticipated that more factors will be revealed that need to be considered, from a social perspective.

(i) Accessibility

Accessibility is an important factor when selecting a site for cemetery establishment; the selected area should be located in an area that is accessible to its users. This means that there should be proper roads for easy access and the location should be at an acceptable proximity to the residential areas.

The Proposed Site 2014 for cemetery establishment is located at the Shayamoya farm, in the Mangethe area. The site is adjacent to the N2 and accessible via dirt road leading from the P415 main road. The site can be easily accessible to the local communities since it is located approximately 8km from Mandeni Town and 6km from Tugela Mouth.

Figure 4.1: Access road P415 and dirt road leading from P415



(ii) [Community acceptability](#)

It is understood that the site identified for cemetery establishment should be acceptable to the local communities who are going to be the users of the proposed cemetery. Should the local communities accept the proposed development, is it likely for them to support and safeguard the cemetery once established. However; if there is no buy-in from locals, it is also likely that the cemetery will not receive the proper safeguard, which may result in vandalism.

During the Public Participation conducted for the 2009, some of the concerns/issues raised by the locals and / or I&APs:

- The community queried why the cemetery would be established when there are no basic services provided in the area
- It was questioned where the land for the proposed cemetery site was acquired from.
- What will happen when the cemetery has reached its capacity? Concerns from adjacent residents that the proposed cemetery may need to be expanded.
- Concerns of the adjacent property depreciating in value
- There will be aesthetic and visual impacts associated with the development of a cemetery.

At this stage the Project Team is not in a position to determine whether the local communities will accept or reject the proposed development. This will only be determined during the Public Participation Stage. However, it is expected that some of the concerns raised in the 2009 study may also be raised for this study. In that case, the Project Team, with the assistance from Mandeni LM, will provide relevant responses.

(iii) [Socio-Economic Considerations](#)

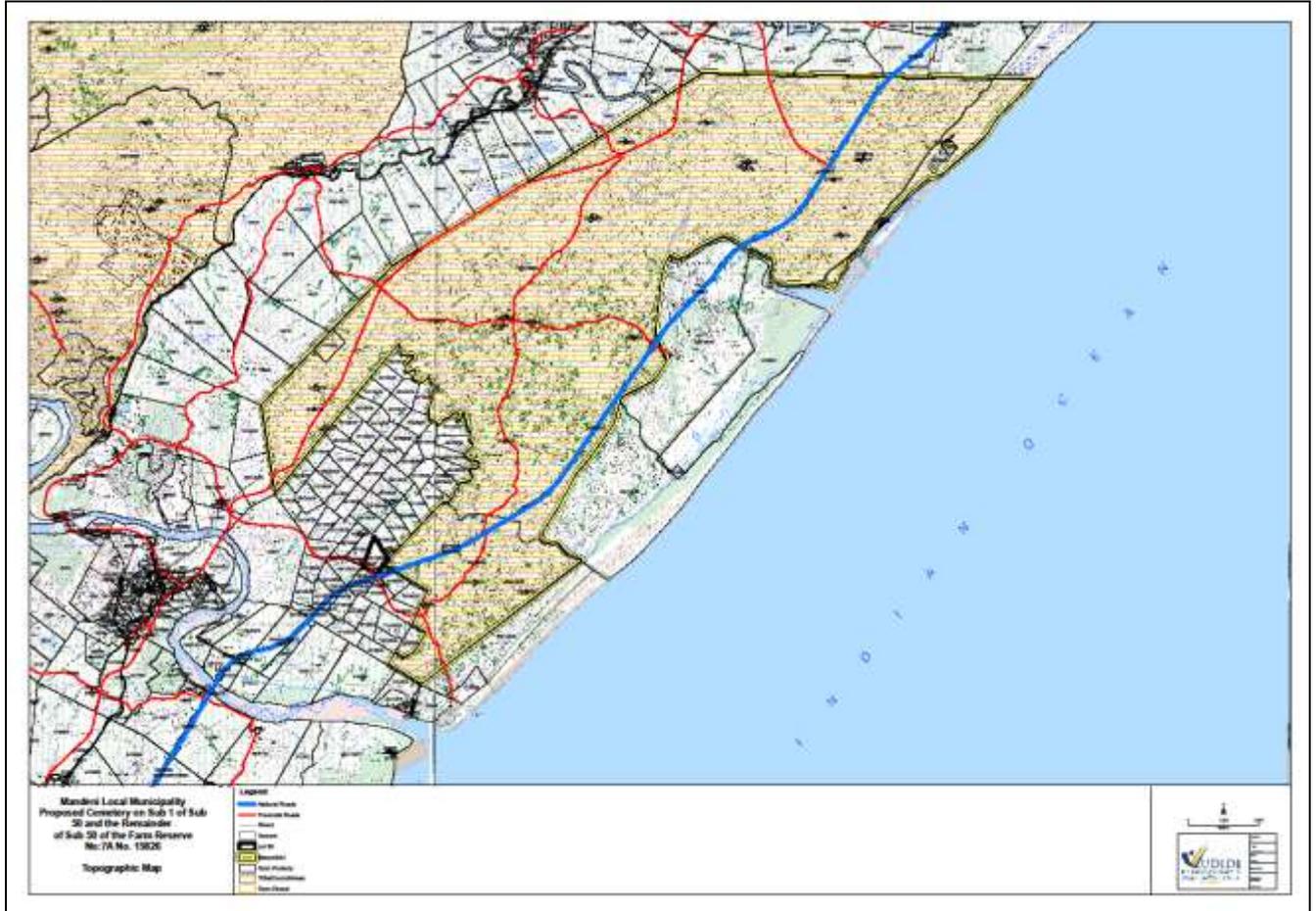
Proposed Site 2014 is located in close proximity to the Mandeni Town and Tugela Mouth. Socio-economic factors have been considered when evaluating suitability of this site. The site identified for cemetery establishment should be easily accessible to the communities (users) and also affordable in terms of users being able to easily commute from their areas of residence to the cemetery.

