

# Cato Ridge Land Development Pre-Feasibility Study

Cato Ridge Land Development  
Pre-Feasibility Study

**Assmang Pty Ltd**

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# 1 Executive Summary

Assmang and its subsidiary companies, Cato Ridge Development Company and Ferralloys has an operational smelter (Cato Ridge Works) north of Cato Ridge. Cato Ridge is located approximately 51km west of Durban via the N3 and 29km south east of Pietermaritzburg. As part of Assmang's corporate social responsibility they want to create long lasting and sustainable job opportunities to the community.

Assmang appointed Aurecon South Africa Pty Ltd to conduct studies on their properties to determine the development potential as well as associated costs. The subject properties are strategically located along the N3 and in recent years the region has experienced a number of industrial developments. Assmang would like to take advantage of the site's strategic location and the current interest shown in its sites.

Aurecon prepared a Pre-Feasibility Study which gives insight to the developability of the properties, proposed concept development as well as associated infrastructure to enable the proposed development. Stakeholder engagement formed a critical part of the project ensuring various stakeholders from the AmaXimba community, Municipality and various others are informed of the project, but also to strengthen and management the relationships between these parties.

## Policies and Legislation

The report firstly provides an overview of various policy and legislative environment (from national to local policies) as well as a few other relevant policies. The National policies indicate that Cato Ridge is earmarked as a critical social and economic development priority area and urbanisation must be effectively managed to ensure that the increasing concentration of people translates into higher levels of economic activity, greater productivity and higher rates of growth. Furthermore, spatial integration, social inclusion and access, inclusive, sustainable economic growth and development and good governance should be at the forefront of all development strategies and interventions. Provincial legislation indicate that Cato Ridge is located within the KZN Industrial and Logistics Hub (Region 1) and the region comprise of interspersed industrial and logistics development. The Local level policies indicate that Cato Ridge has been identified as one of the industrial expansions and potential dry port areas in the Metro that can respond to the increasing demand for industrial land within eThekweni as well as to provide logistical support for the port.

## Stakeholder Engagement

The aim of the Stakeholder Engagement Plan adopted a technical and cultural appropriate approach to consultation thereby improving and facilitating decision making in an atmosphere that actively involve the stakeholders in a timely manner. The key objectives of this plan are:

- Understand the stakeholder requirements;
- Provide guidance for stakeholder engagement;
- Identify key stakeholders that are affected, and/or are able to influence the project;
- Develop a stakeholder engagement process; and
- Define roles and responsibilities for the implementation of the SEP.

The purpose of the stakeholder engagements is to convey Assmangs purpose and vision for the proposed project. The vision is to:

*To make land available that will enable Cato Ridge to become a new economic node with quality developments that will create a conducive environment for industries and businesses of all sizes to thrive.*

## Base map

A base map is created with accurate base information upon which all the specialist studies are overlaid before the concept is developed. The base map is created with the following data:

- Aerial photography which is georeferenced and can be used for design purposes;
- Topographical survey by doing a LiDAR survey and generating a digital topographical model (DTM) to produce 0.5m contours. Additionally, the contours are used to prepare a slope analysis to determine the areas too steep (steeper than 1 in 33 degrees) to be developed and subsequently requires to be excluded from developability; and

- Cadastre information was obtained to delineate all registered properties.

### **Environmental Sensitivity**

The aim of the environmental sensitivity study is to conduct specialist studies including biodiversity (fauna, flora and freshwater systems) as well as heritage studies (archaeology, cultural remains and palaeontology) to determine any environmental sensitive areas on the Assmang properties. The studies revealed that ecologically vulnerable vegetation types namely the KZN Sandstone Sourveld and Dry Coast Hinterland Grassland are present on the properties. The most sensitive vegetation is regarded as “no-go” areas for development as development on these portions will be met by strong opposition from environmental authorities. The vegetation types that are in poor condition are likely to receive little opposition from environmental authorities and the chance of receiving a positive authorisation for development on these areas is high.

The possibility for conservation offsetting can be explored. This implies that land with the same vegetation community and of the same or better quality outside the site is secured for conservation to compensate for the loss of land inside the site. Although this is an option to explore to unlock more land for development, the eThekweni Municipality and Ezembelo KZN Wildlife follow an official policy that there should be no loss of the KZN Sandstone Sourveld and Coast Hinterland Grassland.

Two provincially specially protected species, *Leptailurus serval* (Serval) and *Ciconia Microscelis* (African Woollynecked Stork) were identified in the study area and careful planning is required to minimise the risk to SCCs in the receiving habitats or moderately high to high sensitivity areas.

Furthermore, three hydrogeomorphic units were identified within the study area. These include:

- Channelled Valley bottom (CVB) wetlands;
- Unchannelled valley bottom (UCVB) wetlands; and
- Seep wetlands.

These wetlands on the site have a Present Ecological State rating of “fair” and a “moderate” Ecological Importance and Sensitivity, implying that they are ecologically important and sensitive on a provincial or local scale. However, the wetlands have all been largely modified to some degree by industrial, residential and agricultural land uses, which have encroached on the wetland boundaries. Generally, existing land uses have negatively affected the overall hydrological and geomorphological functioning of wetlands on the site.

Engagement with the Department of Water and Sanitation will be necessary to determine appropriate development options for these wetlands and the requirements for a Water Use License (WUL) should be required should development occur within a wetland or within a defined buffer zone around wetlands.

The agricultural potential study determined that very few soils on the site is suitable for cultivated agriculture. In terms of the heritage study, it was found that low, insignificant and moderate sensitivities are found throughout the study area as such a desktop palaeontological study and protocol for chance finds will be required during the Environmental Impact Assessment process.

Continuous engagement with environmental, conservation and water management authorities will be required to unlock land without compromising the sensitive natural environment.

### **Floodline Study**

Three streams were identified within the land development area, all of which drain in a south-eastern direction. The 1 in 50 year and 1 in 100-year flood lines needs to be considered during the design stage since no permanent buildings are permitted within these floodlines and no infrastructure is permitted within the 1 in 50-year floodline.

### **Geotechnical Study**

The geotechnical investigations provide insight into the subsurface conditions for development. A total of two hundred and twenty-eight test pits were excavated (One hundred and fourteen in the southern portion and one hundred and fourteen in the northern portion of the study area). The results indicate that the water table depths in the northern portion range between 1.0m and 2.8m whilst the material occurring in the southern portion is generally not suitable for use as construction material.

### **Town Planning Investigations**

The town planning investigation considered aspects relating to land ownership, land claims, servitudes, zoning and an assessment of existing social and community facilities in close proximity to the study area. The land ownership study was conducted to confirm that all properties under investigation are owned by Assmang and the subsidiary companies. Furthermore, the investigations confirmed that no land claims have been lodged, however a number of electrical powerline servitudes, right of way servitudes as well as pipeline servitudes are present and restricts the developability of the site. A notarial tie has been registered to secure a buffer area around the Cato Ridge Works. This notarial tie may be lifted / removed to unlock the land adjacent to the Cato Ridge Works.

The properties north of the N3 are predominantly zoned General Industrial 1 and General Industrial 2 which enables general industrial activities to be conducted on these sites whereas no zoning certificate was available for the areas south of the N3. A social facilities model was prepared analysing the population growth of Cato Ridge and surrounding areas and then determining the future required social and civic facilities to support the community. The model indicated that there would be a need for a primary health clinic, fire stations, libraries, a home affairs office, community halls, post offices and worship centres would be required by 2030.

### **Development Concept**

The information obtained from the market assessment as well as the policy section indicated that the study area is ideally located for an industrial park. The concept considered the different industrial park approaches that could be developed. Furthermore, it considered the area requirements for different uses, financing options and operating requirements, clustering and tenant configuration that should be considered when the urban development concept is prepared.

### **Urban Development Concept**

The information obtained from the various investigations and specialist studies have been used to form the backbone of the development concept. Two development concepts have been prepared. The first concept was prepared by making optimal use of the site. As such this concept was prepared with the view that the KZN Sandstone Sourevel and Dry Coast Hinterland Grassland can be offset to unlock all developable land. The second concept, the conservative concept, excluded the high sensitive environmental constraints. As a result, approximately 166.97ha environmentally sensitive land has thus been excluded

It is imperative that the concept is aligned with the policy documents. As such, the southern area is predominantly earmarked for agricultural activities with an expansion of the existing residential areas. These areas also make provision for a new healthcare facility as well as a school and other community facilities. A commercial node is created along The R103 and Uitkomst Street. The areas to the north of the N3 are predominantly industrial. Heavy industry is proposed adjacent to the Cato Ridge Works due to heavy industrial activities that currently takes place at the Cato Ridge works. Medium industry is proposed along Eddie Hagan Drive whilst light industry as well as SMME units are proposed towards the AmaXimba community.

Potential buyers / tenants for a portion of land near the Cato Ridge Works have been identified and they require an operational railway line. Four railway sidings scenarios have been prepared to entice the potential buyer / tenant. Depending on the outcome of negotiations with the potential buyer / tenant, the railway siding may impact of the development concept.

Phasing is an important aspect in that it endeavours to unlock land that can be absorbed within the current market demand. As such the first phase that has been identified are south of the N3 near the N3 and along the R103, phase 2 comprise of the area north of the N3 west of Eddie Hagan Drive, and phase 3 and 4 comprise of pockets of land north and south of the N3. It should be noted that the phasing is fluid and will change with macro and micro market demand and supply of industrial land.

### **Traffic Impact Assessment**

A traffic impact assessment is conducted to determine the nature of required road upgrades based on the urban development concept. The results of the Phase 1 traffic impact assessment are also used to inform the phasing of the development. The results indicate that minor upgrades are required with a total of 680m of road to be constructed.

### **Bulk Infrastructure**

Bulk infrastructure is required to enable the development of the urban development concept. The most pressing issues are with the treatment of sewerage and the Frey's site is proposed should approval be granted. There is sufficient capacity available for roads, water and electricity (albeit limited in some instances). It is furthermore recommended that a dedicated reservoir is provided for the proposed development.

### **Way Forward**

Assmang has embarked on the process of facilitating land development on their land in the Cato Ridge area. In order to effectively facilitate development, it is necessary that some initial de-risking of the site is undertaken. Being a major land owner, and by undertaking studies to de-risk the land for development, Assmang will advertently kick-start land development and demand for land in the general vicinity.

There is however some uncertainty about the developability of the land owing to environmental sensitivity. This uncertainty has already played a negative role in the outcome of some enquiries pertaining to the early release of land. These uncertainties will be addressed in the formal EIA process.

For Assmang to initiate demand, it is not necessary for them to partake in the full development lifecycle. To date, Assmang has completed the first two phases of Concept Development and (with this report) Pre-Feasibility for the entire tract of land. These studies have assessed the land to identify fatal flaws and risks and to ring fence an area that is suitable for the first phase of development. It is important that the first phase does not provide an over supply of land to the market, does not trigger any major bulk infrastructure upgrades that may render the development unfeasible. At the same time, the first phase must make enough land available to the market to ignite further demand of the precinct.

## 2 Introduction

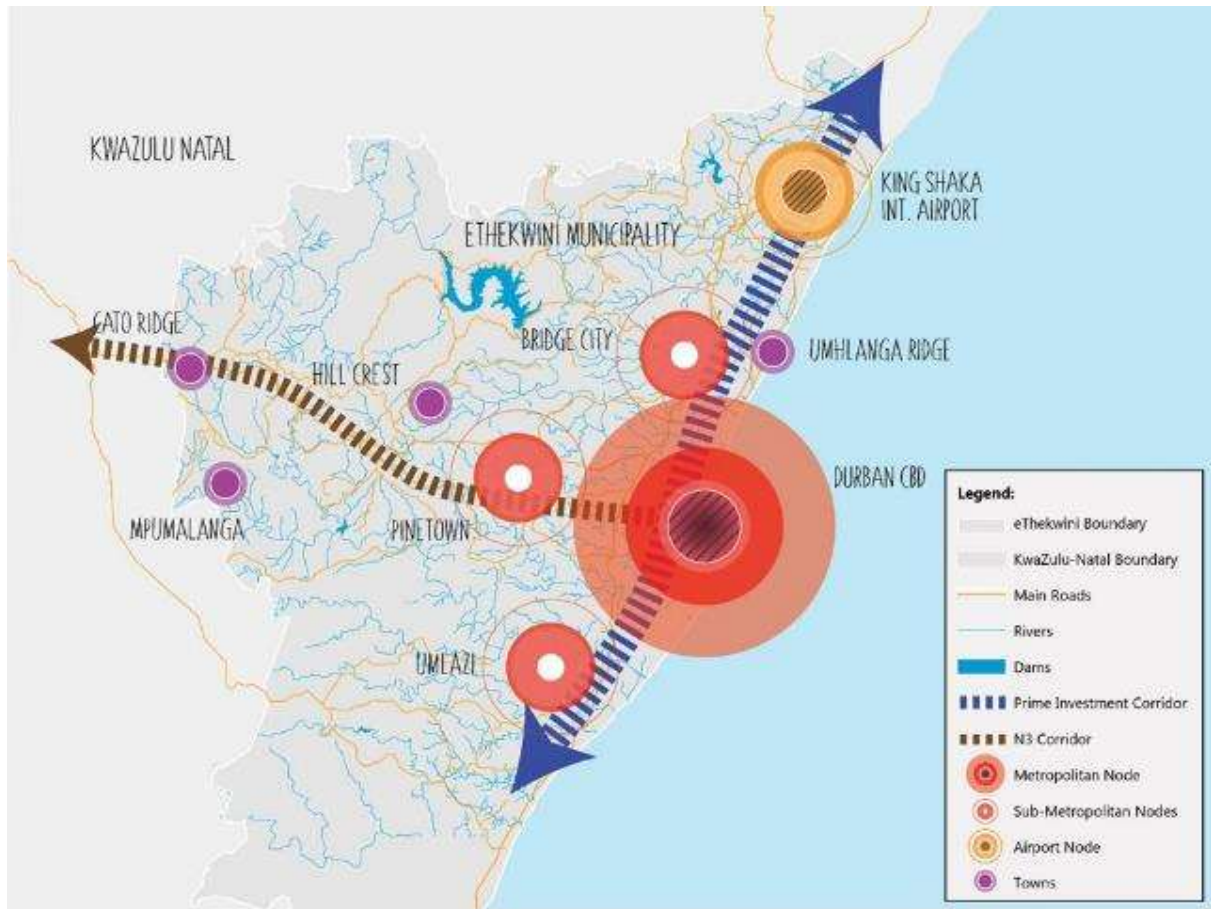
Cato Ridge is situated on the western edge of the eThekweni Metropolitan Municipality, KwaZulu-Natal. The area has been earmarked as a priority area for growth and development in the coming years. It features along the N3 Corridor of one of the most important national transport corridors of South Africa, the National Government's Strategic Integrated Project 2 (SIP 2: Durban-Freestate-Gauteng) and is located within eThekweni's Primary Corridor. The fact that the land is located adjacent to a railway line, the N3 national road and that a large portion falls on the Harrison Flats (one of the few plateaus in the close vicinity), all make the land suitable for logistics and manufacturing and therefore very attractive to potential developers. Development in Cato Ridge has been slow due to the lack of any substantially catalytic land development that would serve as a catalyst for investment to address the shortage of bulk infrastructure. Assmang (Pty) Limited and its subsidiary companies namely Cato Ridge Development Company Limited and the defunct Ferralloys Limited, are major land owners in Cato Ridge. The companies collectively referred to as Assmang, have received various offers to purchase for the development of parcels of land. Assmang would like to take advantage of the site's strategic location and the current interest shown in its land holdings. The development of these land will serve to provide economic opportunities to the wider community, which is one of the primary objectives of Assmang's social agenda.

The overarching aim of the project is for Aurecon to act as an advisor to Assmang and to advise them in terms of a structured land development process. This will include advice on the potential and options available for its land development including a proper due diligence and risk assessment to prove that phased land sales or targeted land development may be more beneficial to the Assmang shareholders than just selling the entire land holding(s) outright. The first phase of this work comprised of a Concept and Due Diligence Report (2018) which concluded that there were no fatal flaws preventing the future development of the land. The report recommended that Assmang proceeds with pre-feasibility to establish if the land can be developed profitably (2019).

### 2.1 Project Overview

#### 2.1.1 The Study Area

The land development area is located near the western boundary of the eThekweni Metropolitan Municipality. It is characterised by central plateaus and bordered by steep valleys and sensitive environmental areas that impact and influence potential development. The land development area is situated to the north and south of the N3 highway and the R103 that acts as an alternative route between Durban and Pietermaritzburg. A central railway line, the Natal Corridor (Natcor), also divides the area with general accessibility to the informal and agricultural areas in the north and south being limited by these features.



**Figure 1: Land development area in the metropolitan context**

The principle purpose of the SIP 2 is to improve logistics and economic integration between the main economic centres and raise the efficiency of export operations.

Given the SIP 2, there is significant potential for corridor development which eThekweni Metropolitan Municipality's Outer West Local Area Plan has capitalised on, but requires actual development.

SIP 2 makes specific reference to Cato Ridge and this is also reflected in the Department of Transport's National Transport Master Plan 2050.

Cato Ridge is strategically located along the N3 corridor which connects Durban to Gauteng. The purpose of the N3 Corridor development in the province is to provide the building blocks necessary to transform major nodes along the N3 into a thriving area that will benefit the province and the country's economy. The KwaZulu-Natal N3 Strategic Corridor Development Plan proposes seven (7) economic development regions, each with a specific purpose as well as proposed interventions that are aligned to key overarching strategies, namely:

- Developing economic potential within the corridor to enable economic inclusion;
- Strengthening local connectivity to the international, national and provincial economies; and
- Providing a platform for human resource development, technology and innovation

Cato Ridge has been identified as a potential industrial and logistics node and falls under the KZN Industrial and Logistics Hub (Region 1). The Hub is defined by the Industrial areas of Pinetown and New Germany to the east up to the Msunduzi Local Municipality and incorporating the Mkhambithini Local Municipality.

An industrial agglomeration exists between New Germany and Pietermaritzburg along the Corridor, which includes Hammersdale, Cato Ridge, Umlaas Road and Mkondeni. The Town Hill area is also a clearly defined edge on the western region. This region is interspersed with existing and planned industrial and logistics developments. The Cato Ridge Industrial Hub seeks to leverage on the existing industrial activity in these areas.

Cato Ridge has furthermore been noted for its potential as a Logistics Hub and Intermodal Terminal Hub in the National Transport Masterplan, 2050 (NATMAP). The intention of such a hub is to augment the transport and distribution of goods between regions within and outside of the corridor. This type of development typically involves large tracts of land clearly demarcated and zoned for the proliferation of the transport services sector which includes: truck staging, repair and truck stops; warehouse and distribution; and container depots for storage and repair.

## Aim and objectives of the project

Assmang has appointed Aurecon as its technical advisor to determine the developability of the properties owned by Assmang and to provide inputs that will enable Assmang's decisions about the future of its properties.

The objective of this phase of the project is to do investigative studies about the developability of all the Assmang properties and design a conceptual layout that can be costed to determine potential input costs at a pre-feasibility level. The aforementioned input costs and the potential yield of the land development area are then assessed in terms of the market studies which will assist Assmang with making the most appropriate decision about the future of the land.

From the onset, Aurecon acknowledged that Assmang is not a land developer as its core business, having both a strong conscience towards empowering the local community, whilst also fulfilling its commercial objectives towards its shareholders. It was thus recommended that during the Concept / Due Diligence phase, the project team (both Aurecon and Assmang) partake in a contextual risk workshop. This workshop not only identified the major risks that faced the project but also helped the project team to understand the critical success factors or objectives of the project. During the workshop, the objectives were firstly identified, then ranked in order of importance and then reassessed in relation to the risk associated with each objective.

The resulting list of objectives (critical success factors) acts as guiding principles for Assmang in the phases to come when assessing development options. The top 5 objectives are:

1. Assure Infrastructure;
2. Assure Viable Land Development Opportunities;
3. Effective Community Communication;
4. Assure Stakeholder Communication (Excl. Communities); and
5. Assure Sustainability (Triple bottom line).

The full list of critical success factors combining effect and uncertainty is seen in the figure below.



**Figure 2: Function Criticality Based on Effect and Uncertainty**

## **2.2 Purpose and structure of the Report**

The Pre-Feasibility Report follows a Concept and Due Diligence Report which was developed in the first phase of the project to determine the development potential and options available for the land development in Cato Ridge. The due diligence and risk assessment were also conducted to determine any fatal flaws that may impact the future development of the land and its impact on Assmang and its stakeholders. The Concept Report recommended that Assmang proceeds with Pre-Feasibility Study to establish viable land development approaches.

The purpose of the Pre-Feasibility Report is to provide a summary of the studies and investigations conducted to establish the developability of Assmang's land. The report then describes the development concept(s) and provides a business case and the optimal project phasing to enable Assmang to make informed decisions on when and how they would develop or sell its land. A preliminary business model is informed by a detailed market assessment(s) and technical studies that will assist with short- and long-term decision making as well as draft land-use planning application(s) to be submitted for approval should Assmang (or another company) want to proceed with the Cato Ridge development.

This report covers the following sections:

- Policy and Legislative Environment.
- Stakeholder Engagement Plan
- Pre-feasibility investigations and technical assessments, namely:
  - Ecological sensitivity
  - Flood line investigation
  - Topographical survey
  - Town planning investigation
  - Geotechnical investigation
  - Transportation study
  - Infrastructure and engineering services
- Development Concept.
- Urban Design Framework.
- Township Establishment Application.
- Financial Model.
- Project Implementation.
- Recommendations and next steps.

## 3 Policy and Legislative environment

### 3.1 Introduction

The objective of this chapter is to assess the practicality of developing the Assmang owned land in the Cato Ridge area within its legislative and policy context. To maximise the success of the project, it is crucial to ensure alignment with governmental objectives and vision for the area. The following sections will discuss the relevant policies and legislation that is applicable to the study area from a national, provincial and local perspective.

### 3.2 National

#### 3.2.1 National Development Plan (2011)

The National Development Plan (NDP) aims to eliminate poverty and reduce inequality by 2030 and identifies the role that different sectors of society need to play in reaching that goal. The NDP predates the United Nations Sustainable Development Goals (SDG) but there is almost complete alignment between the NDP and the United Nations SDG. The NDP emphasises the need to create opportunities for growth and jobs and puts multi-stakeholder partnerships at the centre. Key priorities encapsulated in the NDP include raising employment through faster economic growth, improving the quality of education, skills development and innovation and building the capability of the state to play a developmental, transformative role.

The NDP further states that planning in South Africa will be guided by normative principles to create spaces that are liveable, equitable, sustainable, resilient and efficient and support economic opportunities and social cohesion. These principles for spatial development are premised on spatial justice, spatial sustainability, spatial resilience, spatial quality and spatial efficiency. These principles are regulated in Chapter 2 of the Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013).

The NDP proposes that these principles need to be incorporated into operational principles that provide guidance on integrating rural and urban areas, accommodating social diversity within the built environment, creating more dense settlements without raising the cost of land and housing for the poor, integrating transportation systems and land use, broadening the economic base of towns and cities through the supply of reliable infrastructure, suitable land and property, connectivity, skills and logistics, building community involvement and partnerships, supporting the development of vibrant, diverse, safe, green and valued places, and ensuring that governance arrangements and leadership deliver equitable and efficient decision-making.

It is therefore clear that the local strategies of the eThekweni Metropolitan Municipality must be aligned with the NDP to ensure that the objectives of the NDP are implemented on the local government level and are clearly understood by the private sector. This will then enable the creation of sustainable employment opportunities that address income inequality and skills development at all levels. In order to ensure this, development in marginalised areas should be avoided and the private sector should be engaged in all developments.

The outcomes of the NDP are in line with Assmang's own objectives for this project which is to enable a conducive environment for economic opportunities that will result in further job creation and thus lead to more sustainable livelihoods.

#### 3.2.2 Spatial Planning and Land Use Management Act

The Spatial Planning and Land Use Management Act (Act 16 of 2013) ("SPLUMA") serves as a framework act for all spatial planning and land-use management legislation and was developed to provide a single legislated and integrated land-use system for South Africa. It seeks to promote consistency and uniformity in procedures and decision-making. Other objectives include addressing historical spatial imbalances and the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments. SPLUMA applies to all spatial contexts, both rural and urban.

SPLUMA provides two pillars, namely spatial forward planning and land-use management (or land development) administration. SPLUMA provides general development principles in Chapter 2, Section 7(a)-(e) of the Act that is applicable to spatial planning and land-use management:

- **Spatial justice:** Past spatial and other development imbalances must be redressed through improved access to, and use of land.

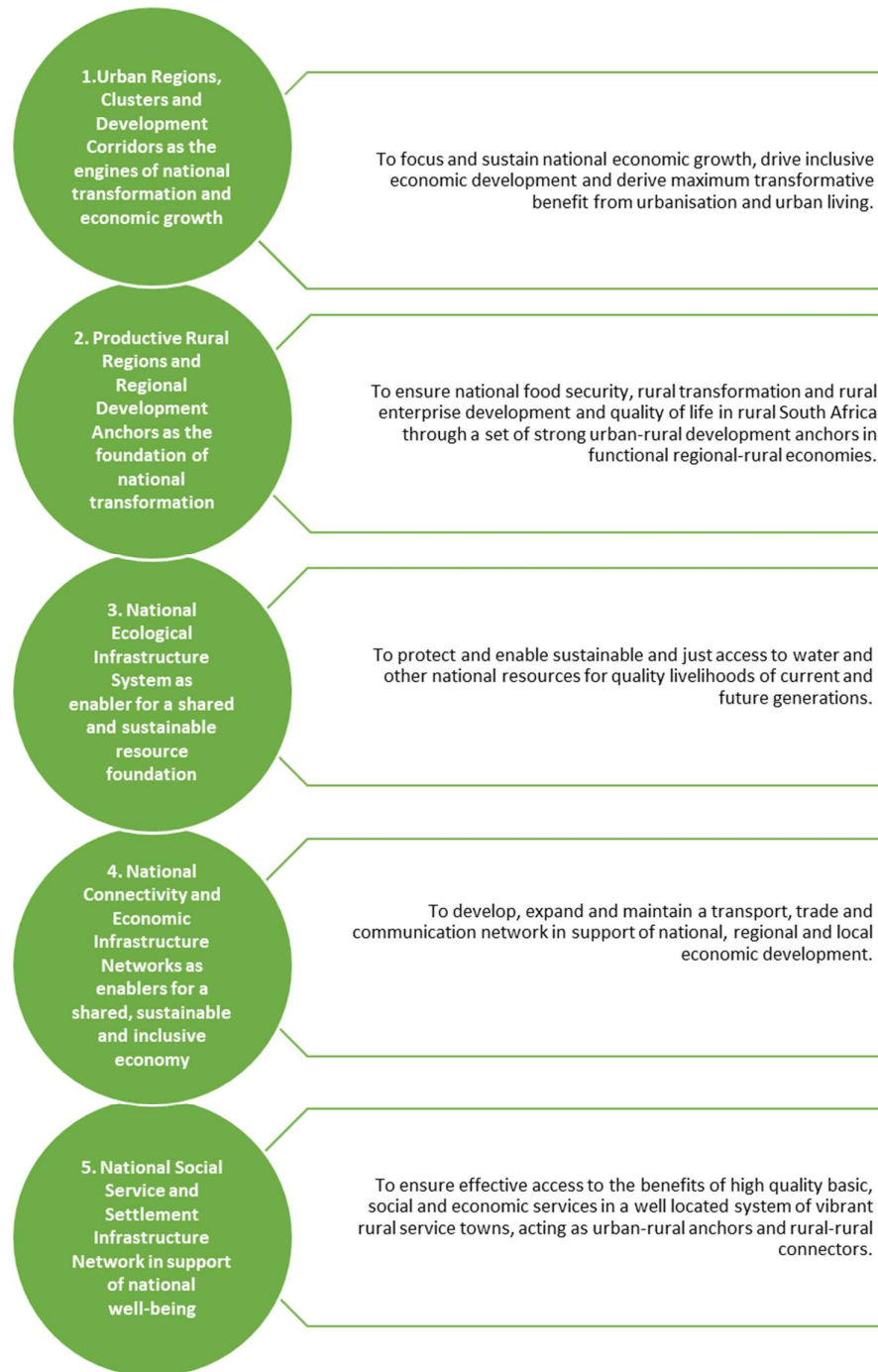
- **Spatial sustainability:** Spatial planning and land use management systems must promote land development that is within the fiscal, institutional and administrative means of South Africa, must protect prime and unique agricultural land, and must comply with environmental laws and limit urban sprawl.
- **Efficiency:** Land development should optimise the use of existing resources and infrastructure, and decision-making procedures must be designed to minimise negative financial, social, economic or environmental impact.
- **Spatial resilience:** Flexibility in spatial plans, policies and land-use management systems is accommodated to ensure sustainable livelihoods in communities that are most likely to suffer the impacts of economic and environmental shocks.
- **Good administration:** All spheres of government are to ensure an integrated approach to land use and land development, that is guided by the spatial planning and land-use management systems. All governmental departments are to provide sectoral inputs, comply with any other requirements and follow a transparent public process when developing guideline documents, or by-laws in support of their regulatory functions.

The development principles contained in SPLUMA guides the manner in which the eThekweni municipality approached development in the Outer West Local Area Plan and inform the development principles proposed for Cato Ridge in this report.

### 3.2.3 National Spatial Development Framework

The draft National Spatial Development Framework (“NSDF”) is the first national-level Spatial Development Framework (“SDF”) and has been prepared in accordance with the provisions of SPLUMA and provides a high-level national spatial diagnostic of the most pertinent challenges, trends, patterns and opportunities in South Africa. The purpose of the NSDF is to be the spatial expression of Provincial Growth and Development Strategies (“PGDSs”) and seeks to guide the development of Integrated Development Plans (“IDPs”) and SDFs on provincial, district and local levels. Importantly, the NSDF helps to prioritise and align investment and infrastructure plans across all spheres of government. The NSDF also provides clear signals to the private sector about desired development directions and aims to increase predictability in the development environment by, for example, establishing no-go, conditional and ‘go’ areas for development and redressing the spatial legacy of apartheid.

The NSDF introduces five national spatial development themes that set out the desired future national spatial development pattern for South Africa in 2050. The five themes are:



**Figure 3: National Spatial Development Frames**

To ensure alignment with the NSDF, the development that occurs in Cato Ridge must ensure that proposed spatial interventions yield and stimulate the desired national spatial development patterns in the future, and consequently, the desired national spatial outcome premised on the 5 themes discussed above. Any development that occurs in and around Cato Ridge should specifically focus on those areas with the potential to achieve the objectives set out in Figure 3. The eThekwin area, including the Cato Ridge area, with the support of the N3, has been highlighted as critical social and economic development priority areas. Spatial planning instruments with specific spatial proposals for these areas are discussed later in this section.

### 3.2.4 Integrated Urban Development Framework

As a policy framework, the Integrated Urban Development Framework (“IUDF”) seeks to foster a shared understanding across government and society about how best to manage urbanisation and achieve the goals of economic development, job creation and improved living conditions for our people. The IUDF is co-ordinated

by the Department of Co-operative Governance and Traditional Affairs (“COGTA”) and responds directly to the Sustainable Development Goals of the United Nations, particularly Goal 11, which focuses on making cities and human settlements inclusive, safe, resilient and sustainable.

An important outcome of the IUDF is that of spatial transformation. The policy levers that have been identified are crucial for maximising the potential of urban areas, by integrating and aligning investments to improve the urban form of our cities. The IUDF adopted a Transit-Oriented Development (“TOD”) approach to urban design, where all development policies promote higher-density urban development along mass transit corridors. This approach should promote investment in human settlements and other key economic infrastructure, further enabling mobility and accessibility to social and economic opportunity.

To reach its vision, the IUDF identifies four strategic goals, defined below, which will aid in achieving the transformative vision of restructured urban spaces and compact, connected cities and towns.

- Spatial integration: To forge new spatial forms in settlement, transport, social and economic areas.
- Inclusion and access: To ensure people have access to social and economic services, opportunities and choices.
- Growth: To harness urban dynamism for inclusive, sustainable economic growth and development.
- Governance: To enhance the capacity of the State and its citizens to work together to achieve spatial and social integration.

To ensure alignment with the IUDF, the eThekweni Metropolitan Municipality needs to ensure that effect is given to the national spatial vision in a manner which is locally relevant. Urbanisation must be effectively managed to ensure that the increasing concentration of people translates into higher levels of economic activity, greater productivity and higher rates of growth. Furthermore, spatial integration, social inclusion and access, inclusive, sustainable economic growth and development and good governance should be at the forefront of all development strategies and interventions. The development of Cato Ridge must give effect to the national spatial vision contained in the IUDF.

### **3.3 Provincial**

#### **3.3.1 KwaZulu-Natal Provincial Growth Development Strategy (2016)**

The Provincial Growth Development Strategy (PGDS) envisions that KwaZulu-Natal will be a prosperous province with a healthy, secure and skilled population, acting as a gateway to Africa and the world by 2035. The PGDS further states that by 2035, KwaZulu-Natal should have maximised its position as a gateway to South and Southern Africa, as well as its human and natural resources, by creating a safe, healthy and sustainable living environment. Abject poverty, inequality, unemployment and the current disease burden should be history, basic services must have reached all its people, domestic and foreign investors are attracted by world-class infrastructure and a skilled labour force.

Goal 7 of the PGDS specifically addresses spatial equity which is applicable to Cato Ridge. The outcome of this goal is resilience and integrated land-use management that will guide the distribution and utilisation of human and environmental resources towards sustainable growth and development. Moreover, the outcome will focus on the promotion of spatial concentration, the co-ordination of development interventions, the integration of spatial planning initiatives and effective land-use management.

Led by the Provincial Growth and Development Plan 2045 vision, the KwaZulu-Natal N3 Strategic Corridor Development Plan provides detailed plans for the economic development, progression and prosperity of the municipalities located along the N3 Corridor. In the Strategic Plan, seven (7) economic development regions have been proposed, each with a specific purpose as well as proposed interventions that are aligned to the key overarching strategies, namely:

- Developing Economic Potential within the Corridor to enable economic inclusion;
- Strengthening local connectivity to the International, national and provincial economy; and
- Providing a platform for Human resource development, technology and innovation.

