STATUS QUO TECHNICAL NOTE

ENVIRONMENT

South Eastern District Local Area Plan

This Technical Note represents part of the Phase Two Deliverable for the South Eastern District Local Area Plan.

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Msunduzi Municipality

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1 INTRODUCTION

1.1 DETAILS OF THE STUDY AREA

The South Eastern Districts (SEDis) of Msunduzi are situated in the south easterly part of the municipality and are approximately 113km^2 in extent, comprising a large portion of the Mkhondeni and Mpushini catchment areas (refer to Figure 1). The study area comprises predominantly agricultural land, with limited development and is sparsely populated. Ashburton and Lynnfield Park and a portion of Ambleton are recognised as low density residential areas within the SEDis. The northern boundary of the study area follows the urban edge of Bellevue and Lincoln Meade, the Duzi River and Ashburton Race Course Training Centre. The boundary then heads south towards Ashburton and follows the N3 highway through the Lynnfield Park/ Lion Park interchange and Richmond/ Umlaas Road Interchange. The southern boundary is Provincial Road P338 which links Umlaas Road and Thornville. The western boundary is formed by the edge of Edendale and Willowfountain and incorporates Shenstone. Furthermore, the study area is bordered by Mkhambathini and Richmond Municipalities. Wards 18, 36, 27, 32 and 33 are impacted by the project and the areas fall within the Northern and CBD, Ashburton and Eastern Areas.

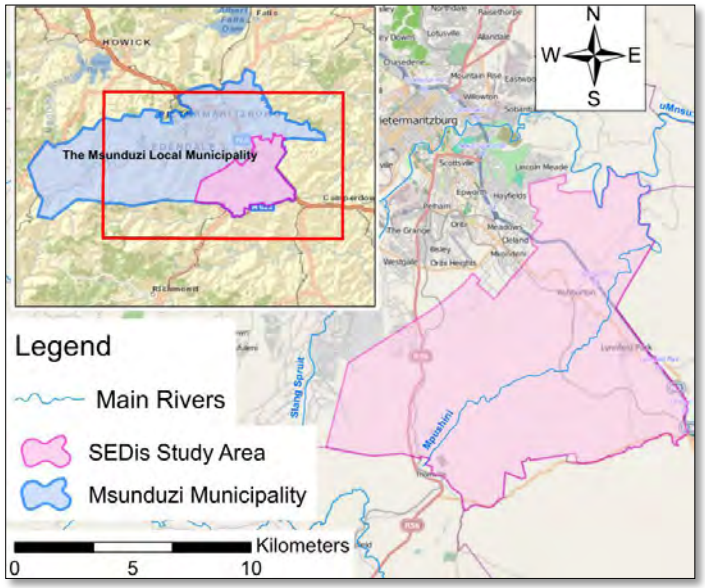

Figure 1: Location of South Eastern District

2 ENVIRONMENTAL STATUS QUO

South Africa and other countries have formulated strategies and legislative tools which are aimed at addressing the decline of non-renewable environmental resources through minimisation of detrimental impacts and better management of environmental resources. In particular, the Constitution Act of South Africa (No 108 of 1996) states that "Everyone has a right (a) to the environment that is not harmful to their health and well being, and (b) to have the environment protected for the benefit of the current and future generation through reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

In recognising this responsibility, Msunduzi municipality is preparing a Local Area Plan (LAP) for the South Eastern District as part of the Spatial Development Framework (SDF) and Integrated Development Plans (IDP) which are aimed at detailing the development and management of the land use within the municipality. To successfully implement the LAP within Msunduzi municipality, it is vital that the current receiving environment is known and understood in order to guide the municipality with their planning of future developments and also minimise the environmental impacts by protecting the sensitive areas and ecological systems located within the municipality.

The sections which follow discuss the current receiving environment of the study area with specific reference to the biophysical environment.

2.1 AIR QUALITY AND CLIMATE

According to the Msunduzi IDP (2013), the climate and local weather within the municipality are strongly influenced by topography (refer to Section 2.2); the higher lying areas in the north and west of the municipality are cooler and receive more rainfall. Pietermaritzburg receives an average of about 695 mm of rain annually, with most rainfall occurring during mid summer. It receives the lowest rainfall (6mm) in June and the highest (112mm) in January (refer to Figure 2). The monthly distribution of average daily maximum temperatures for Pietermaritzburg range from 20.5°C in June to 27°C in February (refer to Figure 3). The region is the coldest

during July when nocturnal temperatures drop to 5.6°C on average (refer to Figure 4) (SA Explore, 2000-2011).

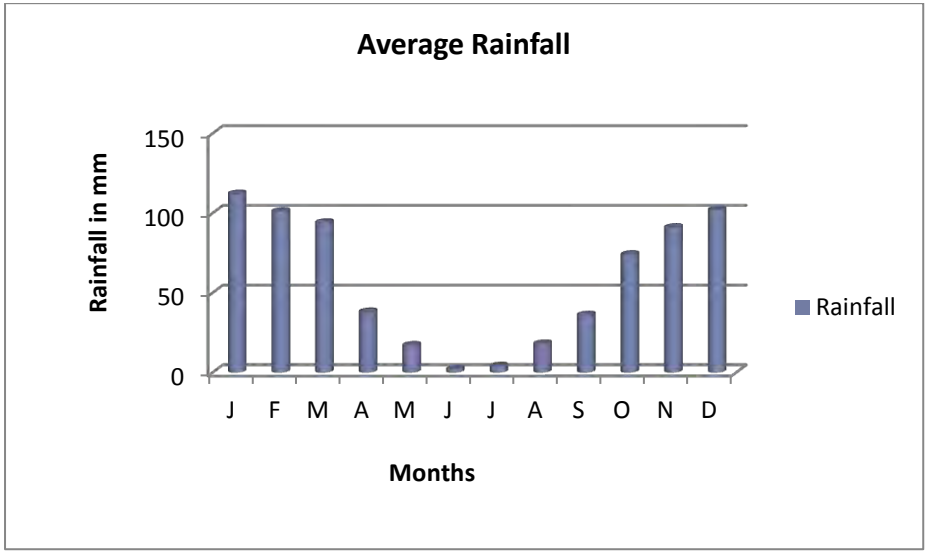

Figure 2: Annual Average Rainfall for Pietermaritzburg, 2000-2011

Source: SA Explore, 2000-2011

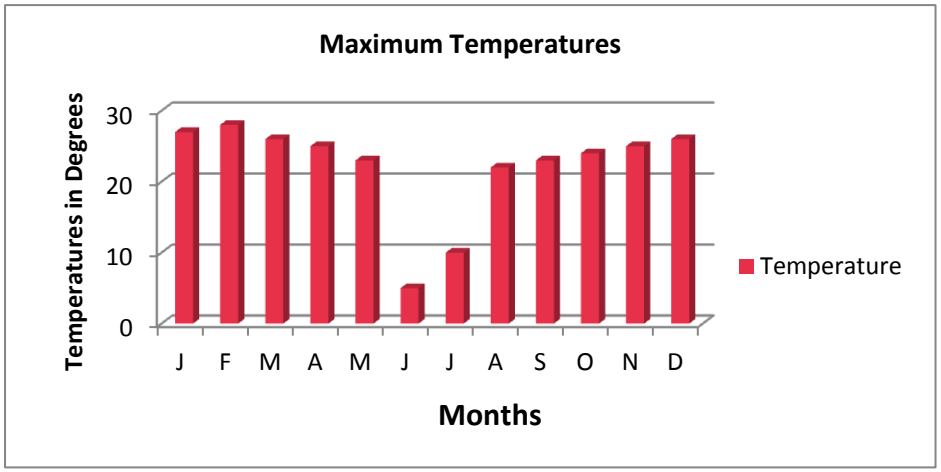

Figure 3: Annual Maximum Temperatures for Pietermaritzburg, 2000-2011

Source: SA Explore, 2000-2011

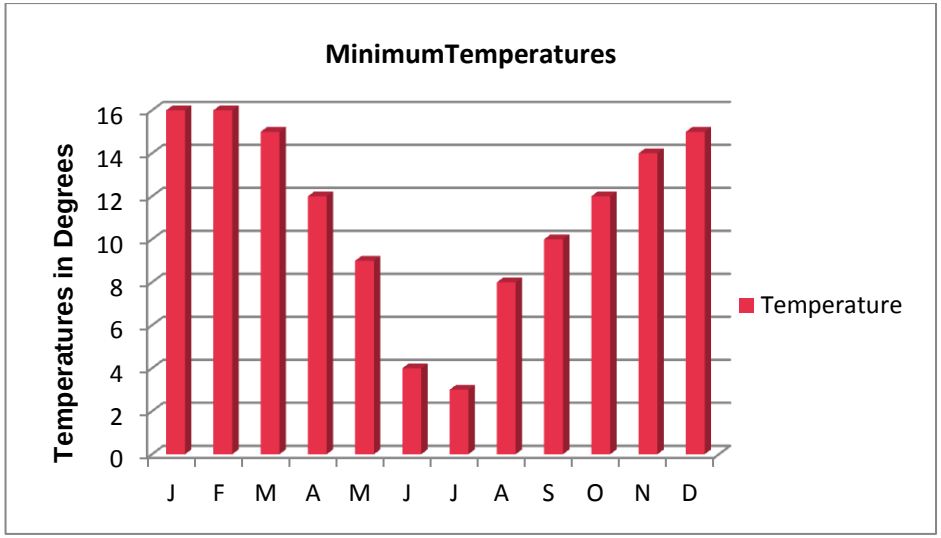

Figure 4: Annual Average Minimum Temperatures for Pietermaritzburg, 2000-2011

Source: SA Explore, 2000-2011

The city of Pietermaritzburg is located in a hollow formed by the valleys of the Msunduzi River and its tributaries. During clear winter nights, Katabatic[1] flow occurs, resulting in the movement of air from upslope areas down to the city. The air flow fills the valley floor with cold, dense air creating inversion that traps pollution within the municipality (Msunduzi IDP, 2013).