(iv) [Land Ownership and Size](#)

Landownership is a critical criterion for determining suitability for cemetery development sites since one cannot develop on a particular land without having the necessary land owner's consent to do so. It is understood from the 2009 study that ownership of the Proposed Site 2009 was disputed by delegations of local Inkosi Mathaba. It is understood that, according to then title deeds, Mr Coleman is the legal owner of the Proposed Site 2009. The Project Team is of the understanding that Mr Coleman is also the lawful owner of the Extension Site 2014 which makes him the lawful owner of the Proposed Site 2014. There should be a Memorandum of Understanding (signed land owners consent form) between the Mandeni LM and Mr Coleman to allow the municipality to undertake the preliminary investigations on the Proposed Site 2014.

The Proposed Site 2014 has an extent of 13.5ha which after the delineation of sensitive areas is expected to yield gravesites that would render the cemetery with a lifespan of at least 15 years.

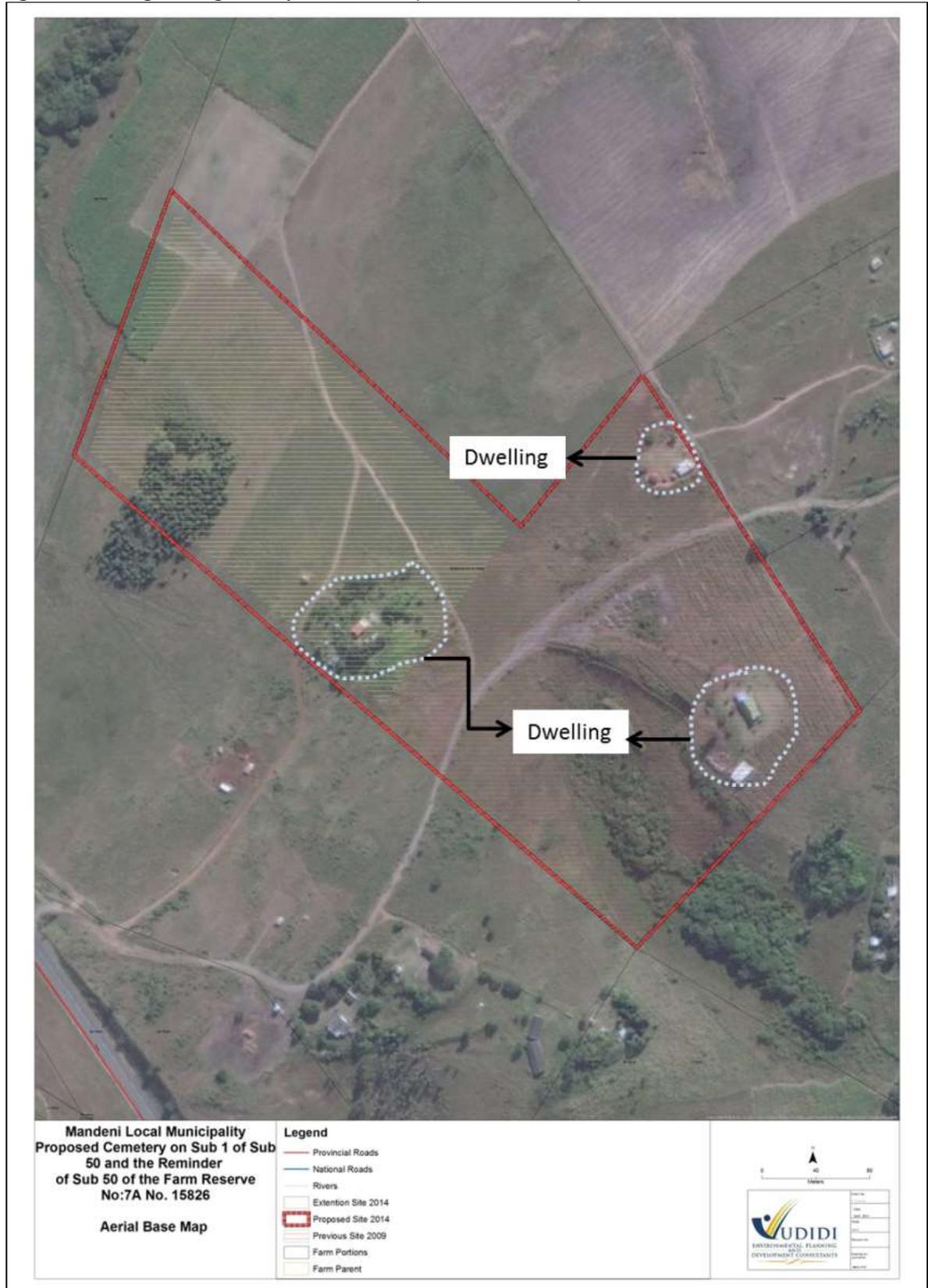
Figure 4.2: Map depicting Study Area in the context of Macambini Traditional Council (see also Annexure 1)



(v) [Proximity to Unregistered Grave Sites](#)

Based on the Project Teams' experience, it is understood that the proximity of the proposed site to existing unregistered grave, the better chance it has to be socially acceptable to its users. Findings from the study conducted in 2009 revealed that there is a grave site situated on the Previous Site 2009. No gravesites were identified during a site visit on Extension Site 2014. However, it was noted that there are existing settlements found within the Proposed Site 2014. The presence of these settlements indicates the possibility that there might be some unregistered graves within the dwelling yards since there are no other registered gravesites in close proximity. This will be explored further during the Public Participation Stage. The Figure 4.3 below shows existing dwellings found within the Proposed Site 2014 which are likely to have unregistered graves.