Cato Ridge falls under the KZN Industrial and Logistics Hub (Region 1). The Hub is defined by the Industrial areas of Pinetown and New Germany to the east up to the Msunduzi Local Municipality and incorporating Mkhambithini Local Municipality. Industrial agglomeration occurs on points between New Germany and

Pietermaritzburg along the Corridor, these include; Hammarsdale, Cato Ridge, Umlaas Road and Mkondeni. The Town Hill area is also a clearly defined edge on the western region. The areas to the east of Pinetown and New Germany are residential. This region is interspersed with existing and planned industrial and logistics developments. The Industrial Hub seeks to leverage on the existing industrial activity in these areas.

### **3.4 Local**

#### **3.4.1 eThekwini Integrated Development Plan (2019/2020)**

The 2019/2020 IDP serves as a tool for transforming local governments towards facilitation and management of development within their areas of jurisdiction. The Municipal Systems Act (MSA) (Act 32 of 2000) identifies the IDP as a key component in entrenching developmental local government principles and must guide and inform all planning, development, and budgeting decisions of a municipality. This framework is rolled out into objectives, key performance indicators, and targets for implementation.

As such, the eThekwini IDP proposes an 8-point plan to address the challenges in the metro as well as to realise the vision for the city. The plan is as follows:

1. Develop and sustain our spatial, natural and built environment.
2. Develop a prosperous, diverse economy and employment creation.
3. Creating a quality living environment.
4. Fostering a socially equitable environment.
5. Supporting organisation design, human capital development and management.
6. A vibrant and creative city - the foundation for sustainability and social cohesion.
7. Good governance and responsive local government.
8. Financially accountable and sustainable city.

Each plan has a goal, desired outcome and specific programmes. Plan 2 which is intended to develop the economic wealth of the eThekwini region for the well-being of all its citizens is directly linked to the development of Cato Ridge. The N3 corridor development has been listed a catalytic project which includes the development of Cato Ridge and the facilitation of development in priority nodes and corridors has been highlighted. The focus will be on the Hammarsdale-Cato Ridge-Mkambathini region through to Pietermaritzburg as well as the Umswati-KwaXimba region.

#### **3.4.2 eThekwini Spatial Development Framework (2017)**

The 2017 eThekwini Spatial Development Frameworks (SDF) is intended to influence the overall spatial distribution of current and future land use within the Metro, in order to give effect to the vision, goals and objectives of the IDP. With its focus on spatial restructuring, the SDF guides the location of future development in a manner that addresses the imbalances of the past. It enables the Metro to manage its land resources in a developmental and sustainable manner. It provides an analysis of the spatial needs and issues and provides strategies and programs to address these challenges. The challenges addressed are linked to municipal budgets according to priority interventions.

Key spatial issues relevant to the proposed land development area that have been identified in the eThekwini SDF are as follows:

- Unlocking infrastructure capacity for new growth in alignment with the spatial intentions, address phasing and costs constraints associated with development;
- Protecting viable agricultural land;
- Growing the Metro's rates base;
- Addressing the housing and infrastructure backlog;
- Strategic economic growth and investment;
- Protecting key environmental assets and services;
- Managing urban growth and strategic densification;

- Integrated and efficient city spatial form, need to curtail urban sprawl and decentralisation of residential and commercial development;
- Alignment with strategies of all spheres of government and neighbouring municipalities
- Improved rural-urban linkages and an acknowledgement of the rural-urban interdependencies to facilitate more inclusive rural development

Through a series of packaged plans, the strategic intent of the SDF has been translated into lower-order plans that contain geographically specific physical development proposals and land use management guidelines.

The Cato Ridge area has been included in a number of spatial proposals that seek to attract investment, boost the local, regional and national economy, as well as uplift the quality of lives of residents of the area. Cato Ridge has been identified as one of the industrial expansion and potential dry port areas in the Metro that can respond to the increasing demand for industrial land in eThekweni area and provide logistics support for the port. However, the area faces enormous challenges especially with regards to traffic (limited accessibility) and bulk infrastructure capacities and as a result, the area has not yet been unlocked to its full potential. By improving the infrastructure, upgrading the N3 and addressing the sewer issue these challenges can be addressed and the area unlocked for industrial and logistics development. The development of Cato Ridge is also seen to act as a stimulus to unlocking the potential of the surrounding areas of Mpumalanga and Hammarsdale.

Given the limited focus on Cato Ridge in the IDP it seems that there is some disconnect between the Outer West Spatial Development Framework and the intent of the municipality to address the infrastructure shortfalls in Cato Ridge in the short term. It is likely that it is a result of historically limited private sector development interest in the Cato Ridge area, despite the Government's acknowledgement of it being an ideal location for development in line with the municipality's spatial objectives. This has changed in recent years, and it must be noted that the development of the Cato Ridge node has been listed as a catalytic project by the President and KZN Premier.

### **3.4.3 eThekweni Industrial Spatial Strategy (2009)**

The eThekweni Industrial Spatial Strategy (2009) serves as an overarching, city-wide, approach to industrial development and seeks to guide industrial development within the eThekweni Metro. It does so by identifying sectors with growth potential, outlining their spatial and infrastructural needs, and identifying available space and the appropriateness of these locations to unlock and maximise economic returns. The strategy goes further by providing motivations for external investment and the growth of existing industries and provides a set of actions toward the implementation of the strategy. Importantly, the strategy aims to guide the planning and spatial development of eThekweni, as well as to identify necessary interventions by the local government.

The strategy provides an analysis of key industrial sectors in the local economy, with the automotive, transport and logistics and marine services and shipbuilding sectors emerging as the top performers. Based on the spatial distribution and clustering of these sectors, a number of strategic high-potential sites were identified. Cato Ridge is identified as an area with a large percentage of unoccupied land, which coupled to its strategic location along the Durban-Pietermaritzburg corridor and available flat topography makes it a key location for future industrial activities. In this industrial strategy, Cato Ridge is envisaged as the next industrial complex and logistic node for the eThekweni region.

In order to outline a more strategic and structured view of growth in the eThekweni metropolitan area, the strategy outlines 3 potential development scenarios which are all centred around port expansion options. In all three scenarios, Cato Ridge has the potential for a logistics park/container terminal, light industries, warehousing, chemicals and a holding area for trucks, with a development and take-up timeframe of 5 to 20 years (short-medium term). However, the Cato Ridge area is described as having poor access, limited bulk infrastructure availability and environmental sensitivities. The investigations that have been done by Aurecon in this pre-feasibility study also confirmed certain environmental constraints as well as infrastructure shortfalls.

The strategy further indicates that Cato Ridge and Mpumalanga have been identified as areas with the required/necessary zoning for industrial activities, notwithstanding the above-mentioned development constraints. A number of initiatives have been identified to unlock development in these areas, which include the development and implementation of detailed infrastructure plans, the creation of precinct plans and detailed layout plans, and the provision of development incentives where applicable.

The development of site-specific sectoral plans was done for the Cato Ridge Corridor study and the Outer West Local Area Plan. The mentioned study was completed in 2010 and identified 94 infrastructure projects with starting dates that range from 2015 to 2030, and funding sources predominantly from the eThekweni Metropolitan Municipality, private developers, eThekweni Transport Authority and SANRAL. To date, none of the projects has materialised and it seems that the lack of implementation is due to the private sector and the municipality waiting for each other to take the initiative.

#### **3.4.4 eThekweni Industrial Land Study and Land Strategy Development (2014)**

The lack of adequate information on industrial land was identified as a key barrier to facilitating investment in the eThekweni area. The local mandate for growth requires that the Metro develops an industrial land strategy and to this end, the eThekweni Economic Development and Investment Promotion Unit appointed the Planning Initiative Team in 2013 to prepare an Industrial Land Study and Industrial Land Development Strategy for the Metro. The eThekweni Industrial Land Study and Land Strategy Development (2014) is an extension of the eThekweni Industrial Spatial Strategy (2009).

The project focusses on both demand and supply-side information, analysis and proposed management interventions and strategies for releasing industrial land that meets the demands of the eThekweni market. The proposed goal of the strategy is to be a proactive facilitator of industrial land development, in order to build confidence in the market to invest in the eThekweni metro and contribute towards economic growth and job creation.

The key objectives of the strategy are to manage existing industrial land in order to retain and grow existing investment and to facilitate the delivery of an adequate “ready for market” land bank. In the context of the strategy, land that is “ready for market” implies that land is zoned for industrial use and bulk services are available, and the land is ready for developers to platform and provide the internal road network and infrastructure required. As such, three key strategies linked to spatial interventions are proposed, namely: (1) decisive, facilitative business and political culture and exemplary urban management, (2) proactive infrastructure delivery, and (3) innovation, research and development.

Given the lack of bulk infrastructure and the delay in commencing with construction of bulk infrastructure, the eThekweni metro is not achieving its objectives and the absence of this enabling bulk infrastructure is causing reluctance from the private sector to start with development in Cato Ridge.

Given the focus of industrial development in Cato Ridge, the strategy proposes Cato Ridge as a priority for greenfields development.<sup>1</sup> An opportunity exists for industrial development due to the significant amount of flat land and the location of the area on the road and rail route between Durban and Pietermaritzburg (and ultimately Gauteng, which is already being demonstrated through the recent growth in the area). It was noted, however, that the feasibility of the Cato Ridge dry port presents concerns given its proximity to the seaport and whether there would be an advantage for logistics related to the seaport. The report advised that first priority should be given to releasing land around King Shaka International Airport followed by Cato Ridge and then the south dry port area (the old Durban Airport).

Another intervention proposed in the strategy as part of Strategy 3 (innovation, research and development) is to prioritise the Strategic Environmental Plan (“SEP”) in (firstly) the aerotropolis area and secondly, the Cato Ridge and N3 corridor areas. This is required to understand the environmental sensitivities and constraints earlier in the process in order to explore the possibility of regional mitigation and off-sets which could then be tested and piloted as part of the SEP process.

#### **3.4.5 eThekweni Rural Development Strategy (2016)**

The purpose of the Rural Development Strategy (“RDS”) (2016), amongst other things, is to provide an accepted definition of eThekweni rural area and develop an overall vision for rural areas. The overall vision then informs the role of rural areas and outlines an appropriate response to the vision by different stakeholders. The strategy defines and unpacks the character and challenges of rural areas within in the eThekweni region and assesses the successes and failures of the previous strategies. The RDS further outlines a rural framework which is aligned to the city’s vision and puts forward strategies which promote sustainable economic development, protection of the environment, food security and sustainable settlement patterns.

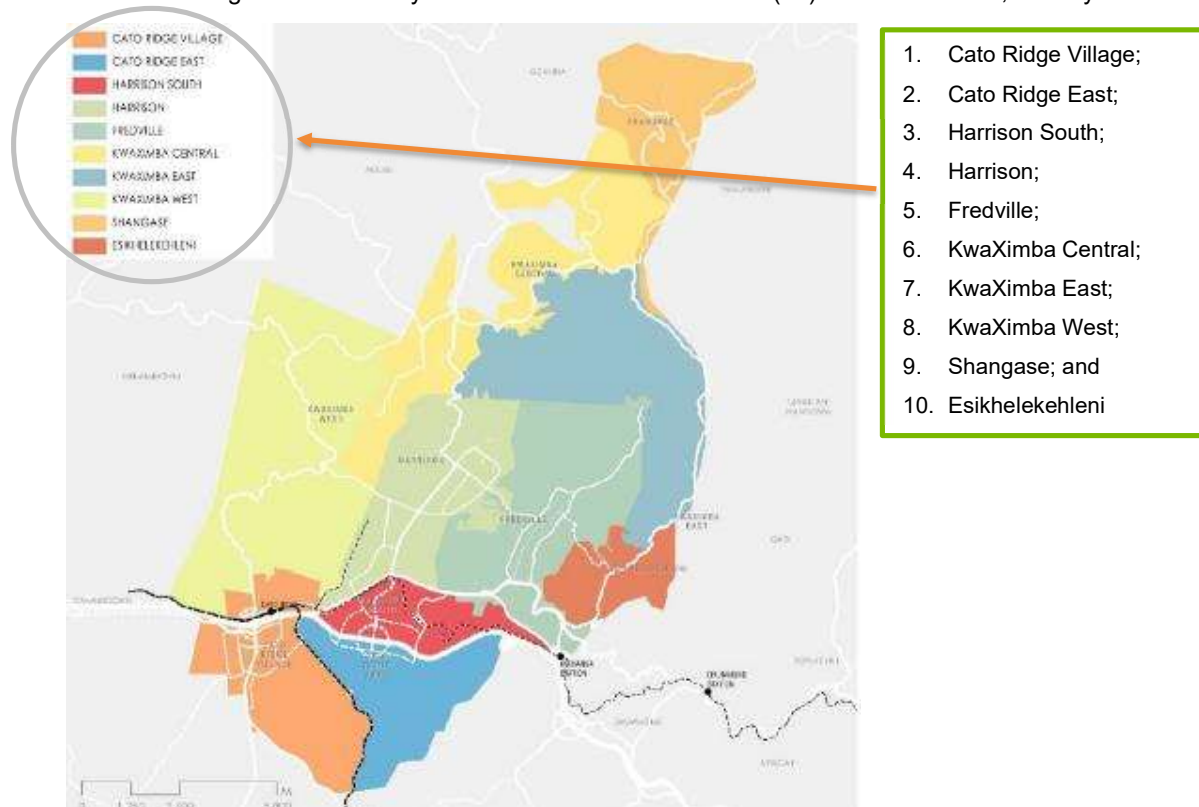
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<sup>1</sup> For the purposes of this study, greenfields means land that is already identified in the SDF but does not have industrial development rights and is not yet serviced.

The Cato Ridge railway line is identified as key infrastructure that can resolve transport challenges, i.e. low passenger volumes. There are a total of seven train stations within the study area – five in the western area along the Cato Ridge line and two in the southern area along the south coast line. The 2008 rail census indicates that the current volumes are relatively low, largely due to slow journey times, limited accessibility and safety concern. A strategy to address this is the improvement of the rail geometry along the Cato Ridge line to increase travel speed. Other spatial proposals may have implications for the Cato Ridge area and should be considered in the future development of Cato Ridge.

### 3.4.6 Cato Ridge Local Area Plan (2018)

A Local Area Plan (“LAP”) has been prepared for Cato Ridge to more effectively unlock development potential and identify projects and land that will unlock public and private investment, stimulate economic growth and develop and improve social service delivery and infrastructure. The study area is located in the Outer West Spatial Planning Region along the western edge of the eThekweni Municipal boundary as illustrated in Figure 4. The study area has been divided into ten (10) functional areas, namely:



**Figure 4: Cato Ridge LAP**

There is increased demand for well-located and accessible land within the Outer West Spatial Planning Region. As a result, new key strategic zones / hubs are emerging on the periphery of the Metro. These nodes are major drivers and are strategically located to stimulate economic growth and job creation. Furthermore, it has been identified that the Outer West Spatial Planning Region supports road-based logistics and industrial development.

The development vision for Cato Ridge as illustrated in the LAP is as follows:

"Cato Ridge will be a balanced and viable business town centre with a regenerated industrial hinterland and new major economic investment areas that will not only generate local employment but will also collectively enable the town to develop into an important sub-regional economic development node in the spatial structure of eThekweni Municipality.

The area will provide a quality living environment that supports a range of urban, suburban and rural/traditional lifestyle options for local communities with supporting services, facilities and amenities and that protects the environmental resources associated with the Mshwati, uMngeni and Sterkspruit (Mlazi) River catchments.

The urban form will be more compacted and structured, and it will be punctuated by an integrated open space system that provides for the protection of biodiversity and for the recreational and cultural needs of the local and metropolitan population, whilst enhancing the resilience of the natural systems and local communities with respect to the implications of global environmental change".

| ROLES                                                                                                                                         | SOCIAL                                                                                                                                                                               | ECONOMIC                                                                                                                                                                                                   | ENVIRONMENTAL                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NATIONAL</b><br><i>(what role does the area play with respect to the growth and development of South Africa)</i>                           | -                                                                                                                                                                                    | Potential economic support role linked to national Durban-Gauteng SIP2 N3 Corridor                                                                                                                         | Vegetation and species of national significance                                                                                                                                         |
| <b>PROVINCIAL/REGIONAL</b><br><i>(what role does the area play for the provincial, metropolitan and surrounding communities and business)</i> | Accommodate urbanisation                                                                                                                                                             | Contribution to the Durban to Pietermaritzburg N3 Corridor at a provincial level                                                                                                                           | Protected area – contributes to provincial conservation assets<br>Waste dilution role for upper catchments in provincial riparian network                                               |
| <b>LOCAL</b><br><i>(what role does the area play for local people and communities)</i>                                                        | Provides for a small-holding lifestyle and suburban/traditional residential choices<br>Recreational and adventure sport & tourism activities<br>Local social services and activities | Local employment potential linked to industry, agriculture, tourism and road-based logistics<br>Local industrial and commercial opportunities<br>Tourism potential linked to natural environment/landscape | Visual gateway to the metro and coastal areas<br>Local biodiversity and environmental assets<br>Eco-tourism significance – natural assets and landscape<br>Landscape and sense of place |

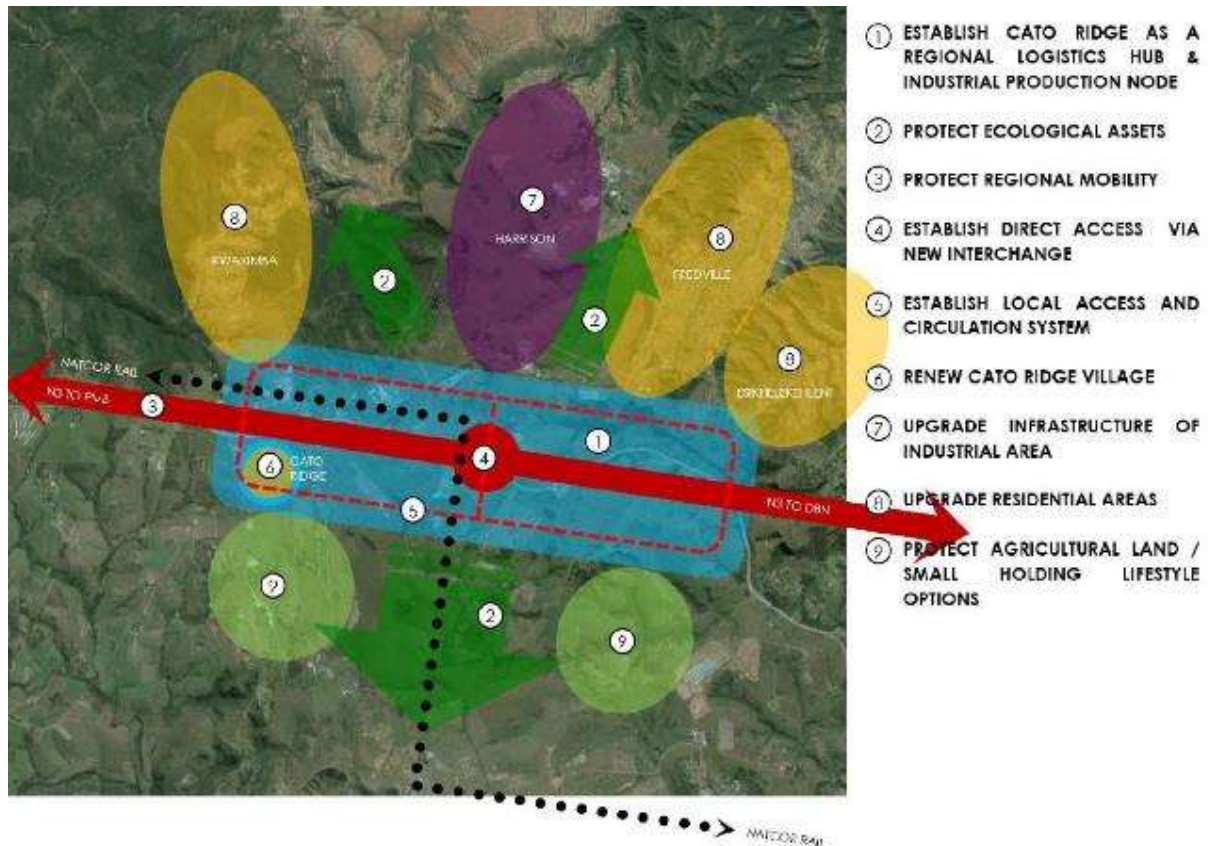
**Figure 5: The role of Cato Ridge**

The following objectives that pertain to the land development area have been identified;

- Cato Ridge should be established as a city / regional-wide logistics hub and industrial production node which compliments existing industrial zones of the City and provides for expansion of industry and enhancement of the City's logistics platform;
- The zones immediately adjacent to the N3 will provide opportunities for logistics and industrial activity growth and development;
- The ecological assets contribute to the mitigation of climate change impacts and contribute towards building urban resilience for eThekweni;
- Renew and redefine the Cato Ridge Village as service and commercial centre to service the logistics hub and industrial production nodes of the area and the needs of the adjacent residential populations;
- Upgrade residential areas to provide attractive housing for workers and investors;
- Protect productive agricultural land for long-term food security;

- No development is permitted within the habitats and eco-systems without approval from the Environmental Planning and Climate Protection Department;
- The Sterkspruit (Mlazi), Mshwati and uMngeni water catchments have a system of integrated rivers, streams and drainage lines, as well as their associated floodplains and wetland areas. These areas are not suitable for development and as such, no development will be permitted within watercourse and/or wetlands areas;
- A minimum of a 30m development buffer must be maintained between proposed developments and the wetlands;
- A minimum buffer of 20m is required between the footprint of development and the top of the bank of a stream or drainage line;
- Development is not supported within the 1:100-year flood line. In addition, a setback of 10 to 40 m from the 1:100-year flood line is required, depending on the stream order. This is applied to ensure the protection of vegetation outside the flood zone;
- Promote the establishment of a balanced, integrated and sustainable mix of land uses and activities;
- Enable the establishment of a range of land uses that will be necessary to support the primary function of the logistics and industrial production hubs;
- Enable the establishment of a hierarchy of commercial, industrial and service nodes that protect complimentary cores i.e. Mpumalanga Town Centre, Hillcrest, Shongweni, Camperdown etc;
- Support more compact and structured urban settlement and economic development with higher densities (up to 40 units/ha) in appropriate, accessible locations, such as around activity nodes and spines; and
- Ensure the establishment of an appropriate range of regional and local level community facilities.

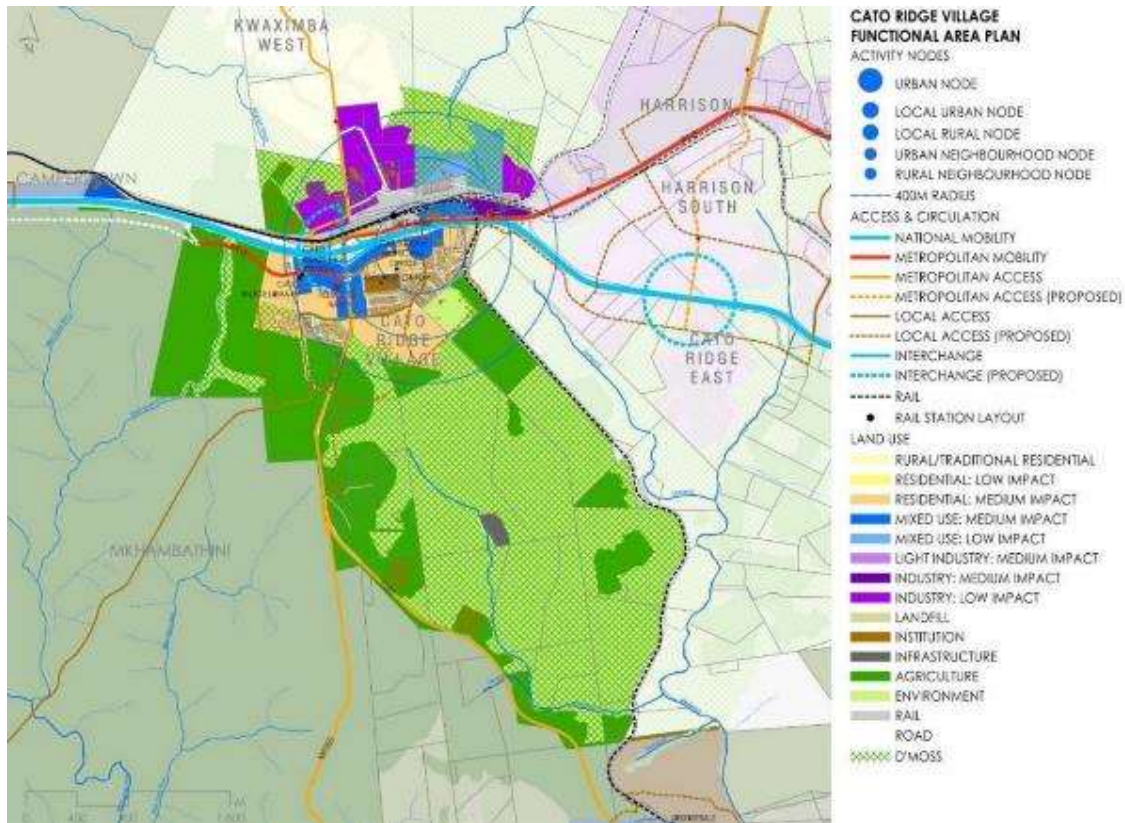
The following spatial concept has been prepared which culminates these points:



**Figure 6: Cato Ridge LAP Spatial Concept**

The land owned by Assmang that falls south of the N3 primarily falls within the Cato Ridge Village functional area, the Harrison functional area as well as the areas to be protected as ecological assets. The Cato Ridge LAP earmarks the following land use activities for the Cato Ridge Village functional area (Figure 7):

- Redefine Cato Ridge village as a mixed-use business, services and transport node serving the surrounding industrial zones;
- Provide for informal trading activities to be accommodated within the node;
- Provide for the long-term mixed use/higher density residential expansion of Cato Ridge south of the existing village;
- Consolidate existing industrial development north of the P1-3 and restrict new development in terms of environmental and infrastructure limitations; and
- Protect and consolidate remaining agricultural activities on the P385 in order to preserve the integrity of the adjacent Mkhambathini agricultural production area.

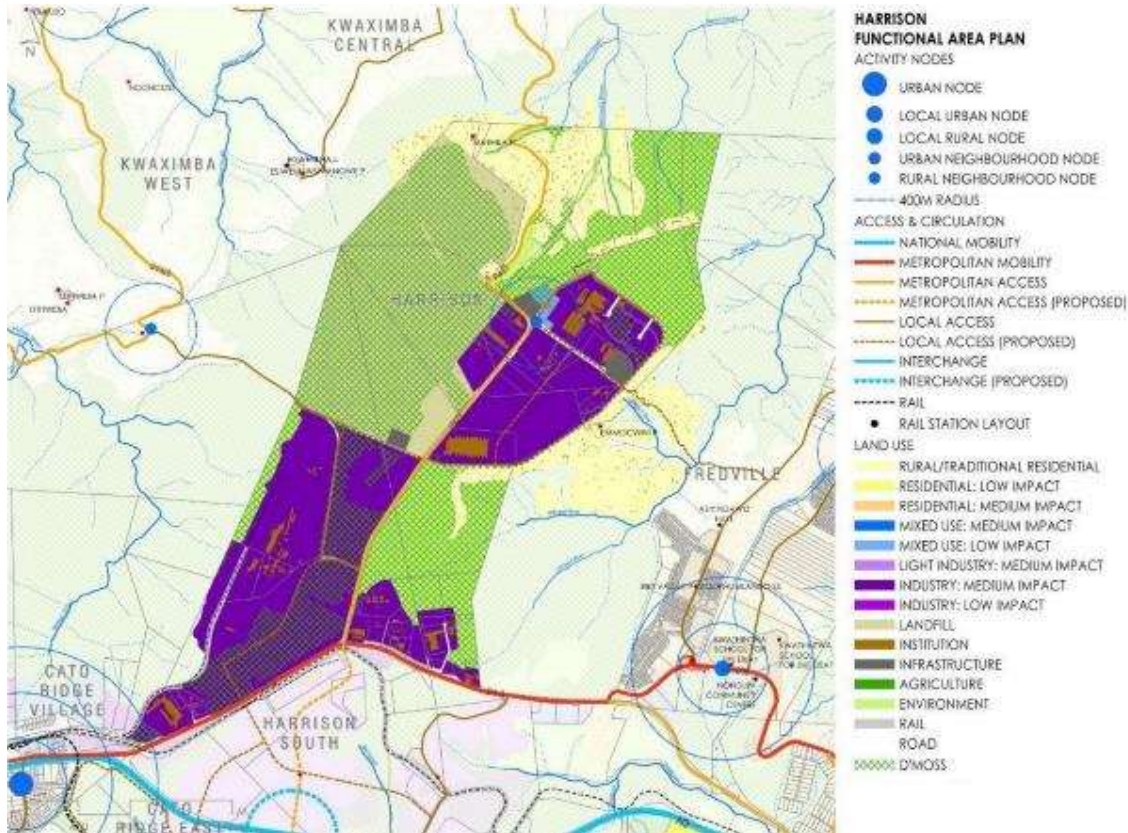


**Figure 7: Cato Ridge Village LAP Land Use Activity Framework**

Based on the Cato Ridge Village Land Use Activity Framework, the sites south of the N3 should accommodate moderate growth of the village into a sustainable urban node whilst the remaining land to the south remains agricultural in nature.

The Cato Ridge LAP earmarks the following land use activities for the Harrison functional area (Figure 8):

- Consolidate and revitalise Harrison Flats as a metropolitan node for mixed medium impact manufacturing industrial node where new industrial, logistic, warehouse & distribution facilities are activities permitted;
- Encourage clustering within the functional areas i.e. food and beverages in the vicinity of the Abattoir, metal products around the Assmang Cato Ridge Works and the SAFAL steel complexes, chemicals and building materials along with the P1-3 corridor and recycling activities around the proposed landfill site;
- No new heavy (polluting) manufacturing activities to be permitted;
- Establish a mixed-use urban neighbourhood activity node at the intersection of Eddie Hagan Drive and the MR423 which serves the local industrial precinct;
- Provide for informal trading activities to be accommodated within the nodes;
- Upgrade and consolidate existing rural/traditional settlements in the Functional Areas;
- Cluster residential development near major access intersections and places with good road access in order to facilitate the provision of an efficient public transport system;
- Limit densities for rural housing to be no greater than 3du/ha; and
- Identify and clearly demarcate communal grazing lands.



**Figure 8: Harrison LAP Land Use Activity Framework**

Based on this Harrison Land Use Activity Framework, the sites north of the N3 adjacent to the existing Cato Ridge Works (“CRW”) smelter are earmarked for medium impact industry, however, there is the significant presence of environmentally sensitive land identified through D’MOSS. Furthermore, based on the plan, the land has been identified as potential landfill to the north of the CRW smelter and west of Eddie Hagen Drive. This implies that a mixed-use development in the area is supported by the LAP, however, the D’MOSS should be taken into consideration when proposing the mixed land uses.

The purpose of the LAP is to give direction to developers as a guideline document that spatially represents the objectives of the municipality, but the directives of the LAP is subject to site-specific investigations, such as the ecological studies.

### 3.5 Other Applicable Policies

#### 3.5.1 Sustainable Development Goals

The Sustainable Development Goals (“SDGs”) are intended to be a universally shared and globally accepted vision to progress to a just, safe and sustainable space for all inhabitants. South Africa is a member of the United Nations (UN), and therefore subscribes to the development goals and objectives of this global organisation. In 2015, countries adopted a set of 17 goals as part of a new sustainable development agenda. Each goal has specific targets which need to be realised by 2030. The achievement of these goals and associated targets requires all parties – particularly those at the local level, such as municipalities – to play their part to end poverty, protect the planet and ensure prosperity for all. While it is noteworthy that the SDGs are not legally binding, it is recommended that all governments take ownership of, and establish national frameworks for the achievement of the 17 goals.



**Figure 9: Sustainable development goals<sup>2</sup>**

It is critical that the development principles for Cato Ridge are aligned to the vision that the SDGs aim to achieve. Furthermore, although all the SDGs apply to the project, Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation and Infrastructure) and Goal 11 (Sustainable Cities and Communities) are directly linked to the project and should thus be prioritised.

### 3.5.2 The New Urban Agenda

The New Urban Agenda was officially adopted in Quito, Ecuador in November 2016. The agenda provides a 20-year “roadmap” to guide sustainable urban development globally and focuses on making cities and human settlements inclusive, safe, resilient and sustainable as specified in Goal 11 of the SDGs.

The New Urban Agenda lays out standards and principles for the planning, construction, development, management, and improvement of urban areas along its five main pillars of implementation, namely (1) national urban policies, (2) urban legislation and regulations, (3) urban planning and design, (4) local economy and municipal finance, and (5) local implementation. South Africa is a member state that has committed to the New Urban Agenda, which should be translated at regional, national, subnational and local levels. The New Urban Agenda as a set of standards and principles have been designed in a manner which enables governments and other relevant stakeholders across the world to adopt and tailor it according to their individual contexts and associated needs. As such, Cato Ridge will play a pivotal role in contributing to the global commitment to promote and achieve sustainable urban developments.

<sup>2</sup> Sustainable development goals, viewed 10 Jan 20 <<https://sustainabledevelopment.un.org/sdgs>>

## 4 Stakeholder Engagement Plan

The overall aim of this SEP is to enable the Company (referring to Assmang (Pty) Limited) to proactively manage its current and potential new stakeholder relationships, especially in relation to its proposed land optimisation. The SEP also seeks to define a technically and culturally appropriate approach to consultation as well as to improve and facilitate decision making and create an atmosphere of understanding that actively involve project-affected people and other stakeholders in a timely manner. Through early and appropriate stakeholder engagement these stakeholders would be provided with opportunity to voice their opinions and concerns and in turn provide guidance in the Company's decisions.

Assmang has always maintained and upheld a strong relationship with the AmaXimba community. During the Cato Ridge footprint optimization and contextual risk workshop, assuring relationships by maintaining a symbiotic relationship with the local communities and stakeholders was ranked as one of the most important success factors. In light of the importance that successful stakeholder engagement plays for the overall success of the project, the SEP seeks to clearly set out the expectations and define what successful engagement should be. The draft SEP was circulated to Assmang for comment in July 2019.

The SEP will also describe the engagements that have already been undertaken with limited stakeholders during previous phases, both by Aurecon and Assmang. The SEP will ultimately assist in guiding engagement with stakeholders during the pre-feasibility (and subsequent feasibility) stage.