The inversion layer mostly occurs where there are major industrial establishments and as a result of a flat land and close proximity to transport infrastructure such as roads and rail. According to the 2013 IDP, the main sources of air pollution are listed below (Msunduzi IDP, 2013):

[1] Katabatic flow/wind: a wind that carries high density air from a higher elevation down a slope under the force of gravity

- An increase in vehicles volumes and traffic congestion in peak hours in arterial routes and Central Business District;
- Industries operating with old and outdated technologies;
- The use of coal and firewood for heating and cooking in formal and informal settlements; and
- Burning of brushwood and sugarcane.

Air pollution within most parts of the municipality is not a major problem as the large portion of its location extent (particularly the western areas) emit less pollution compared to the areas located in the north, east and south where high amounts of pollutants are emitted (refer to Figure 5).

According the Msunduzi IDP 2011/2012, there is limited monitoring and management of pollutants and this necessitates the development of monitoring stations and equipment which will extend the monitoring to the entire municipal jurisdiction and also facilitate the monitoring of vehicle emissions.

Figure 5 shows that within SEDis there is almost an even split between not sensitive, sensitive and very sensitive areas in relation to air quality. The conclusion to be drawn is that air quality sensitivity is an area of concern within SEDis, particularly in the Ashburton and Lynnfield Park areas (most likely due to their proximity to the N3 highway and industrial areas).

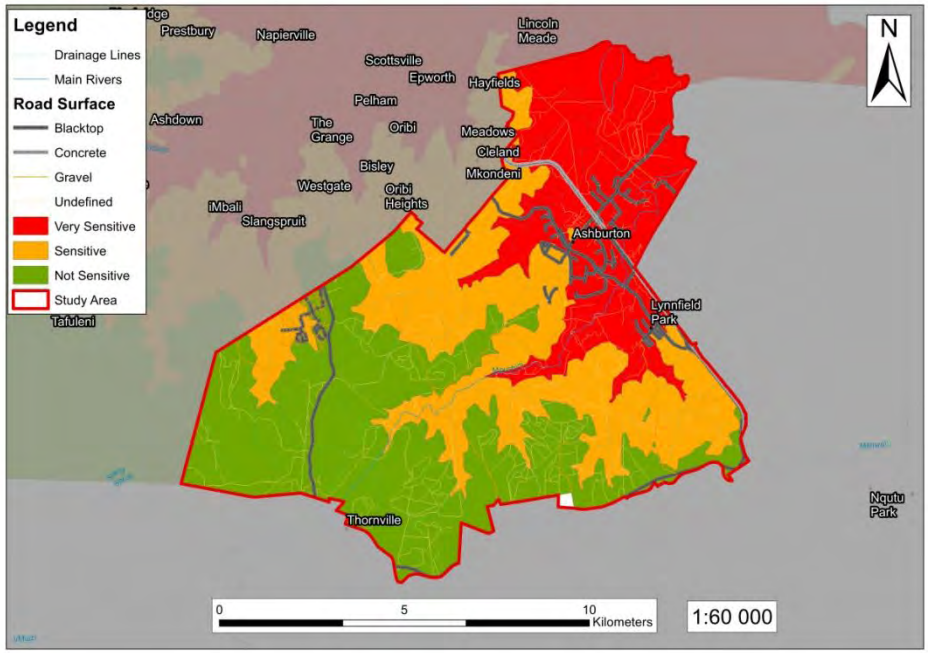

Figure 5: Air Quality Map

Source: Msunduzi EMF, 2010

2.2 GEOLOGY, SOILS AND TOPOGRAPHY

2.2.1 TOPOGRAPHY

The escarpment of Msunduzi is 400m above the city to the West and North West. The altitude ranges from 495m to 1795m above sea level and slopes from west to east. The mountains surrounding the city in the north west have created a clear distinction between rural and urban parts of the municipality. Furthermore, this situation has also limited the city from expanding along these directions and thus a number of small urban hubs have been formed outside the city towards the south east where the slope gradient varies between 0.5 to 10% due to undulating hills and flat terrain (Msunduzi IDP, 2013). Figure 6 shows slope percentage for the SEDis area (outlined in blue). The study area is characterised predominantly by fairly low-lying areas with slope percentages ranging between 0.5 and 10%. There are isolated high-lying areas with slope percentages from 10% upwards, occurring predominantly as incised river valleys

and ridges. It is noteworthy that slopes greater than 1:3 (10-18.43% slope) are generally not considered safe for development.

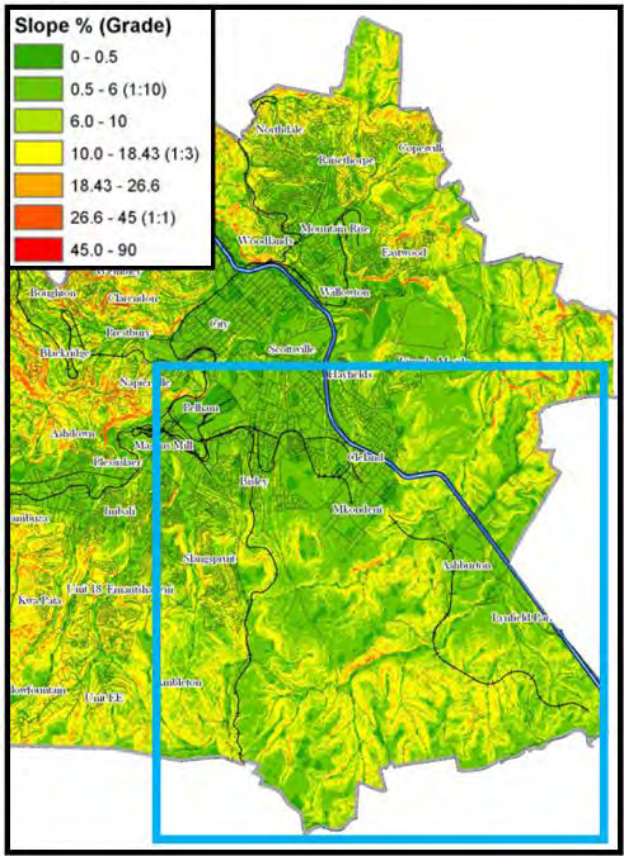

Figure 6: Topographical Map

Source: Msunduzi EMF, 2010

2.2.2 GEOLOGY

Msunduzi municipality is underlain by sedimentary rocks of Ecca and Dwyka Formation which forms part of the lower Karoo Supergroup. The sedimentary rocks are intruded by Jurassic post -Karoo dolerite sheets, dykes and sills that outcrop the municipal area. The diversity of the geotechnical conditions in Msunduzi municipality which was brought about by the geology and geomorphology has resulted in a complex interplay between slope gradient and unstable transported sediments and soils (Msunduzi IDP, 2013). This is further exacerbated by the hilly areas in the municipality. The geology of SEDis consists of Granite, Dwyka and Dolerite (refer to Figure 7). These are associated with faulting and fracturing of groundwater seepage and resource which potentially have a negative impact on the development potential (Richard, Botha, Schoeman, Clarke, Kota and Ngcobo; 2006). Development proposals will have to be carefully assessed to mitigate any geological risk.

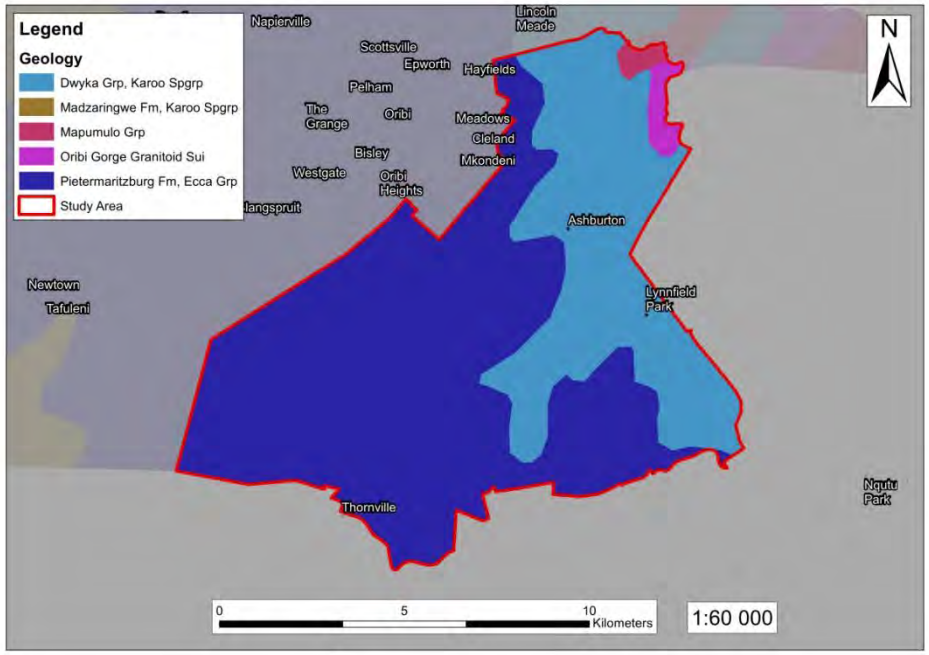

Figure 7: Geology Map

Source: Msunduzi SDF, 2009

The development implications of the different geological conditions apparent in the different parts of SEDis essentially relate to areas where there are steep slopes and unstable soils. In these areas, the development needs to take cognisance of these conditions and ensure that appropriate building design (foundations etc) and infrastructure (water pipelines etc) are provided. In some instances, this may increase the development costs.