Figure 4.3: Existing dwellings on Proposed Site 2014 (see also Annexure 1)



4.2 Economic Assessment

It is understood that economic assessment (financial feasibility) is a prerequisite in terms of the principles of sustainable development. Therefore; financial sustainability of the project is critical and must still be determined before the project is initiated. The Project Team is of the understanding that the Mandeni LM intends to establish a cemetery that would cater for a municipal population of approximately 140 000 people for the next 10 – 15 years and beyond. It further aims to provide burial location in close proximity to the local communities, so as to prevent back yard burials.

(i) [Access to Basic Services and Facilities](#)

Basic services such as water, electricity and certified waste disposal site are important requirements and the closer the proposed cemetery development is to such facilities, the better the access is to them.

The study area (Proposed Site 2014) is accessed via a dirt road from P415. The condition of the dirt road can be classified as poor. There are existing electrical and telephone service lines in the study area.

Proposed Site 2014 is situated approximately 8 km to the town of Mandeni and 6 km from Tugela Mouth and that will enable the Mandeni LM to access some of the services which are currently not found on site. That includes access to potable water and solid waste management services. Such services are important for both the construction and operation of the proposed cemetery.

(ii) [Socio-economic value of the proposed development](#)

It is anticipated that the proposed cemetery development will create temporal and permanent employment opportunities for local members. The establishment of the proposed cemetery will contribute to service infrastructure provided by the Mandeni LM to its communities.

4.3 Biophysical Assessment

It is understood that biophysical assessment (feasibility) is a prerequisite in terms of the principles of sustainable development

(i) [Irreplaceability Analysis](#)

The Ezemvelo KZN Wildlife (EKZNW) C-Plan and Minset is a systematic conservation-planning package that analyses biodiversity features. According to EKZNW data, only a small portion in the northern part of the Proposed Site 2014 has been classified as Critical Biodiversity Area 1 Mandatory (Previously: Biodiversity Priority Area 1). That small portion of land has been identified as having an Irreplaceability value of 1, these planning units represent the only localities for which the conservation targets for one or more of the biodiversity features contained within can be achieved i.e. there are no alternative sites available. The rest of the Proposed Site 2014 does not appear to have any sensitive areas, as shown in both Figure 4.4 and Figure 4.5.

Figure 4.4: C-Plan Map showing Proposed Site 2014 (see also Annexure 1)