This version of the SEP is an initial guide to the engagement and will need to be revised following Assmang's approval and when necessary as the project progresses.

The SEP will provide steps for stakeholder engagement to assist Assmang in identifying and engaging their stakeholders to build and maintain constructive relationships. The SEP is in line with the International Finance Corporation's (IFC) Performance Standard 1 (PS 1) on Assessment and Management of Environmental and Social Risks and Impacts (IFC, 2012), and its Good Practice Handbook for Companies Doing Business in Emerging Markets (IFC, 2007).

The key objectives of the SEP can be summarised as follows:

- Understand the stakeholder engagement requirements;
- Provide guidance for stakeholder engagement;
- Identify key stakeholders that are affected, and/or are able to influence the project;
- Develop a stakeholder engagement process; and
- Define roles and responsibilities for the implementation of the SEP.

### 4.1 Sphere of influence

A person's sphere of influence could be a fundamental force behind your company or project's success, and just like any other business that keeps its fundamentals warm, you need to keep your sphere of influence warm for it to keep producing benefits.

This visualisation assists the planners, decision makers and implementers to obtain a holistic view of who has an influence on the company or project. The sphere of influence for the Company includes the main stakeholders that would have the power to influence or sway the decision of the proposed project.



**Figure 10: Assmang sphere of influence**

## **4.2 Stakeholder identification**

Stakeholders are individuals or groups who are affected or likely to be affected by the project and who may have an interest in the project.

Because the process of downsizing presents different risks and opportunities, the range of potential stakeholders and their interests could be significantly different from those at earlier stages of the project. The role change of management presence and the transfer of assets will require new forms of strategic collaboration with external stakeholders, including landowners and local communities, government utilities and possibly other private sector entities. Stakeholder identification and analysis should be revisited as the first step toward engagement at this phase of the project cycle.

The first step in the SEP is to identify the Key Stakeholders to be consulted and involved in this phase of the project. The initial list of potential stakeholders was developed during the Concept Phase of the Cato Ridge Land Development project and consists of the following:

| Landowner/business interest                                 | Description                                                                                                                             |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>African Heritage Foundation (AHF)</b>                    | Stakeholder engagement consultant appointed by Cato Ridge Logistics Hub Consortium                                                      |
| <b>AmaXimba Community</b>                                   | Community associated with Cato Ridge that is situated to the north around the Cato Ridge Works                                          |
| <b>AmaXimba Development Trust (ADT)</b>                     | Represents the AmaXimba community which is associated with the Cato Ridge area                                                          |
| <b>Assmang Cato Ridge Works Monitoring Committee (ACRW)</b> | Environmental, Assmang SHEQ<br>Engage through Mr J Schoeman                                                                             |
| <b>Cato Ridge Corridor Development Trust (CRCDT)</b>        | A Trust that was established to drive community related projects.                                                                       |
| <b>Cato Ridge Development Company (CRDC)</b>                | Owners of the landholdings in the Cato Ridge area (a subsidiary of Assmang)                                                             |
| <b>Cato Ridge Land Development Committee (CRLDC)</b>        | A committee comprising of Assmang representatives that deal with land-related matters in the Cato Ridge area.                           |
| <b>Cato Ridge Landholders Forum (CRLF)</b>                  | A forum representing landholders in the area. To be established if they still exist.                                                    |
| <b>Cato Ridge Logistics Hub Consortium (CRLHC)</b>          | Cato Ridge intermodal facility developer                                                                                                |
| <b>Cato Ridge Works (CRW)</b>                               | Assmang Manganese Smelter                                                                                                               |
| <b>City Ventures Trust</b>                                  | A developer also interested in land development in the area.                                                                            |
| <b>Frikkie Brooks</b>                                       | Retired head of secretariat for the Provincial Planning Commission, now Consultant to the Consortium. Possible development facilitator. |
| <b>Inkanyezi YeZulu Investment</b>                          | Consortium's investment partner                                                                                                         |
| <b>KwaXimba Community Development Trust (KCDT)</b>          | An additional Trust set up in the area which has not been officially recognised.                                                        |
| <b>N3 Toll Consortium (N3TC)</b>                            | A developer also interested in land development in the area.                                                                            |
| <b>SA National Roads Agency Limited (SANRAL)</b>            | South African National Roads Agency limited                                                                                             |
| <b>Trade and Investment KZN (TIKZN)</b>                     | South African trade and inward investment promotion agency in the KwaZulu Province.                                                     |
| <b>Transnet</b>                                             | Landowner & provider of rail services                                                                                                   |
| <b>Ward 1 COGTA representative</b>                          | Appointed councillor for Ward 1                                                                                                         |

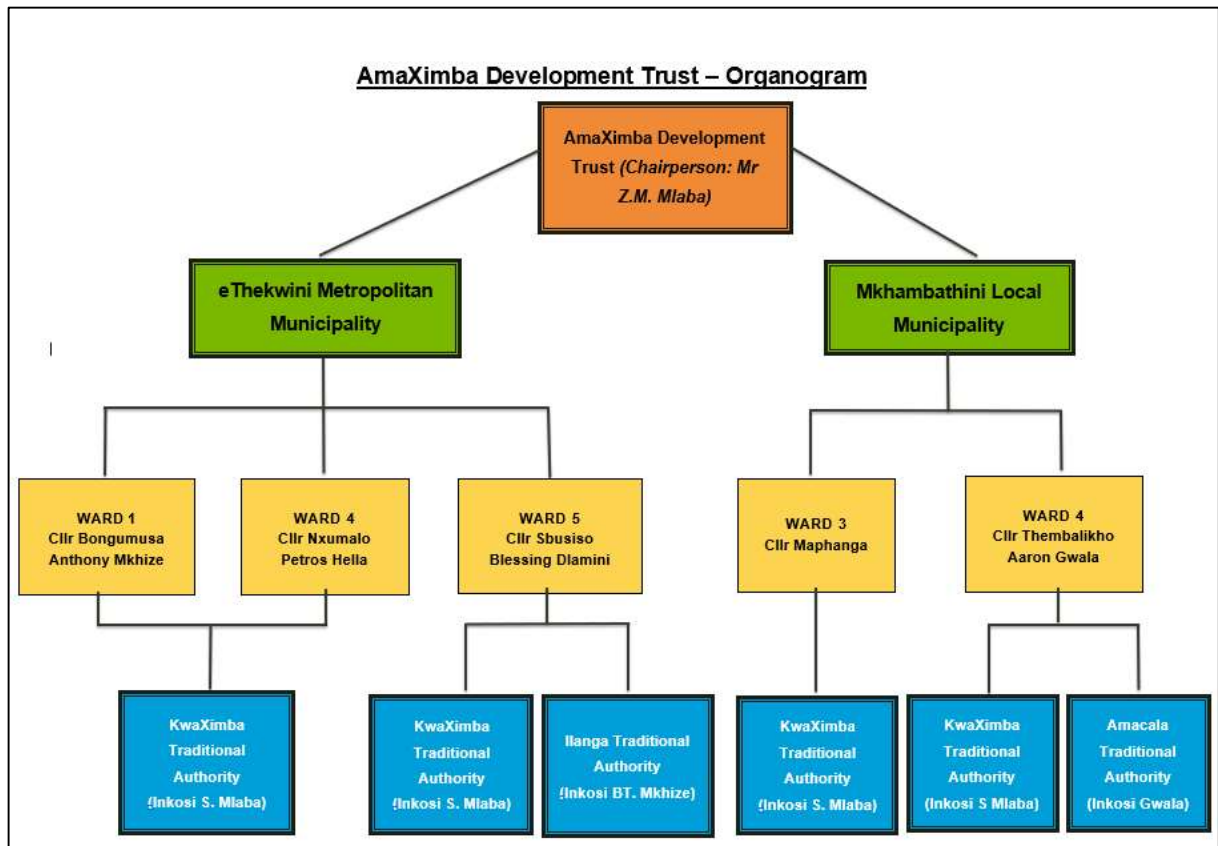


Figure 11: ADT organogram

### 4.3 Stakeholder analysis

Stakeholder analysis is the process of understanding the stakeholder groups that are likely to affect or be affected by a proposed action. Stakeholder analysis is an ongoing process which may evolve as new stakeholders are introduced to the project or as the nature of relationships change. The analysis will also shape the design of stakeholder consultation events and determine which stakeholders to engage with and when.

Note: Please clarify what the colours and numbers mean.

| Stakeholder                                                 | Engagement level | Frequency and Engagement method                   | Theme / concern                                                                                                                                                                                                                                                                                                               | Level of influence | Level of interest | Overall importance to the project | Rating of relationship | Responsible for engagement                                         |
|-------------------------------------------------------------|------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------|-----------------------------------|------------------------|--------------------------------------------------------------------|
| <b>African Heritage Foundation (AHF)</b>                    | Inform           | Meetings when required                            | Overlapping issues. Stakeholder engagement consultant appointed by Cato Ridge Logistics Hub Consortium. Provide project-specific information relating to infrastructure provision                                                                                                                                             |                    |                   |                                   | Neutral                | Meetings with Assmang / CRLHC. Tiaan van Aswegen                   |
| <b>Amacala Traditional Authority (Inkosi Gwala)</b>         | Consult          | Quarterly information sharing meetings            | Traditional Authority under ADT, socio-economic projects delivery, employment, procurement, educational programmes, , skills development. Engagement on possible outstanding commitments, community-based issues.                                                                                                             |                    |                   |                                   | Positive               | Princess Twala and Aurecon SE Team                                 |
| <b>AmaXimba Community</b>                                   | Collaborate      | Monthly or Quarterly information sharing meetings | Provide project-specific information relating to infrastructure provision (ultimate approval authority for capacity). Traditional Authority, socio-economic projects delivery, employment, procurement, educational programmes, , skills development. Engagement on possible outstanding commitments, community-based issues. |                    |                   |                                   | Positive               | Princess Twala and Aurecon SE team                                 |
| <b>AmaXimba Development Trust (ADT)</b>                     | Collaborate      | Monthly or Quarterly information sharing meetings | Traditional Authority, socio-economic projects delivery, employment, procurement, educational programmes, , skills development. Engagement on possible outstanding commitments, community-based issues.                                                                                                                       |                    |                   |                                   | Positive               | Meeting on 17 May with the ADT. Princess Twala and George Karstens |
| <b>Assmang Cato Ridge Works Monitoring Committee (ACRW)</b> | Collaborate      | Monthly or Quarterly information sharing meetings | Environmental issues, SHEQ                                                                                                                                                                                                                                                                                                    |                    |                   |                                   | Positive               | Joe Schoeman                                                       |

|                                                      |             |                                                   |                                                                                                                                                                                         |  |  |  |          |                                                                                                                      |
|------------------------------------------------------|-------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|----------|----------------------------------------------------------------------------------------------------------------------|
| <b>Cato Ridge Development Company (CRDC)</b>         | Empower     | Monthly or Quarterly information sharing meetings | Provide project-specific information relating to infrastructure provision. Owners of the landholdings in the Cato Ridge area (a subsidiary of Assmang)                                  |  |  |  | Positive | Tiaan van Aswegen                                                                                                    |
| <b>Cato Ridge Land Development Committee (CRLDC)</b> | Collaborate | Monthly or Quarterly information sharing meetings | A committee comprising of Assmang representatives that deal with land-related matters in the Cato Ridge area. Provide strategic guidance and adjacent landowner with a vested interest. |  |  |  | Positive | Tiaan van Aswegen                                                                                                    |
| <b>Cato Ridge Landholders Forum (CRLF)</b>           | Involve     | Meetings when required                            | A forum representing landholders in the area. <b>To be established if they still exist.</b> Interested and affected party. May provide input on appropriate land uses.                  |  |  |  | Neutral  | Tiaan van Aswegen and Aurecon Team                                                                                   |
| <b>Cato Ridge Logistics Hub Consortium (CRLHC)</b>   | Inform      | Meetings when required                            | Cato Ridge intermodal facility developer. A potential purchaser of the Company land. Politically connected.                                                                             |  |  |  | Negative | Meetings with Assmang. Submitted offers to purchase Assmang / CRDC land (2017 – 2019). Tiaan van Aswegen             |
| <b>Cato Ridge Works (CRW)</b>                        | Collaborate | Monthly or Quarterly information sharing meetings | Assmang Manganese Smelter. Monitoring information on water, air etc. The operational life of CRW could potentially impact the development phasing or land divestment recommendations.   |  |  |  | Positive | Tiaan van Aswegen                                                                                                    |
| <b>City Ventures Trust</b>                           | Involve     | Monthly meetings                                  | A developer also interested in land development in the area.                                                                                                                            |  |  |  | Positive | Prior engagement with Assmang in the proposed Dry Port development at Cato Ridge. Tiaan van Aswegen and Aurecon Team |

|                                                         |             |                                                   |                                                                                                                                                                                                                                                                                                                                            |  |  |  |          |                                                                                                       |
|---------------------------------------------------------|-------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|----------|-------------------------------------------------------------------------------------------------------|
| <b>eThekwini Metropolitan Municipality</b>              | Collaborate | Monthly or Quarterly information sharing meetings | Will approve most applications that will be made as part of the development and will be responsible to provide bulk services (with SANRAL) to the development.                                                                                                                                                                             |  |  |  | Positive | Aurecon engineers have engaged the engineering departments as part of the concept study. Aurecon Team |
| <b>Frikkie Brooks</b>                                   | Inform      | Meetings when required                            | Retired head of secretariat for the Provincial Planning Commission, now Consultant to the Consortium. Possible development facilitator. Given his municipal and provincial government connections and his possible interest in the CRLHC he could either make the rezoning and development process easier or significantly more difficult. |  |  |  | Negative | Engagement through Tiaan van Aswegen where so required. Dirk Trollip (Aurecon) Teacher at school      |
| <b>Ilanga Traditional Authority (Inkosi BT. Mkhize)</b> | Consult     | Quarterly information sharing meetings            | Traditional Authority under ADT, socio-economic projects delivery, employment, procurement, educational programmes, , skills development. Engagement on possible outstanding commitments, community-based issues.                                                                                                                          |  |  |  | Positive | Princess Twala and Aurecon SE Team                                                                    |
| <b>Inkanyezi YeZulu Investment</b>                      | Inform      | Meetings when required                            | Consortium's investment partner. CRLHC SEP partner                                                                                                                                                                                                                                                                                         |  |  |  | Negative | Tiaan van Aswegen                                                                                     |
| <b>KwaXimba Community Development Trust (KCDT)</b>      | Involve     | Meetings when required                            | An additional Trust set up in the area which has not been officially recognised. Socio-economic projects delivery, employment, procurement, educational programmes, skills development. Engagement on possible community-based issues.                                                                                                     |  |  |  | Neutral  | Princess Twala and Aurecon SE Team                                                                    |
| <b>KwaXimba Traditional Authority (Inkosi S. Mlaba)</b> | Involve     | Meetings when required                            | An additional Trust set up in the area which has not been officially recognised. Socio-economic projects delivery, employment, procurement, educational programmes, skills development. Engagement on possible community-based issues.                                                                                                     |  |  |  | Neutral  | Princess Twala and Aurecon SE Team                                                                    |

|                                                  |             |                                                   |                                                                                                                                                                                              |  |  |  |          |                                                                                       |
|--------------------------------------------------|-------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|----------|---------------------------------------------------------------------------------------|
| <b>Mkhambathini Local Municipality</b>           | Collaborate | Monthly or Quarterly information sharing meetings | Will approve most applications that will be made as part of the development and will be responsible to provide bulk services (with SANRAL) to the development.                               |  |  |  | Positive | Tiaan van Aswegen and Aurecon Team                                                    |
| <b>N3 Toll Consortium (N3TC)</b>                 | Inform      | Quarterly meetings                                | A developer also interested in land development in the area. Indirect interest due to toll concession on N3. No direct interest.                                                             |  |  |  | Positive | Frans du Plessis (Aurecon) Project manager for MAJV. Manages Sanral properties        |
| <b>SA National Roads Agency Limited (SANRAL)</b> | Collaborate | Meetings when required                            | Upgraded N3 interchange will be critical for successful development. The timing of this interchange will strongly affect the project's phasing.                                              |  |  |  | Positive | Frans du Plessis (Aurecon) Project manager for MAJV. Manages Sanral properties        |
| <b>Trade and Investment KZN (TIKZN)</b>          | Involve     | Meetings when required                            | South African trade and inward investment promotion agency in the KwaZulu Province.                                                                                                          |  |  |  | Positive | August 2018 / April 2019, with follow up engagement planned for September 2019        |
| <b>Transnet</b>                                  | Involve     | Meetings when required                            | Landowner & provider of rail services. Transnet's urgency and seriousness about developing the 'inland port' will strongly influence the CRDC land value and the phasing of the development. |  |  |  | Positive | Rilette Avenan-Buys (ARM). Phil Hendricks and Stpehan Jooste {Gert de Beer} (Aurecon) |

|                                                                          |         |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |          |                                                                         |
|--------------------------------------------------------------------------|---------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|----------|-------------------------------------------------------------------------|
| <b>Ward 1 COGTA representative - eThekweni Metropolitan Municipality</b> | Involve | Quarterly information sharing meetings | With the next municipal elections planned for 2021, the possibility exists that due to the volatile political environment in KZN the ward councillor might misuse this project and cause instability in the area. Alternatively, he/she could play a role in expediting municipal approvals and buy-in. The current person cannot be elected again. A new councillor will be chosen and a relationship needs to be built with that person. |  |  |  | Positive | CDW – Community Development Workers. Princess Twala and Aurecon SE Team |
| <b>Ward 3 COGTA representative - Mkhambathini Local Municipality</b>     | Involve | Quarterly information sharing meetings | With the next municipal elections planned for 2021, the possibility exists that due to the volatile political environment in KZN the ward councillor might misuse this project and cause instability in the area. Alternatively, he/she could play a role in expediting municipal approvals and buy-in.                                                                                                                                    |  |  |  | Positive | CDW – Community Development Workers. Princess Twala and Aurecon SE Team |
| <b>Ward 4 COGTA representative - eThekweni Metropolitan Municipality</b> | Involve | Quarterly information sharing meetings | With the next municipal elections planned for 2021, the possibility exists that due to the volatile political environment in KZN the ward councillor might misuse this project and cause instability in the area. Alternatively, he/she could play a role in expediting municipal approvals and buy-in.                                                                                                                                    |  |  |  | Positive | CDW – Community Development Workers. Princess Twala and Aurecon SE Team |
| <b>Ward 5 COGTA representative - eThekweni Metropolitan Municipality</b> | Involve | Quarterly information sharing meetings | With the next municipal elections planned for 2021, the possibility exists that due to the volatile political environment in KZN the ward councillor might misuse this project and cause instability in the area. Alternatively, he/she could play a role in expediting municipal approvals and buy-in.                                                                                                                                    |  |  |  | Positive | CDW – Community Development Workers. Princess Twala and Aurecon SE Team |

|                                                                          |         |                                        |                                                                                                                                                                                                                                                                                                         |  |  |  |          |                                                                         |
|--------------------------------------------------------------------------|---------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|----------|-------------------------------------------------------------------------|
| <b>Ward 4 COGTA representative - eThekweni Metropolitan Municipality</b> | Involve | Quarterly information sharing meetings | With the next municipal elections planned for 2021, the possibility exists that due to the volatile political environment in KZN the ward councillor might misuse this project and cause instability in the area. Alternatively, he/she could play a role in expediting municipal approvals and buy-in. |  |  |  | Positive | CDW – Community Development Workers. Princess Twala and Aurecon SE Team |
| <b>Ward 4 COGTA representative - Mkhambathini Local Municipality</b>     | Involve | Quarterly information sharing meetings | With the next municipal elections planned for 2021, the possibility exists that due to the volatile political environment in KZN the ward councillor might misuse this project and cause instability in the area. Alternatively, he/she could play a role in expediting municipal approvals and buy-in. |  |  |  | Positive | CDW – Community Development Workers. Princess Twala and Aurecon SE Team |

## 4.4 Purpose and goal of engagement

The purpose of this phase of work is to further clarify the development vision for the Cato Ridge land. However, prospective development/release opportunities will be still considered on an ad hoc basis to ensure that development is still facilitated and encouraged by responding to market demand.

To support the outcomes of this phase, strategic and targeted engagement with selected stakeholders is envisaged to achieve the following goals:

- Support for the development vision;
- Alignment of strategic objectives of stakeholders;
- To provide input into the development vision; and
- Inform the community of project progress and align their expectations with the development vision.

The “stake” or interest that each of these different individuals or groups have in the land development project projects or investments will vary over time and will depend on the activity Assmang is undertaking at a particular point in time.

Assmang's stakeholders are listed in a stakeholder database and this database should be regarded as dynamic and regularly updated as new stakeholders are identified. Some preliminary analysis results of these stakeholders are presented below. Validation of the stakeholder list should continuously take place.

They mostly include land owners and communities who:

- Are directly and/or indirectly affected by CRW (AmaXimba and KwaXimba);
- Have “interests” in the parent company that classify them as stakeholders;
- Have an interest in the land development and investment; or
- Have the potential to influence project outcomes.

## 4.5 Communication methods

The appropriate communication methods are aimed at bringing about coordinated and planned communication that strengthens the participation of all stakeholders. On the other hand, all engagement should proceed on the basis of what is culturally appropriate for each of the different stakeholder groups. For instance, a meeting with the Tribal Authority will have to follow a protocol that is observed in the local isiZulu culture. The three Tribal Authorities in Assmang's zone of influence (Mlaba Tribal Authority, Mkhize Tribal Authority and Gwala Tribal Authority), might require continuous engagement via a single communication method.

A meeting with a Government Department and its officials will include formal coordination of set agenda items, presentations and documentation of events. The same protocol might have to be taken into consideration when communicating with other stakeholder groups where methods shown in the mapping are the most preferred but can be refined along the journey of understanding stakeholders.

Social media platforms such as Twitter and Facebook are considered for engagements in future but are not considered to be part of current engagement methods. Communication through the website is only done at group-level.

When deciding on the frequency and the appropriate engagement technique used to consult with new or evolving stakeholder groups, the following should be taken into consideration:

- The extent of how the stakeholder is impacted by Assmang's operations and activities;
- The level of influence the stakeholder group has or could have on CRW operations or activities as well as the proposed land development; and
- Cultural norms and accepted methods of engagement.

The frequency, period and intensity of engagement will therefore be proportionate to the influence of the stakeholder and the intensity of the impact felt by the stakeholder in question.

## 4.6 Information disclosure and feedback

Disclosure refers to making information accessible to stakeholders and communicating such information in a manner that is understandable to stakeholders and is an important first (and on-going) step in the process of

stakeholder engagement. All other activities, from consultation and informed participation to negotiation and resolution of grievances, will be more constructive if stakeholders, including affected communities, have accurate and timely information. Disclosure should be premised on the following principles:

- Transparency;
- Applying good practise principles by providing meaningful information;
- Ensuring accessibility to information;
- Weighing up the risks and benefits; and
- Managing information on sensitive and controversial matters.

Information disclosure should always provide a reference as to the records held and the process that needs to be followed to request access to such records.

After having spent time designing engagement with stakeholders and physically engaging with stakeholders as well as them having spent time engaging with the Aurecon team, it is critical that the team return to the stakeholders and share with them how their interests and issues have been considered and resolved as well as what has been done in relation to feedback given by the stakeholders or what has not been possible and why. The best way to achieve this is through recurring engagement where regular updating can be provided, and progress can be seen.

It is therefore crucial to incorporate a feedback loop in the stakeholder engagement process, as a feedback loop will assist to maximise the potential benefits of stakeholder engagement and encourage further engagements. Having a feedback loop will also enable Assmang to:

- Plan next steps for follow-up and future engagements;
- Identify opportunities for partnership;
- Promote greater stakeholder satisfaction and ensuring commitment and buy-in to any future strategies and challenges;
- Improve chances for project / initiative success; and
- Promote open, two-way communication.

## **4.7 Key messages**

A message map is a framework used to create compelling, relevant messages for various audience segments. It also serves as an organisational alignment tool to ensure message consistency.

Some of the key messages Assmang wants to convey to its stakeholders, along with supporting statements are as follows:

1. Assmang will facilitate making land available for the development of industry related land uses to uplift Cato Ridge.
2. Assmang will facilitate making land available for growth opportunities in Cato Ridge so that various stakeholders can be part of a legacy of growth and sustainable development.

**MAIN IDEA: Integrated logistical hub with supporting land uses.**

### **4.7.1 Vision:**

To make land available that will enable Cato Ridge to become a new economic node with quality developments that will create a conducive environment for industries and businesses of all sizes to thrive.

### **4.7.2 End result:**

Economic thrust in the region creates jobs and creates opportunities for entrepreneurial spirit and that improves the livelihoods of the society.

Assmang would have released land to developers for the upliftment of the area and job creation

## **4.8 Supporting messages to target audiences:**

### **4.8.1 Communities (AmaXimba and Traditional Authorities):**

1. We would like this development to economically benefit everyone.
2. Like to ensure economic sustainability for everyone.
3. Socio-economic development and upliftment of the people-
4. Looking after the ecological environment.
5. Need to instil a viable economy so that we can have a stable socio-economic environment-
6. This is a B-BBEE and socio-economic driver. It is not meant to improve and give wealth to only one traditional group. This is for the broader society.
7. Based on the studies that have been conducted, it is expected that developers who invest in Cato Ridge will create significant opportunities for employment, new skills and ownership of businesses and property.
8. You are important, and your voice needs to be heard. Come and play a role in benefitting your community in partnership with Assmang.
9. Become a development ambassador, no matter who you are. Share your ideas, be part of the collaboration for economic growth.
10. A wonderful opportunity for people and businesses of all sizes to grow in skills, capacity and be a part of a larger economic partnerships.
11. Communities have a chance to take ownership of their own progress by collaborating with Assmang on their new economic logistics hub.
12. Assmang's release of land for sustainable development opportunities that will promote ecologically friendly practices and initiatives.

### **4.8.2 Business and surrounding land owners:**

1. If you improve Cato Ridge everyone should benefit. We want to share. Identify catalytic thrusts.
2. We would like to collaborate to fulfil the vision of government to develop Cato Ridge as a national landmark industrial hub.
3. Create growth and development through development in Cato Ridge.
4. Assmang would like to collaborate. We need to make economic sense of what we are doing. Therefore, we need to be sensitive to market demand. There will be an increase in demand for various civil services. It is key for financial benefit to collaborate to reduce unnecessary expenditure.
5. Better opportunities for businesses. Sustainable growth for all types of enterprises and increased employment through the release of land for development.
6. The well positioned economic logistics hub will be easily accessible for businesses to thrive and create good working relations and collaborations with various stakeholders.
7. Investment opportunities for business growth while positioning Cato Ridge economic logistics hub as one of the biggest projects in KZN to bring sustainable change.
8. Unprecedented upliftment for the Cato Ridge area through new, exceptional business opportunities and collaboration at all levels. Resulting in the fulfilment of governments vision of a landmark industrial hub.
9. The best location for future investments, new partnerships and your business' publicity.
10. Developing Cato Ridge means more employment and sustainable benefits for all stakeholders. The new economic logistics hub promotes ecologically friendly growth.

### **4.8.3 External (Provincial and municipalities):**

1. Industrial development is important.
2. Assmang wants to implement the vision for Cato Ridge. We can enable you to make your vision come to reality.
3. Needs to be financially feasible for everyone that needs to implement.
4. Need endorsement of the proposed land development area master plan.

5. Assmang will release developable land for developers to partner with provincial and municipal authorities to create an environment conducive to infrastructure and business development.
6. Assmang's new economic logistics hub will provide an opportunity for harmonious leadership between different tiers of government via collaborative efforts on industrial development and social upliftment.
7. KZN Province will have a chance to achieve eminence as large scale new industrial developments bring partnerships and investment opportunities to the province.

#### **4.8.4 Ingonyama Trust**

The Ingonyama Trust will only be consulted during the public participation processes mandated by SPLUMA and NEMA.

#### **4.8.5 Internal (Assmang employees):**

1. Assmang will be gradually releasing their land to enable developers to create exceptional growth for the betterment of Cato Ridge and its employees.
2. Assmang needs to act now to ensure that it establishes itself as a positive influence in Cato Ridge.

## 5 Base map

One of the first activities of the PFS phase is to compile a map with accurate base information upon which all the specialist studies are then overlaid. In the previous phase, base information was sourced from public databases, however, the PFS requires the data to be verified by registered land surveyors and conveyancing attorneys. Aurecon appointed GeoAfrika Surveys to compile the base map, namely: aerial photography, topography and cadastre.

### 5.1 Aerial photography

Aurecon contracted professional land surveyors from GeoAfrika Surveys (Pty) Ltd to provide aerial photography for the land development area. GeoAfrika Surveys placed benchmarks on various places on the land development area to georeference the aerial photos. The aerial photography that has been obtained from GeoAfrika is being used for design purposes due to its accuracy and to identify existing attributes on the land development area.

Figure 12 shows the aerial photograph obtained. This has been verified and signed off by a Professional Land Surveyor. This aerial imagery may also be used in subsequent phases for detailed design.

Aurecon further uses licensed Bing imagery for discussion purposes and master planning to provide a perspective of an area wider than the land development area that was surveyed by GeoAfrika Surveys.

### 5.2 Topographical Survey

GeoAfrika Surveys (Pty) Ltd provided the topographical data by doing a LiDAR survey and generating a digital topographical model (DTM). LiDAR measures reflected light that bounces off the ground and back to the sensor to obtain the elevation of the earth's surface. In order to extract the topographical information from the orthophoto imagery, the point clouds are reclassified into LAS format. Ground-level Digital Terrain Models (DTM) on a 1m grid are established showing contours on a 0.5m vertical interval. Figure 13 shows the results of the survey. The contours have been deemed fit to use by the professional land surveyors from GeoAfrika (Pty) Ltd for determining flood lines, a prerequisite for Aurecon's hydrology engineer to proceed to model the flood lines (discussed in a subsequent section) and for urban design purposes. Before submission of the town planning applications to the municipality, the plan that indicates the contours needs to be signed off by a Professional Land Surveyor, a requirement of the Township Establishment.

The contours were then used to do a slope analysis to determine which areas are too steep (steeper than 1 in 33 degrees) to be developed and are thus required to be excluded from the developable area. Slopes steeper than 1 in 33 degrees require significant bulk earthworks to create the flat platforms required by tenants. The slope analysis is shown in Figure 14.

The topographical survey concludes that the land development area consists of a natural high point north of the N3, with steep hills sloping away from the higher centre. The slopes are more even south of the N3. The area high point is approximately 800 above mean sea level and sloping downwards from there.

### 5.3 Cadastre

In the Due Diligence phase, Aurecon's town planners utilised public cadastral information sourced from the Surveyor General's office to conduct their initial assessment. During this Pre-feasibility phase, the Professional Land Surveyors from GeoAfrika (Pty) Ltd compiled a cadastral key plan with registered Surveyor General diagrams and servitude diagrams. This plan provides the correct description and extent of all properties owned by Assmang.