2.2.3 Soils, Land Cover and Land Capability

The soils within the municipality vary greatly but most parts have soils with high clay content. The Msunduzi River catchment has shallower soil depths (0.2m and 0.6m) when compared with the Mngeni River catchment (1.2m and 10m) (Msunduzi SDF, 2009). The KZN Department of Agriculture have used the following characteristics in the Land Capability Classification System: soil depth, texture, drainage, moisture holding capacity, slopes and rockiness (Msunduzi SDF, 2009). The areas with a high agricultural potential occur as a result of the topography, rainfall patterns and geology. Large portions of land with agricultural potential have however been developed for other uses including housing, commercial and industrial developments (refer to Figure 9).

According to the KwaZulu-Natal Department of Agriculture and Environmental Affairs (DAEA) Agricultural Land Potential Categories Report (2012), land categorised as Irreplaceable (Category A) is regarded as very high potential agricultural land that should be retained exclusively for agricultural use so as to ensure national food security. Included within this Category is also identified grazing land that has a very high production value for sustained livestock production. Land categorised as Threatened (Category B) is regarded as high potential agricultural land. Primary agricultural land (Category C) is regarded as land with moderate agricultural potential, on which significant interventions would be required to achieve viable and sustainable food production, although agriculture is the still the majority land use in the rural landscape. Secondary (Category D) land is regarded as land with low agricultural potential. This land requires significant interventions to enable sustainable agricultural production. Finally, Mixed Agricultural Land (Category E) land is regarded as land with limited to very low potential for agricultural production. Cultivation within this land category is severely limited in both extent and in terms of the natural resources available, and grazing value will be poor with a very low carrying capacity. The SEDis study area is characterised predominantly by secondary agricultural land, with the highest agricultural potential occurring in the western portions of the area, where a mix of threatened, irreplaceable and primary agricultural land are found. Generally, poor agricultural practices in SEDis have historically affected the productivity of the land (Msunduzi IDP, 2013).

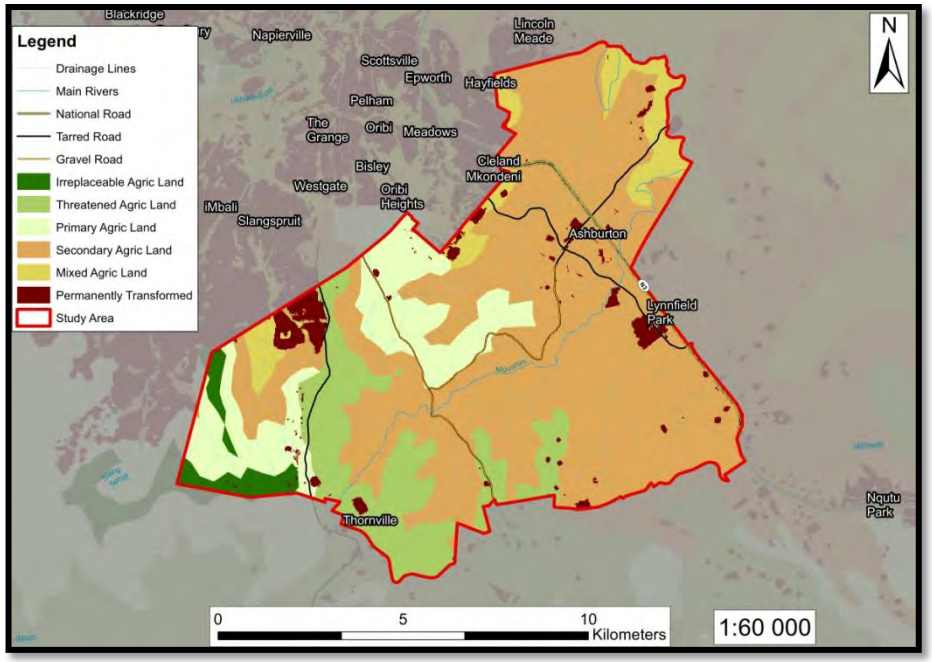

Figure 8: Agricultural Land Categories

Source: KZN DAEA, 2012

Figure 9 shows 2008 landcover for the study area, and is a useful indicator of the type of activities (land use) that occur within the SEDis. Natural areas consisting of bushland, grassland, and grassland and bush clump mixes predominate the landcover of the study area, with high and low density settlement concentrated around Lynnfield Park and Ashburton respectively. Agriculture is also a landuse within the SEDis, illustrated by the presence of commercial sugarcane areas and old cultivated fields (refer to Figure 9).

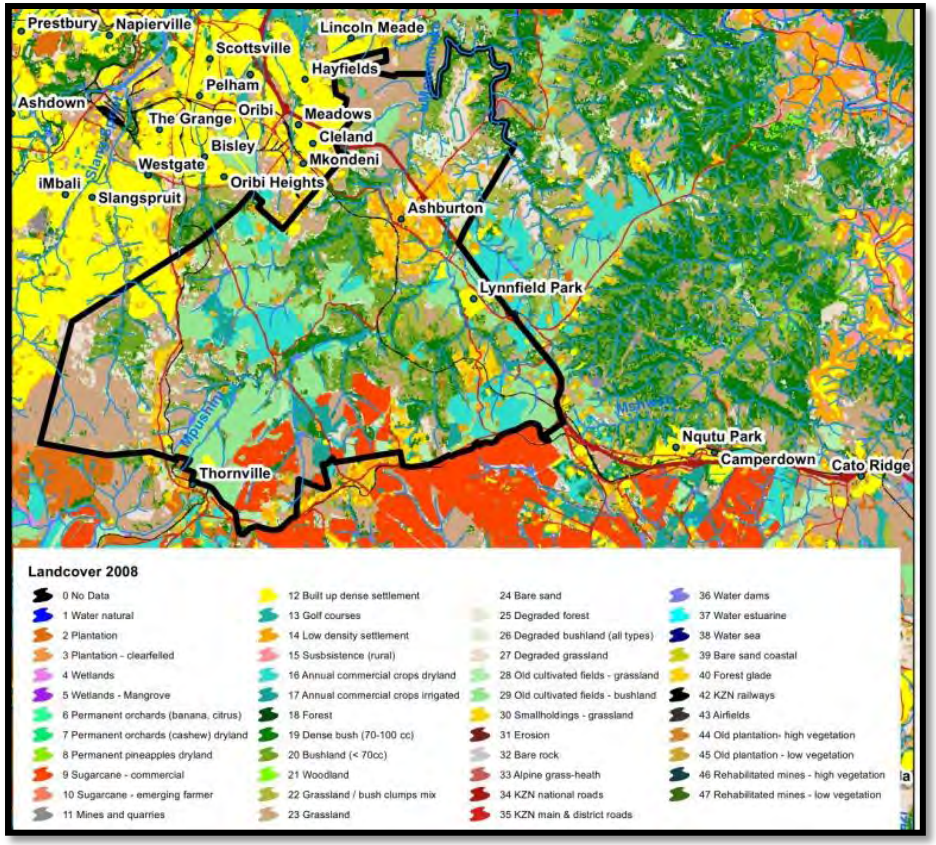

Figure 9: 2008 Landcover for the SEDis

Source: KwaZulu-Natal Department of Agriculture and Environmental Affairs, 2008

2.3 BIODIVERSITY

Msunduzi Municipality is rich in biodiversity with many different species consisting of 56 animals, 20 plants, 8 vegetation types and 50 endemics that are of importance (Msunduzi EMF, 2010). There are high numbers of threatened species that occur with the municipality and a few which are thought to be extinct. The diversity of habitats and species richness is as a result of topography, geology and other characteristics. However there has been a significant loss of natural habitat due to high levels of transformation; thus leaving a low proportion of untransformed habitats. Approximately 20,186 ha or 31.7% of the municipal requires conservation (Msunduzi EMF, 2010). Aquatic species which are of high conservation status within Msunduzi include fish and frogs (Msunduzi EMF, 2010).

From a biodiversity perspective, the SEDis study area is considered crucial for meeting the municipality's conservation targets, owing to the presence of large areas of pristine climax grassland, narrow endemic species (such as millipedes, Giant Green Earthworms and molluscs) and is a biodiversity hotspot of provincial importance (Msunduzi Municipality Conservation Manager, pers. comm., 2013).

Alien invasive plant species occur within the study area, consuming space for naturally occurring species and negatively impacting on the provision of ecosystem goods and services. The average density of alien plant species within the municipality as at 2009 is indicated by Figure 10.

There are ongoing efforts within the SEDis aimed at managing the spread of alien plant species, namely clearing of Spanish Reed (*Arundo donax*) in the Mpushini area, and Working for Water in the Polyshorts conservation area (Msunduzi Municipality Conservation Manager, pers. comm., 2013).