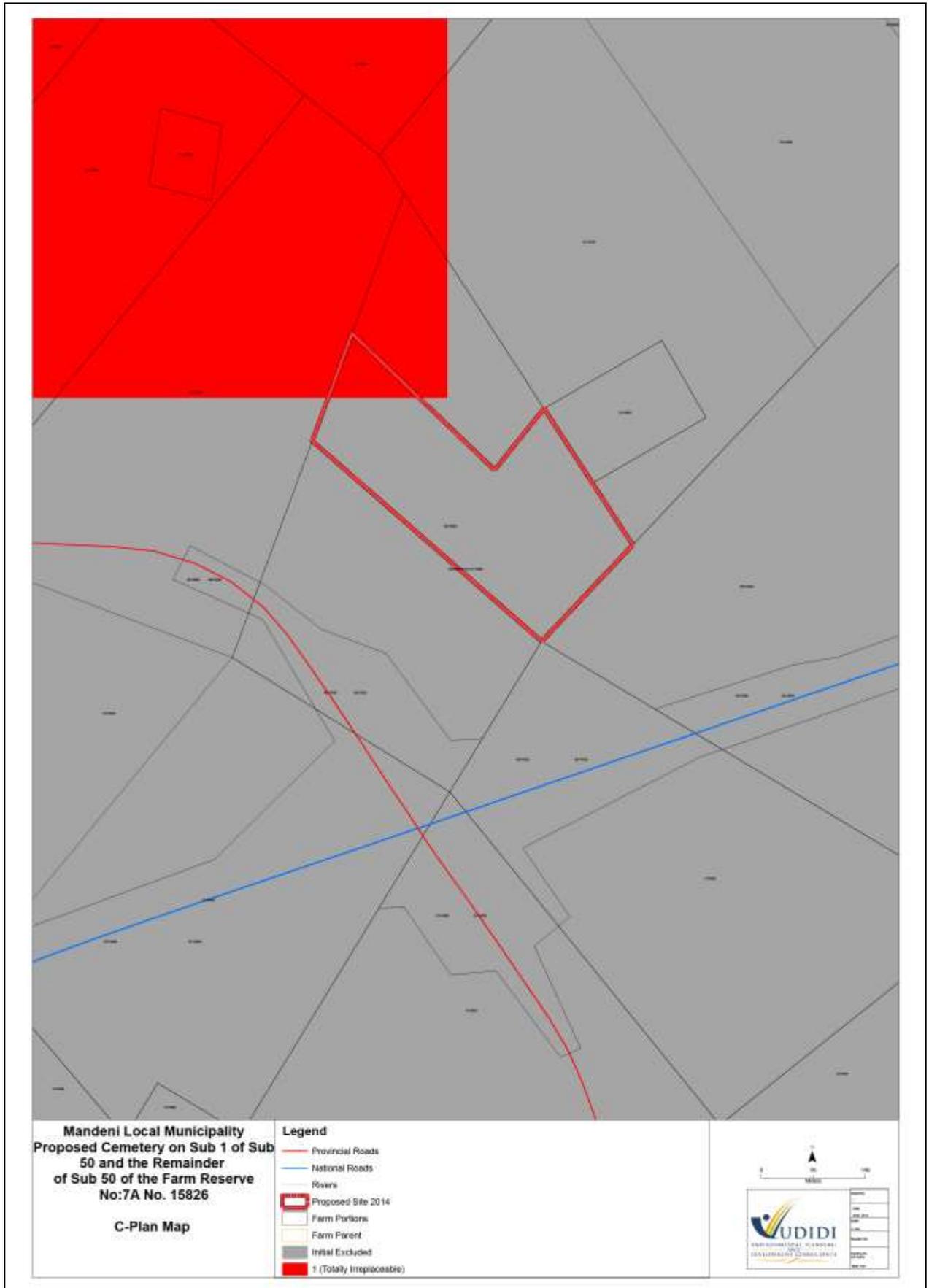
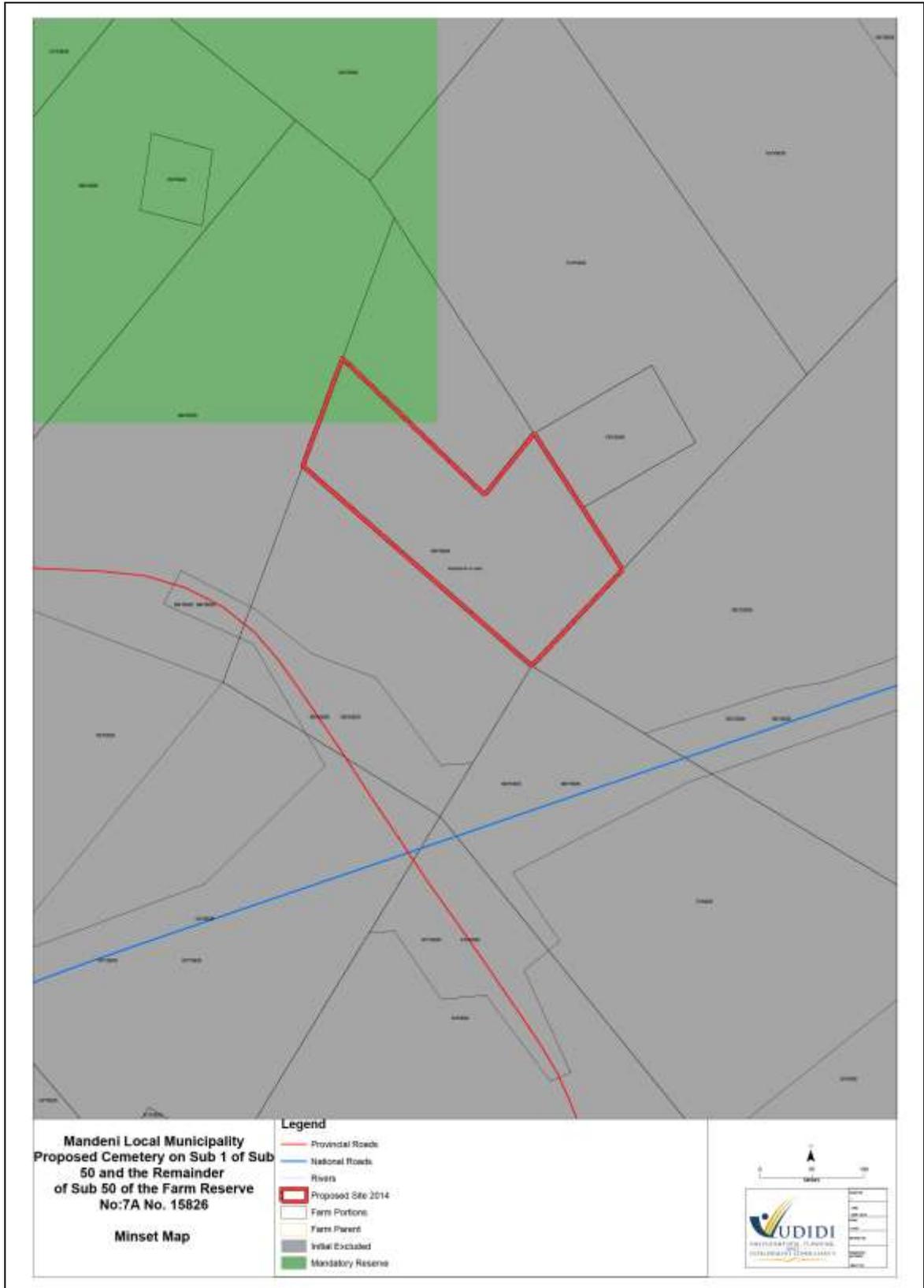


Figure 4.5: Minset Map showing Proposed Site 2014 (see also Annexure 1)



(ii) [Slope](#)

The findings of the study conducted in 2009 reveals that some parts of the Previous Site 2009 have slopes with gradients of between 13° and 16° which are not considered ideal for the location of a grave sites. In the Extension Site 2014, the topography is generally flat which is easier to develop and will not increase soil erosion and contamination of water catchments during rainfall seasons. However, there are some areas which are a bit steep having the possibility of increased soil erosion. A Geotechnical Specialist Study will be conducted for the Extension Site 2014.