**Figure 12: Aerial photograph of Cato Ridge land development area**

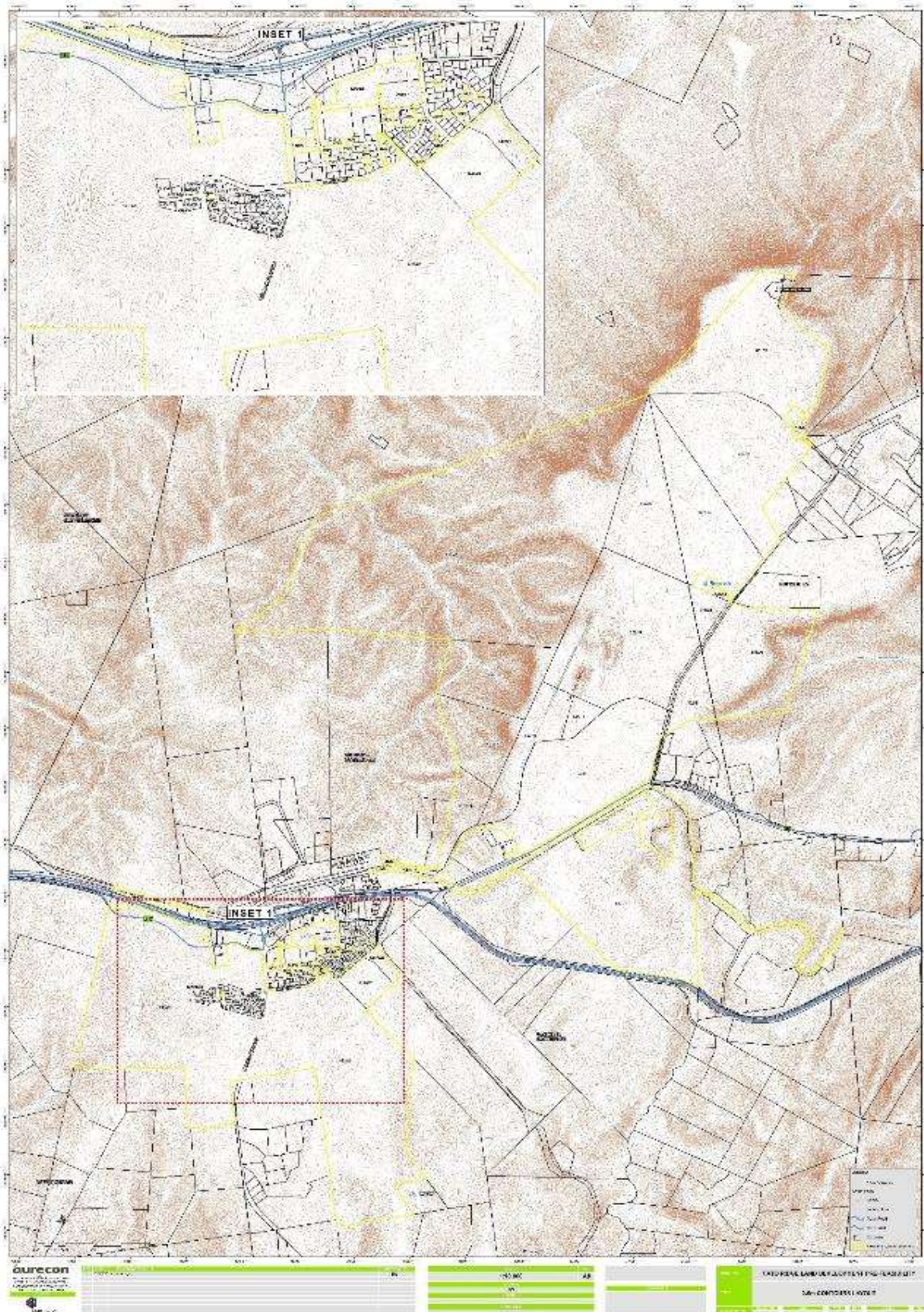


Figure 13: Contours

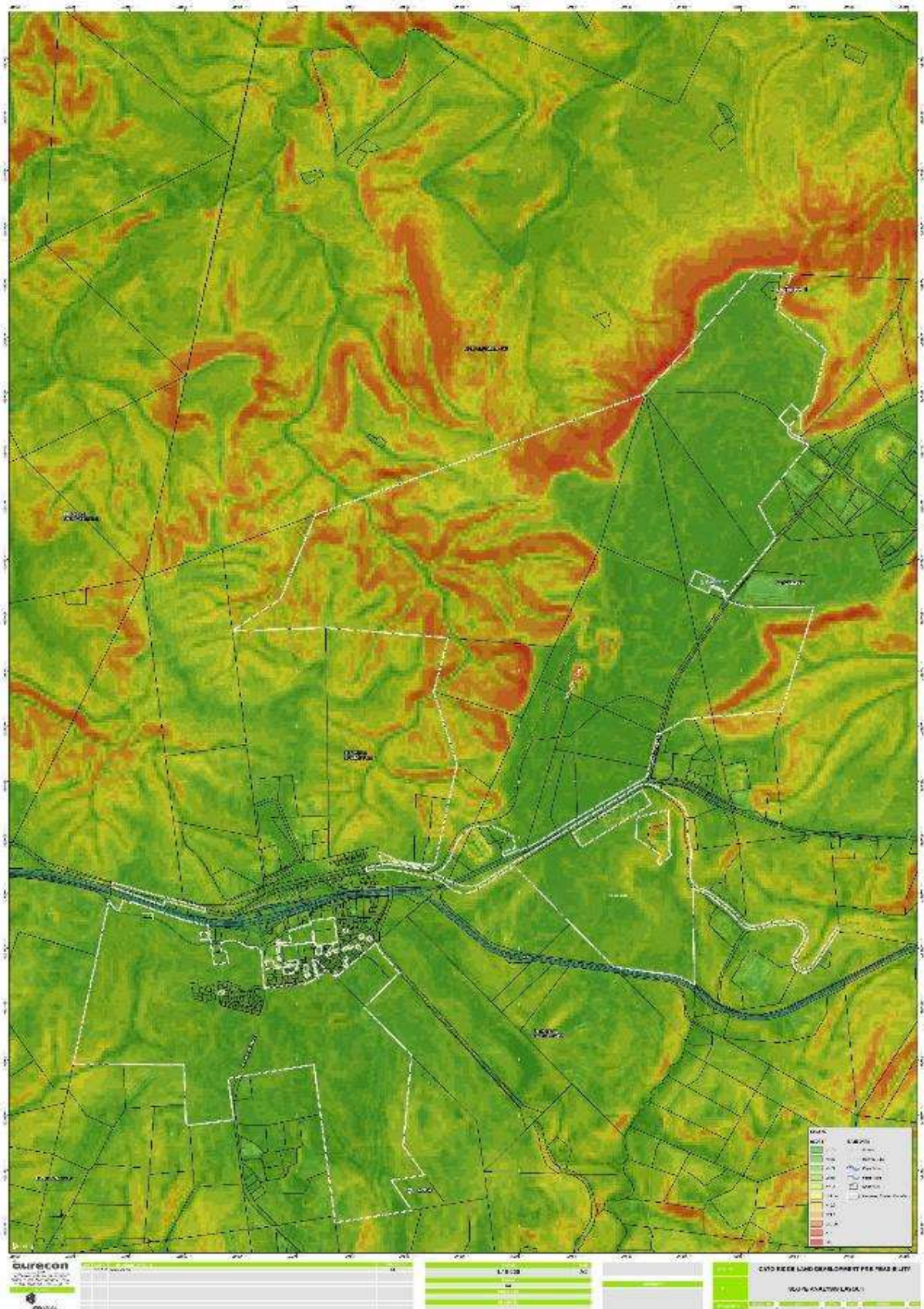


Figure 14: Slope analysis

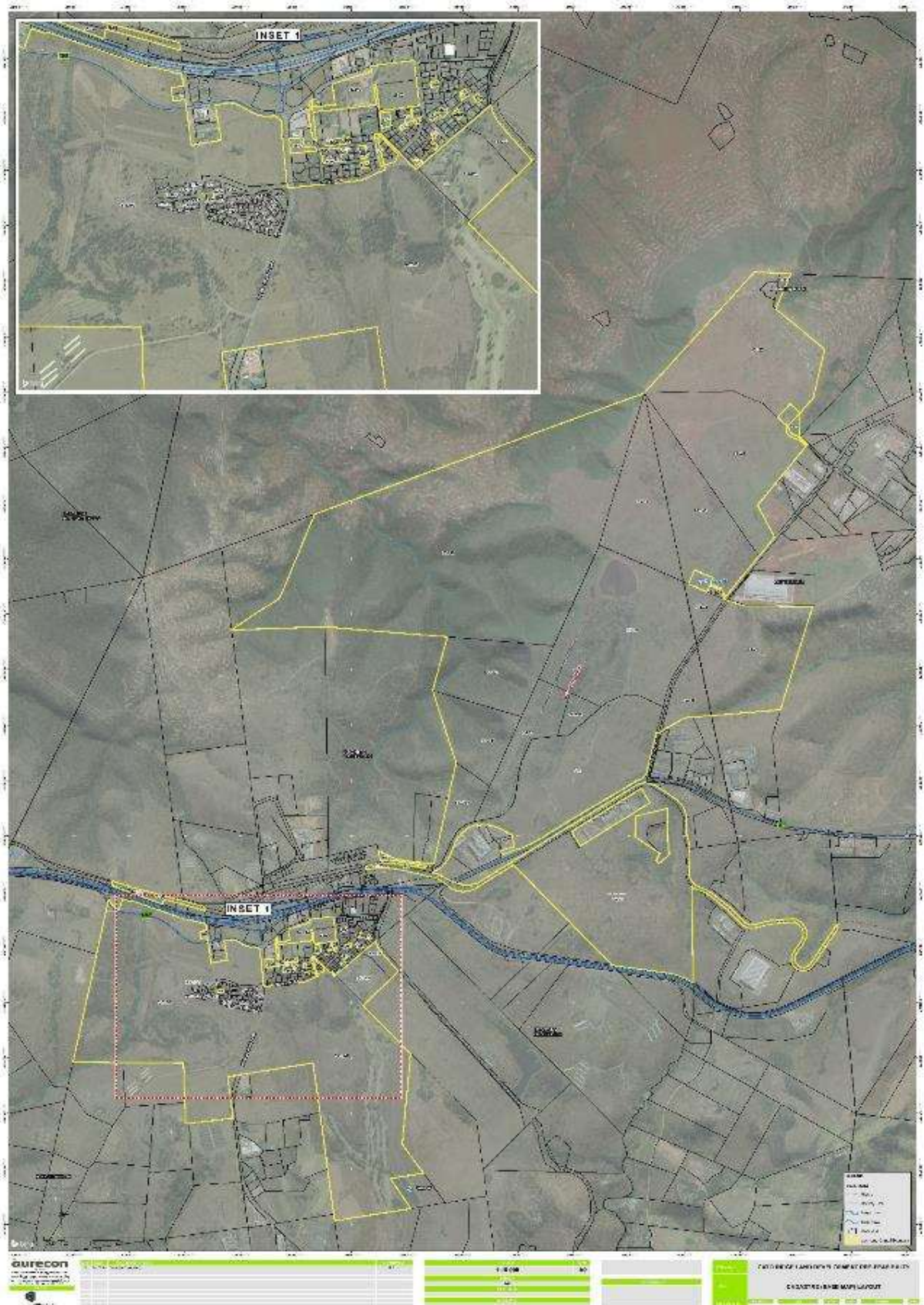


Figure 15: Base map with the cadastre

## 6 Environmental Sensitivity

The ecological investigation and report are an important part of the pre-feasibility when delineating the extent of the developable land. It is therefore important to do thorough ground truth field work at the onset of the project. The specialist studies include biodiversity screening assessments (fauna, flora and freshwater systems assessments) and a heritage study (archaeology, cultural remains and palaeontology). These assessments will also inform the development concept and the business case for the land development area.

This section of the report summarises the main findings of these assessments.

### 6.1 Vegetation communities

From a floral perspective, several vulnerable areas that should preferably be excluded from future development were identified. These areas are recognised as having high floristic diversity, harbouring several species of conservation concern (SCC). Habitat units with lower sensitivities can be utilised but care should be taken to prevent degrading the biodiversity integrity of the surrounding natural habitat. This will require managing edge effects such as alien invasive vegetation spread and habitat fragmentation.

Based on national scale vegetation mapping by “Vegmap” (Rutherford and Mucina, 2018<sup>3</sup>), the site is dominated by Dry Coast Hinterland Thornveld on the escarpment areas, with Eastern Valley Bushveld on the steep slopes of the Umgeni Valley (Figure 16). This is based on national scale mapping and provides a general outline of the vegetation communities, so it does not necessarily represent site-specific conditions.

The more detailed ecological screening undertaken by SAS<sup>4</sup> in 2019 and commissioned by Aurecon, identified the following broad habitat units:

- Woody communities, including Eastern Valley Bushveld and Scarp Forest;
- Grassland, including Dry Coast Hinterland Grassland, Rocky Grassland, Grassland associated with wetland features and Rocky Grassland;
- Freshwater Habitat; true freshwater features as well as artificial dams and ponding areas;
- Degraded Habitat, including alien and invasive plant (AIP) dominated vegetation; and
- Transformed Habitat.

During January 2020, the eThekweni Municipality raised concerns about the presence of “KZN Sandstone Sourveld”<sup>5</sup>, based on a vegetation survey<sup>6</sup> that was conducted in 2015 for a landfill site that the municipality was considering at that time. This survey mapped 209 ha of KZN Sandstone Sourveld (“KNZ SS”) within the boundaries of the currently considered sites. For comparison, the 2018 version of “Vegmap” shows the presence of KZN Sandstone Sourveld only outside the site, to the southeast (Figure 16).

#### 6.1.1 Detailed surveying of grassland communities

KZN SS is considered critically endangered at a provincial level and the following conservation concerns apply:

- Its conservation target is 25%, but currently, only 0.2% is formally conserved in small nature reserves. It is considered a threatened ecosystem and endangered nationally and critically endangered at a provincial and local level<sup>7</sup>.

<sup>3</sup> Rutherford, M.C. & Mucina, L. 2018. The Vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute: Pretoria.

<sup>4</sup> This included site visits

<sup>5</sup> Personal communication from Greg Huggins (Environmentalist: Biodiversity Impact Assessment), in a meeting with Aurecon on 24 January 2020.

<sup>6</sup> Styles, D. 2015. *Report on Vegetation on a Proposed Landfill Site at Cato Ridge*. Unpublished report for the eThekweni

<sup>7</sup> Jewitt, D. 2011. *Conservation targets and status for vegetation types in KZN*. Unpublished internal report. Biodiversity Conservation Planning Division, Ezemvelo KZN Wildlife, Pietermaritzburg. Available online:

[http://www.bgis.sanbi.org/KZN/KZN\\_vegetationtypes\\_conservationtargetstatusreport.pdf](http://www.bgis.sanbi.org/KZN/KZN_vegetationtypes_conservationtargetstatusreport.pdf) (accessed

- Some 68% is already transformed, with agriculture, urban expansion and densely populated subsistence farming being some of the primary threats.
- Most remaining areas are subject to heavy grazing and frequent grazing, which are not conducive to the survival of seedlings of many of the floral species of conservation concern.

The current threats to KZN SS include subsistence grazing, illegal sand mining and alien invasive plants. According to Huggins (op. cit.), the areas of KZN SS with highest sensitivity occur on the northern escarpment, with progressively lower sensitivity towards the south-east.

In order to provide a higher level of certainty regarding the presence and extent of KZN SS and other grassland communities, David Styles was commissioned to undertake a survey on the site in April 2020. He is well known to both the KZN Department of Economic Development Tourism and Environmental Affairs (DEDTEA) and eThekweni Municipality's environmental department, and was recommended by the latter. The value of this new survey is that Styles has an in-depth knowledge of flora on the site, based on his previous detailed survey, and that current results could be compared with previous results to discern trends in vegetation condition (e.g. with respect to anthropogenic disturbances such as sand mining).

### 6.1.2 Updating of ecological surveys

SAS was also commissioned to update its ecological survey, since its previous fieldwork was conducted in May 2019 - outside the growing season. It was intended that SAS would update all aspects of its biodiversity survey (wetlands, botanical, avifauna and fauna). However, due to timing of the instruction to proceed with these studies, and the commencement of the lockdown for COVID-19 on 27 March 2020, SAS could complete only the botanical survey by 26 March 2020.

A diverse range of floral SCC were identified on site, with the woody communities and the grassland vegetation expected to harbour additional SCC. Several endemic species and two new (undescribed) species have been recorded in the Sandstone Sourveld areas (Styles, 2015).

### 6.1.3 Consolidated vegetation units for the site

The mapping provided by SAS and David Styles has been synthesised so that the following six vegetation types have been mapped on the site:

- Eastern Valley Bushveld
- Scarp Forest
- KZN Sandstone Sourveld
- Dry Coast Hinterland Grassland
- Wetland and hygrophilous grassland<sup>8</sup>
- Transformed (developed)<sup>9</sup>

Each of these communities are described below.

- a) **Eastern Valley Bushveld:** This is a woody and semi-succulent vegetation community that occurs in low-lying, dry parts of major river valleys between the Tugela and the Kei, including the Umgeni. The vegetation type is described as "semi-deciduous savannah woodlands in a mosaic with thickets, often succulent and dominated by species of *Euphorbia* and *Aloe*. In the study area, this occurs on the steep north west facing slopes west of the current Assmang plant. Due to the steep topography, this community would in any event not be suitable for development. For this reason, it was not sampled to intensively, but the little sampling that was carried out yielded many species of conservation concern. This community is regarded as an Irreplaceable Critical Biodiversity Area (CBA) in terms of the Kwa-Zulu Natal Biodiversity Spatial Plan (2016).

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March 2014)

<sup>8</sup> Unlike the other vegetation communities, wetlands, which are widely defined in the National Water Act, 1998, enjoy specific protection in this act, irrespective of the type of wetland community.

<sup>9</sup> Some transformed areas (e.g. paved areas) are completely devoid of vegetation and could strictly speaking not be regarded to be vegetated at all. However, for the purpose of this discussion their environmental value is the same as areas where all indigenous vegetation has been replaced by invasive exotic vegetation.

- b) **Scarp Forest:** a woody community in which the trees form a closed canopy, typically occurring on steep and damp east-facing slopes below cliffs, where they are protected from fire. In the study area, there is a single example of this on the eastern boundary of the site, east of Eddie Hagen Drive and south of the Makro Distribution Centre. All forests are protected by the National Forests Act, 1998.
- c) **KZN Sandstone Sourveld:** KZN SS is a grassland community that was first recognised as a distinct vegetation type in the national vegetation classification system for South Africa in 2006 and is described as a “*short, species-rich grassland with scattered low shrubs and geoxylic suffrutices*”. It’s natural distribution is on elevated coastal inland [Natal Group] sandstone plateaux from Mapumulo near Kranskop to St. Faiths near Port Shepstone in the south. The Natal Group sandstone geology gives rise to a landscape of flat (or rolling) plateau tops and steep slopes commonly forming table mountains. This vegetation type is considered **Critically Endangered**. Little is conserved, with more than two-thirds transformed and most of what remains has been degraded to some extent. In the study area, it occurs only north of the N3.
- d) **Dry Coast Hinterland Grassland** (or Coast Hinterland Grassland): Prior to 2011, Ngongoni Grassland was recognised as a grassland community in which Ngongoni Grass (*Aristida junciformis*), a wiry, unpalatable grass, is dominant. Since then, this grassland has been renamed and split into dry and wet variants, namely Dry and Wet Coast Hinterland Grassland. Dry Coast Hinterland Grassland only south of the N3 on the site on tillite. Is it naturally distributed on the coastal escarpment (400–900 m a.s.l.) between Libode in the Eastern Cape and Melmoth in KZN on heavy soils including those derived from tillite and dolerite. It is described as a dense, tall grassland, overwhelmingly dominated by Ngongoni grass, with this monodominance associated with low species diversity. Dry Coast Hinterland Grassland is variously assessed as **Vulnerable** or **Endangered** (by Ezemvelo KZN Wildlife).
- e) **Wetlands:** The National Water Act, 1998 defines a wetland as “*land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil*”. Due to the legal protection status of wetlands, this is the only vegetation community that has not been defined based on its floristic composition. Three types of wetlands have been identified on the site; Channelled Valley Bottom (CVB) Wetlands, Unchanneled Valley Bottom (UCVB) Wetlands and Seep Wetlands. Wetlands are also protected by legislated buffer zones, which are generally 32m from the defined edge of the wetland. Due to the very wide definition of wetlands and watercourses, even artificially created ponds or dams are considered to be wetlands.
- f) **Transformed areas:** These areas have been cleared of natural vegetation and are either completely covered in infrastructure, are bare or the majority of the natural vegetation has been replaced with alien vegetation.

Based only on the identification of the above-mentioned vegetation types, it could be said that the most ecologically vulnerable vegetation types on the site are KZN SS (due to its *Critically Endangered* status) and Dry Coast Hinterland Grassland (based on its *Endangered* status).

#### 6.1.4 Classification of vegetation quality

Within each of the vegetation types a) to d), vegetation patches have been further mapped and classified based on their quality i.e. their disturbance status: the more “pristine” or less disturbed the vegetation, the better its quality. Thus, the following classes have been distinguished, in descending order of importance:

- Good
- Good to intermediate
- Intermediate with important endemics<sup>10</sup>

<sup>10</sup> This implies that despite the vegetation’s intermediate state of disturbance, it continues to harbour important endemic species (species with a small distribution range). If these patches were to be assessed

- Intermediate
- Intermediate to poor
- Poor

For the grasslands, David Styles based this classification on a combination of the degree of disturbance and the density of herbaceous species per m<sup>2</sup>. For the density of herbaceous species, scores close to 10 indicate the best quality (highest biodiversity). With respect to this scoring, it must be emphasized that the biodiversity value of grassland lies not so much in the grass species themselves as it does in the diversity of the herbaceous species between the grasses.

The most sensitive and least disturbed KZN SS is found on the eastern extremity of the site, east of the railway line. *Good to intermediate* KZN SS, which occurs on the top of the northern escarpment, is considered to be the second-most sensitive grassland community, due to the high density of endemic species, despite it being slightly more disturbed than KZN SS of *Good* quality.

The lower down in the scale from *good* to *poor*, the lower the value of the particular patch of vegetation for conservation. Factors that reduce the conservation value towards poor quality include too frequent burning, overgrazing, sand mining, uncontrolled roads, dumping, and other forms of disturbance.

### 6.1.5 Development sensitivity

The sensitivity of floral communities to development shows the resulting implications of the vegetation quality classes for development, as a continuum of risks for development, on a scale from 1 (high environmental sensitivity - red), to 5 (low environmental sensitivity - green). This valuation of development sensitivity is based on the work of Styles.

Areas with values of 1 or 2 (red and orange) can effectively be regarded as “no-go” areas for development as development on these portions will be met by strong opposition from environmental authorities. The risk of receiving a negative environmental authorisation for development on these areas is high. Areas with values of 5 are likely to receive little opposition from environmental authorities and the chance of receiving a positive authorisation for development on these areas is high. Between these extremes, values closer to 4 indicate greater suitability for development (implying less resistance to development from environmental authorities).

At this stage, no guarantees can be given regarding which areas will be approved for development, and any development in area rated 3 to 4 will require some form of negotiation with environmental authorities.

### 6.1.6 Conservation Offsets

An option of conservation offsetting can be explored if there is insufficient land of low sensitivity available for development. An offset implies that land with the same vegetation community and of the same or better quality outside the site is secured for conservation to compensate for the loss of land inside the site. Offsets are meant to be used as a last resort, after all other means of minimising impacts have been exhausted.

Whilst offsetting remains an option, it must be emphasised that eThekweni Municipality and Ezemvelo KZN Wildlife follow an official policy that there should be no loss of the KZN SS or Coast Hinterland Grassland, irrespective of the condition of the grassland i.e. irrespective of whether or not it is in pristine condition. This may prove to be difficult and not pragmatic enough for planning purposes. Therefore, offsets may still need to be considered at Cato Ridge, particularly if development will take place on areas of Critically Endangered KZN SS.

There are limited areas of KZN SS that exist around the site. David Styles has mapped the potentially available areas of KZN SS in proximity to the site. He states that opportunities for offsetting are greater south of the N3, where grassland is not closely bounded by informal settlement and there is little or no industrial development. In practice the offset ratio is recommended to be up to 30:1 for KZN SS (i.e. 30 ha of offsets for every 1 ha lost to development.<sup>11</sup>

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purely on the basis of their level of disturbance, they might not appear to be valuable. The presence of endemic species elevates their conservation value.

<sup>11</sup> See text box below.

Despite these offset ratios recommended by the authorities, David Styles has indicated to Aurecon (pers. comm.) that authorities may be willing to negotiate these ratios. He also points out the significant threats that the existing grasslands face in this area, the most important being urban and industrial expansion, uncontrolled grazing, and too frequent fires. Given these threats, it is inevitable that grasslands are going to be lost in this area, even under the no-go option (continuation of the status quo).

Given this reality about the loss of grasslands, authorities are likely to be willing to negotiate about the loss of some grasslands if the effective conservation of a representative sample of the grasslands can be secured. This can be achieved, for instance, by a conservation agreement, in which a landowner like Assmang formally agrees to conservation management of a portion of land over a defined period of time. The greater the conserved area that an EIA applicant is willing to offer, the more willing these authorities will be to negotiate about the loss of other portions of (preferably relatively low quality) grassland.

### **Sandstone Sourveld Offset ratios**

- High quality or “pristine” communities can be expected to be offset at a ratio of 1:30 (the loss of 1 hectare of vegetation on site to be compensated by 30 ha conserved off-site). However, as mentioned above, this may prove to be unrealistic, since such large areas may not be available off-site, thus effectively making such communities “no-go” areas on the site.
- Areas with intermediate quality can be expected to be offset at a ratio of 20:1.
- Disturbed areas can be expected to be offset at a ratio of 15:1.

These ratios are rules of thumb and subject to negotiation with the relevant authorities, although they can be expected to err on the side of caution, thus requiring a higher offset ratio unless it is conclusively proven that a lower offset ratio can be applied.

An important principle of these offset ratios is that offsets must apply “like for like” rule i.e. the loss of a portion of grassland cannot be compensated by an offset of a portion of forest, or even by a different type of grassland.

It is worth noting that, despite the “like for like” rule of offsetting, David Styles also recommends (pers. comm.) that the option of offsetting the conservation of Eastern Valley Bushveld for the loss of grassland communities could be explored with the environmental authorities, in view of the classification of Eastern Valley Bushveld as an Irreplaceable CBA.

## **6.2 Fauna**

The ecological screening that SAS conducted in 2019 found that the area contains four faunal habitat units, with each providing a different support base to faunal species through habitat and resource provision, as listed below:

- Woody communities, comprising Eastern Valley Bushveld and Scarp Forest;
- Grassland vegetation, consisting of Dry Coast Hinterland Grassland, Rocky;
- Freshwater Habitat, consisting of comprising channelled-valley bottom wetlands, artificial impoundments and artificial depressions. These systems provide ideal habitat to faunal species that are predominantly water dependent species, notably amphibians. These areas are well utilised by small mammals, insects and predatory reptiles; and
- Transformed Habitat.

Two provincially specially protected species, *Leptailurus serval* (Serval) and *Ciconia Microscelis* (African Woollynecked Stork) were identified in the study area. Other faunal SCCs may occur within several of the moderately high to high sensitivity areas shown in Figure 19. According to the municipality<sup>12</sup>, Oribi also occurs in this area, particularly in the grasslands on the southern portion. According to the international Redlist, the

<sup>12</sup> Personal communication from Greg Mullins (Environmentalist: Biodiversity Impact Assessment), in a meeting with Aurecon on 24 January 2020.

species *Ourebia ourebi* has a status of “Least Concern”<sup>13</sup>, but according to the Southern African *Red List of Mammals of South Africa*<sup>14</sup>, the subspecies *Ourebia ourebi* is endemic to South Africa and Mozambique and is “Endangered”.

Careful planning is required to minimise the risk to SCCs in the receiving habitats of moderately high to high sensitivity. These sensitive faunal habitats broadly correspond to the zones of moderate to high floral sensitivity.

### 6.3 Wetlands

The freshwater communities identified on the study area are shown in Figure 20. Besides artificial dams, three hydrogeomorphic units were identified, namely:

- Channelled Valley bottom (CVB) wetlands;
- Unchannelled valley bottom (UCVB) wetlands; and
- Seep wetlands.

The Present Ecological State (“PES”) and Ecological Importance and Sensitivity (“EIS”) of these freshwater communities are reflected in Table 1 below. These findings are applicable to all wetlands of the same classification across the site.

PES is an indication of the status quo (current condition) of the wetlands, from A (near natural) to F (critically modified). This evaluates current impacts on the wetlands and describes how their ecological condition has already changed. EIS is a combination of ecological importance (an expression of its importance to the maintenance of ecological diversity and functioning on local and wider scales) and ecological sensitivity or fragility (the system’s ability to resist disturbance and its capability to recover from disturbance once it has occurred (resilience)). The categories of EIS are explained in Table 2 below.

**Table 1: PES and EIS of Cato Ridge freshwater communities**

| Watercourse | HGM Unit       | PES | EIS      | REC | Ecoservices     |
|-------------|----------------|-----|----------|-----|-----------------|
| CVB Group   | HGM 13, 16     | D   | Moderate | D   | Moderately High |
| UCVB Group  | HGM 14, 15, 18 | D   | Moderate | D   | Moderately High |
| Seep Group  | HGM 1-12, 17   | D   | Moderate | D   | Intermediate    |

**Table 2: EIS Categories**

| EIS Categories | General Description                                                                                                                                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very High      | Wetlands that are considered ecologically important and sensitive on a national or even international level (habitat diversity, species diversity, unique species, rare and endangered species). The biodiversity of these wetlands is usually very sensitive to flow and habitat modifications |
| High           | Wetlands are considered ecologically important and sensitive (habitat diversity, species diversity, unique species, rare and endangered species). The biodiversity of these wetlands may be sensitive to flow and habitat modifications                                                         |
| Moderate       | Wetlands are considered ecologically important and sensitive on a provincial or local scale (habitat diversity, species diversity, unique species, rare and endangered species). The biodiversity of these wetlands is usually not very sensitive to flow and habitat modifications             |

<sup>13</sup> IUCN SSC Antelope Specialist Group. 2016. *Ourebia ourebi*. *The IUCN Red List of Threatened Species 2016*: e.T15730A50192202. <https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T15730A50192202.en>. Downloaded on 28 January 2020.

<sup>14</sup> Shrader AM, Little I, Coverdale B, Patel T. 2016. A conservation assessment of *Ourebia ourebi*. In Child M.F., Roxburgh, L, Do Linh San, E, Raimondo, D & Davies-Mostert, H.T. (editors). *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

|                |                                                                                                                                                                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low / Marginal | Wetlands are not ecologically important and sensitive at any scale. The biodiversity of these wetlands is ubiquitous and not sensitive to flow and habitat modifications |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

As can be seen, all the wetlands on the site have a PES rating of “D” (Fair) and a “moderate” EIS, implying that they are ecologically important and sensitive on a provincial or local scale. All the valley bottom wetlands (both channelled and unchannelled) provide “moderately high” ecoservices – an indication of the natural benefits they provide to humans. These benefits include services like flood attenuation, streamflow regulation, sediment trapping, phosphate assimilation, foods, cultural value, etc.

The wetlands located within the study area have all been largely modified to some degree by industrial, residential and agricultural land uses, which have encroached on the wetland boundaries. Generally, existing land uses have negatively affected the overall hydrological and geomorphological functioning of wetlands on the site.

The following constraints are applicable to wetlands:

- Red flags: Although the CVB wetland on the southern portion of the site (pink in Figure 20) has been developed into a golf course, and it has low floral sensitivity, the hydrological function of the wetland remains important, as it continues to convey water in spite of the presence of manicured exotic vegetation. The same observation is applicable to the UCVB wetlands on the southern site (light blue in Figure 20).
- Seep wetlands (light green in Figure 20) are extensive over much of the southern and northern portions of the site.

Engagement with the Department of Water and Sanitation will be necessary to determine appropriate development options for these wetlands. Further degradation of the wetland resources within the study area should be avoided. If development is planned within the wetlands, this should be limited to those that have been more significantly affected and impact on the seasonal and temporary wetland zones should not be permitted. Any residual loss of wetland areas will require offsetting to ensure a no net loss scenario of wetland habitats.

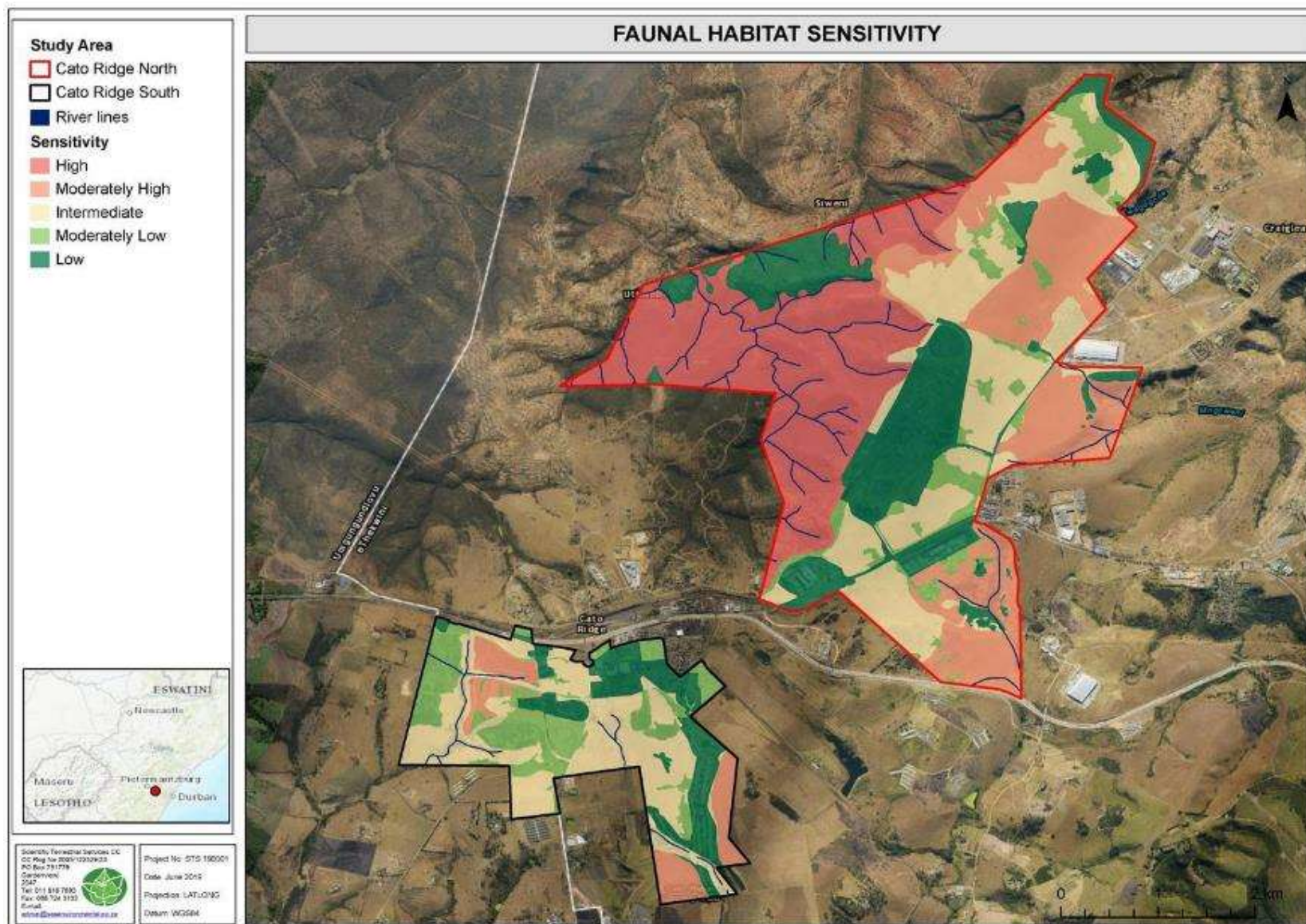
The requirements for a Water Use License (WUL) in terms of the National Water Act, 1998 (Act No. 36 of 1998) are important in this respect. The Act requires a Water Use License for any form of development in a wetland or within a defined buffer zone around wetlands. The time frame for such applications (300 calendar days) is an important constraint for development planning.

It is important to understand that, despite the appearance of the wetlands, the presence of alien trees and lawn (e.g. in the golf course) does not imply that this gives a license for further transformation of the wetland. Despite the presence of alien vegetation, these wetlands continue to serve hydrological functions. The development options that are proposed must allow the hydrological function of the wetlands to continue i.e. the movement of water must not be drastically impeded or changed.