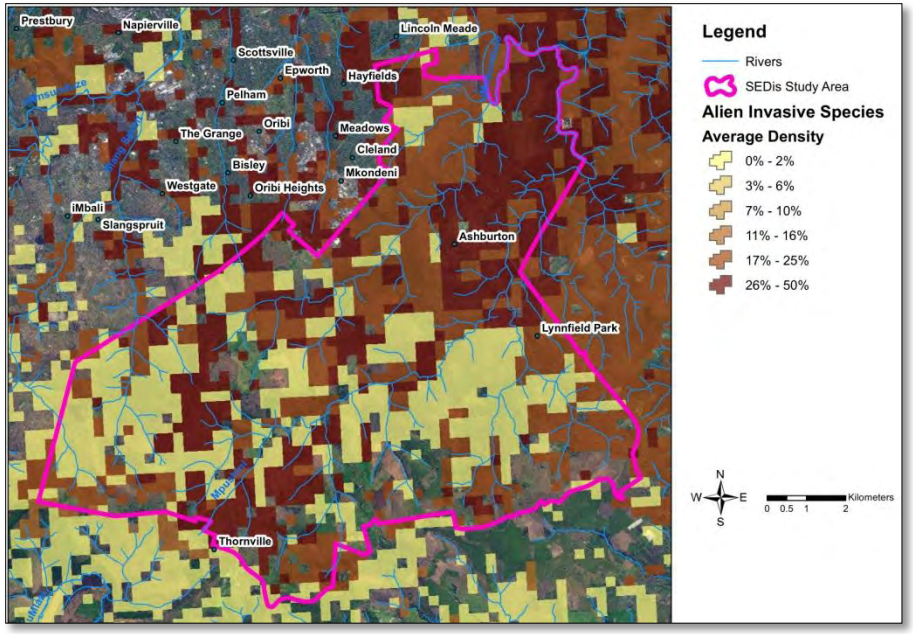

Figure 10: Alien Invasive Species

Source: Working for Water Alien Invasive Species dataset, 2009

2.3.1 Vegetation

The Msunduzi Municipality consists of the following vegetation/veld types (refer to Figure 11) (Msunduzi SEA Report, 2010):

- Eastern Mistbelt Forest
- Drakensberg Foothill Moist Grassland
- Midlands Mistbelt Grassland;
- Dry Ngongoni Veld;
- Moist Ngongoni Veld;
- Eastern Valley Bushveld; and
- KwaZulu Natal Hinterland Thorn Veld.

All of these vegetation types occur within the SEDis, with the exception of those types endemic to the Drakensberg region; a factor which is further illustrative of the biological diversity of SEDis area.

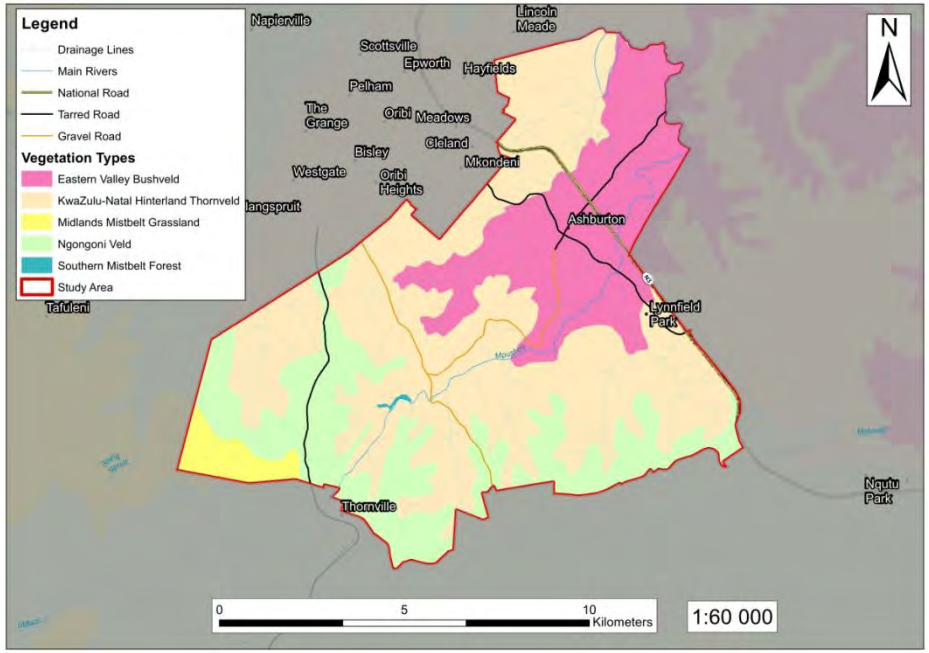

Figure 11: SEDis Vegetation Types

Source: Macfarlane & Quayle, 2009

2.3.2 Protected Areas

Msunduzi municipality has a number of protected areas within its jurisdictional boundary. These are owned and managed by the municipality, Ezemvelo KZN Wildlife or National Government. In addition, there are a number of game reserves and conservancies within Msunduzi (and particularly SEDis), which also form a valuable part of the municipality's conservation network. These areas serve a variety of functions including recreation, eco-tourism and ecological functioning. There are a number of properties within the study area that form part of the greater Mpushini Protected Area which has an extent of nearly 600 ha (refer to Table 1); while larger cadastral parcels immediately adjacent to the SEDis are also within this protected area (Figure 12). These areas are Category 2 protected areas, which may

include mountain catchment areas (in terms of the Mountain Catchment Areas Act, 1970), local nature reserves which may be managed by a municipality, and National Botanical Gardens. Crucially, these properties will form part of the proposed Eastern Areas Biosphere Conservation Corridors (Upper Mpushini Conservancy, 2012). Protected areas within the study area are depicted in Figure 12.

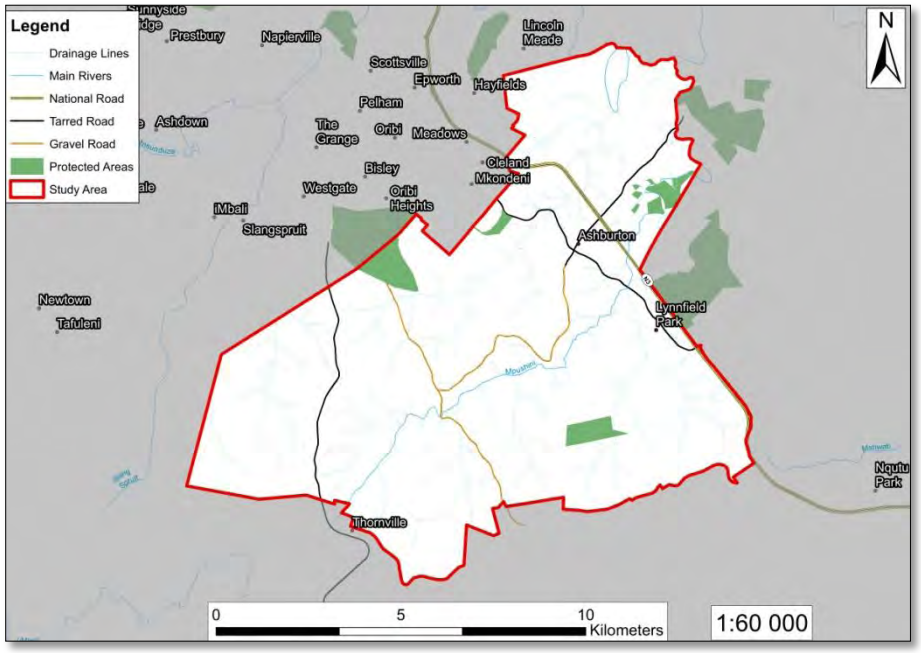

Figure 12: Protected Areas with reference to the study area

Source: Msunduzi Municipality, 2013

Protected areas within Msunduzi are classified into two types, namely type 1 and type 2. Type 1 are those protected areas that are underpinned by strong legislation such the EIA Regulations and effective management; whereas Type 2 are those protected areas that are underpinned by weak legislation and limited management. The various protected areas in Msunduzi are described in Table 1 below (Macfarlane and Quayle, 2009). With respect to the study area, the Upper Mpushini Conservancy and Lower Mpushini Valley Conservancy are relevant.

Table 1: Classification of Protected Areas

Name	Type	Extent (Ha)	Description
Queen Elizabeth Park	1	93.5	This park is managed by Ezemvelo KZN Wildlife with a lease of 99 years, but the land is owned by Msunduzi Municipality. The park was proclaimed under the Provincial ordinance as a park and provides important habitat for a range of important species such as the Natal leaf-folding frog, Black-headed dwarf chameleon and Hilton Daisy. The park also acts as the headquarters for Ezemvelo KZN Wildlife and is used as a recreational area by the general public.
Bisley Valley Nature Reserve	2	358.4	This reserve was proclaimed in terms of the town planning scheme as a Nature Reserve in 1986. The reserve is owned by Msunduzi who are responsible for management of the reserve. The nature reserve was initially proclaimed to preserve and protect biodiversity and to provide recreational opportunities to Pietermaritzburg residents. Important species known from this reserve include the modest millipede, Shaw's earthworm, the javelin flat-backed millipede, and corn crake. There are a number of walking trails, bird hides and a resource centre for day visitors and basic overnight accommodation for 16 visitors.
Ferncliff Nature Reserve	2	147.6	This reserve was proclaimed in terms of the town planning scheme as a Nature Reserve in 1986. The reserve is owned by Msunduzi who are responsible for management of the reserve. The reserve

Name	Type	Extent (Ha)	Description
			was established largely due to conservation significance of the site, representing one of last remaining remnants of Mistbelt Forest in the Pietermaritzburg area. This forest also represents the type locality for a range of invertebrate species. The nature reserve offers a number of trails, picnic sites and an education resource centre for day visitors. Cannot accommodate overnight visitors.
Worlds View Conservation Area	2	31.7	This conservation area was proclaimed in terms of the town planning scheme as a Conservation Area in 1995. The site encompasses indigenous Mistbelt grasslands between worlds view road and old Howick road. The site was proclaimed largely because of its biological diversity and presence of rare and endangered species such as the Hilton Daisy. Only a portion of this site falls within the demarcated Msunduzi Municipal boundary.
Hesketh Conservation Area	2	92.5	This conservation area has been proclaimed in terms of the town planning scheme as a Conservation Area. The site represents an area of Southern Tall grassveld, located above the Maritzburg Golf Course in the Scottsville area. The site was proclaimed largely due to the need to protect areas of this veld type. The site is particularly well known for its ground orchids and other plant species.
Alexandra Park	2	71.4	This park was donated to the Municipality by a resident for the management as a park for urban residents. Protection of this area is written into the title deeds. The park is widely used for recreational use – there are few environmental components of any value.
Wylie Park	2	10.6	This park was also donated to the Municipality by a resident for the management as a park for urban residents. The site is perhaps most important for its horticultural value as an arboretum which is also used for passive recreation.
Pietermaritzburg National Botanical Gardens	2	47.7	The botanical gardens are managed and owned by National government. The area is an important arboretum and used for passive recreation but does have some untransformed land with some biodiversity value.
Upper Mpushini Conservancy & Lower Mpushini Valley Conservancy	**2**	**598**	**The Mpushini Valley is situated on either side of the Ashburton interchange on the N3 national road between Durban and Pietermaritzburg. In order to formalise the conservation activities undertaken by local landowners, the Lower Mpushini Valley Conservancy and the Upper Mpushini Conservancy were formed and registered with Ezemvelo KZN Wildlife.**

Source: Macfarlane and Quayle, 2009; Msunduzi Municipality, 2013

2.3.3 Areas of high biodiversity value

Areas of high biodiversity value occurring within the municipality were identified and mapped in the Msunduzi Conservation Plan also referred to as C-Plan to ensure their protection and continuity. The most sensitive areas of the municipality occur in the north westerly direction and the least sensitive in the south easterly direction (refer Figure 14 and 15). Furthermore, areas which pose developmental constraints and where ecological systems need to be conserved and preserved were identified (Msunduzi EMF, 2010).