(iii) [Geological and Geotechnical Considerations](#)

A detailed Geotechnical Specialist Study was conducted for the Previous Site 2009. According to this Geotechnical Specialist Study, the ideal cemetery site should have the following characteristics:

- Deep soils (minimum 1.8m; 2.4m required for a double burial);
- Water table should be at least 2.0m below the coffin;
- Workable soils that will easily backfill the hole, that is, not too clayey that it will clump when backfilling;
- Stable sidewalls, that is, not loose sandy walls
- Gentle slope gradients (ideally less than 6° but in extreme cases with special precautions required, up to 9° can be tolerated)
- Limited permeability of the natural soils to prevent surface water migrating through the soils and transporting contaminants to the ground water;
- Limited use of surface and/or groundwater sources within a kilometre radius of the site.

Some of the key findings for the study included:

- Site topography – there are parts within the western and eastern side of the Previous Site 2009 that have slopes with gradients of between 13° and 16° which are not considered ideal for the location of grave sites.
- Grave sidewall stability – collapse of loose aeolian sandy soils is likely to occur in the northern part of the site. This poses a threat to the safety of the workers excavating the graves as well as the people who are likely to get very close to the grave site during the burial ceremony. Across the remainder of the site, graves site must not be left open for extend period so as to prevent sidewall collapse.
- Water Table - There are areas within the Previous Site 2009 that were found to have soil profiles that suggests long term seasonal water table fluctuations. It was concluded that such an area should not be developed in order to preserve the natural attenuation properties of the drainage feature.

The Geotechnical Specialist Study concluded that in terms of the rating system, the Previous Site 2009 rates 65 out of 100. The site was considered to be poor for a cemetery site; however, the study further recommended that special precautions needed to be undertaken.

It is understood from the Mandeni Housing Sector (2007) that the Proposed Study Area 2014 falls under an area that have tillite with sandstone, mudstone, shale, intruded by dolerite along north Natal Coast. A Geotechnical Study will be undertaken for the Extension Site 2014 and the findings will be merged with those of 2009 to produce one Geotechnical Specialist Study for the Proposed Site 2014.

(iv) [Hydrological Suitability](#)

When the geohydrological investigation was conducted in 2009, it was found that the site is underlain by a thin mantle of colluvial and/or Aeolian sandy clay or fine grained sand with low silt content to a maximum depth of 3mbgl. Based on unified soil classification testing, the unsaturated zone soils have a permeability range of 5×10^{-1} to 1×10^{-9} cm/s. The colluvial soils are underlain by fine to medium grained shale/sandstone. The main groundwater occurrence is from an intergranular and fractured aquifer type. Regional faults were indicated west and east of the site, however, these could not be delineated in the field. Several local structural geological features were identified on or near the site from satellite photo interpretation.

The hydrocensus survey was carried out to establish groundwater usage in the vicinity of the proposed site. Three boreholes were reported by the Department of Water Affairs and Forestry National Groundwater Database (NGDB), however only one could be identified in the field. Five boreholes in total were located in the field, three of which may or may not correspond to NGDB boreholes. One borehole was located on the site and the recorded depth to water was 10.5 mbgl.

No borehole drilling was carried out as the existing borehole on site provided sufficient information for the purpose of the investigation. The depth to groundwater was measured at 10.5mbgl, which will provide a reasonable basal buffer zone for the development. A limited duration pumping test was carried out in the existing borehole on site to establish typical aquifer parameters. The hydraulic conductivity of the aquifer beneath the proposed site was calculated as 0.1 m/d. groundwater flux under steady state conditions was calculated as 1.8m/yr. faults zones near the site may result in groundwater flux velocities being orders of magnitude greater, and a worst case estimated result in ground water flux of 180m/yr with corresponding increases seepage velocities.

Groundwater sampling and analysis of the existing borehole on site indicates the groundwater quality to marginally exceed the class I ideal drinking standards, and hence be suitable for human consumption for a limited period. A risk assessment was carried out to determine if the proposed development would impact the aquifer beneath the proposed site. The risk assessment reviewed the vulnerability of the strategic value of the aquifer in order to establish the level of risk of contamination from the proposed cemetery development. The risk assessment summarizes that the aquifer vulnerability is low and the aquifer strategic value is low to medium.

Based on the risk assessment it was concluded that the proposed cemetery site will have a minimal impact on the aquifer, however the aquifer currently has strategic value and is used by local communities. A buffer will be required around the existing borehole on site or the borehole can be decommissioned and converted into a monitoring station

The 2009 Geohydrological Study concluded that a good cemetery design and management practices will be required for the duration of the cemetery development in order to help minimise the impact on the ground water system. It further suggested that, should the environmental authorisation be granted, at least two monitoring boreholes should be positioned on the Previous Site 2009 for monitoring purposes.

A similar study (Geohydrological Specialist Study) will be conducted on the Extension Site 2014. This will amongst other things establish the locations of water resources, water uses in the area, as well as existing potential contamination sources in and around the Extension Site 2014.

(v) Surrounding Land Uses

The proposed site area is located close to a few residential houses and a farm north west of the proposed site area. There are only a few overhead power cable straddling the site. Eskom has servitude rights and guidelines for developing within such areas should be followed.