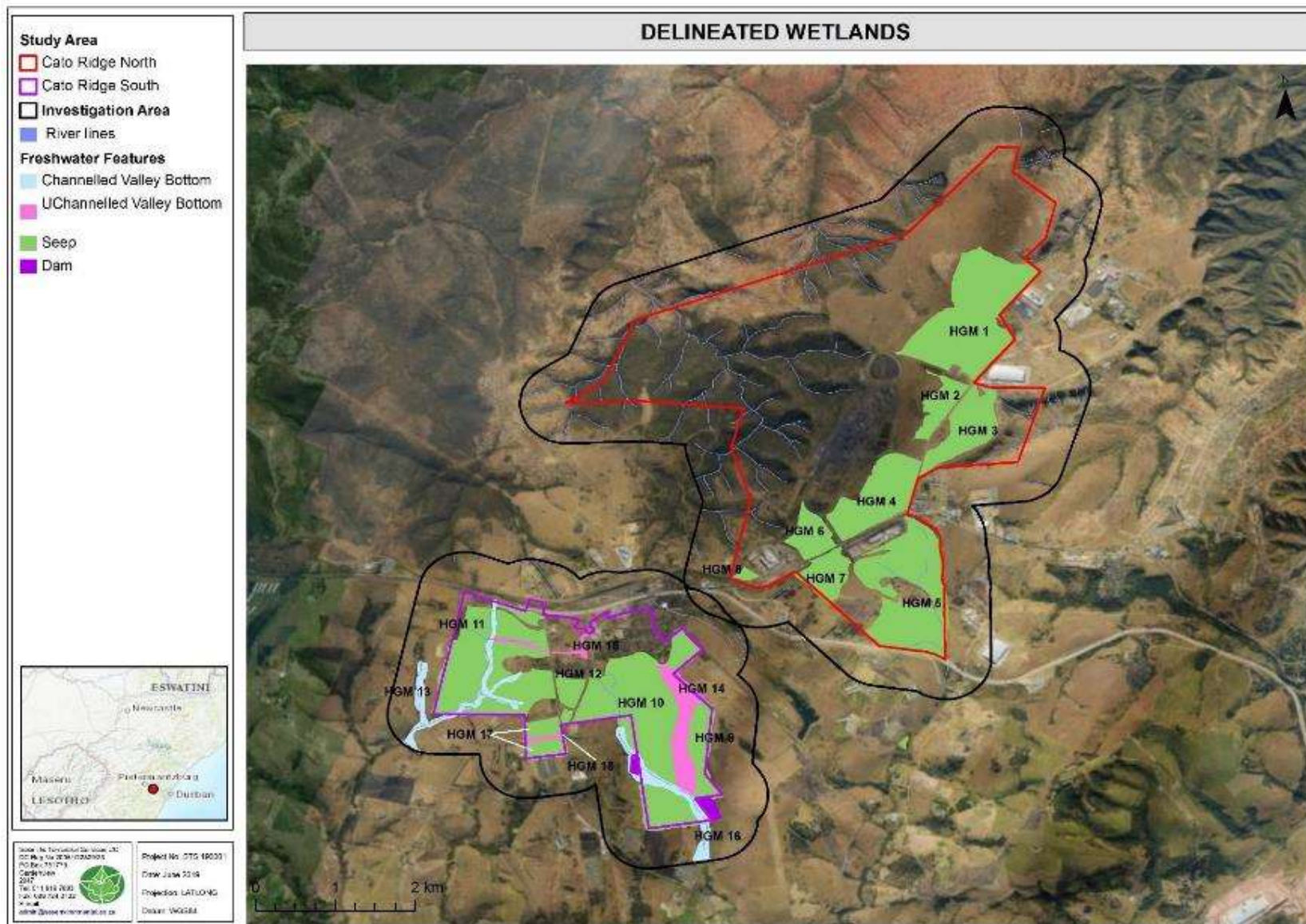


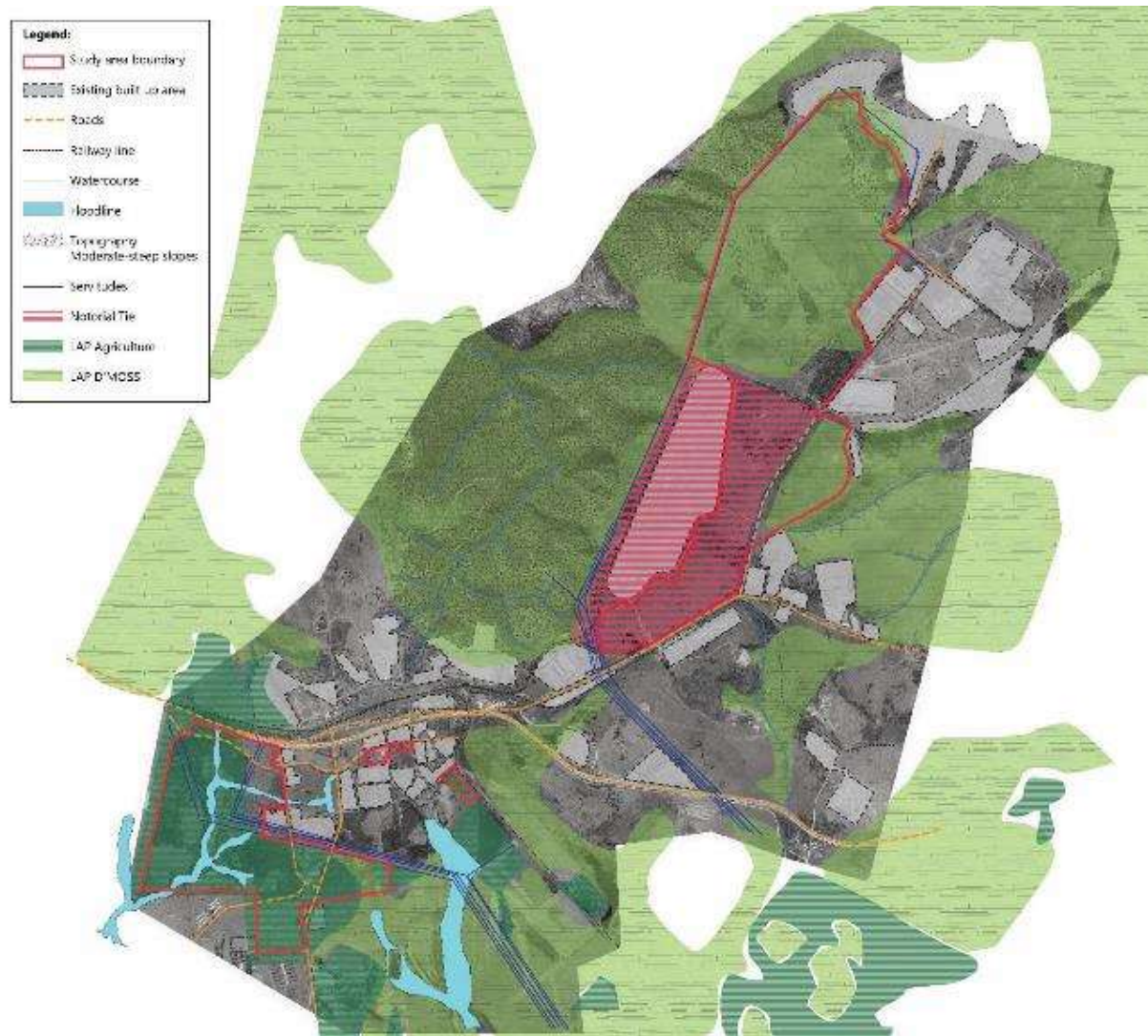
Figure 20: Freshwater (wetland) units of the site

## 6.4 Agricultural Potential

The Cato Ridge LAP earmarked the land south of the N3 and west of the existing village to be utilised for agricultural purposes and the D'MOSS is located on some of the properties as indicated in Figure 21. These proposals contained in the LAP do not restrict development in its entirety, merely provide guidance on what the land could be used for.

There are a number of restrictions that could have a negative impact on how the land is developed. These constraints include the above-mentioned ecological sensitivities, flood lines, servitudes, title deed restrictions, topography as well as soil conditions.

The map below indicates the relevant environmental development constraints limiting the developability of the land.



**Figure 21: Environmental development constraints**

A large portion of the Cato Ridge north of the N3 is underlain by red, yellow and /or greyish soils with high base status. This portion's soil class contains imperfectly drained soils, often shallow and often with a plinthic horizon. With this soil class, relative wetness is favourable in dry seasons. The majority of the Cato Ridge south site is also underlain by the same soil.

The easternmost and westernmost portions of the Cato Ridge North site is underlain by soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils. Lime is rare or absent in the landscape.

On the western side of the Cato Ridge North site, the soil is classed as undifferentiated structureless soils with favourable physical properties. A limit with these soils is that one or more of the soils have low base status,

Cato Ridge North site has a very small portion on the west of the site where the soil class is freely drained and structureless. The soils have favourable physical properties but may have restricted soil depth, excessive drainage, high erodibility, and low natural fertility. The westernmost of the site have Lithosols (shallow soils on hard or weathering rock). The soil may receive water runoff from the associated rock but has restricted soil depth.

Based on the above-mentioned soil descriptions, there are very few soils on the site suitable for cultivated agriculture. This is supported by satellite photographs, which indicate virtually no cultivation across either of the sites.

The heritage screening of the study area comprised a desktop assessment of existing archival data sources and online databases. Palaeontological sensitivity (likelihood of the presence of fossils) and other heritage resources (e.g. buildings, graves, archaeological sites, etc.) were considered.

[illegible]

No other heritage resources of provincial or national heritage significance were identified. However, due to limited previous research in this area it is possible that such sites might still be found here. The historic occupation indicators also mean that there is a high likelihood of further graves and burial sites. A site inspection will be required from a Heritage Specialist to verify on-site conditions and potential risks prior to an environmental authorisation.

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re-interment. It further requires that practices of the affected communities should be respected. Therefore, stakeholder engagement will be a critical component to understand customs and norms regarding the deceased, if graves need to be relocated.

## 6.6 Interpretation of results

The sensitivity maps as included in the various sensitivity reports must be considered in planning. Areas of moderately high to high sensitivity should not be targeted for infrastructure that will transform the habitats. These types of development should be avoided in these sensitive areas. Open space or compatible land uses are preferred in these areas, as they will stand a greater chance of being authorised.

As far as possible development footprints should be located outside of the identified sensitive habitats (preferably outside of all areas of intermediate to high biodiversity sensitivity).

The assessment by David Styles confirms the presence of large areas of KZN SS on the site, ranging from good to poor condition, and of Dry Coast Hinterland Grassland of varying conditions. It is important to note that, whilst acknowledging the sensitivity of threatened grassland communities on the site, he also recognises the threats posed by current uncontrolled activities on the site and the implications of allowing these activities to continue. Therefore, he states he *“can support some development of Poor condition grassland if this will result in formal, definite and sustained protection and conservation management of the remaining KwaZulu-Natal Sandstone Sourveld north of the N3 and preferably also Dry Coast Hinterland Grassland south of the N3. This is so, because unless grazing impacts are relieved, together with associated over-burning, it is likely that more of the plant species diversity will be lost even under a complete no-development scenario.”*

### 6.6.1 Biodiversity aspects

It is recommended that the development team engage with the environmental team to identify suitable options for development that will carry the highest potential for authorisation by environmental authorities (and hence also the lowest risk for rejection). Such development options may include a combination of the following:

- Not developing in certain areas (e.g. the areas of “High” to High to moderate” condition).
- Development of land uses and concepts that are compatible with the environmental and cultural baseline of the site. This may include land uses such as “eco estates” in vulnerable or sensitive areas of the site, and appropriate placement of land uses. It may further include the design of buffer zones to control development impacts and the integration of a network of open spaces and linkages to ensure that ecological processes can continue to function. Such developments may include low density developments with large open-space components in the golf course on the southern portion of the site, although this is considered a Valley Bottom Wetland. The transformation of the golf course into a different land use could also be commissioned at a later stage to improve the sensitive areas, whilst improving the status of the adjacent neighbourhood.
- Development of ecological offsets. An offset compensates for unavoidable impacts on significant environmental matters (e.g. valuable species and ecosystems) in one location, by securing land at another location, and managing that land over time to replace the environmental resources that will be lost. Offsets, although allowed in South African conservation practice, are a last resort, to be used only if it is impossible to secure the necessary value from land development without affecting valuable environmental resources. This will require consideration of the regional environment around the Cato Ridge site to identify suitable portions of land that would contribute to meeting conservation targets. Offsets are typically much larger than the affected areas on the development site, with the ratio of “affected resource” vs. “replacement resources” being up to 1:30 (higher ratios for highly significant or scarce resources). eThekweni Municipality and Ezemvelo KZN Wildlife officially not any loss of endangered or critically endangered ecosystems, but in practice may consider offsets for grassland areas with moderate to low sensitivity. However, it is unlikely that they would consider any offsets for grassland with high sensitivity, especially KZN SS classified as *Good*, *Good to Intermediate* and *Intermediate with important endemics*.
- Two forms of offsets are possible:

- On-site offsets: preserving vulnerable portions of the site as a “trade-off” to develop other predominantly natural, but less vulnerable / sensitive portions of the site.
- Off-site offsets: purchasing tracts of natural vegetation for incorporation in conservation areas. This, as mentioned above, is risky, since it is unlikely that large enough offset areas will be available outside the site.

With regards to open space elements of the layout, the municipality is concerned that private landowners should not be responsible for maintaining such areas if they remain in private ownership, as their management objectives and practices could vary widely. eThekweni Municipality recommends the declaration of “*Special Rating Areas*” for privately owned open space. A nominal levy is charged on these areas to allow the municipality to maintain them in a natural condition. Ezemvelo on the other hand is in favour of formal conservation agreements, wherein landowners agree to specified conservation practices over a long term – typically 20 to 30 years – for which the landowners remain responsible.

Engagement and negotiations with the environmental authorities would be required to reach agreement on developable areas (especially within sensitive vegetation types), and associated offset / conservation requirements in return.

### **6.6.2 Wetlands**

Wetlands occur over a very large area of the site. Although the Unchanneled Valley Bottom Wetlands and Channelled Valley Bottom Wetlands are fairly narrow and occupy small portions of the site, Seep Wetlands occupy large part on the eastern side of the northern portion of the site and most of the southern portion of the site. This has important implications for Water Use License applications (“WULAs”), since any development within 500m of a wetland requires a licence. This may mean, in effect, that almost the entire site will need some form of WULA. In practice, the consideration of all seep wetlands in the development layout will probably prove too cumbersome to be practical, and a relaxation of the DWA’s requirements regarding these wetlands is supported.

A WULA application requires detailed designs of infrastructure and should be commissioned during the end of the feasibility phase. Once this level of design information is available, engagement with DWS can commence around the approach to wetland management to reach agreement on what is considered acceptable loss. Seep areas can be accommodated in an open space network and with the design of a drainage system on areas that are planned for development.

### **6.6.3 Heritage aspects**

A desktop palaeontological study and protocol for chance finds will be required during the EIA process. A Phase 1 Heritage Impact Assessment (a site-based assessment) and Desktop Palaeontological Assessment should be conducted during the EIA process to identify graves, fossil-bearing sediments and other heritage resources that may have been missed during the initial high-level desktop assessment. It is further recommended that a Chance Finds Procedure be drawn up to deal with any accidental finds during further development phases of the project.

## **6.7 Limitations**

As indicated in section 6.1.2, it was intended that the additional ecological surveys (wetlands, avi-fauna and fauna) should take place during the wet season, since the first surveys in May 2019 took place in the dry season. However, the additional surveys took place in April 2020 (marginally outside the wet season), and it was not possible to undertake faunal surveys at all. The lack of wet season data for all biotic components means that there is a limitation on the confidence that can be placed in the identification of species of endangered flora, as their peak flowering season is in summer. It also implies that animal species that seasonally move into or out of the area seasonally, including terrestrial fauna and birds, could have been missed in the surveys. This means that Ezemvelo’s requirements for wet season surveys cannot currently be met.

Should development planning continue, and authorities insist on wet season data for the EIAs, then additional surveys will have to be undertaken in the next wet season – typically October to December, but dependent on the start of rains.

## 6.8 Recommendations

Based on the above, the following key actions are recommended:

- Continued engagement with environmental, conservation and water management authorities will be important to confirm that the design concept will contribute to realise as much value as possible for the development, while also ensuring the targets for conservation of natural and cultural resources are met. Initial engagement has taken place with the municipality's Development Planning, Environment and Management Unit and Ezemvelo KZN Wildlife's Conservation Planning: Integrated Environmental Management unit. Such engagement must continue, particularly with regards to the areas of high value grassland (*Good*, *Good to intermediate* and *Intermediate with important endemics*) be conserved on the site and conservation offsets (if required). Options to conserve sensitive vegetation in conjunction with development must be discussed further, since the simple exclusion of sensitive areas from the development footprint will merely perpetuate the degradation of vegetation communities.
- In this engagement, a rational and pragmatic approach needs to be followed. It is clear that the continuation of trends in current land use (fires, grazing, settlement, sand mining and industrial land use) will lead to the further degradation of grasslands. The affected areas of grassland are already being lost at an alarming rate. Appropriately designed development can unlock value from the land and also deliver much needed socio-economic value, whilst at the same time securing the conservation of representative portions of the grassland. Both developers and conservation authorities stand to benefit from such a pragmatic approach. Therefore, it is concerning to note that the eThekweni Municipality (Cameron McLean, Acting Head, pers. comm.) does not support any development in threatened vegetation types, even in degraded portions. By the same token, meeting this with a "hard-line" approach by developers is also unlikely to yield favourable results for either party. "Give and take" by both parties will be required to get to an outcome that meets the needs of conservation and development.
- It will also provide an indication of offset areas, even including the possibility of Assmang treating grassland with high conservation status that it owns as high value "offset banks" into which other developers in the region can invest to offset their impacts caused by other developments
- It is suggested that authorities be approached with a full footprint of the proposed development, and then test the willingness of the authorities on what they will and will not accept. Negotiations must then proceed with the understanding of the minimum requirements required to make the development economically sustainable and work towards that.
- Buffer zones for areas that are of high value to conservation will have to be considered. In the case of wetlands a buffer of 32m is usually prescribed, as this is the buffer from the edge of wetlands prescribed the applicable listed activities in the EIA regulations. In the case of grasslands, the buffers are dependent on judgement of the ecological specialists and authorities. David Styles has recommended buffers of 50m to 100m in some instances. There is no fixed rule about the size of the buffers and will need to be negotiated based on the proposed landuse and proximity to sensitive receptors.
- As indicated above, continuation of the status quo (the "no-go" alternative) will cause further degradation and loss of grassland communities. Therefore, it is recommended that the authorities be made aware of this, preferably through a site visit to demonstrate the current activities.
- It is recommended that these actions must take place within the context of an understanding of the provincial policies regarding development of this node and social needs. Engagement with the relevant political office bearers (e.g. the MEC's office) may be necessary to achieve this.

These actions will facilitate the emergence of an informed land use plan and strategy that is sensitive to the needs of the environment whilst unlocking socio-economic development potential for the region. .

## 7 Flood line Study

In the process of determining the extent of land that will be considered 'developable', it is critical to delineate areas that fall within low lying areas that are classified as flood lines and therefore are required to be preserved. The purpose of the flood line study is to determine the extent of possible flooding that may occur once every hundred years and once every fifty years, within the land development area. The purpose of the Flood Line Study is to indicate the extent of the flood lines in the Cato Ridge development area and to determine possible impacts on future infrastructure. This Study's report covered three sections, namely: topography, hydrological modelling methodology and modelling output with the objective of:

- Indicating the 1:50 and 1:100 year flood lines.
- To avoid flooding of existing and future infrastructure.
- To document all assumptions and findings regarding the hydraulic modelling.

### 7.1 Topographical Information

Aerial topography and 5m contours were utilised in the hydrological study to determine the low-lying areas of interest. The figure below shows only the 5m contours and the location of the streams that formed part of the flood line study.

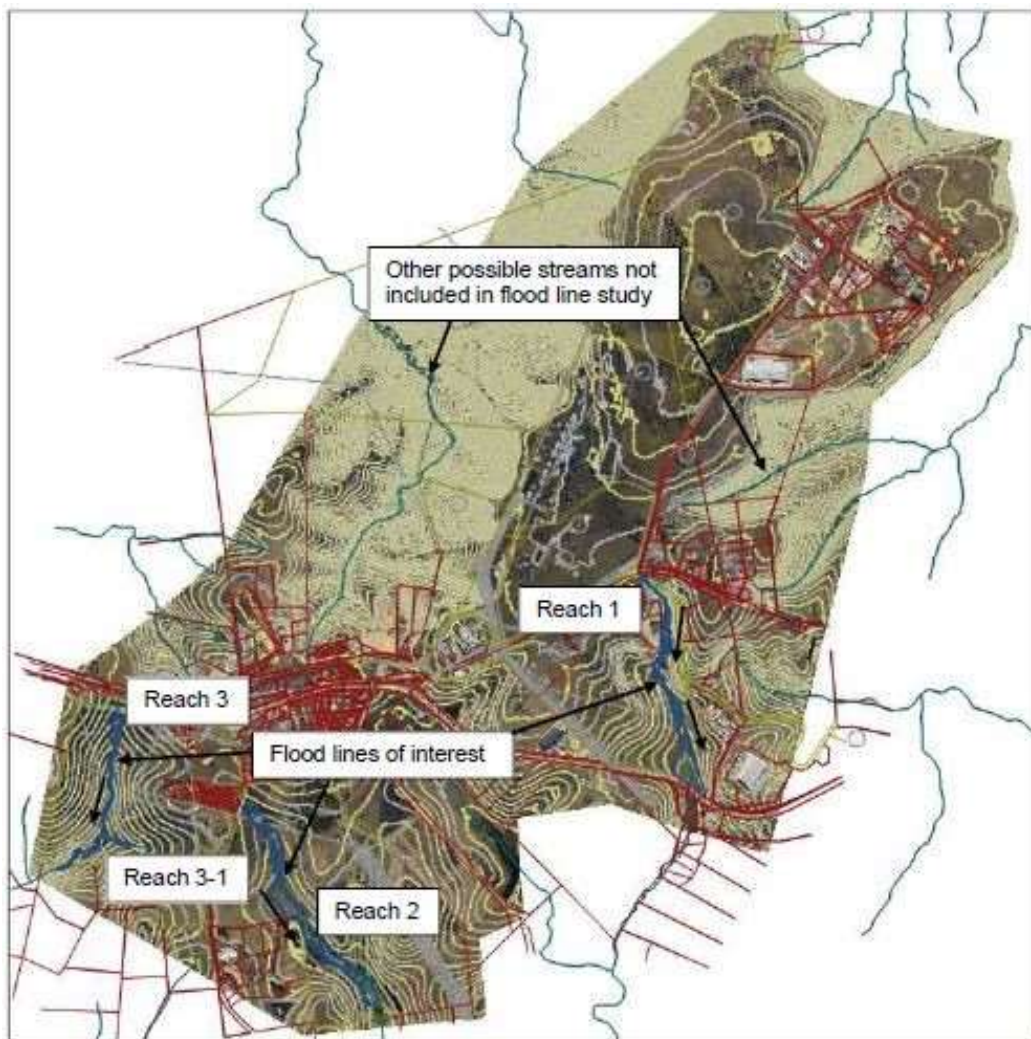


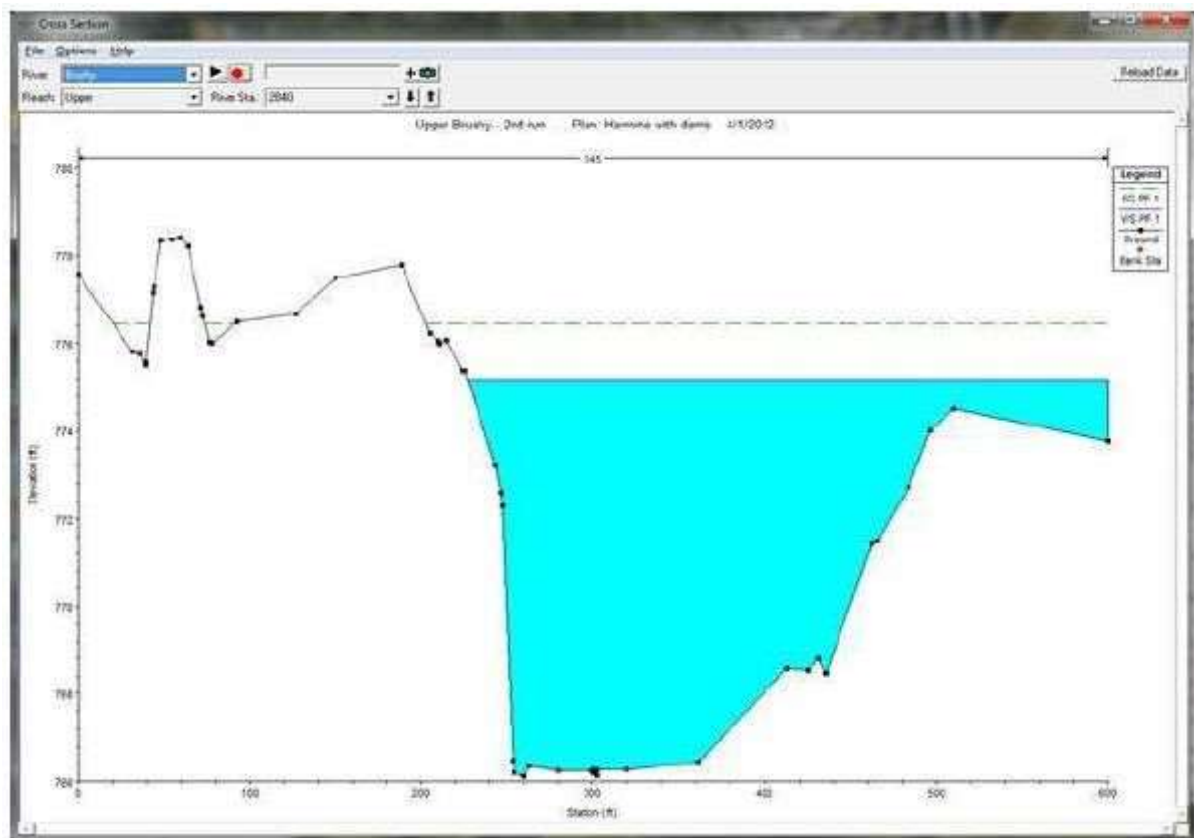
Figure 23: 5m Contours layout of the study area

## 7.2 Hydrological Modelling

To determine the flood lines that will affect the proposed land development area, the following flood scenarios were created:

- Existing conditions – 1:50 and 1:100-year flood line with Rational Method and compared with Alternative Rational Method;
- Future conditions, assuming the new development comprises 50% of the area – 1:100-year flood line with Rational Method and compared with Alternative Rational Method;
- Future flood conditions including an additional 15% for climate change circumstances – 1:100-year flood line with Rational Method and compared with Alternative Rational Method; and
- 1:50 and 1:100-year flood line using the Standard Design Flood Method. This method uses a different design approach than Rational Method and usually gives a very high run-off in comparison to other methods. This check ensures we have the worst-case flood line boundary.

Three streams were identified within the land development area, all of which drain in a south-eastern direction. After creating alignments for the three tributaries centrelines and cross-sections were defined, horizontally and vertically as indicated in Figure 24. The horizontal plane was defined using aerial photos and the vertical aspects from survey information that showed the centre line of the stream. The watersheds and control points were identified by means of survey and aerial photos.



**Figure 24: Typical cross-section**

The investigation included an analysis of surface runoff within the area, this was calculated using the Coastal rainfall intensity equation. The total volume of rainfall does not necessarily result in run-off. A certain volume is retained in the catchment either as ponds or as infiltration and the rate at which water infiltrates into the ground changes over time as soil becomes saturated. This alters the run-off rate during a storm event continuously and does not only affect run-off volumes but also run-off peaks.

### 7.3 Model Output

The Cato Ridge catchment areas and flows are shown in the following tables. The flows were obtained using various methods as applied in the Utility program for drainage.

**Table 3: Reach 1 (3.762 km²)**

| Calculation Method                                       | Rational Method |       | Alternative Method |       | SDF   |       |
|----------------------------------------------------------|-----------------|-------|--------------------|-------|-------|-------|
| Flood lines                                              | 1:50            | 1:100 | 1:50               | 1:100 | 1:50  | 1:100 |
| Existing Conditions                                      | 23.91           | 30.47 | 22.74              | 27.16 | 69.25 | 89.17 |
| Future Conditions; 50% developed area                    | 28.76           | 35.99 | 27.35              | 32.08 | 69.25 | 89.17 |
| Future Conditions with additional 15% for climate change | 33.01           | 41.39 | 31.45              | 36.89 | 69.25 | 89.17 |

**Table 4: Reach 2 (25.040 km²)**

| Calculation Method                                       | Rational Method |       | Alternative Method |       | SDF  |       |
|----------------------------------------------------------|-----------------|-------|--------------------|-------|------|-------|
| Flood lines                                              | 1:50            | 1:100 | 1:50               | 1:100 | 1:50 | 1:100 |
| Existing Conditions                                      | 29.3            | 37.3  | 27.5               | 32.8  | 79.2 | 102.0 |
| Future Conditions; 50% developed area                    | 35.2            | 44.0  | 33.0               | 38.7  | 79.2 | 102.0 |
| Future Conditions with additional 15% for climate change | 40.5            | 50.6  | 38.0               | 44.5  | 79.2 | 102.0 |

**Table 5: Reach 3 (2.710 km²)**

| Calculation Method                                       | Rational Method |       | Alternative Method |       | SDF  |       |
|----------------------------------------------------------|-----------------|-------|--------------------|-------|------|-------|
| Flood lines                                              | 1:50            | 1:100 | 1:50               | 1:100 | 1:50 | 1:100 |
| Existing Conditions                                      | 18.6            | 23.7  | 17.9               | 21.3  | 56.7 | 73.0  |
| Future Conditions; 50% developed area                    | 22.3            | 27.9  | 21.5               | 25.2  | 56.7 | 73.0  |
| Future Conditions with additional 15% for climate change | 25.6            | 32.1  | 24.7               | 29.0  | 56.7 | 73.0  |

**Table 6: Reach 3-1 (0.624 km²)**

| Calculation Method                                       | Rational Method |       | Alternative Method |       | SDF  |       |
|----------------------------------------------------------|-----------------|-------|--------------------|-------|------|-------|
| Flood lines                                              | 1:50            | 1:100 | 1:50               | 1:100 | 1:50 | 1:100 |
| Existing Conditions                                      | 6.7             | 8.5   | 7.0                | 8.4   | 26.2 | 33.8  |
| Future Conditions; 50% developed area                    | 8.0             | 10.0  | 8.5                | 9.9   | 26.2 | 33.8  |
| Future Conditions with additional 15% for climate change | 9.2             | 11.5  | 9.8                | 11.4  | 26.2 | 33.8  |



The findings of the model show that there are no major flood lines to the north of the N3. However, towards the south there are several 1:100 and 1:50 year flood lines that lie to the south and west of Cato Ridge village respectively.

During the development of the layout it is important to take note that no permanent buildings are permitted within the 1:100 years flood line and no infrastructure is permitted within the 1:50 flood line. Braai areas and park facilities and similar infrastructure can be accommodated but any human habitation is not permissible between the 1:50 and 1:100 year floodlines. Limited encroachment of the 1:100 year flood line is permissible for land use, but properties that are subject to a flood line may use the area under the 1:100 flood line for parking and open spaces but no human habitation. School stands may use the area between the 1:00 and 1:50 year flood line for sports fields. The flood line data generally also correspond with riparian vegetation that is protected in terms of NEMA. Areas that are subject to a 1:100 year flood should be included in the land development design as parks or conservation areas and may be used for leisure activities or agriculture.

## **7.4 Recommendations**

The flood line study reveals that no existing infrastructure is affected by the flood lines, however, future possible development would increase the run-off ultimately increasing the water level of the flood lines. Other aspects such as climate change can also have an impact on the water levels and will be considered in the study.

There are options to mitigate future risk of flooding that could materialise due to climate change or future developments, such as creating embankments with gabions. These recommendations can be more accurately described in the detail design phase of potential land development areas, but it must be noted that and modifications of river embankments must be done in compliance with the Water Act and may require a water use licence.

## 8 Geotechnical Investigations

The phase 1 geotechnical investigation is used to determine the zonings of the land development area that pertains to subsurface conditions. The geotechnical investigation makes recommendations about the suitability of the subsurface conditions for development and further could make recommendations for foundations to mitigate risks if any unstable geotechnical characteristics are prevalent.

Aurecon implemented the SAICE Site Investigation code of practice, and GFSH-2 to scope the investigations.

The objectives of the investigation were:

- To provide an overview and suitability of the land for the proposed development;
- Brief description of the regional geology;
- Obtain a description and variability of the geotechnical conditions and characterising the site;
- Discussion of geotechnical factors which would impact the development, such as foundation conditions, excavatability, stability of service trenches, corrosivity of in situ materials and suitability of in-situ materials for use;
- To identify constraints that may influence the proposed developments;
- To provide generic geotechnical related recommendations including recommendations for additional geotechnical investigations; and
- Provide site zoning in accordance to the National Home Builders Registration Council (NHBC) guidelines.

The field work was carried out in August and September 2019 by an engineering geologist from Aurecon and two laboratory technicians from SGS Matro laboratory.

### 8.1 Geology

According to the 1:250 000 scale geological map of the Durban Sheet 2930 (CGS, 1988), the Cato Ridge area comprises shales and siltstones of the Pietermaritzburg Formation of the Ecca Group. The shales are underlain by sandstones of the Vryheid Formation of the Ecca Group. The Dwyka Group is the oldest and lowermost deposit in the Karoo Supergroup Sequence and comprises tillite with subordinate varved shale and boulder shale. The first sedimentary sequence deposited on the new basement was the Cambrian to Ordovician Natal Group sandstones (Figure 26, refers). The area also include granites and gneiss of the Natal Metamorphic Province.