Figure 13 shows the C-Plan study spatially for the SEDis study area. It is noteworthy that a large portion of the study area is categorized as 'totally irreplaceable', meaning that should these areas be lost or degraded, there are no sites within the municipality of equal biodiversity value. This information lends further impetus to the notion of the SEDis as a biodiversity hotspot of critical importance to the Msunduzi Municipality.

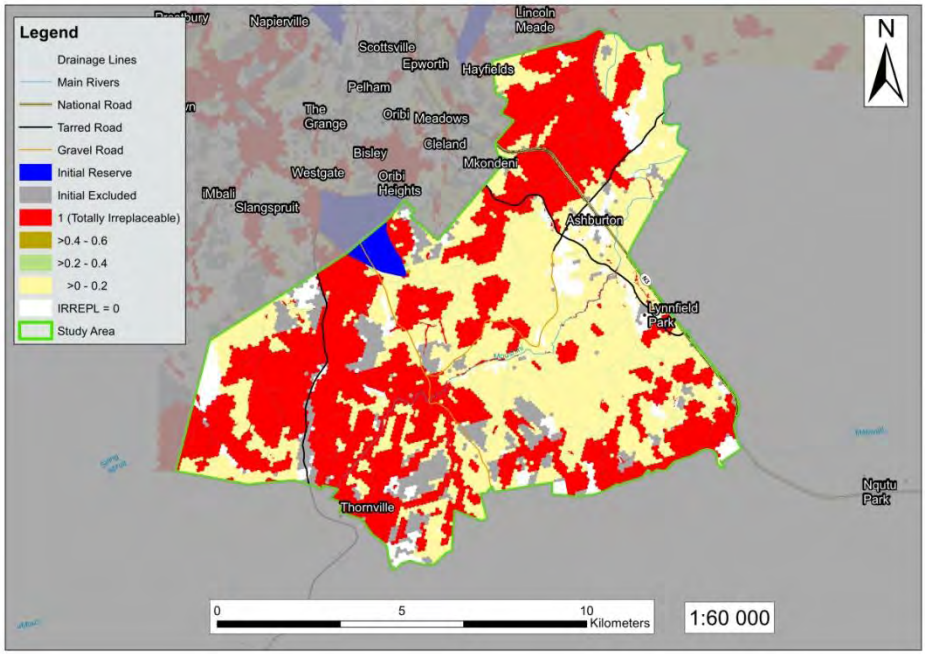

Figure 13: Msunduzi Municipality C-Plan

Source: Msunduzi Municipality, 2013

In order to manage and protect the irreplaceable areas, Msunduzi has embarked on the development of a Metro Open Space System (MOSS). Figure 14 shows this layer for the study area, indicating proposed protected areas, key areas, terrestrial corridors and riparian corridors. Large portions of the SEDis are considered key areas within the proposed MOSS system. Specific policy directives associated with these sensitive areas are contained in the MOSS. Many of these areas also provide for further socio-economic development opportunities through sustainable use and management.

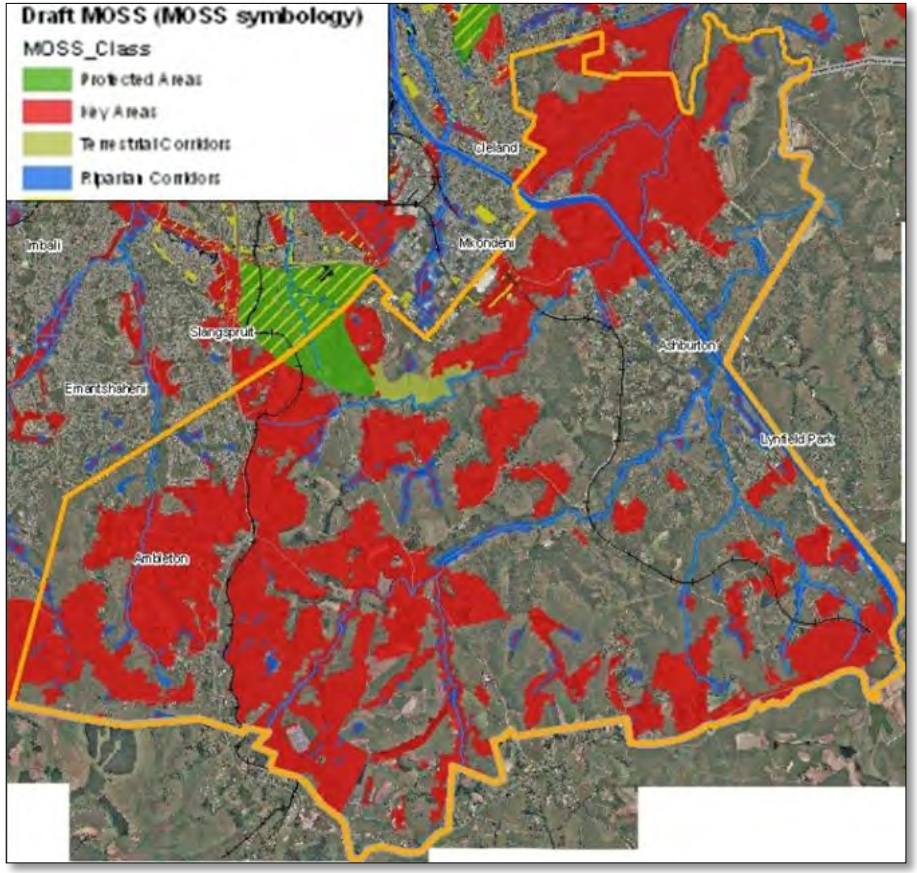

Figure 14: Draft Metro Open Space System for the study area

Source: Msunduzi Municipality, 2013

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) provides for the listing of threatened or protected terrestrial ecosystems in one of four categories: critically endangered, endangered, vulnerable or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction, including sites of exceptionally high conservation value by preventing further degradation and loss of structure, function and composition of these threatened ecosystems (SANBI, 2011). Figure 15 indicates the presence of threatened ecosystems within the SEDis.

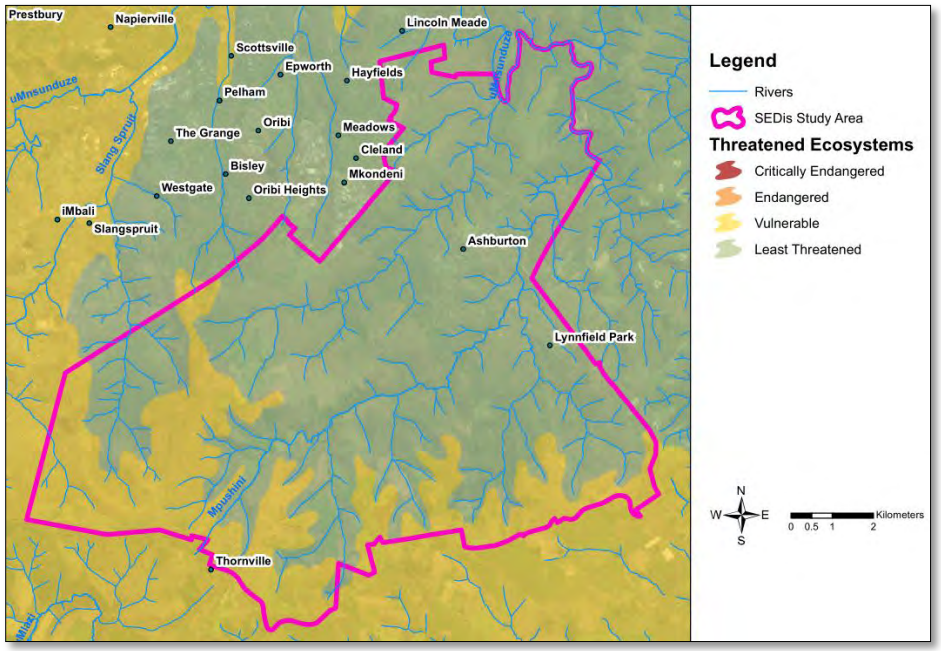

Figure 15: Threatened Ecosystems within the SEDis
Source: SANBI, 2011

If a species is listed as threatened, it must be further classified as critically endangered, endangered or vulnerable. According to SANBI (2001), critically endangered species are any indigenous species facing an extremely high risk of extinction in the wild in the immediate future; endangered species are any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species; while vulnerable species are any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.

2.4 WATER RESOURCES AND MANAGEMENT

According to the Msunduzi Draft EMF 2010, the municipality consists of one primary catchment, the Msunduzi. The Msunduzi does not only supply the areas within the municipality but the supply also extends to eThekwini Metropolitan Municipality. Figure 16 shows the Subcatchment structure of the Msunduzi Municipality, with approximate the SEDis study area highlighted in red. Subcatchments that fall wholly or partially with the SEDis are the Mpushini (1), Mkhondeni (2), Slangspruit (3), Fox Hill Spruit (4) and the Blackborough (5).