The basic guidelines for developing within such areas include;

- Development should not be directly beneath the power lines.
- Due to the servitude being narrow, it only allows for development to be along each side of the power line. This particular power line allows for development on each side of 23.47m away towards the east and 35.36m towards the west.
- Development should allow for future expansions, power lines of this magnitude have a bigger footprint thus when replacement is due often these are replaced with even bigger structures.
- There should be no trees planted directly beneath power lines.
- As a safety precaution machinery for digging of graves may not be used directly underneath the power lines.
- There should be access roads allowing for Eskom to access power lines for service and maintenances purposes.
- Roads must be 10-30m away from the power lines/tower (along the side) NOT underneath.

Figure 4.6: Residential House and power line situated within the Extension Site 2014

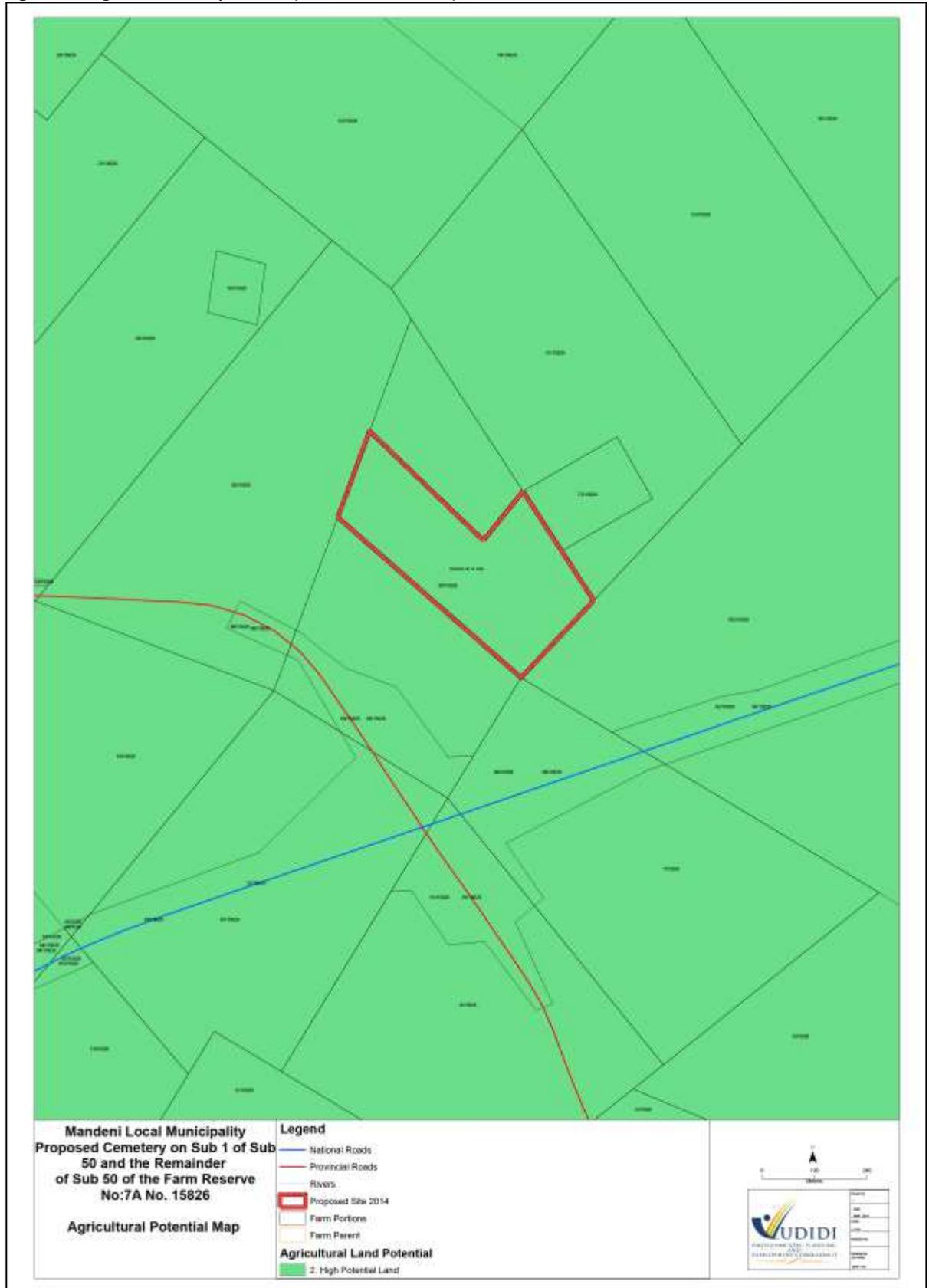


(vi) [Agricultural Potential](#)

Good quality agricultural land is land which is capable of sustainable use for agriculture, with a reasonable level of inputs, and without causing degradation of land or other natural resources. In this context, agricultural land is defined as land used for crop or animal production.

Findings from the study conducted in 2009, showed that there is sugarcane, Macadamia plantations on the Previous Site 2009. During site visit to the Extension Site 2014, sugarcane plantation and gum and bamboo tree plantation were identified. In general, the study area is considered as having high agricultural potential with a lot of open spaces/pieces of land for cattle grazing. The Figure 4.7, below, shows agricultural potential in the Proposed Site 2014.

Figure 4.7: Agriculture land potential (see also Annexure 1)



(vii) Other Environmental Considerations

- Scope of Environmental Impact Assessment

In terms of the EIA Regulations (General Notice R543 and R544) promulgated in terms of Chapter 5 of the National Environmental Management Act (NEMA) (No. 107 of 1998) as amended 18 June 2010, cemetery establishment is a listed activity under GN R544: Activity 21 – The establishment of cemeteries of 2,500 square meters or more in size; the proposed cemetery site covers an extent of 55,760 square meters or 5.576 hectares. This means that this activity would require environmental authorisations prior to its commencement and there would be a need to identify competent authorities in terms of sections 24(2) and 240 of the National Environmental Management Act, 1998. Based on the Project Teams' experience with the development of cemeteries, it is envisaged that the cemetery establishment in Mandeni LM will be subjected to the Basic Assessment in terms of the EIA Regulations 2010.