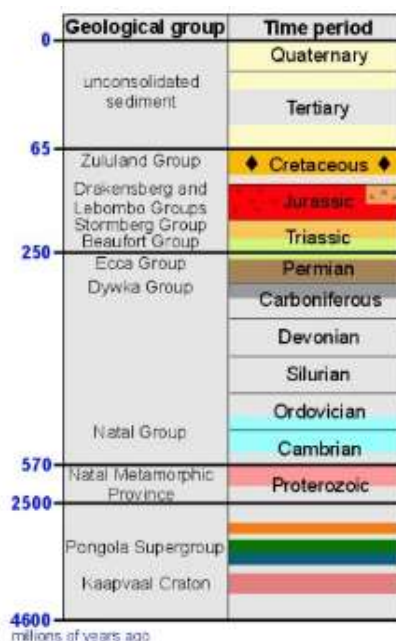


Figure 26: Stratigraphic representation of the site geology

### 8.1.1 Natal Group:

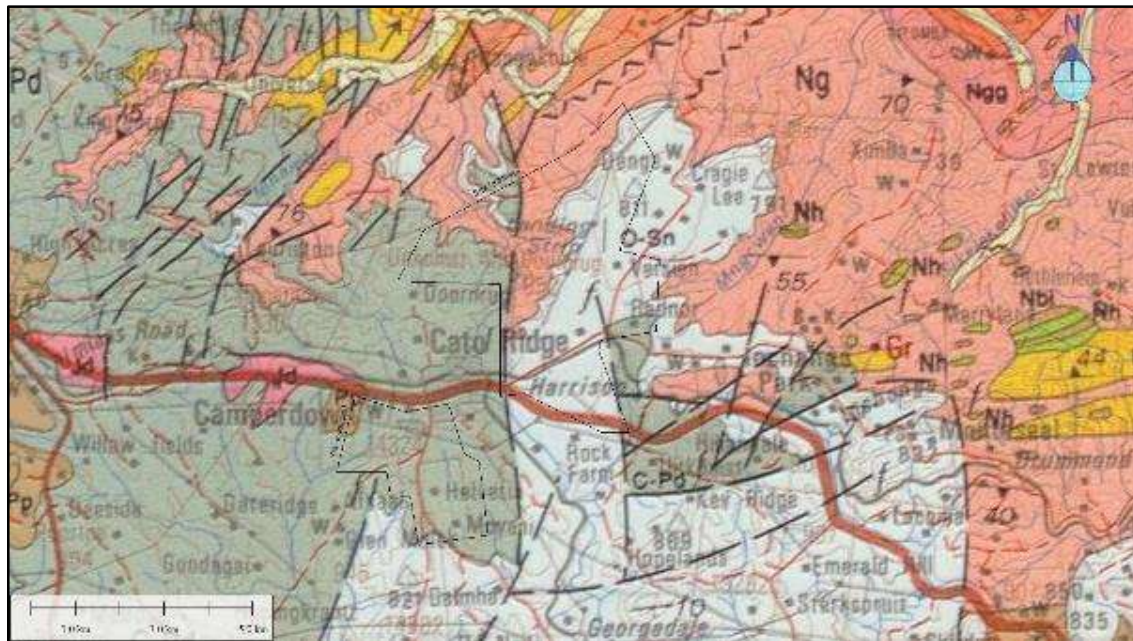
The Natal Group comprises red-brown coarse-grained arkosic to subarkosic Sandstone, quartz arenite, micaceous sandstone, small pebble conglomerate, with subordinate siltstone and mudstone (1:250 000 scale geological map (2930 Durban), 1988). The Palaeozoic Natal Group underlies the Dwyka Group and overlies the Archaean and Proterozoic basement granites in Kwazulu-Natal. Fluvial activity and debris flow processes led to the deposition of the conglomerates, and braided rivers deposited the arenaceous and minor argillaceous sediments. The erosional regime was later replaced by conditions of deposition of the sediments derived from the mountains of southern Mozambique. The sandstone and interbedded mudstone and siltstone was formed shortly after the deposition of the conglomerates (M. R. Johnson, 2006, pp. 433-441).

### 8.1.2 Dwyka Formation:

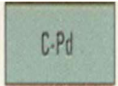
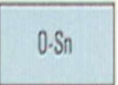
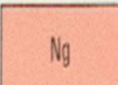
This formation comprise diamictite, tillite, subordinate varved shale and boulder shale horizons (1:250 000 scale geological map (2930 Durban), 1988), Figure 27.

### 8.1.3 Weinert Climatic N-value

According to Weinert's climatic N-value [2], the site falls in an area where the N-value is less than 5, indicating that the area is associated with more humid regions where chemical weathering is the predominant rock weathering mode.



#### Legend:

|                                                                                     |                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Diamictite; subordinate varved shale and boulder shale                                                                                                          |
|  | Red-brown coarse-grained arkosic to subarkosic sandstone; quartz arenite;<br>Micaceous sandstone; small pebble conglomerate; subordinate siltstone and mudstone |
|  | Megacrystic biotite granite                                                                                                                                     |

## **8.2 Site investigation**

The test pit locations were determined by considering topography, geological variability, site coverage and in accordance with the prescribed requirements in line with SAICE Site Investigation and GFSH-2.

A total of two hundred and twenty-eight (228 No) test pits were excavated. One hundred and fourteen (114 No) test pits (C-TP01-C-TP114) were excavated at the southern portion and one hundred and fourteen (114 No) test pit (C-TP121-C-TP135) within the northern portion. Six (6 No) test pits C-TP115 – C-TP120 were allocated on Portion Rem 29 which was not part of the investigation area and therefore not excavated extensively.

All test pits were excavated using a JCB 3DX light tractor-loader backhoe (TLB) to refusal on hard material or to the maximum reach of the TLB (varying between 3.0 and 3.8m depth). A three-person team carried out the test pit profiling in order to comply with accepted safety requirements as reflected in the South African Code of Practice (SAICE, 2007). The test pits were profiled in accordance with South African standards (Jennings, Brink and Williams (1973)), and were backfilled after profiling. The test pit co-ordinates were set out on-site using a hand-held GPS with a nominal accuracy of 5 m to 8 m.

Representative samples were taken from the test pits and submitted to SGS - Matrolab (Pty) Ltd testing laboratory. Tests included:

- Foundation Indicator tests, comprising grading analyses (sieve and hydrometer) and Atterberg Limits (71 No);
- Maximum Dry Density (MDD), Optimum Moisture Content (OMC) and California Bearing Ratio (CBR) tests (35 No);
- pH and conductivity tests (21 No);
- Standard consolidation tests (6 No); and
- Lump tests (2 No).

## **8.3 Investigation results**

In the northern portion, groundwater seepage was encountered at six (6 No) of the investigated positions (C-TP122, C-TP123, C-TP143, C-TP144, C-TP169 and C-TP184) located in the low-lying areas or floodplains. According to the information recorded during fieldwork the water table depths range between 1.0m and 2.8m.

Groundwater was only found to occur in test pit C-TP105 in the southern portion. However, it should be noted that test pits C-TP16, C-TP17 and C-TP33 were excavated in the vicinity of a wetland.

The foundation indicator results indicate that the transported material, residuum and bedrock are low in plasticity and characterised by low and occasionally moderate potential expansiveness.

The material occurring within the southern portion is generally not suitable for use as construction material. Also, a limited volume of suitable material will be available from the northern portion. It is recommended that construction materials be sourced commercially.

The fill, transported material (alluvium, colluvium and hillwash), residuum (tillite, siltstone and sandstone) and very soft rock tillite and siltstone bedrock classify as 'Soft Excavation', according to the SANS 1200D guidelines. Cobbles and boulders of up to 1200mm were occasionally encountered in the hillwash, residual tillite and residual sandstone. These may be classified as 'Boulder Excavation'. TLB refusal was recorded on hardpan ferricrete, medium to hard rock tillite and hard rock siltstone and sandstone at the site. According to the SABS 1200D (1988) guidelines, the classification of the bedrock may vary from 'Intermediate Excavation' or 'Hard Excavation'. An excavator and / or power tools may be required for the excavation of Intermediate material. Blasting will be required to excavate trenches where materials are classified as Hard Excavation.

For foundation pressures not exceeding 50 kPa, modified strip footings are proposed in areas underlain by deep residual and / completely weathered tillite and siltstone horizons. Typically, the hard rock siltstone and sandstone bedrock provides a competent founding horizon. The proposed buildings can be founded on hard rock bedrock using conventional strip footings and pad footings.

It is understood that commercial, industrial and / or mixed-use (including a shopping centre) developments are planned in the northern portion. At the time of reporting details about the magnitude and loads of the proposed structures were not available.

## **8.4 Recommendations**

Ultimately the site is considered suitable for the proposed development, however before any more informed decision can be made, the Phase 1 investigation must be followed at the appropriate time by a Phase 2 investigation. Both are required in terms of the GFSH-2 specification. The Phase 2 investigation forms part of the National Home Builder's Registration Council (NHBRC) requirements for enrolment of residential dwellings in their warranty scheme and will require that a competent person inspect services trenches (sewerage and water) as they are excavated. The reason for the inspections is to refine the geotechnical zoning so that a stand-by-stand soil classification and founding recommendation is made possible. The phase 2 geotechnical investigation is therefore conducted during the first period of the construction process and for the purposes of pre-feasibility and feasibility, including all required statutory approvals, the phase 1 geotechnical investigation is adequate.

## 9 Town Planning Investigations

### 9.1 Land Ownership

Assmang and its subsidiary companies, Cato Ridge Development Company and Ferroalloys, are the three major landowners in Cato Ridge as illustrated on Figure 30. The land ownership investigation reconciled the list of properties compiled by Assmang together with a comprehensive WinDeed search of all the properties in the area, particularly around Manglo Ridge, to ensure that all properties that fall under Assmang's ownership have been accounted for. This search revealed that there were portions of land owned by the CRDC that were not in Assmang's records, namely:

- Portion 4 of 14324 Manglo Ridge (Figure 28)- this portion was subdivided but never transferred out of CRDC's ownership. Cato Ridge Club house was built on this portion and the *site remains part of Manglo Ridge (14324) owned by CRDC*.
- The Remainder Uitkomst & Doornrug 852 (Figure 29) – Early in 2020 Transnet approached Assmang to assume ownership of this portion. This property is in its entirety occupied by the railway reserve and it is possible that the railway reserve is protected by means of a historical proclamation. This land is of no value to Assmang and it is recommended that it be transferred to Transnet. Parts of the SAR reserve extend further east of the area indicated in Figure 39, refer land north of Cato Ridge Village & north of the N3 in Figure 40.

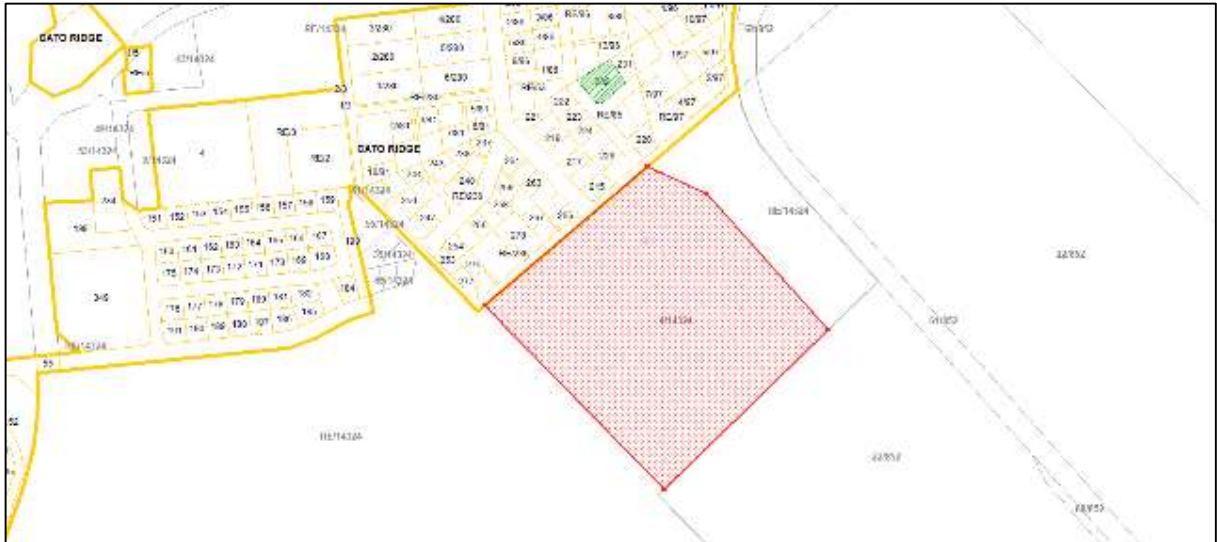


Figure 28: Portion 4 of 14324 Manglo Ridge

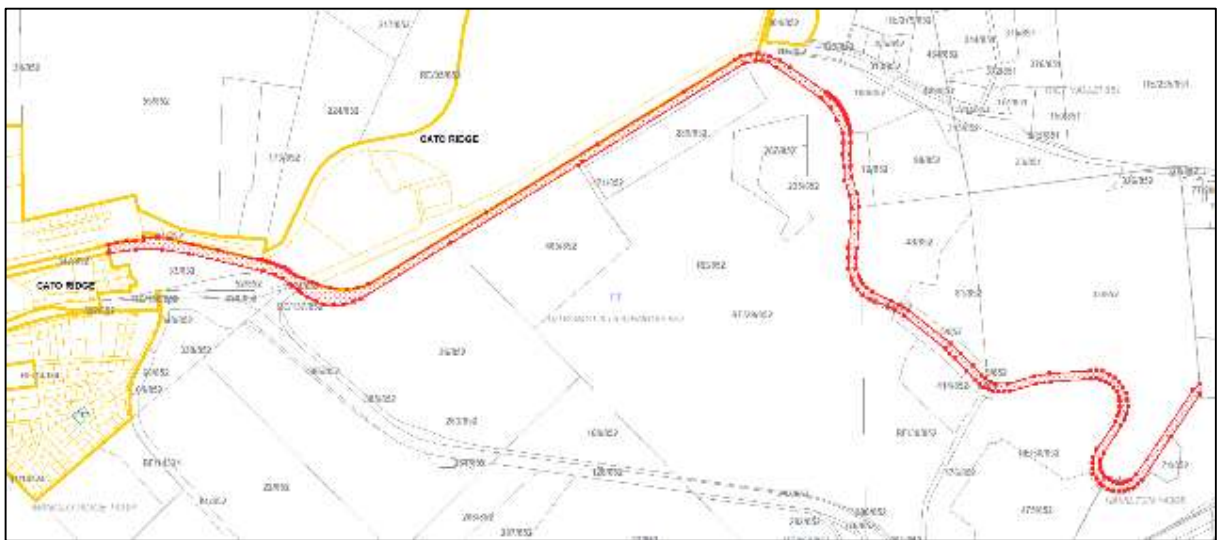


Figure 29: Remainder of the farm 852 Uitkomst & Doornrug

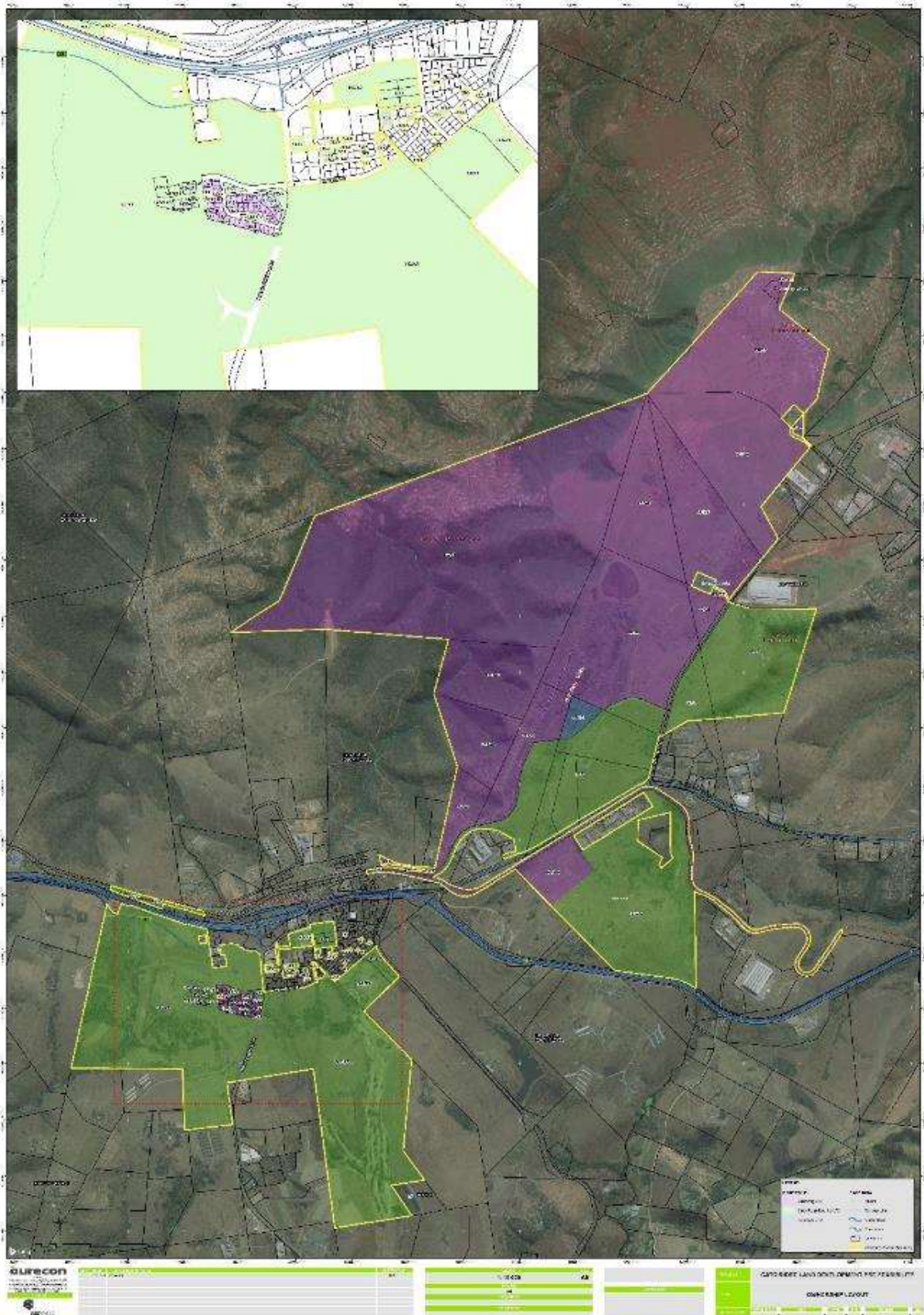


Figure 30: Landownership

## **9.2 Land Claims**

At each phase of the project it will be necessary to double check whether any land claims have been registered over any of Assmang's land.

The Regional Land Claims Commissioner in Kwazulu-Natal confirmed that as of 11 July 2019, there were no land claims in terms of the Restitution of Land Rights Act 22 of 1994 (as amended) against the relevant properties.

## **9.3 Servitudes**

A land audit was conducted by GeoAfrika Surveys. The purpose of the land audit is to identify any land encumbrances in the form of servitudes and restrictive conditions that might affect the properties from further development.

The Deeds Registries Act No 47 of 1937 defines a servitude as limited real right registered in the Deeds Office against the title deed of a property in terms of which a burden is imposed on an immovable property restricting the rights, powers or liberties of its owner to a greater or lesser extent in favour of either another person or the owner of another property.

A number of servitudes extend over the properties. These servitudes comprise electrical powerline servitudes, right of way servitudes as well as pipeline servitudes. Each servitude is registered at the Surveyor General's Office and illustrated on the relevant SG diagram as well as in the Deeds Office and noted in the relevant Title Deeds. Figure 31 illustrates the various servitudes.

## **9.4 Notarial tie**

A notarial tie of land binds contiguous properties together and these properties cannot be sold to third parties individually. This notarial tie was registered in order to secure a buffer area around Cato Ridge Works. The notarial tie is shown in Figure 32.

To enable the development of the land, this notarial tie may be lifted/removed through an application that is submitted simultaneously to the township establishment or rezoning application. Subsequent to the adoption of SPLUMA, the municipality now has the authority to remove the notarial tie.

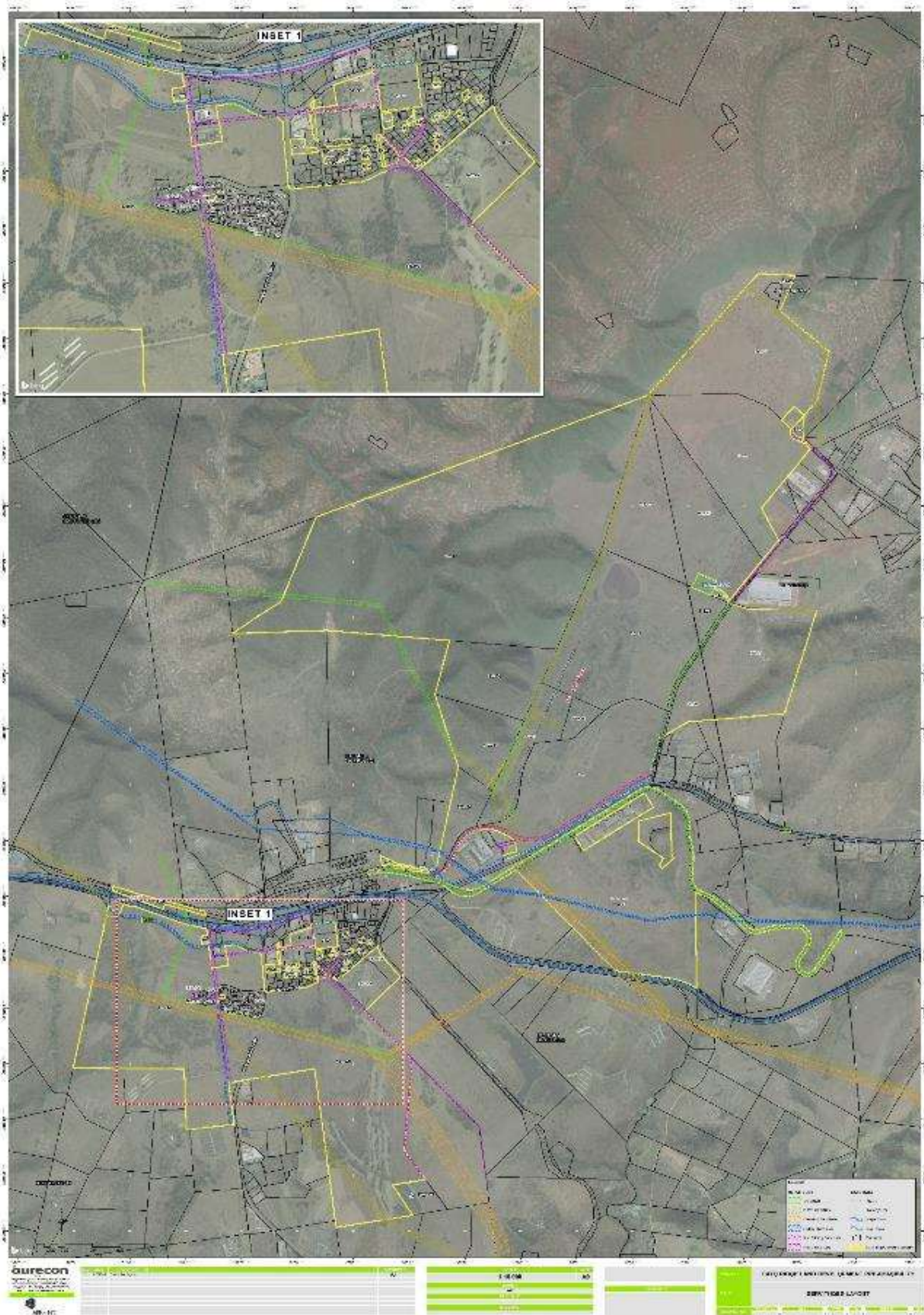
## **9.5 Zoning**

In the Due Diligence phase, Aurecon obtained eThekweni's open-source GIS zoning database to determine the existing zoning rights of the properties. This is unofficial confirmation from the municipality of zoning rights.

In this phase of the project, Aurecon requested the official Zoning Certificates to be issued for each of Assmang's properties. A zoning certificate is an official document from the municipality which describes the zoning and developmental rights of a property. This is done by going through the town planning records to see what applications have been approved on that portion of land and what conditions were granted with approval.

Given the information that has been received from the municipality, there seem to be many inconsistencies at eThekweni about the correct zonings of certain properties. The majority of the land development area to the north of the N3 is currently zoned as General Industrial 2 as per the zoning certificates obtained from eThekweni Municipality. This current zoning is favourable towards the proposed development since the proposed land uses will require a zoning of General Industrial 2. This means that for most of the proposed uses in the land development area, no rezoning will be required as part of the land development process.

The existing zonings, as per the zoning certificates are shown in Figure 33.



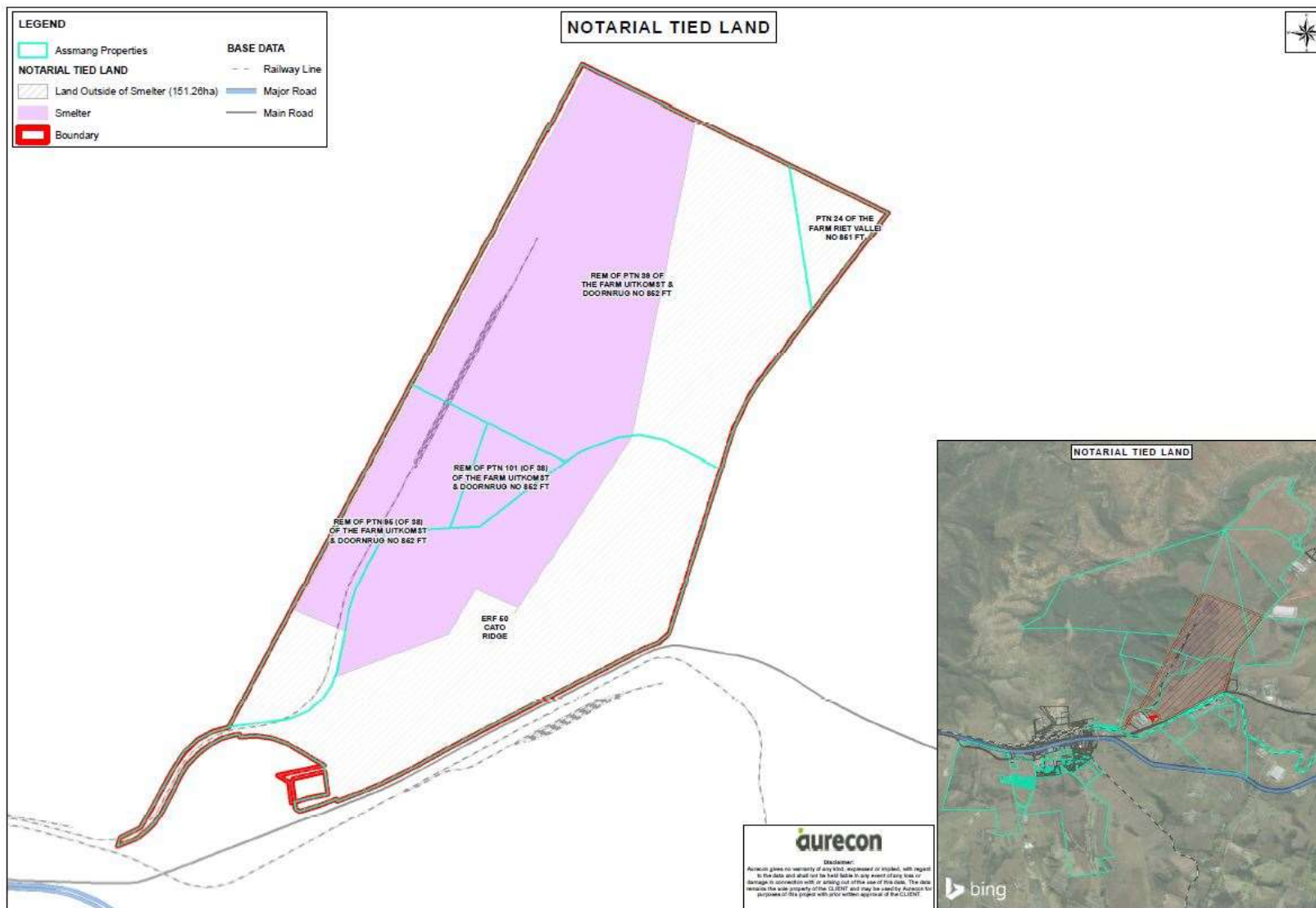


Figure 32: Notarial tie

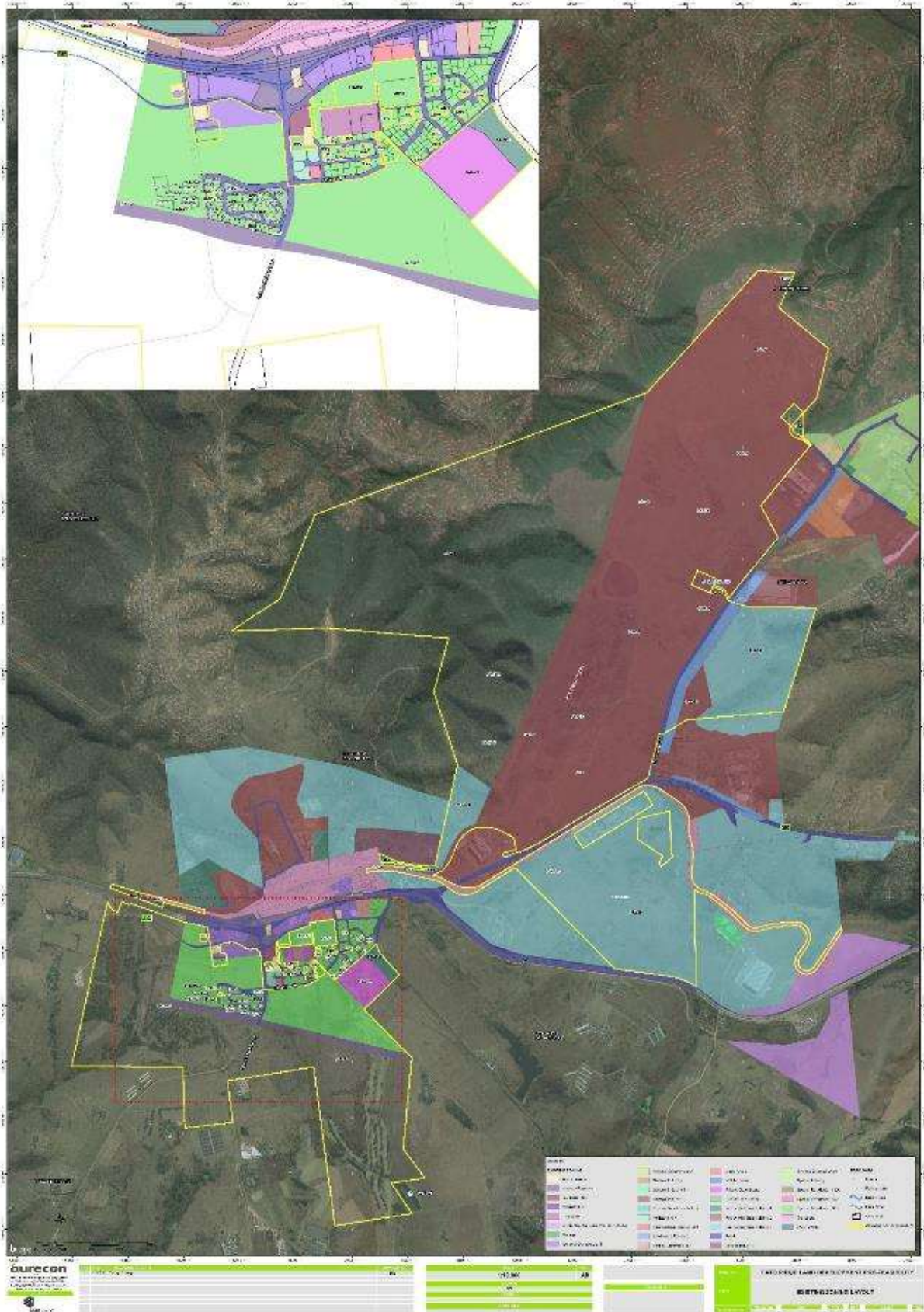


Figure 33: Existing zoning

## 9.6 Social facilities assessment

The Cato Ridge LAP includes a land use framework which is intended to identify land for the efficient and sustainable expansion of the metropolitan area at Cato Ridge and to enable the establishment of a mix of land uses that will be appropriate and/or necessary to support the development of an emerging strategic economic role that has been identified for the area. Furthermore, the framework also promotes the development of a mix of land uses accompanied by a set of strategic spatial structuring tools and associated development controls that will promote the establishment of efficient and sustainable urban and rural settlement forms. In relation to social facilities, the objectives of the land use framework are, but not limited to:

- Ensuring the establishment of an appropriate range of regional and local level community facilities; and
- Promoting the productive and recreational use of the landscape for agriculture, tourism, recreation and amenities.

To achieve the above-mentioned objectives, the Cato Ridge LAP provides analysis of the demand for social facilities based on a population threshold of  $\geq 100\ 000$  people. The demand is illustrated in Figure 34 below.

| CSIR ACCESSIBILITY APPROACH                                                        |                                     |                                 |                     |                   |          |                    |                        |                                 |
|------------------------------------------------------------------------------------|-------------------------------------|---------------------------------|---------------------|-------------------|----------|--------------------|------------------------|---------------------------------|
| B: Social Facilities required for Metropolitan Cities ( $\geq 1\ 000\ 000$ people) |                                     |                                 |                     |                   |          |                    |                        |                                 |
|                                                                                    | CSIR AVERAGE THRESHOLD (POPULATION) | ACCEPTABLE TRAVEL DISTANCE (KM) | PROVISION CRITERIA  | EXISTING FACILITY | REQUIRED | SURPLUS/ SHORTFALL | MINIMUM SITE SIZE (ha) | COMMENT                         |
| <b>EDUCATION</b>                                                                   |                                     |                                 |                     |                   |          |                    |                        |                                 |
| Primary School                                                                     | 7,000                               | 5km                             | C                   | 19                | 15       | -4                 | 1.40                   |                                 |
| Secondary School                                                                   | 12,500                              | 5km                             | C                   | 8                 | 8        | -                  | 2.60                   |                                 |
| <b>HEALTH &amp; EMERGENCY FACILITIES</b>                                           |                                     |                                 |                     |                   |          |                    |                        |                                 |
| Community Health Centre                                                            | 100,000 to 140,000                  | 90% of population with 5km      | C                   | 0                 | 1        | 1                  | 1.50                   | To be accommodated in Fredville |
| Primary Health Clinic                                                              | 24,000 to 70,000                    | 90% of population with 5km      | C                   | 1                 | 1        | 0                  | 0.50                   |                                 |
| Police Station                                                                     | 40,000 to 100,000                   | 8km                             | C                   | 0                 | 1        | 1                  | 0.10                   | To be accommodated in Fredville |
| Fire Station                                                                       | 80,000 to 100,000                   | 5-23min (response time)         | C                   | 1                 | 1        | -                  | 0.30                   |                                 |
| <b>SOCIAL &amp; CULTURAL (PUBLIC SERVICE FACILITIES)</b>                           |                                     |                                 |                     |                   |          |                    |                        |                                 |
| Regional Library                                                                   | 200,000                             | 15km                            | C                   | 0                 | 1        | 1                  | 0.03                   | To be accommodated in Fredville |
| Local Library                                                                      | 20,000 to 70,000                    | 8km-10km                        | C                   | 1                 | 1        | 0                  |                        |                                 |
| Museum [Small/Medium]                                                              | Variable                            | Variable                        | D                   | 0                 |          |                    |                        |                                 |
| <b>SOCIAL SERVICES</b>                                                             |                                     |                                 |                     |                   |          |                    |                        |                                 |
| Community Hall [Medium/Small]                                                      | 10,000-15,000                       | 10km                            | D                   | 7                 | 5        | -2                 | 0.20                   |                                 |
|                                                                                    |                                     |                                 | EXISTING POPULATION | 74 947            |          |                    |                        |                                 |
|                                                                                    |                                     |                                 | FUTURE POPULATION   | 103 977           |          |                    |                        |                                 |

### Criteria Categories

C – Compulsory (basic essential service)

D = Discretionary (non-essential provision based on under supply/unserved need, distance or other factors including funding availability)

R = Recommended (valuable services that are unfunded or non-essential)

**Figure 34: Cato Ridge LAP social facilities demand**

The social facilities demand figures are based on the *CSIR Guidelines for the Provision of Social Facilities in South African Settlements*<sup>15</sup>. The purpose of the model is to determine, on a high level, what type of and how much space would be required for social facilities in Cato Ridge in the future. As indicated in Figure 34, there is a shortfall of one (1) community health care centre, one (1) police station in the study area. The study area delineated in the LAP is indicated in Figure 35 below.