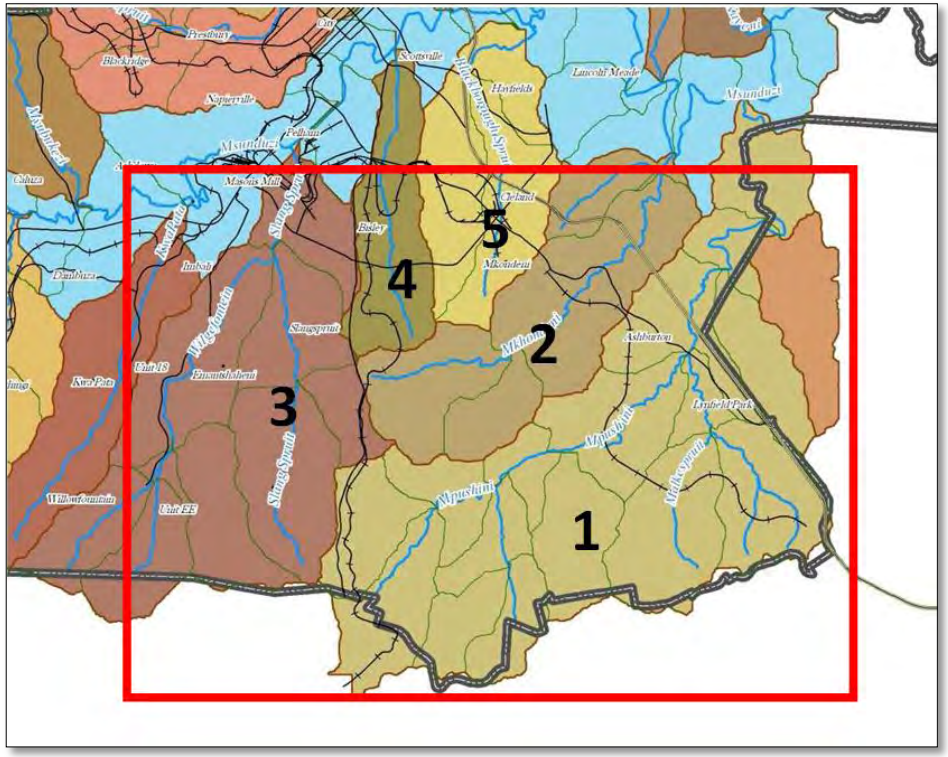

Figure 16: Subcatchments of the Msunduzi Municipality
Source: Msunduzi EMF, 2010

At a coarse level, the sub catchments exhibit an ecological state which varies from modified (CBD); poor (westerly areas) to natural (SEDis) and some catchments have reached their full supply capacity (refer to Figure 17). The water quality varies between the sub-catchments and there has been a decrease in water quality in various parts of the municipality which has compromised development opportunities (Msunduzi SEA Report, 2010). Within the SEDis, there is ongoing water testing undertaken on the Mpushini and Mkhondeni rivers (Msunduzi Municipality Conservation Manager, pers. comm., 2013). In terms of river ecological health, according to the information provided by the Msunduzi EMF, the SEDis is characterised predominantly by rivers in a 'natural' state, but also includes a substantial portion of seriously modified river systems (refer to Figure 17). This represents one of the few catchments with an ecological health category of 'good or natural' and therefore the management of the system to retain its ecological functioning is critical.

As a result, there is a significant mandate to protect areas in natural or 'good' states, and rehabilitate those areas categorised as 'seriously modified' in order to ensure the continued provision of ecosystems goods and services to the area. Development proposals in SEDis will have to be carefully assessed to ensure that there is no negative impact on the ecological heath of these river systems.

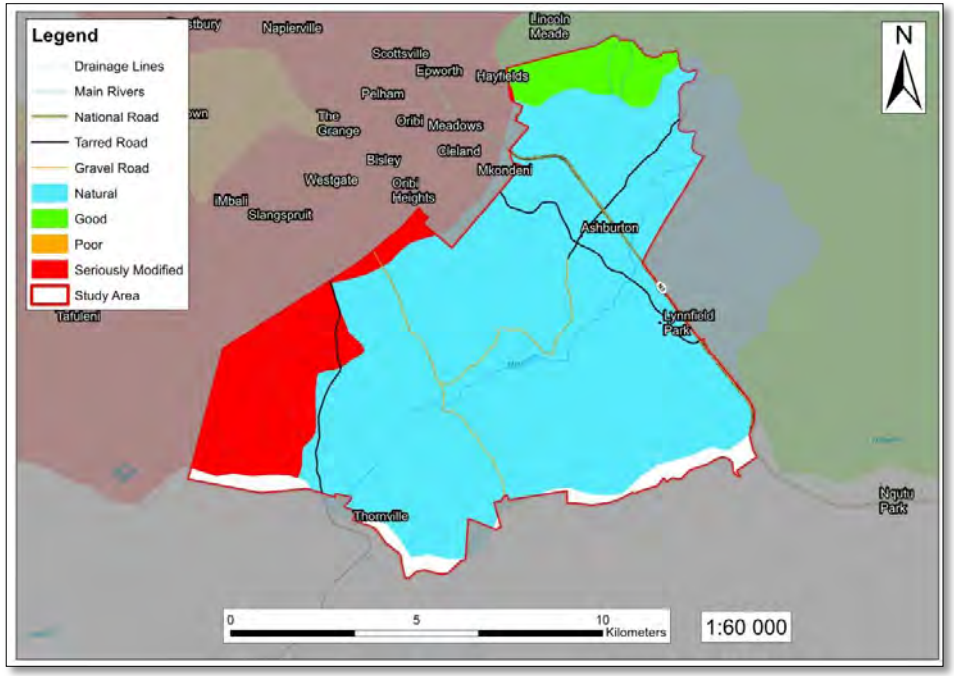

Figure 17: Catchment Water Quality

Source: Msunduzi EMF, 2010

2.4.1 WETLANDS

There are few wetlands within the municipality which are still in a good state (Msunduzi SEA and EMF, 2010). Most of the wetlands have been transformed and degraded due to development activity. Figure 18 shows known wetlands within the SEDis, which are protected by national legislation (usually a 32m buffer, elevation dependent).

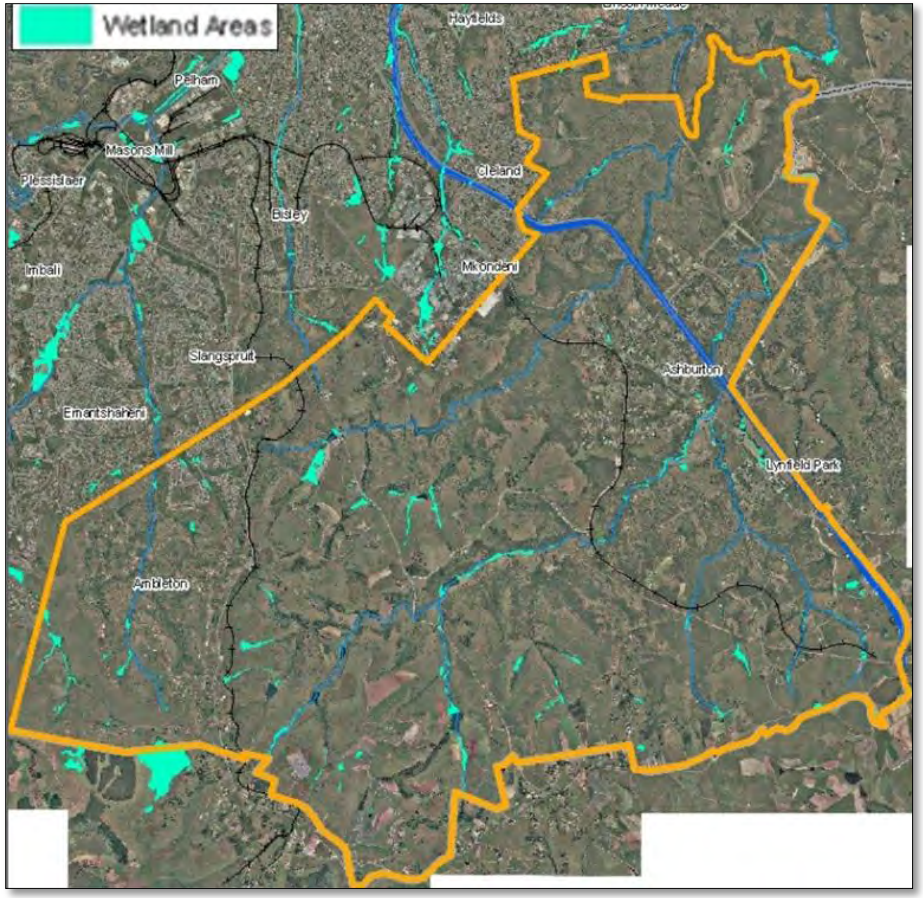

Figure 18: Wetlands occurring within the study area

Source: Msunduzi Municipality, 2013

2.4.2 Environmental Risk

Within Msunduzi, there is an increased risk of downstream flooding due to the rapid increase in settlement density, the destruction, degradation and reduction of wetlands, and misuse of floodplains within the municipality (Msunduzi IDP, 2011/2012). Figure 19 shows potential flood zones within the SEDis, which are considered areas of high environmental risk.