At this stage, the Project Team can also confirm that input will be required from Geotechnical, Geohydrological and Wetland Delineation and Functional Assessment Specialists. The Specialist Reports will be merged with similar Specialists Studies conducted in 2009. Whether the current project needs HIA or application to be exempted from conducting HIA will depend on a decision from Amafa-AKwaZulu-Natali. Public participation will be undertaken as per the requirements of the EIA Regulations 2010.

In the instance where cemetery establishment in the Proposed Site 2014 has proved to be feasible and the Environmental Authorisation is granted by DAEARD, the Project Team will then apply for Air Emissions License at Ilembe District Municipality) and Water Use licensing at the Department of Water Affairs.

- Regulatory Assessment

The Project Team do not envisage any fatal flaws in terms of the environmental regulatory requirements. Relevant legislations, as well as their implications for the project at hand have been discussed in Section 2 of this document.

- Alternatives

It is understood that consideration of alternatives is one of the most critical elements of the environmental assessment process. Its role is to provide a framework for sound decision-making based on the principles of sustainable development. The Project Team also understands that alternatives should be identified as early as possible in the project cycle. The following types or categories of alternatives can be identified:

- Activity alternatives
- Location alternatives
- Process alternatives
- Demand alternatives
- Scheduling alternatives
- Input alternatives
- Routing alternatives
- Site layout alternatives
- Scale alternatives
- Design alternatives

In this instance, it is understood from the study that was conducted in 2009 that a series of preliminary Geotechnical Investigations were undertaken on numerous sites within the Mandeni LM however; these sites were found to be fatally flawed when measured against the Geotechnical criteria requirements for cemetery sites. A number of alternative site layouts were also developed for the Previous Site 2009.

In terms of the current study, the Project Team is also of the understanding that Mandeni LM has no other potential land that could be assessed / explored for cemetery establishment. Therefore; it is anticipated that the site layout alternatives will also be explored. Site layout alternatives allow consideration of different spatial configurations on an activity on a particular site. This may include particular components of a proposed development or the entire activity.

- **Wetland delineation**

There is a wetland area found on the southern half of the Previous Site 2009, feeding into a drainage line which in turn feeds into Nyoni River. A Wetland Delineation and Functional Assessment was conducted in this site. Some of the key findings included:

- A 32m buffer was recommended around the wetland system. This means that there will be no cemetery development within the 32m wetland buffer.
- The functionality of the wetland was found to be intermediate to moderate high, with erosion control and nitrate removal being the two most prominent eco-services offered.

No wetland was identified on the Extension Site 2014, during the site visit and over the desktop analysis. However; there is a wetland identified on the north-western part, almost 100m outside the Extension Site 2014. Therefore, a Wetland Delineation and Functional Assessment will also be conducted on Extension Site 2014 to determine whether the proposed cemetery development will have impact on that wetland, if it would have impact, then that wetland will be delineated and its functionality assessed. Key findings will be consolidated with the initial key findings from the previous specialist study conducted in the Previous Site 2009. Only one consolidated report will be issued in this regard.

Figure 4.8: Wetlands associated with the Proposed Site 2014 (see also Annexure 1)