<sup>15</sup> Provision of social facilities in the guidelines provides sets of **access distance norms and population threshold provision values** for a range of settlement types. The values are based on the spatial provision and development of social facilities and public open spaces at different scales, with some variation in contexts. Guidelines are provided mainly in terms of demand thresholds, access and service level targets (defined as travel time or distance) and provide a framework for negotiating appropriate facility sizes within a range of contexts.



**Figure 35: Cato Ridge facilities study area**

The Cato Ridge LAP presents valuable insight into the demand for social facilities in the identified area, however the study area that was delineated excludes some of the surrounding areas that should be investigated given the spatial, social and economic dynamics and interdependencies in these areas. For this reason, and for purposes of this study, a new study area was delineated which includes Cato Ridge, Inchanga, Ximba, Mpumalanga, Camperdown and Ilanga to determine demand for social facilities. Whilst the main study area is Cato Ridge, the surrounding areas were included due to their close proximity to the Cato Ridge and the potential to leverage from existing and planned social facilities (within acceptable travelling distances) in these areas. Using the Large Town or Regional Centre settlement type/classification based on the *CSIR Guidelines for the Provision of Social Facilities in South African Settlements*, the demand for social facilities in the study was determined. The focus of the social facilities demand model is, more especially, the compulsory provision of the type of social facilities, which are basic and essential services that need to be provided.

Under the Health and Emergency services category, the social facilities model indicated a future demand for one (1) primary health care clinic and two (2) fire stations.

| Town Profile (Caperdown-CatoRidge-Ilanga-Inchanga-Mpumalanga-Ximba) |         |        |        |  |  |  |  |
|---------------------------------------------------------------------|---------|--------|--------|--|--|--|--|
| Population                                                          | 2001    | 2011   | 2030   |  |  |  |  |
| Population (add future date)                                        | 207,977 | 202852 | 231498 |  |  |  |  |

| Facility name                        | Average Threshold (Population) | Maximum Threshold (Population) | Acceptable Traveling Distance (KM)   | No. Facilities Required based on population | Provision criteria (C/R/D) | No. Current Facilities | Need/ Requirement |
|--------------------------------------|--------------------------------|--------------------------------|--------------------------------------|---------------------------------------------|----------------------------|------------------------|-------------------|
| <b>Health and Emergency Services</b> |                                |                                |                                      |                                             |                            |                        |                   |
| Community Health Centre              | 120,000                        | 140,000                        | 90% of population served within 5 km | 2                                           | C                          | 2                      | (0)               |
| Primary Health Clinic                | 47,000                         | 70,000                         | 90% of population served within 5 km | 5                                           | C                          | 4                      | 1                 |
| Fire Station                         | 80,000                         | 100,000                        | 8-23 minutes response time           | 3                                           | C                          | 1                      | 2                 |

Under the social and civic facilities, the social facilities model indicated a future demand for almost all facilities under this category, with community halls and cemetery presenting the largest demand.

| Town Profile (Caperdown-CatoRidge-Ilanga-Inchanga-Mpumalanga-Ximba) |                                |                                |                                     |                                             |                            |                        |                   |
|---------------------------------------------------------------------|--------------------------------|--------------------------------|-------------------------------------|---------------------------------------------|----------------------------|------------------------|-------------------|
| Population                                                          | 2001                           | 2011                           | 2030                                |                                             |                            |                        |                   |
| Population (add future date)                                        | 207,977                        | 202852                         | 231498                              |                                             |                            |                        |                   |
|                                                                     |                                |                                |                                     |                                             |                            |                        |                   |
| Facility name                                                       | Average Threshold (Population) | Maximum Threshold (Population) | Acceptable Traveling Distance (KM)  | No. Facilities Required based on population | Provision criteria (C/R/D) | No. Current Facilities | Need/ Requirement |
| Social and Cultural (Public Service Facilities)                     |                                |                                |                                     |                                             |                            |                        |                   |
| Local Library                                                       | 45,000                         | 70,000                         | 8-10km                              | 5                                           | C                          | 2                      | 3                 |
|                                                                     |                                |                                |                                     |                                             |                            |                        |                   |
| Civic                                                               |                                |                                |                                     |                                             |                            |                        |                   |
|                                                                     |                                |                                |                                     |                                             |                            |                        |                   |
| Home Affairs                                                        | 160,000                        |                                | 15km urban<br>25km rural hinterland | 1                                           | C                          |                        | 1                 |
|                                                                     |                                |                                |                                     |                                             |                            |                        |                   |
| Social Services                                                     |                                |                                |                                     |                                             |                            |                        |                   |
| Community Hall - Medium / Small                                     | 12,500                         | 15,000                         | 15km                                | 19                                          | D                          | 7                      | 19                |
| Post Office / Agency with post boxes                                | 15,000                         | creche                         | 5-10km                              | 15                                          | C                          | 3                      | 12                |
|                                                                     |                                |                                |                                     |                                             |                            |                        |                   |
| SASSA Office                                                        | Variable                       |                                | 15km urban<br>25km peri-urban       |                                             | C                          | 1                      | (1)               |
| Cemetery (Large)                                                    | 100,000                        |                                | 30km                                | 2                                           | C                          | 5                      | (12.25)           |
| Warshia Centre                                                      | 4,500                          | 6,000                          |                                     | 51                                          | C                          | 41                     | 10                |

Education facilities, specifically primary and secondary schools as well as SASSA Office and cemetery indicated a surplus. In addition, sports and recreational facilities also presented a high demand. This was, however difficult to determine based in the limited data that was available on sports facilities.

### 9.6.1 Limitations

- It is unknown if all of the social facilities in the study area were accounted for in the data sets that were available used for the demand model. This may contribute to inaccuracy of the future demand.
- The model does not account for the current standard or quality of the social facilities, but rather focuses on the quantitative measurement of social facilities in the study area. It is recommended that further studies be conducted to determine the current state of existing facilities

### 9.6.2 Service Area Analysis and accessibility

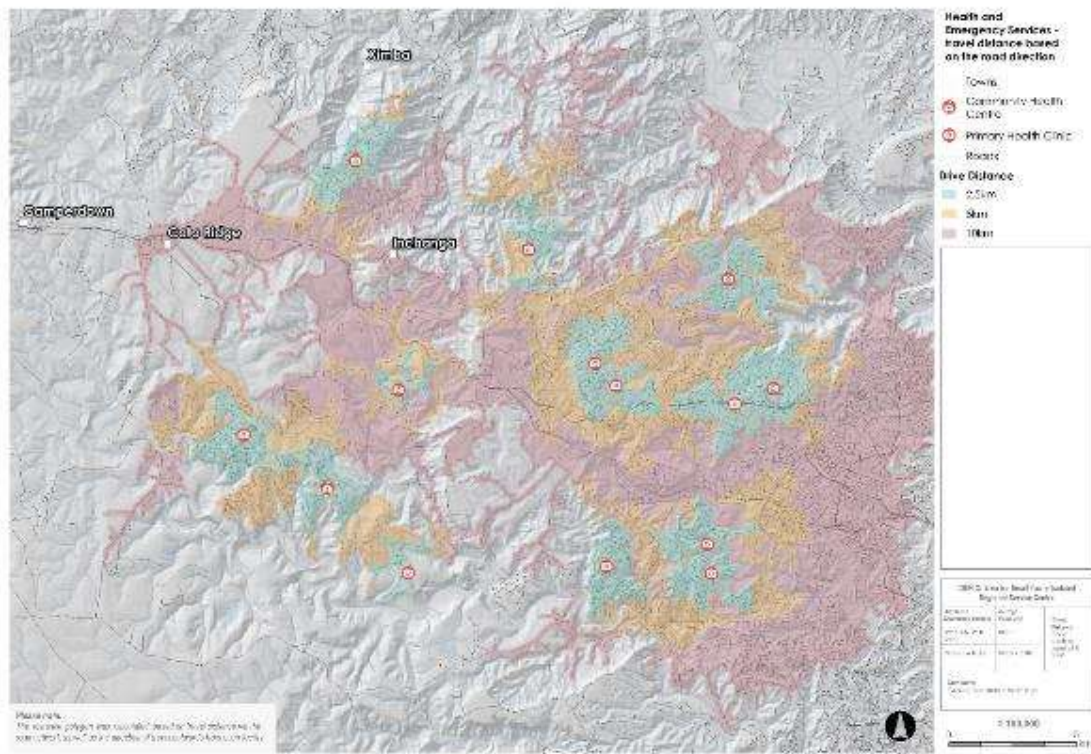
A service area analysis was conducted to determine the travel distances for each social facility in the study areas across the various types. The analysis enables visualization and measured accessibility of these facilities for the people located within the prescribed catchment area of a type of facility. The service area analysis takes into account accessible streets and a DEM (digital elevation model) to determine travel distance. The analysis was done for the following categories of social facilities:

- Health and emergency services.
- Education.
- Sports.
- Social and cultural services.

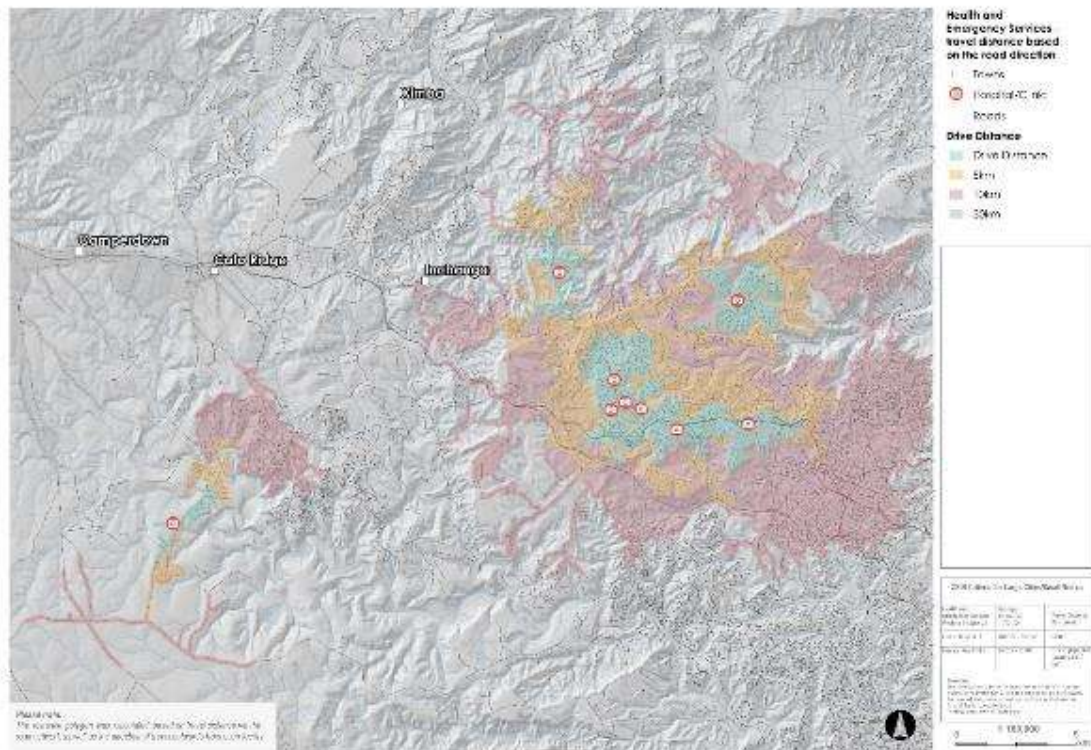
The norms and standards for acceptable travel distances are based on the *CSIR Guidelines for the Provision of Social Facilities in South African Settlements*. The following sections provide a brief discussion of the analysis under each social facility category.

### 9.6.3 Health and emergency services

Health care facilities are predominantly located to the east of Cato Ridge, with one only private hospital located in the Cato Ridge area. These health care facilities include hospitals, community health care centres and primary health care clinics. The service area analysis also indicates that there are no public hospitals within an acceptable travel distance of 40 km, nor are there public community health care centres or primary health care clinics that are within an acceptable travel distance of 5 km. Figure 36 and Figure 37 below is an illustration of the distribution of health care facilities in the in the study area.



**Figure 36: Travel distance for Community Health Care and Primary Health Care Facilities in the study area**



**Figure 37: Travel distance for Hospitals in the study area**

Service area analysis for the emergency services include police stations, fire stations and other (unclassified) types of facilities. Overall, the analysis indicates that access to police stations, fires stations and other emergency services is good, with the majority of Cato Ridge residents located within the acceptable 8-23-minute response time for emergency services and within 2.5 km for police stations.

#### **9.6.4 Education**

This analysis looks at 6 categories of education facility, namely combined schools, pre-primary schools, primary schools, secondary schools, special needs schools and tertiary institutions. The following is a summary of the service area analysis for the education facilities.

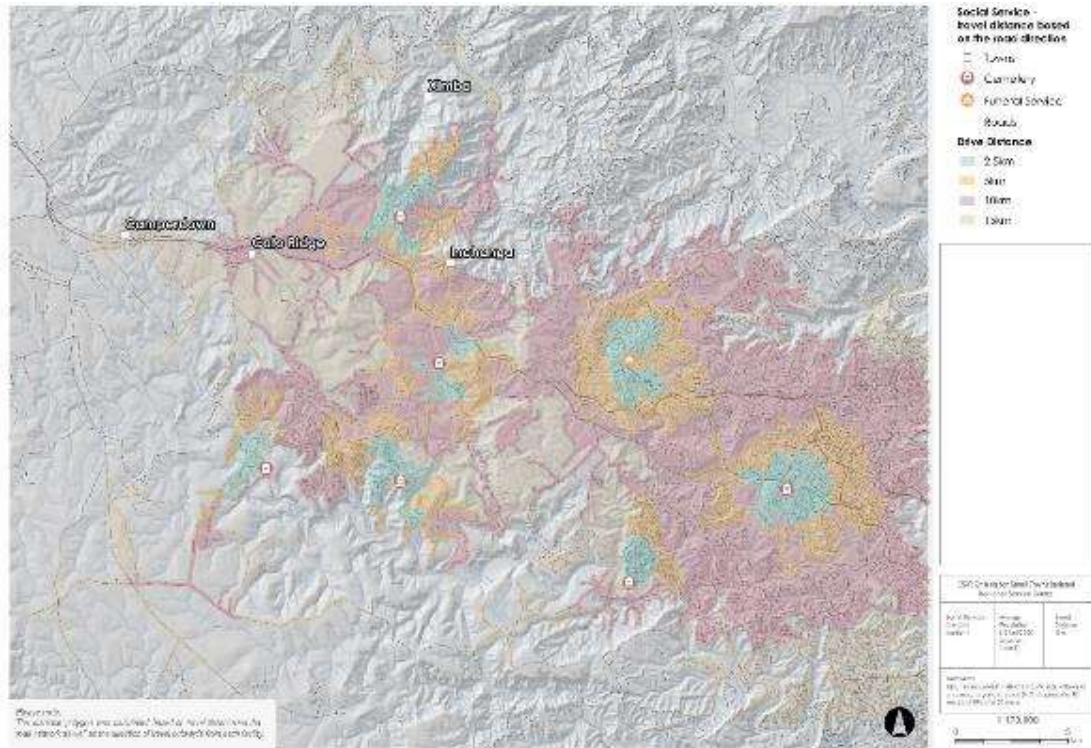
- Pre-primary schools: Pre-primary schools are located to the east of Cato Ridge with only 1 facilities in the Cato Ridge area. There are no pre-primary schools within the acceptable travel distance of 5km.
- Primary schools: Primary schools are located to the south, east and north of Cato Ridge with one school in Cato Ridge and one to the West.
- Secondary schools: Secondary schools are located to the south, east and north of Cato Ridge with one school to the west. There are no secondary schools within Cato Ridge. Moreover, only one secondary school is located within the acceptable travel distance of 5km.
- Combined schools: Combined schools are located to the south, east and north of Cato Ridge. There are no combined school within an acceptable travel distance of 5km from Cato Ridge.
- Special needs schools: There are two special needs education facilities located within the study area. Both are within the acceptable 25km travel distance from Cato Ridge.
- Tertiary institutions: Tertiary facilities are located to the east of Cato Ridge. Some are located within the acceptable travel distance of 20km from Cato Ridge.

#### **9.6.5 Sports**

The central part of Cato Ridge has one private sports facility within an acceptable travel distance. However, this facility is located to the south and east of Cato Ridge. There is a requirement for public recreational facilities to be provided to serve the community.

#### **9.6.6 Social and cultural services**

Service area analysis for the social and cultural facilities was based on access to community centres and halls, postal services, cemetery services and library facilities. Overall, Cato Ridge residents have access to all the above-mentioned facilities within the acceptable travel distance, however, cemeteries are the least most accessible as compared the other facilities. Figure 38 below indicates the travel distance to cemetery facilities and the overall distribution.



**Figure 38: Travel distance to Cemetery facilities in the study area**

## 9.6.7 Conclusion

The need for social facilities in the greater Cato Ridge areas has been considered particularly in respect of open spaces, recreation, schools and hospitals. The uptake of such public facilities will only become clearer after the approval of the land development application, but an indication of interest should be investigated during the consultation with public departments. The land may be preserved and purchased by the respective departments at a determined market related price. If no interest is shown, the demand can be tested in the private sector and if no interest is shown for such facilities in the private sector, the land can be released for alternative land uses.

# 10 Development Concept

## 10.1 Introduction

The preceding sections set the scene to inform the development concept and layout. This section will describe the envisaged future urban form and character of the site. It is important to create a flexible framework based on practical actions, ideas and solutions that will adapt to changing market conditions. The framework will provide guidance for capital budgets and future land use planning requirements and will be underpinned by a vision that will enable a positive change to the existing built environment. Two urban development concepts have been prepared. The first concept provides a framework for an optimal site development whilst the second concept illustrates a conservative approach taking into consideration all the environmental sensitivities, especially the KZN SS, into consideration. This resulted in two very different concepts as presented in Section 9.4.

## 10.2 Cato Ridge in Context

### 10.2.1 Strategic Location of the Site

Cato Ridge's strategic location is acknowledged on a national, provincial and local. From a national perspective, Cato Ridge is strategically located along the N3 corridor which connects from Durban to Gauteng. The importance of the N3 corridor is shown in its inclusion into the National Infrastructure Plan as Strategic Infrastructure Project (SIP) 2 which is aimed at strengthening the logistics and transport corridors between the major industrial hubs in the country. The development of Cato Ridge as a logistics hub has been identified by the Presidential Infrastructure Coordinating Committee ("PICC") as one of its Strategic Infrastructure Projects and thus classified as a catalytic development project by government and is supported by various departments and organs of state at the municipal, provincial and national level.

Towards the latter part of 2019 the Public Enterprises Minister assembled a working group to find a solution to the inefficiencies at the Durban harbour and the traffic gridlock leading to the port. A Port Decongestion Plan is to be presented by mid-February 2020. In response to this, the KZN Premier and MEC for Economic Development, Tourism and Environmental Affairs have been mandated through KwaZulu-Natal Trade and Investment (TIKZN) to establish a Project Brokering Unit (PBU). The Cato Ridge Logistics Hub Consortium is a participating member of the PBU, representing the role that Cato Ridge may play in decongesting the port through rail linkages.

Prior to this TIKZN committee, Cato Ridge as a Logistics Hub was listed as one of 25 priority investment opportunities in KZN. This has been endorsed by the MEC. This followed from the KZN Growth Development Study (GDS) which designates Cato Ridge under the KZN Industrial and Logistics Hub (Region 1).

On a local level, the policies, plans and frameworks of eThekweni support the strategic intent for the development of Cato Ridge. The SDF includes the area into its Primary Investment Corridor, which has resulted in the development of the Cato Ridge LAP to demonstrate the municipality's intent.

All plans and policies have consistently identified the Cato Ridge portions to the north of the N3 as strategically located and ideally suited for industrial development, with a specific focus on logistics. The need to develop Cato Ridge village with supporting facilities and land uses has also been identified.

## 10.3 Industrial Parks Overview

### 10.3.1 SEZs, IDZ and Industrial Parks

According to the policy on the development of Special Economic Zones ("SEZs") in South Africa, SEZs were implemented in order to advance government's strategic objectives of industrialisation, regional development and job creation. Of particular interest is Government's aim of expanding the manufacturing sector and the creation of additional industrial hubs to regionally diversify the national industrial base.

A SEZ is defined as "a geographically designated area of a country set aside for specifically targeted economic activities, which are then supported through special arrangements, which may include laws, and support

systems to promote industrial development”<sup>16</sup>. The SEZ programme is a tool that is used by many economies to promote trade, economic growth and industrialisation. Furthermore, an SEZ is an economic development tool to promote rapid economic growth by using incentive packages to attract targeted investments and technology. The zones act as a magnet for investment in desirable activities in specially designated areas by providing quality infrastructure complemented by an attractive incentive package(s), business support services, cluster development and minimal red tape.

SEZs are essentially an expansion of the Industrial Development Zone (“IDZ”) programme launched in 2000 by the South African Government. IDZs had the core focus of acting as a vehicle to attract foreign direct investment (“FDI”) as well as exporting value-added commodities. The purpose of the SEZ programme is to:

- Clarify and strengthen governance arrangements, while expanding the range and quality of support measures beyond the provision of infrastructure;
- Provide a framework for a predictable financing framework and arrangements to enable long term planning;
- Expand the strategic focus to cover diverse regional development needs and improve design deficiencies of IDZ; and
- Provide a clear predictable systemic planning framework for the development of a wider array of SEZ to support industrial policy objectives.

SEZs require the development and application of special economic systems, policies and support measures that are responsive to the strategic intents and needs of the host region, investors, and other key stakeholders.

The benefits of operating within an SEZ includes:

- 15% corporate tax;
- Building allowance;
- Employment incentive;
- Customs-controlled Area;
- 12i tax allowance; and
- SEZ Fund.

IDZ on the other hand are purpose-built industrial estates linked to an airport or seaport that leverages domestic and foreign fixed direct investments in value-added and export-oriented manufacturing industries and services.

IDZs were introduced in 2000 in order to increase foreign direct investment with the aim of increasing economic growth, employment and inclusion of previously disadvantaged and marginalised communities. Between 2001 and 2014, five (5) IDZs were designated, as follows: Coega (2001), OR Tambo International Airport (2002), East London (2002) and Richards Bay (2002), with Saldanha Bay achieving designation much later in 2013. From 2002 to 2010, a total of 38 investors were attracted into the IDZs with more than R12.8 billion investments generated, and more than 41 thousand jobs created (Steyn, 2011). During the 2017/18 financial year the East London IDZ (ELIDZ) and Coega (CDC) created more than 21 400 jobs (Zuzile, 2018). The ELIDZ has created 4 165 jobs and secured 14 new investors with a combined impact value of R937.7 million (Zuzile, 2018).

Unlike many SEZs around the world, investors in South Africa’s IDZs receive no special incentives. The zones also do not deviate from the social, labour, and environmental legislation in force elsewhere in the country. The stated reason for this was an unwillingness to distort the economy, but it has meant that IDZs have not been able to offer investors a more attractive environment.

All South Africa’s IDZs were exclusively government-owned, promoted and financed. The management and delivery of services to firms is the responsibility of a zone operator, all of which are owned by provincial and local governments. This runs counter to the global trend, which is shifting towards greater private sector involvement in owning, operating, and promoting SEZs.

Given the development of national economic policies and strategies, such as the New Growth Path and the Industrial Policy Framework, a review of the programme began in 2007. The main criticism or limitation to the

<sup>16</sup> Department of Trade and Industry. (2012). Policy on the development of Special Economic Zones in South Africa. Available: [http://www.gov.za/sites/www.gov.za/files/34968\\_gen45.pdf](http://www.gov.za/sites/www.gov.za/files/34968_gen45.pdf).

concept of IDZ, is that they had to be specifically located near sea or international airports, which in effect excluded other regions in South Africa that had industrial development potential but did not meet the geographic IDZ criteria. In comparison with IDZ, SEZ offers a more inclusive industrial facilitation model. IDZ also presented government with the following challenges or key constraints to success:

- Dependence on government funding;
- Lack of targeted investment promotion measures;
- Insufficient guidance related to governance arrangement;
- Lack of coordinated planning arrangements; and
- Inadequate coordination across government agencies.

Industrial parks are facilities (buildings) that are set aside for production and business services to attract new businesses by providing integrated infrastructure in one location and providing localised environmental controls that are specific to the needs of an industrial area.

The DTI has been mandated to revitalise old industrial parks to allow them to serve as catalysts for broader economic and industrial development in their host regions. The response was the creation of the Industrial Parks Revitalisation Programme. The objectives of the Programme were to accelerate economic development in the lagging regions such as the old homelands and rural areas, and also to support job creation in manufacturing and related sectors so as to arrest negative externalities associated with urban congestion. In this context, these industrial parks function differently from those in the category of SEZs.

Phase 1 of the Programme covered security infrastructure upgrades, fencing, street lighting, top structures and critical electricity requirements. Phase 2 dealt with engineering designs and construction of new and existing roads, bulk water supply and sewerage treatment plants or industrial effluent control. Phase 3 dealt with upgrades of electricity infrastructure and to build new top structures that were in line with the expansion programme of the industrial parks. Phase 4 dealt with the development of sustainable industrial clusters in industrial parks.

# SA's 10 industrial and special economic zones

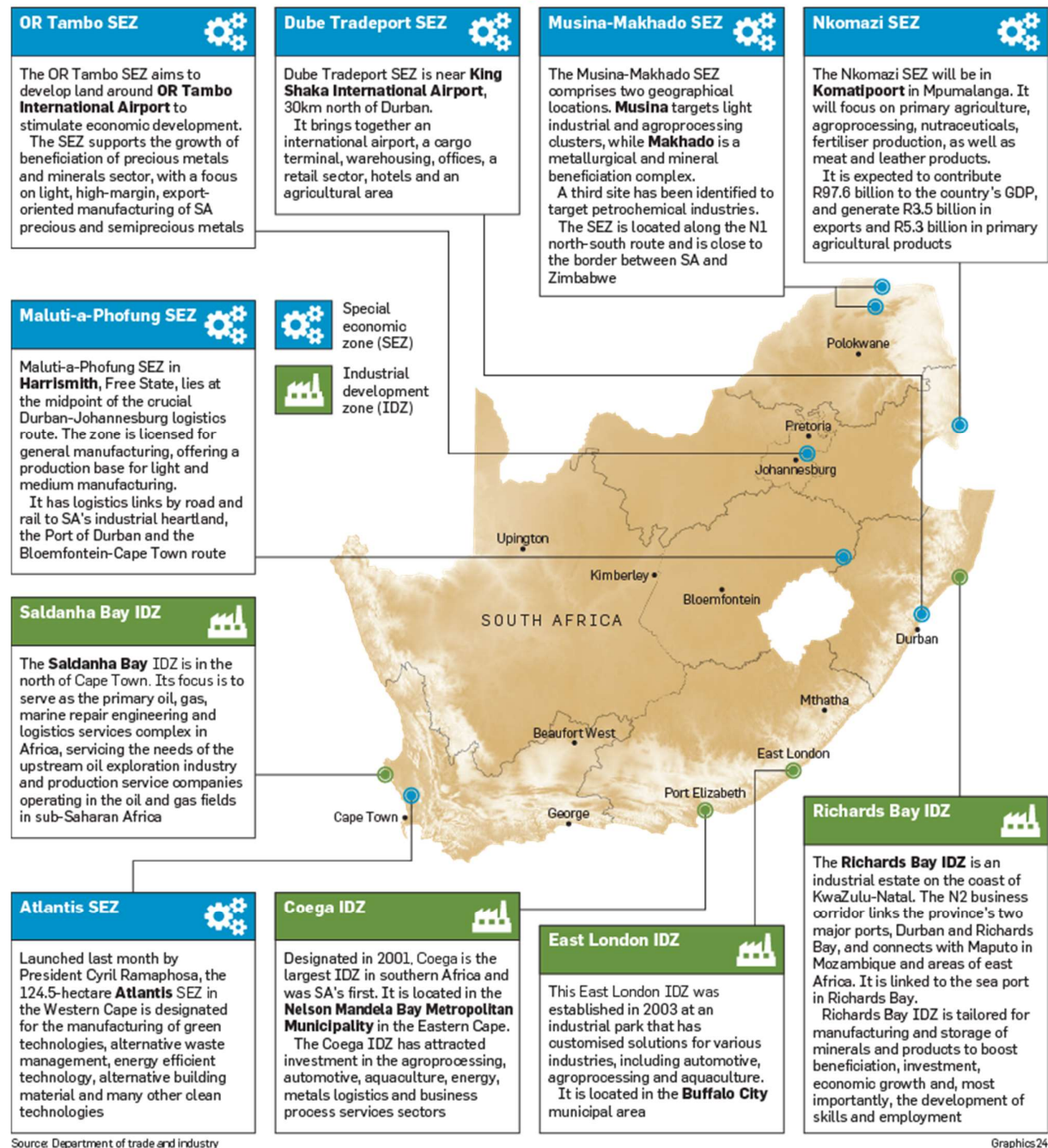


Figure 39: Industrial and Special Economic Zones in South Africa

## 10.3.2 SEZ in KZN

### Dube TradePort SEZ

The Dube TradePort is located approximately 30 minutes from the Durban city centre, 90 minutes from the Richards Bay Harbour and in close proximity to the King Shaka International Airport. The Dube TradePort has been designed in terms of the Special Economic Zone Act, 16 of 2014 and endeavours to enhance the country's manufacturing and export capabilities as well as to attract foreign direct investment.

Dube TradePort is a catalyst for global trade and a portal between KwaZulu-Natal and the world. It is the only facility in Africa that brings together an international airport, a cargo terminal, warehousing, offices, a retail sector, hotels, and an agricultural area. Furthermore, the Dube TradePort SEZ hosts a number of value-added business solutions that support businesses within the precinct. The TradePort enjoys government support for

investor-related infrastructure from the Department of Trade and Industry. The Provincial Government also provides financial support and resources necessary to manage and implement the SEZ.

The Dube TradePort includes the following precincts:

- Dube TradeZone - A prime, fully serviced industrial precinct of 77 hectares, growing to 300 hectares, for electronics, pharmaceuticals and aerospace manufacturing, assembling, and distribution;
- Dube Cargo Terminal - A state-of-the-art cargo handling facility with digital tracking and secure cargo flow through on-site statutory bodies, which prides itself on 0% cargo loss since inception in 2010;
- Dube AgriZone - An advanced agricultural precinct that provides world-class facilities and technical support for propagating, growing, packing and distributing high-value perishables and horticultural products through an efficient supply chain;
- Dube City - A 12-hectare premium business and hospitality precinct, just 3 minutes from the passenger terminal;
- Dube iConnect - A cutting-edge telecommunications platform and premier cloud service provider, servicing the Dube TradePort precinct and KwaZulu-Natal's only locally-hosted cloud service, making it the premier offering for regional data recovery.



**Figure 40: Dube TradePort Master Plan**

### 10.3.3 Industrial Park, IDZ, SEZ Best Practice

Industrial land is typically land bought by a private entity that is then rezoned and subdivided into various land parcels by local government for industrial use and upgraded with the necessary infrastructure. Land parcels are subsequently sold off or rented to tenants. Management is low, with limited institutional arrangements and virtually no government involvement after rezoning.

Industrial parks that do not belong under the categorisation of SEZs are typically regarded as industrial estates. It is often used as a tool to promote small scale industries and industrial activities in more rural or disadvantaged communities. Unlike SEZs, the focus is mostly on domestic markets.

Industrial parks have increased management arrangements, more organising principles in comparison to industrial land as industry players tend to converge towards these parks without incentives. Government typically provides limited support. In South Africa, the Industrial Park Revitalisation Programme is an example of broad Government support across all Industrial parks.



An important governance tool for resolving offsite/onsite and other private-public industrial park coordination challenges is the institution of dedicated Governmental “steering committees” to help oversee the development of the park, with at least some form of private sector representation (usually by the developer and/or tenants).

Steering committees typically take on such functions as:

- Approval of the land-use masterplan;
- Coordination of its off-site utility service delivery with existing utility providers; and
- Obtaining their commitment to supply unmet utility requirements.

It is therefore important to consider the establishment of a development steering committee with the eThekweni Metropolitan Municipality or to firm up the position of Assmang as a major stakeholder and land owner in the existing structures.