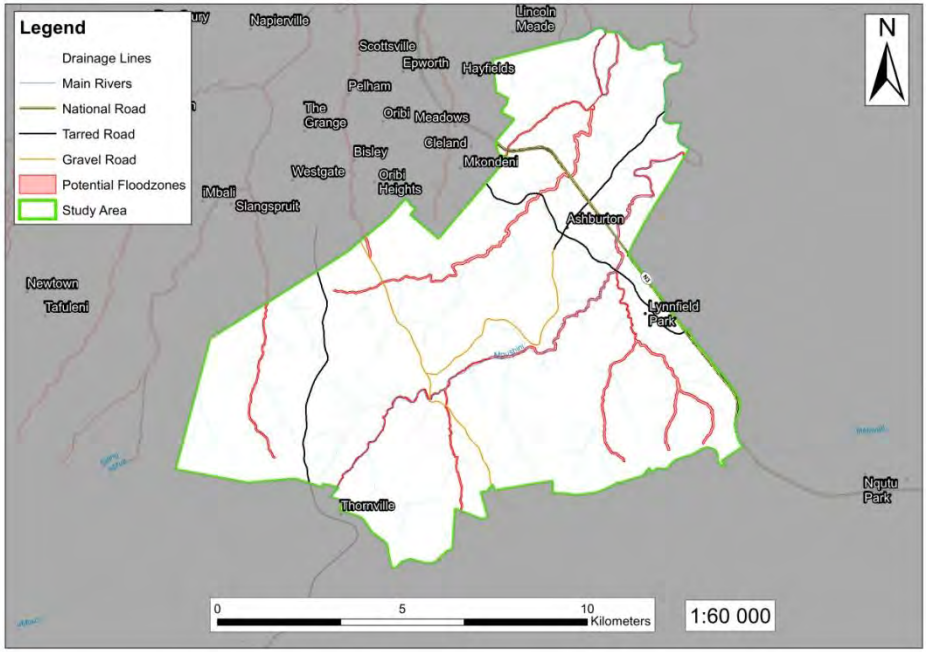

Figure 19: Flood Zones within the Municipality

Source: Msunduzi IDP, 2011/2012

2.5 Waste Management

The waste management business unit within Msunduzi municipality provides a waste management service in a form of collection, transportation, street cleaning, garden refuse and public awareness (Msunduzi Annual Report 2011/2012). Over the past four consecutive years the municipality has been collecting waste from 89,910 households at least once a week and 19,000 households less than once a week (refer to Table 2). It should be noted that the information obtained for solid waste collection is at a strategic level and it is not clear which areas are serviced by the municipality/ or contracted out on a regular basis. Another anomaly is whether the services are being extended as the population grows and new townships are developed (the figures indicate that the same number of customers have been serviced for four consecutive years).

Table 2: Households Solid Waste Service Delivery

Source: Msunduzi Annual Report 2011/2012

Description	2008/2009	2009/2010	2010/2011	2011/2012
	Actual Number	Actual Number	Actual Number	Actual Number
Solid Waste Removal above minimum level				
Removed at least once a week	89,910	89,910	89,910	89,910
Minimum Service Level and above sub total	89,910	89,910	89,910	89,910
Minimum Service Level and above percentage	62.43%	62.43%	62.43%	62.43%
Solid Waste Removal above minimum level				
Removed less frequently than once a week	19,000	19,000	19,000	19,000
Using communal refuse dump	NA	N/A	N/A	N/A
Using own refuse dump	N/A	N/A	N/A	N/A
Own Rubbish Disposal	35,090	35,090	35,090	35,090
No Rubbish Disposal	N/A	N/A	N/A	N/A
Below Minimum Service Level sub-total	54,080	54,080	54,080	54,080
Below Minimum Service Level Percentage	37.57%	37.57%	37.57%	37.57%
Total number of households	144,000	144,000	144,000	144,000

2.5.1 Landfill Sites

The municipality has one permitted landfill in the New England landfill site that services the disposal needs of the Msunduzi residents as well as other local municipalities surrounding the municipality (Msunduzi Annual Report 2011/2012). The landfill site is located in the SEDis region. The infrastructure of the landfill site has been upgraded extensively in order to increase its lifespan. The landfill site receives daily waste of approximately 700 tons that is spread, compacted and covered. Statistical data of waste categories disposed and processed at the landfill site is maintained for reporting purposes (refer to Table 3). Furthermore, the site is compliant with environmental legislation where there is bi-annual monitoring for gas emissions, ground and surface water contamination (Msunduzi Annual Report 2011/2012).

Table 3: Waste Disposal Service Statistics

Source: Msunduzi Annual Report 2011/2012

Waste Disposal per category	2008/2009	2009/2010	2010/2011	2011/2012
	Tons	Tons	Tons	Tons
Builders Rubble	22 740	24 104	25 550	27 594
Bulk Food Waste	15	16	17	19
Garden Refuse	25 164	26 674	28 808	31 688
General Domestic Waste	60 768	64 416	69 567	76 524
Industrial Ash	126	133	144	159
Sawdust	60	63	68	75
Cover Material	50 208	53 220	57 478	63 226
Wood Waste	10	10	11	13
Total	159 091	168 636	181 643	199 298

2.6 CULTURAL AND HERITAGE RESOURCES

The Msunduzi municipality has rich cultural, architectural, historical and archaeological features which as a collective make up the heritage resources of the area (Msunduzi EMF, 2010). There are 646 heritage resource points and 32 heritage zones within the municipal area. The significant numbers of the heritage resources are architectural in the form of buildings that are located within the CBD, surrounding suburbs and the Edendale area. Less significant archaeological features are spread within the entire municipality including the SEDis (refer to Figure 20).

The historical and cultural features are presented by churches, temples, cemeteries, open spaces and areas of political significance (SEA, 2010). Maintenance of the heritage resources within the municipality has not been consistent (Msunduzi EMF, 2010).

Most notably within SEDis is the prevalence of archaeological sites particularly in the Ashburton and Lynnfield Park areas. Any development proposals in the SEDis area would have to adhere to the provisions of the National Heritage Resources Act specifically the following:

Section 34 – Structures older than 60 years:

- In most cases evaluated and handled by Conservation Architects.

Section 35 - Archaeology, palaeontology and meteorites:

- Provides protection for these sites on Provincial and National levels.
- Stipulates State ownership of all archaeological objects, palaeontological material and meteorites.
- Protects archaeological and palaeontological sites and meteorites from unlawful destruction, trade and excavation without permitting.
- Makes provision for mediated action to protect archaeological and palaeontological sites and meteorites being damaged.
- Register private collections of archaeological objects, palaeontological material and meteorites.

Section 35 – Burial grounds and graves:

- Provides protection for graves of conflict, as well as burial grounds containing graves of conflict.
- Graves and burial grounds older than 60 years outside formal cemeteries administered by local authorities.
- The issuing of permits for the exhumation and relocation of such graves and burial grounds.

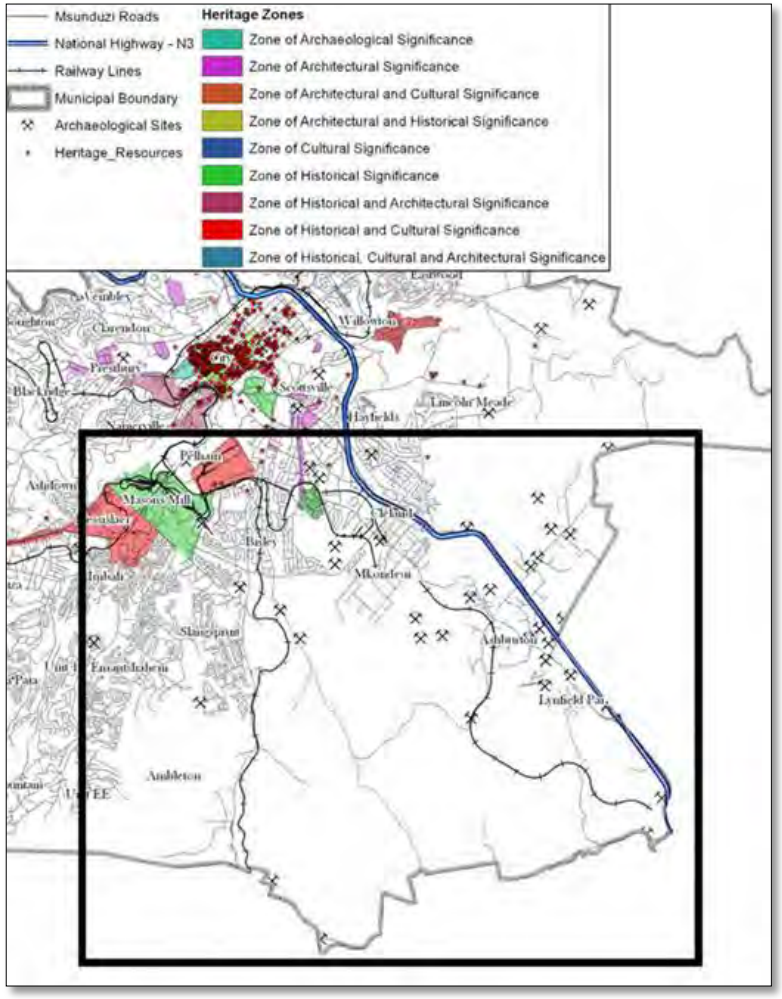

Figure 20: Location of Msunduzi Heritage Resources (approximate location of study area in black)

Source: Msunduzi EMF, 2010

Section 38 – Heritage Resources Management:

- Subsection (1) stipulates the types of development that require the developer to contact the relevant heritage authority, to determine the need for a Heritage Impact Assessment (HIA).
- Stipulates the minimum information required in such a HIA. These requirements and the minimum requirements for Archaeological Impact Assessments were issued by SAHRA in 2006.