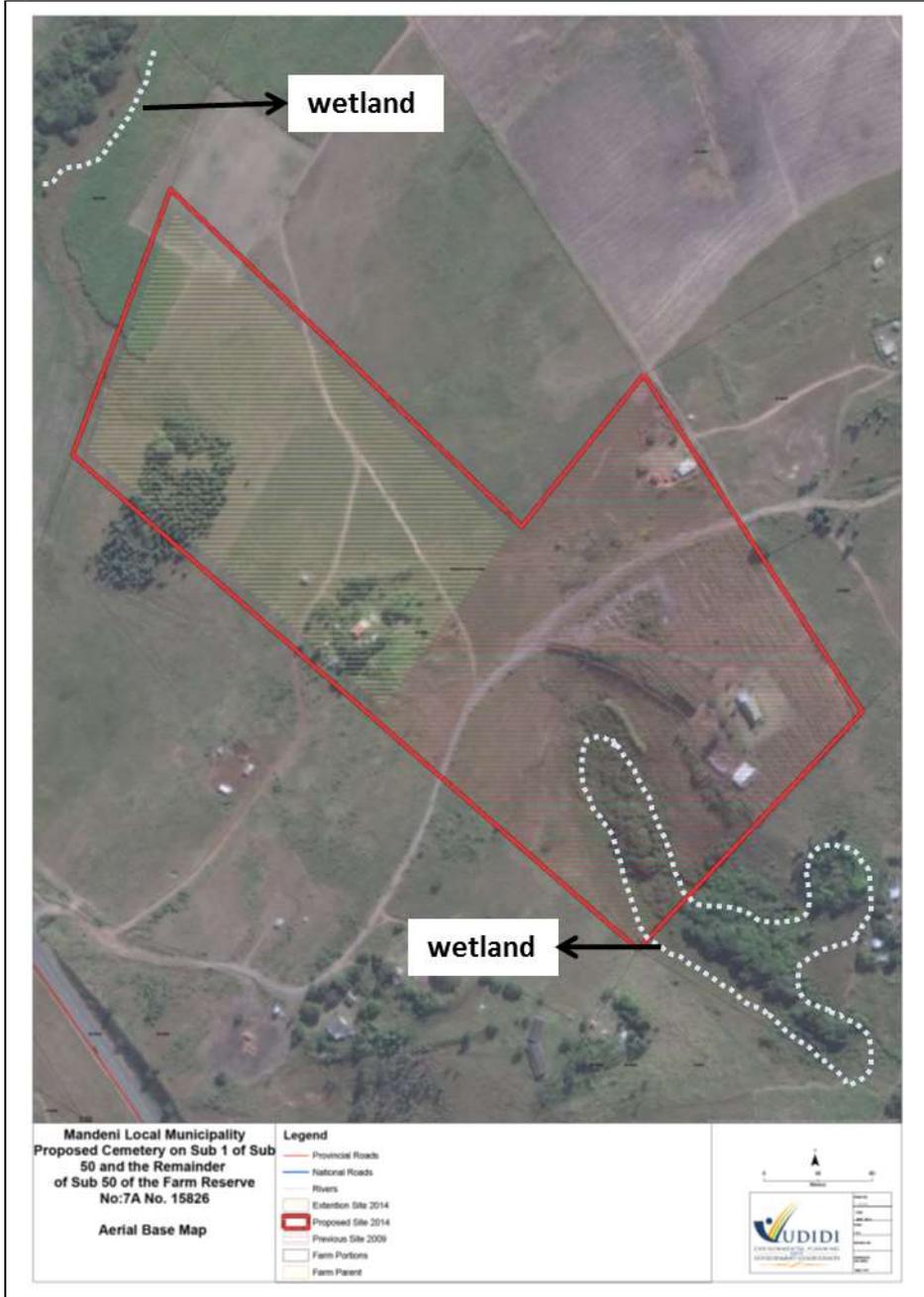


Figure 4.9: Wetland found within the Previous Site 2009



- Heavily Wooded Areas

The site identified for cemetery establishment in Mandeni LM is not located in a forested or heavily wooded area. However; there are gum trees and bamboo trees on the north-western part of the Extension Site 2014. It is recommended that forested and heavily wooded areas be avoided.

Figure 4.10: Gum and Bamboo trees found within Proposed Site 2014 (see also Annexure 1)



- Air quality

There does not appear to be any existing air quality issues at the Proposed Site 2014, and there are currently no apparent fatal flaws with respect to air quality issues. However, once the construction of the cemetery begins, as well as when the cemetery establishment has been completed, the following air quality issues may need to be considered:

- Construction vehicles may contribute to decline in air quality
- Increased traffic congestion especially from busses, taxis and private cars attending burial ceremonies may contribute to a significant decline in air quality

- Noise pollution

There does not appear to be any existing significant noise pollution issues at the Proposed Site 2014, and there are currently no apparent fatal flaws with respect to noise. However, once the construction of the cemetery begins, as well as when the cemetery establishment has been completed, the following air quality issues may need to be considered:

- Noise that would be generated from the construction vehicles during the construction phase
- Noise that would be generated from increased traffic congestion especially from busses, taxis and private cars attending burial ceremonies
- Noise generated from burial ceremonies i.e. mourners singing

5. CONCLUSION AND RECOMMENDATIONS

The cemetery site evaluation criteria used above, suggests the following conclusions for the proposed cemetery establishment in Mandeni LM:

- The Proposed Site 2014 is located in close proximity to both the Mandeni Town and Tugela Mouth, meaning that it is closer to its potential users. The site is easily accessible via the dirt road from the Main Road P415.
- The necessary services (i.e water and electricity) for construction and operation of the proposed cemetery can be drawn / source from existing services and facilities provided by the Mandeni LM.
- The Extension Site 2014 appears to have generally a slope that is flat and can be considered suitable for cemetery establishment.
- The Proposed Site 2014 is surrounded by land uses that are compatible with cemetery development however; there is a need to consider development further away from dissecting overhead power cables.

Although no fatal flaws are being anticipated in terms of the social, economic and biophysical environments, the following recommendations have been brought based on the site inspection conducted on the Extension Site 2014, as well as the findings from the previous study conducted on the Previous Site 2009:

- The detailed assessments of the geological and geotechnical conditions need to be carried out on the Extension Site 2014
- The detailed assessment of geohydrological condition needs to be carried out on the Extension Site 2014
- The wetland delineation and functional assessment need to be carried out on the Extension Site 2014
- A Heritage Impact Assessment should be conducted or an application to be exempted from conducting HIA should be lodged, with Amafa-AKwaZulu-Natali, for the Proposed Site 2014.

An Environmental Management Programme (EMPr) will be developed to mitigate the potential generic and site specific environmental risks associated with cemetery development. The EMPr will cover design, construction and operational phases. Over and above preparation of the EMPr, a Cemetery Management Plan as per the requirements of the Terms of Reference for this project will be developed and will focus on the operations and maintenance part of the proposed cemetery development.

5. REFERENCES

Draft Basic Assessment Report for the Proposed Mandeni Cemetery Establishment, EIA Reference DC29/0019/10

Ilembe District Municipality Environmental Management Framework 2013

Mandeni Housing Sector Plan (2007)

Mandeni Integrated Development Plan (2013/14)

Mandeni Integrated Development Plan (2012/17)

National Environmental Management Act, 1998 (Act No 107 of 1998), Publication of Need and Desirability Guideline in Terms of the Environmental Impacts Assessment Regulations, 2010