3 APPLICABLE LEGISLATION, BYLAWS AND POLICIES

Table 4 lists and describes the relevant national laws, bylaws and policies which are potentially applicable for development applications. With regard to environmental authorisation, it is important to note is that the Provincial Department of Agriculture and Environment Affairs (DAEA), as designated provincial competent authority, remains the mandated department with regards to decisions and approvals of environmental authorisations. The LAP provides information in support of the decision making process but all existing legally prescribed regulatory processes need to be adhered to.

Table 4: Applicable Legislation, Policies and Bylaws

APPLICABLE LEGISLATION	DESCRIPTION
National Laws	
Constitution of the Republic of South Africa Act (No 108 of 1996)	Section 24 of the Act emphasis the protection of the environment which must be sustainable for the current and future generation. Section 151 and 152 of the Act relates to the establishment of the municipalities and the functions which they need to fulfil within their respective communities.
National Environmental Management Act (No 107 of 1998)	The main purpose of the act is to protect the environment. Section 24 of the mandates the Minister of Environmental Affairs to identify and authorise activities which will result in the detrimental effect to the environment. Section 28 relates the duty of care towards the environment where developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
National Water Act (No 36 of 1998)	Provides principles that govern the distribution, use and management of water resources in the Republic South Africa. Details the prevention and remedial measures of water pollution. It further lists the permissible water uses and those that require authorisation in a form of Water Use Licence from the Minister of Water Affairs.
National Environmental Management: Biodiversity Act (No 10 of 2004)	Provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act107 of 1998; the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.
National Environmental Management: Air Quality Act (No 39 of 2004)	It provides the control and management of dust, fuel, noise and odour. Section 21 of the mandates the Minister of Environmental Affairs to identify the activities which may result in the detrimental effect of the atmosphere and the authorisation which needs to be obtained. The municipalities have been given a mandate to authorise activities that are occurring within their jurisdiction.
National Environmental Management: Waste Act (No 59 of 2008)	Defines the national waste management strategy, norms and standards. It emphasises the role of the provincial organ of the state in the implementation of the waste management. It also relates to the duty of care by developer or manufacture to avoid generation of waste and if not avoided minimise and manage it accordingly. It further lists the activities which need to be

APPLICABLE LEGISLATION	DESCRIPTION
	authorised by the Department of Environmental Affairs.
National Heritage Resources Act (No 25 of 1999)	Defines the protection, management and evaluation of heritage resources including structures older than 60 years (Section 34), protection of archaeology, palaeontology and meteorites and provision for mediated action to protect these (Section 35), protection for burial ground and graves (Section 35), and heritage resource management (Heritage Impact Assessments etc) (Section 38).
Local Government: Municipal Systems (Act No 32 of 2000)	Section 23 (1) of the act indicates that a municipality must undertake developmentally orientated planning and Section 24 (1) indicates that planning undertaken by the municipality must be aligned with and compliment plans of other municipalities and organs of state. Section 26 of the Act indicates that a core component of an IDP is a SDF which must include the provision of basic guidelines for a land use management system for the municipality.
MUNICIPAL BYLAWS, POLICIES AND FRAMEWORKS	
Water Service By-Laws (No 7 of 2005)	The bylaw relates to the water and sanitation services rendered by the municipality to the residents, commercial and industrial institutions and the tariffs charged for the services. It lists the limits of industrial effluents which may be discharged into the sewage systems and the permits that must be obtained by the industries for the discharge.
Solid Waste By-Laws (No 8 of 2005)	The Bylaws relates to the collection, management and disposal of waste within the municipality jurisdiction and the tariffs charged by the municipality for collection and disposal. It further outlines the conduct which must be adhered to by the public when accessing the landfill sites.
Noise abatement By Law (No 514 of 1984)	The Bylaws details the parameter of ambient noise levels required outdoors and indoors within the municipality. It provides penalties for the exceeding the parameters contained in the By-Laws.
Environmental Management Framework	The purpose the framework is to assist the municipality in making informed decisions in their planning about the development of the city. The objectives the framework are to: • Identify areas both suitable and unsuitable for development; • Provide information to assist decision making (such as development applications) and thereby • streamline the process; • Identify environmentally sensitive areas that require protection so as to ensure ecosystem service • delivery ; • Provide environmental goals and mechanisms to achieve the objectives as stated.
Integrated Development Plan	The plan is aimed at assisting the municipalities to plan for the future developments within their jurisdiction in order to effectively use scarce resources, accelerate service delivery, attract additional funds for development, strengthen democracy, overcome the legacy of apartheid and promote coordination between local, provincial and national government.
Spatial Development Framework	The framework form part of the IDP and represents the spatial expression of the municipality's development. It is also reviewed regularly to account for the changes that constantly occur as the cities develop and expand.

4 KEY FINDINGS

This technical note has provided an overview of the environmental features occurring within the SEDis study area within the context of the Msunduzi municipality. It has described the current receiving biophysical environment, its sensitivity and key issues from a biodiversity and environmental risk perspective.

Figure 21 provides a useful summary of the main issues by identifying areas where there are inherent development constraints. Due to its high biological diversity and subsequent role in the regional and provincial conservation network, the SEDis is best described as an area of high biodiversity value with a high level of development constraint. These constraints do not preclude development rights and the assessment of development applications will need to be done carefully and with due consideration of trade-offs, impacts and regulatory requirements.

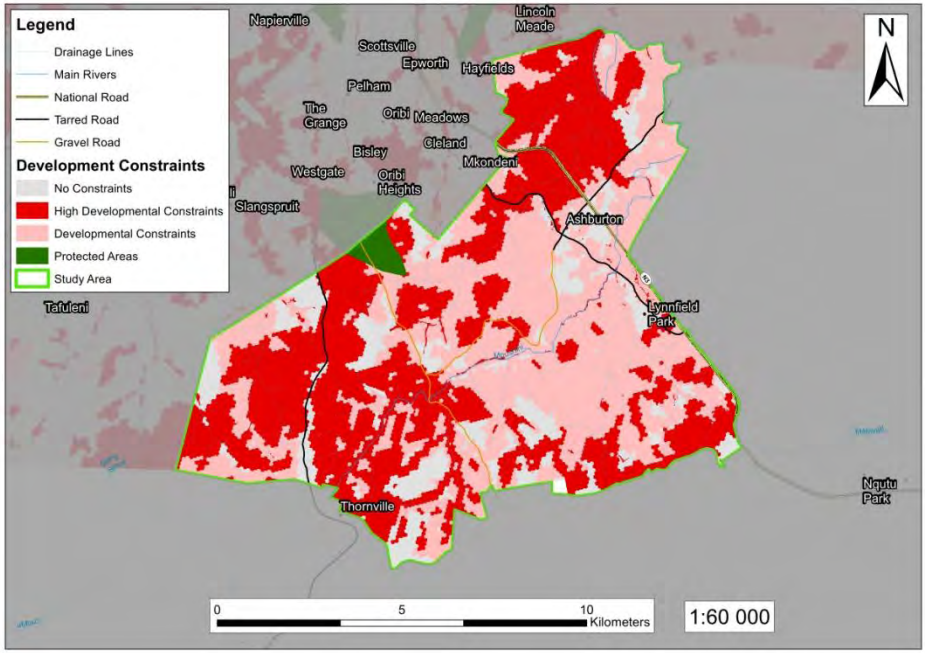

Figure 21: Areas of Developmental Constraints

Source: Msunduzi EMF, 2010

The biodiversity of the area presents opportunities in terms of eco-tourism and conservation activities which can stimulate further economic growth and social enhancement. These revenue generating activities can contribute significantly to the value attached to the natural resource and if managed appropriately still continue to render ecological goods and services.

SEDis fulfils a number of different roles in the local, provincial and national context. These are summarised as follows: biodiversity and heritage assets are important at a national scale, protected areas and waste assimilation are important at a provincial scale; and eco-tourism opportunities, agricultural assets, the landscape and sense of place in the SEDis area, as well as waste assimilation are important at a local scale.

Table 5 highlights key issues noted during the compilation of this technical note.

Table 5: Key issues

Issue	Comment
Air Quality	Within SEDis there is almost an even split between not sensitive, sensitive and very sensitive areas in relation to air quality. The conclusion to be drawn is that air quality sensitivity is an area of concern within SEDis, particularly in the Ashburton and Lynnfield Park areas (most likely due to their proximity to the N3 highway and industrial areas).
Geology	The geology consists of Granite, Dwyka and Dolerite. The development implications of the different geological conditions apparent in the different parts of SEDis essentially relate to areas where there are steep slopes and unstable soils. In these areas, the development needs to take cognisance of these conditions and ensure that appropriate building design (foundations etc) and infrastructure (water pipelines etc) are provided. In some instances, this may increase the development costs.
Soils and Land Capability	The study area has pockets of good soil for potential agricultural activities, although this may be dependant on other factors such as availability of water resources and environmental sensitivity.
Biodiversity	The study area is located in a biologically sensitive portion of the municipality which is important in terms of meeting biodiversity conservation targets. The biodiversity of the

	area presents opportunities in terms of eco-tourism and conservation activities, and freely provide ecological goods and services (flood retention, filtering water, carbon sequestration, etc). There will need to be careful assessment of development applications with regard to biodiversity features, with discussion regarding trade-offs and regulatory requirements.
Water Resources	The study area has good water quality and ecological status. Development proposals in SEDis will have to be carefully assessed to ensure that there is no negative impact on the ecological heath of these river systems. However certain parts of the area have are susceptible to flooding which poses a risk to infrastructure, ecological function and human well-being.
Protected Areas	There are opportunities within the study area to consolidate and formalise the existing protected areas with private game reserves and conservancies. The two conservancies in SEDis are the Upper Mpushini and Lower Mpushini Valley Conservancies.
Heritage Resources	There are a number of archaeological sites within SEDis particularly in the Ashburton and Lynnfield Park areas. Any development proposals in the SEDis area would have to adhere to the provisions of the National Heritage Resources Act.

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