**Table 8: Private sector development roles**

| Preparation of the Land                                                                                                                                                                                 | Provision of Infrastructure                                                                                                                          | Provision of Utilities and Other Services                                                                                               | Marketing and Leasing                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>■ Creates a final land use master plan;</li> <li>■ Prepares the land accordingly; and</li> <li>■ All pre-construction steps of grading and levelling.</li> </ul> | <ul style="list-style-type: none"> <li>■ Construction of onsite infrastructure (offsite service provision generally falls to Government).</li> </ul> | <ul style="list-style-type: none"> <li>■ Utilities may be provided via onsite network using a variety of transaction models.</li> </ul> | <ul style="list-style-type: none"> <li>■ Experienced private developers often have a network of multinational clients to which they can market new SEZ opportunities (national image building is performed by the public sector).</li> </ul> |

Source: Gauthier (2011)

**Table 9: Public sector roles in SEZ operation**

| Preparation of the Land                                                                                                                                                                                                                                                                                                                                                                                | Provision of Infrastructure                                                                                                                                                                                                                                                                                                    | Provision of Utilities and Other Services                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>■ Facilitate licensing, permitting and regulatory services within the SEZ; particularly relating to land use, business licensing, environmental permitting, and labour regulation including foreign work permits and inspections;</li> <li>■ Facilitate utilities provision; and</li> <li>■ Set fees commensurate with the cost of service delivery.</li> </ul> | <ul style="list-style-type: none"> <li>■ In the delivery of certain other government services (i.e. customs and tax administration, etc.), the regulator should coordinate this delivery with them; and</li> <li>■ Enter into service delivery agreements or memoranda of understanding with key Government bodies.</li> </ul> | <ul style="list-style-type: none"> <li>■ Monitor compliance with the SEZ legal framework through risk-based monitoring and inspection techniques, and enforce compliance through appropriate penalties independently from other public agencies.</li> </ul> |

Source: Gauthier (2011)

## Area requirements

Given the sheer number of industrial parks around the world of varying size and success, it is challenging to find globally accepted norms with regards to area or land size requirements. Table 10 provides minimum area requirements and takes into account the global economic slowdown, adverse tax changes, that contribute to developers’ inability or difficulty to fill large areas of designated land. Table 10 also distinguishes between special category states and normal states. The categorisation affects total size, as the industrial park located near more established cities have a higher spatial requirement than those that are located in less developed and resourced areas.

**Table 10: Area requirements**

| Type | For larger states | For special category state |
|------|-------------------|----------------------------|
|------|-------------------|----------------------------|

|                                                | <b>Min. Total area required</b> | <b>Processing area required</b> | <b>Min. Total area required</b> | <b>Processing area required</b> |
|------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>Multi product</b>                           | 1 000ha                         | 35%                             | 200 ha                          | 35%                             |
| <b>One / more services</b>                     | 1 000ha                         | 50%                             | 200 ha                          | 35%                             |
| <b>Sector specific / port / airport</b>        | 10 ha                           | 50%                             | 10 ha                           | 50%                             |
| <b>Electronic hardware and software</b>        | 10 ha                           | 50%                             | 10 ha                           | 50%                             |
| <b>Information technology enabled services</b> | 10 ha                           | 50%                             | 10 ha                           | 50%                             |
| <b>Gems and jewellery</b>                      | 10 ha                           | 50%                             | 10 ha                           | 50%                             |
| <b>Biotech / non-conventional energy</b>       | 10 ha                           | 50%                             | 10 ha                           | 50%                             |
| <b>Free trade warehousing zone</b>             | 40 ha                           | 50%                             | 40 ha                           | 50%                             |

Source: EPCES (2013)

### Financing

The developer generally takes on the main financial risk of the project and orchestrating its various components during the industrial park development. While the developer is usually from the private sector, in some cases the private sector may not be willing or able to take on the risk inherent in this role fully. If the project or the investment climate do not provide for a reasonable expectation of return, then a private sector developer will be unable to secure long term financing.

Governments can interject to enhance the attractiveness of SEZs to private partners, a Government can engage in a number of Government zone-enhancement investments to shift resource/risk allocation from the private sector, improve the terms and conditions of the transaction, and increase the likelihood of long-term project success, including:

- Discounted land prices or free land;
- Engineering and master planning;
- Building of offsite and “enabling” infrastructure; and
- Internal basic infrastructure – notably for more developmental projects.

There is clear intent by the municipality to provide enabling infrastructure in the various policy documents, but the actual application of the policies are falling short. There could be merit in engaging the municipality in a more structured way in the next phase of the project to forge a partnership with them that will ensure that the roles of the landowner and the municipality are better understood and agreed upon. As developers get involved in the later stages of the land development opportunity, they will take over the role as the private sector partner for a specific land development area to be developed. The land owner could take a coordinating role to ensure the overall vision of the masterplan is still maintained.

### Typical operating requirements

Some of the typical operating requirements (as well as key costs) include, but are not limited to:

- General management and administration;
- Engineering services;

- Utilities;
- Safety, health and environment; and
- Salaries, wages and service fees.

### 10.3.4 Industrial Park Ecosystem

This chapter provides an overview of an indicative operational framework that should be considered during the development of the Assmang industrial land.

The purpose of the framework is to offer direction to prospective developers relating to requirements and outcomes which they are able to incorporate these into their business model, conduct the necessary analysis and respond to the opportunity.

This framework provides the desired outcomes, strategy and requirements with respect to the following elements:

- **Targeted sectors and opportunities:** outlines the strategy that has been adopted with respect to target sectors and opportunities;
- **Tenant structure:** outlines the aspirations with respect to tenant diversity, the inclusion of SMMEs and the anchor tenant principle;
- **Infrastructure:** outlines the minimum requirements and other opportunities with respect to infrastructure;
- **Access control bounded environment:** describes the expectation for creating a bounded environment and access control;
- **Facilities and support services:** crucial to exploitation of the benefits of the Park and an outline of desired facilities and support services;
- **Training, research and development:** outlines the skills, product innovation and technology to penetrate market and exploit the proposed value chains;
- **Linkages:** are an essential part of creating an ecosystem in which the industrial park will prosper; and
- **Branding:** essential in penetrating markets the framework outlines the expectation in terms of regarding branding.

The industrial areas will encompass the entire industrial ecosystem consisting of the following:

- Raw materials;
- Manufacturing and processing;
- Packaging and repackaging;
- Logistics and distribution; and
- Warehousing.

The ultimate intention of this framework is to ensure that the industrial area in its entirety is able to sustain its own value chain and provide a world class facility with a unique collaborative approach where start-up and large-scale businesses can share, engage and connect.

### Strategy

The various sites offer unique opportunities to the industrial park. The areas in close proximity to the main routes are ideally situated for logistics and distribution facilities, the area directly south of the N3 offers ideal location advantage for small, medium and micro enterprises (SMME) facilities where tenants can capitalise on accessibility and visual awareness from the N3. Other areas are in close proximity to existing manufacturing and heavy industry and clustering of activities can create unique opportunities for similar uses.

The framework refrains from prescribing specific targeted products and/or value chains to allow the market and economic conditions to determine/inform the opportunities.

## Clustering

Whilst the framework does not outline the targeted opportunities, the desired outcome is that there is an element of clustering of activities. One of the key elements of the rationale of the industrial area is to derive benefits for the value chain through clustering and co-location. Significant research exists that support this philosophy. However, there is also an appreciation that this must be balanced against the dynamics of market demand.

Ideally, the following principles should be implemented into the strategy to realise the benefits of clustering and agglomeration:

1. Accommodating a significant portion of a Value Chain within the industrial park;
2. Products and or services that are required by multiple producers in the industrial park; and
3. Incorporating an anchor tenant approach.

## Tenant Configuration

In an industrial park of the proposed size of the proposed development at Cato Ridge, it is likely that the industrial park will provide a home to a range of industries in terms of size and operations who leverage and exploit the advantages of clustering.

This mix of tenants have been identified as:

- Large to multi-national scale business (possible anchor tenants);
- Medium to large sized business;
- Small business (SMMEs); and
- Incubators.

The presence of an anchor tenant is important to ensure the commencement of the investment with a pre-secured take-off, ensure critical mass at commencement and ensure the long-term sustainability of the industrial park. Anchor tenants also provide assurance of production, income generation and require spin-off industries that provide inputs and support to the anchor, which can then be filled by the medium and small businesses.

One of the aspirations is that the industrial park should be an enabler of SMMEs. This is in line with National Government's priority to unlock the potential of SMMEs to stimulate growth and job creation. The belief is that this industrial area could be an environment where SMMEs are supported to develop and grow into thriving enterprises and contribute to socio-economic development.

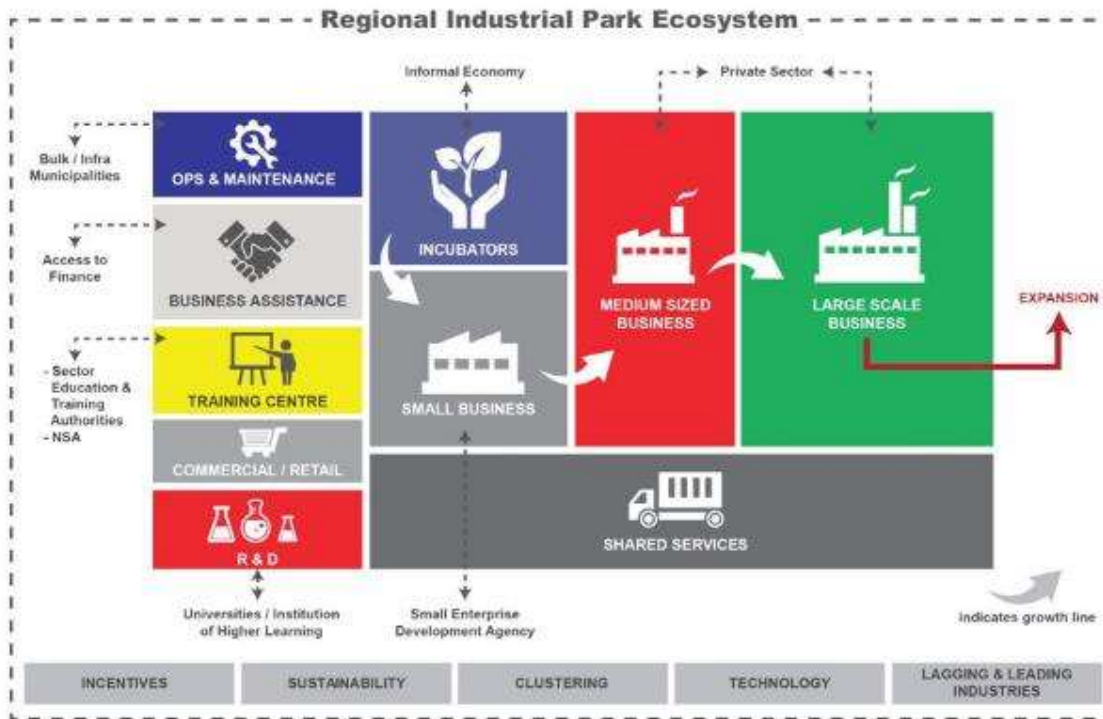
This desired outcome with respect to SMME development is referred to as the "growth model". This model assumes that incubated businesses who can exploit the benefit of:

- Shared services;
- Production inputs at competitive rates as a result of economies of scale;
- The synergies of smaller companies being co-located with large companies; and
- Other offerings of the industrial park including R&D, training and business assistance will grow beyond their natural organic trajectory.

They will then "graduate" through the various stages (i.e. become small, then medium and then large) and perhaps eventually be the catalyst for the industrial area's expansion, thus creating an internalised pipeline of demand for industrial space. Thus, it is required that the proposal from a prospective developer must include a strategy to include SMMEs into their business model.

Figure 41 below provides an indicative breakdown of the allocation of the industrial park to various tenants. There are no prescribed rules when it comes to exact splits between industries and a certain fluidity needs to exist in the land use split, however the principle of mix with large industries making up the bulk of the tenants.

It is reasonable to expect incubators and small businesses to occupy less area in the industrial park, with more being allocated to medium businesses and the majority of the area being allocated to the large-scale business (the anchor).



**Figure 41: Regional industrial park ecosystem**

### Challenges

Incorporating an SMME unit into a real estate endeavour that is expected to be driven by the private sector does present certain challenges with regards to commercialization.

From a financing perspective, a key aspect that banks scrutinize when considering providing a debt facility for a commercial land use development is the so-called "strength of the lease". The view is that banks scrutinize the ability of a tenant(s) to meet their rental obligation and thus there is a bias towards established, sustainable business where historical financial results are above average i.e. the notion of "blue chip" tenants. This phenomenon can be offset to a degree with anchor tenants, but it will still be a cause for concern.

The dichotomy then for the developer is to unlock finance to develop these spaces but at the same time balance the risk and aspirations of the industrial area.

## **10.4 Urban Development Concept**

### **10.4.1 High-Level Concept (Optimal site development concept)**

It is important to not only consider the relevant properties under investigation but to also consider the wider area surrounding the study area. The area south of the N3 is predominantly residential with some commercial activity along the N3. Development further south of the village is restricted by a number of electrical power line servitudes as well as environmental sensitivities in the form of floodlines and wetlands. By contrast, to the north of the N3 along the R103 and Eddie Hagan Drive, the predominant land use is industrial bordered by the AmaXimba community in the valley.

The existing urban form on either side of the N3 is vastly different as such, the concept should be developed in such a way as to complement the existing urban form and thereby creating attractive liveable spaces. Furthermore, this concept has been designed to make optimal use of the land and discounts the (KZN SS) found within the study area.

A number of new industrial parks have been developed near Hammarsdale and Mpumalanga. The M385 Road is seen as an important road which connects Cato Ridge, Hammarsdale and Mpumalanga with the N3 and forms a ring road. Due to this strategic importance, it lends itself to intensification along Uitkomst Street and Old Georgedale Road with general industrial activities envisioned, forming a light industrial node south of Cato Ridge.

Additionally, Cato Ridge's residential component is expected to expand westward and south from the existing built-up area. These new residential developments are on the periphery of Cato Ridge and should be characterised by low density single residential dwellings.

The existing Cato Ridge interchange along the N3 is expected to be upgraded in order to facilitate accessibility and ease of movement of a large volume of goods and passengers from both sides of the N3. Furthermore, the new KwaXimba interchange is proposed approximately 2.5 km east of the existing Cato Ridge interchange. This KwaXimba interchange will provide a new link between the N3, the R103 and Eddie Hagan Drive. Based on these expected upgrades, the properties along Eddie Hagan Drive are therefore ideally located for logistics operations.

The AmaXimba community lives along the northern border of the Cato Ridge development area. This community has limited access to job opportunities as well as community and retail facilities. As such, a new commercial node is proposed which will create retail and job opportunities for the community. SMME units are proposed in close proximity to the AmaXimba community to provide affordable commercial and general industry space for entrepreneurs to start or grow their business. Larger scale general industrial activities can be conducted between the SMME units and the area identified for logistics.

To the east and west of the proposed development is a pristine natural landscape which should be protected from future development.

A flexible design is critical to the success of a development of this size. In order to accommodate the change in demand and supply, a mix of erf sizes should be provided. Thereby allowing multiple erven to be consolidated to form a larger site or the subdivision of a larger site into smaller sites which would be in line with the demand within the area.

Figure 42 illustrates the high-level concept that has been prepared for the Cato Ridge development area. In order to visually illustrate the maximum development potential (mass and bulk) of this proposed concept, a 3D model was prepared and a few images of key areas are shown in Figure 44 to Figure 47.

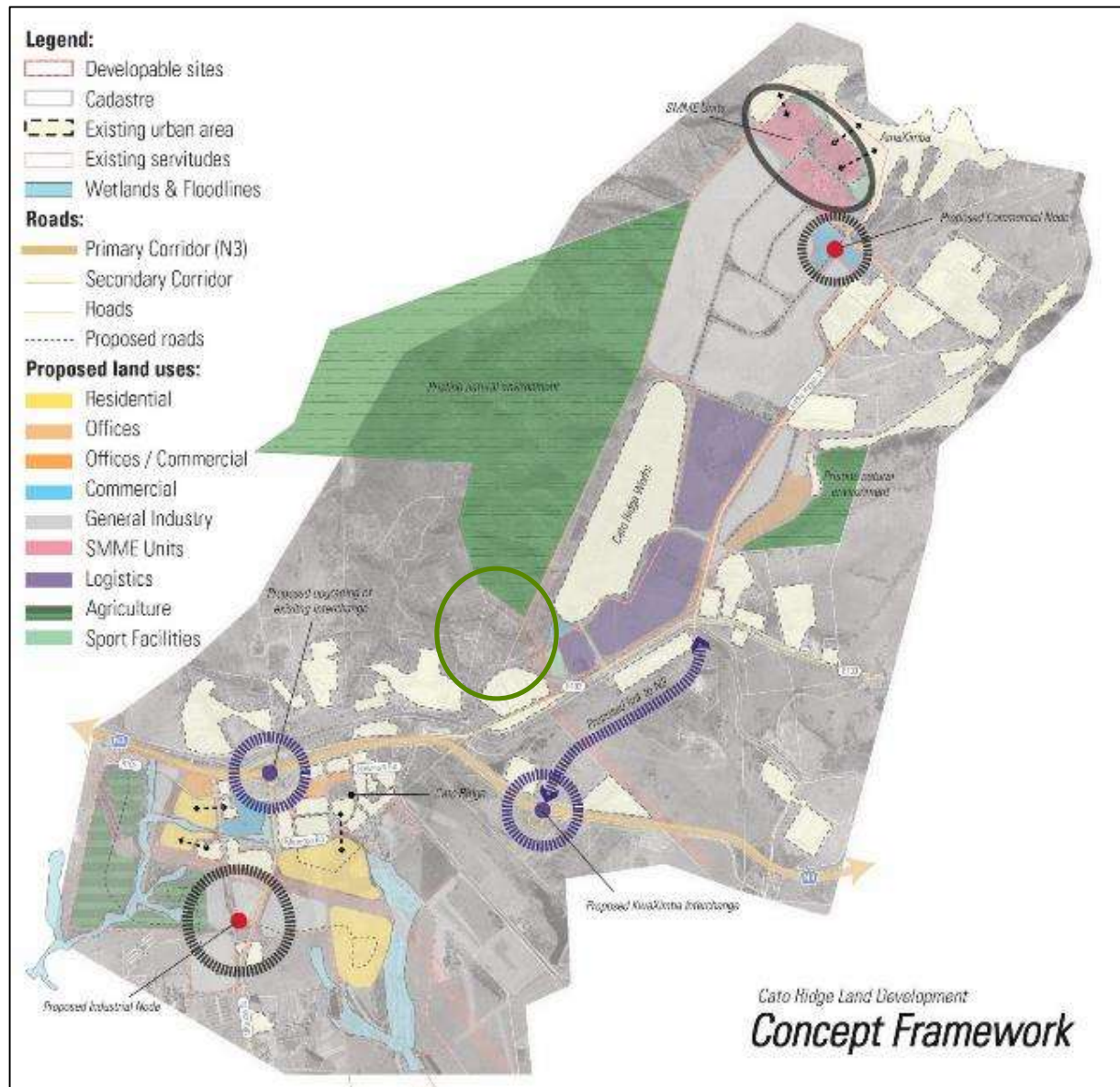


Figure 42: Concept Framework

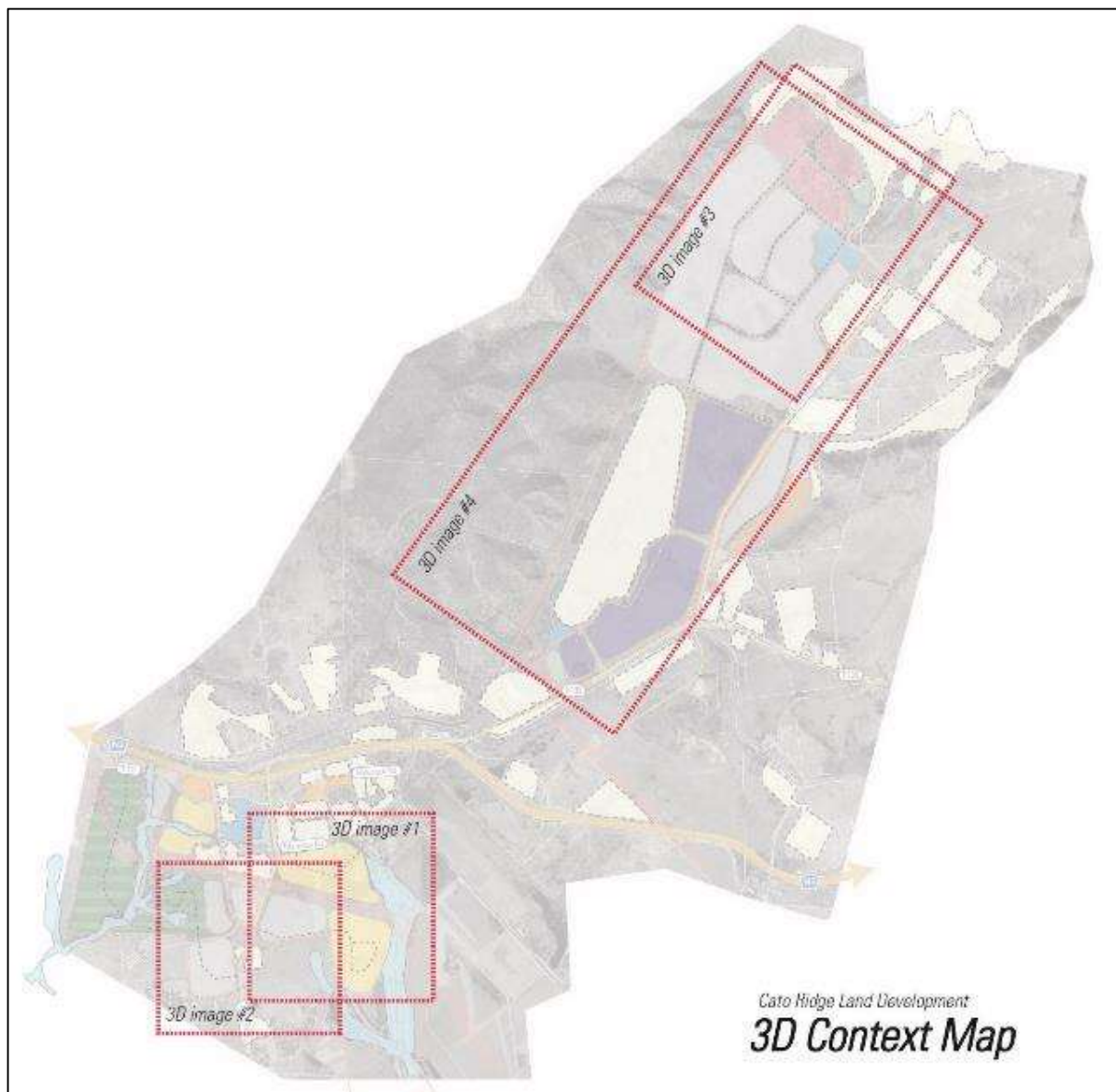


Figure 43: Contextual map of 3D images



Figure 44: Image #1 - Residential neighbourhood development potential south of Cato Ridge



Figure 45: Image #2 – Commercial & Industrial hub development potential south of Cato Ridge



Figure 46: Image #3 - Northern industrial land development potential

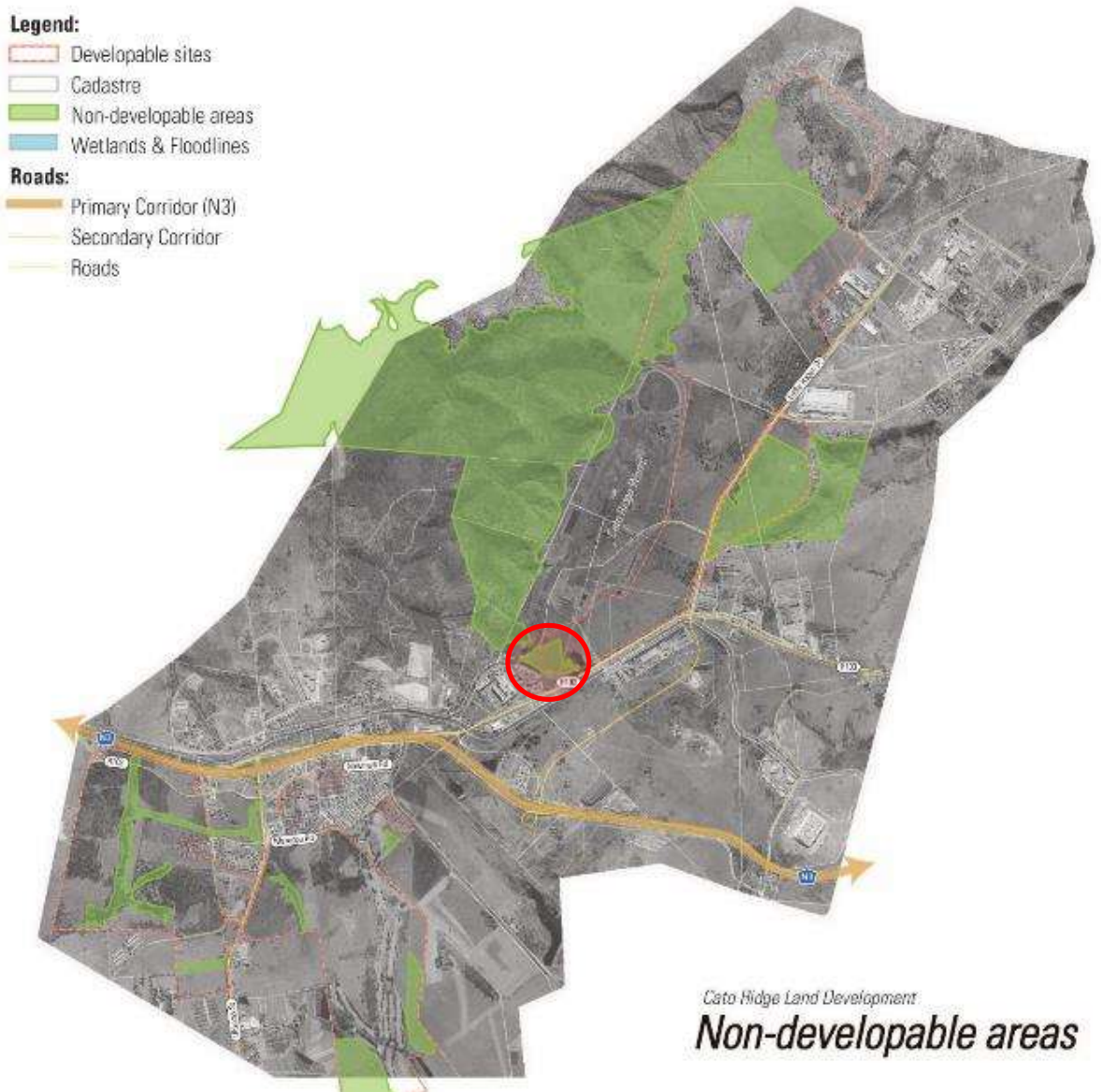


Figure 47: Image #4 - View of the industrial area development potential from the north-east

#### 10.4.2 Conservative Concept

The conservative concept is prepared in light of the updated environmental studies that was conducted in 2020. During the additional studies environmental sensitivities were found on the site which impacts on the developability of study area as well as the concept prepared.

Figure 61 illustrates the area impacted by the environmental sensitivities. The new layout proposes additional road design and erven in order to protect the environmental sensitivities. Where possible these environmental sensitivities will be incorporated into the layout, however no roads or new erven may traverse with these areas. The total area of land impacted by these environmental sensitivities are ha within the study area boundary. Due to the irregular shape and form of these sensitivities additional land could potentially not be developed.



**Figure 48: Areas constrained by environmental sensitivities**

The concept development illustrated on Figure 42 as well as the discussion layout illustrated on Figure 50 has been impacted by the findings of the environmental studies and more specifically the prevalent (KZN SS). Since it cannot be guaranteed that any approvals will be granted to develop some of the KZN SS; therefore, a new concept has been developed which excludes these environmental sensitive areas.

The amended, more conservative concept focuses on treating the KZN SS areas as non-developable areas. The areas largely impacted by the KZN SS are light industry towards the north of the N3 and a total of 166.97 hectares developable land has been lost due to the presence of the KZN SS.

**Legend:**

- Developable sites
- Cadastra
- Existing urban area
- Non-developable areas

**Roads:**

- Primary Corridor (N3)
- Secondary Corridor
- Roads

**Proposed land uses:**

- Residential
- Commercial
- SMME
- Light Industry
- Medium Industry
- Heavy Industry
- Agriculture

**Cato Ridge Land Development  
Conservative Concept Framework**

### 10.4.3 Discussion layout

Subsequent to the development of the concept more detail was allocated to the plan relating to the location of specific community facilities e.g. schools, religious facilities, creche's, etc. This is collated in what is referred to as the Discussion Layout. A number of iterations were performed over the course of the pre-feasibility phase incorporating inputs from municipal officials, technical experts, interested buyers and the client. The final Discussion Layout is illustrated in Figure 50 below.

The final layout aims to preserve the environmental sensitivities, while still incorporating a variety of land uses and erf sizes to enable attractive urban environments that are able to respond to the changing market conditions.

Similar, to the Concept Plan, agricultural land uses are proposed towards the south of Cato Ridge village. This is in line with the LAP and aims to protect the natural landscape. These agricultural sites are relatively large which will enable further subdivision in the future.

It is proposed to extend the existing residential areas south towards the wetlands and flood lines since residential land use has limited impact on these environmental sensitivities. It is envisioned that these residential areas will be low density with only one dwelling on each site. There is an interest to develop a motel along the N3. This motel is proposed to provide short term accommodation to people visiting specific industrial facilities and provide employment for members of the local community.

Community facilities such as schools, religious facilities and creches are ideally located within close proximity to the residential areas. The market study indicated the need for a new school as well as a healthcare facility. Additionally, Assemang and key stakeholders indicated the need for a TVET college. These facilities have been incorporated in the design together with a religious facility and a crèche. The school, crèche and religious facility have been located in close proximity to the proposed residential expansion. It is important that a safe and friendly environment is created for school children and parents walking to these facilities. The TVET college is proposed along Old Georgedale Road which is still very accessible and would act as a buffer between the higher income residential neighbourhood and the proposed industrial hub. A new public hospital is proposed along Uitkomst Street south of the existing town. This location is well located in terms of accessibility and can as such serve Cato Ridge and surrounding area.

There are a number of erven in Cato Ridge village which belong to the client which are currently still undeveloped. This proposed development is expected to attract people to the area and currently there are limited commercial opportunities within Cato Ridge. Therefore, infill development in the form of commercial facilities are proposed on these vacant and underdeveloped erven.

The area north of the N3 lends itself towards general industrial activities. This is due to the existing industrial activities already developed along the R103 and Eddie Hagan Drive. The area between the Cato Ridge Works, the R103 and Eddie Hagan Drive is ideally located for logistic facilities, especially with the planned interchange and new roads connecting Eddie Hagan Drive with the KwaXimba interchange.

With the AmaXimba living along the northern boundary of the land development area, it is important to scale the industrial erven to reduce the impact on the AmaXimba community. SMME units are proposed directly adjacent to the residential development. These units will provide accessible formal facilities of various sizes for the community to start new businesses as well as to expand existing business. Light industrial activities are proposed adjacent to the SMME units and the area towards the Cato Ridge Works are earmarked for medium industrial activities which includes the manufacturing and processing of goods. A limited number of heavy industrial erven have been earmarked directly adjacent to the Cato Ridge Works. Table 11 below gives an illustration of the various industrial typologies that can be explored.

**Table 11: Typical industrial typologies**

### Single-Tenant Light Industrial



**Description:** Build-to suit for a single tenant; fit for specialized design and manufacturing using equipment of technology-based activities.

### Multi-Tenant Industrial



**Description:** Speculative product, generally accommodating various small-scale assembly and warehousing activities.

### Single-Tenant Flex



**Description:** A flexible combination of functions, including office, R&D, high-tech processing, small scale distribution and showrooms.

### Multi-Tenant Flex



**Description:** Speculative product, including office, R&D, high-tech processing, small scale distribution and showrooms, ideal for start-ups.

### Warehousing / Distribution Centre



**Description:** Large footprint, single story building(s), primarily for the storage and distribution of goods serving logistics or retail companies.

### SMME



**Description:** Flexible space dedicated to start-up and early stage companies, also accommodating business assistance services.

### Mineral Resource Processing Facility



**Description:** Facility for extracting commercially valuable minerals from ores and mine wastes – also for fabrication of mineral products.

### Single Tenant Assembly Facility



**Description:** Build-to suit for a single tenant; fit for large-scale, high-volume fabrication and end-point assembly of product components.

### Food Processing and Packaging Facility



**Description:** Built for a single tenant; for processing of bulk ingredients into food products as well as final packaging and cold storage.



## 10.5 Additional design determinants

### 10.5.1 Railway sidings scenarios

The railway line that runs adjacent to the site is a key physical feature that has the potential to play a critical role in the design of the site. The Port of Durban's capacity constraints and Transnet's intention to consider decongestion possibilities opens the Cato Ridge site up to playing a regional role via the railway. The current site has potential for the development of new and re-instating of existing rail siding infrastructure for rail specific products.

The site straddles the Transnet Natcor line, the rail corridor that links Durban Port with Johannesburg at City Deep. The current infrastructure includes Cato Ridge station and staging yard, CRW siding, and several other non-operational sidings used by steam train hobbyists. The area is suitable to rail infrastructure with fairly flat grades, particularly on the sections that utilise the previously dismantled tracks.

#### Railway sidings scenarios

Whilst the layouts shown below, identify four possible scenarios, it should be noted that more permutations and alternative scenarios can be developed. At this stage, the most likely feasible scenarios are shown. These cover a range of potential siding configurations (in-line and balloon) and offer a variety of sizes / lengths, thus unlocking different areas within the site.

The site currently has an old dismantled siding which use to run adjacent to the R103, past Metallica Chemicals via a constructed rail-over-road bridge and northwards along Eddie Hagan Drive, past Harrison and Makro Distribution Centre. Although the rail superstructure (tracks, sleepers, ballast, signals) is no longer there, much of the underlying formation layers and cuttings are there, allowing for potential re-instatement of superstructure as opposed to completely new railway siding. This may effectively save up to 60% of railway construction costs.

It should also be noted that:

- For new sidings, land expropriation would be required for a railway corridor width of 18 m – 30 m width, depending on terrain and services required.
- The proposed scenarios provide a wide range of development solutions using rail due to its proximity to the Natcor line.
- The scenarios are indicative and can support small, medium and large development adjacent and within the proposed rail infrastructure.
- The major current limitations identified are road crossings. These can be overcome by means of bridge structures, or less favourably, level crossings for low trafficked roads like Road D1022.

#### Scenario 1

This scenario makes use of the existing railway siding that goes to the CRW. The siding continues over Road D1022 and is developed into a balloon with minimum curve radii of 300 m. This siding may serve multiple customers to the north of Road D1022 in addition to supporting the manganese works operations. Terrain slope at the balloon with average slopes being under 2% for both platform terraces and railway.

Limitations / conflicts include:

- Crossing of Road D1022.
- Northern tailings dam / dump encroachment at CRW.

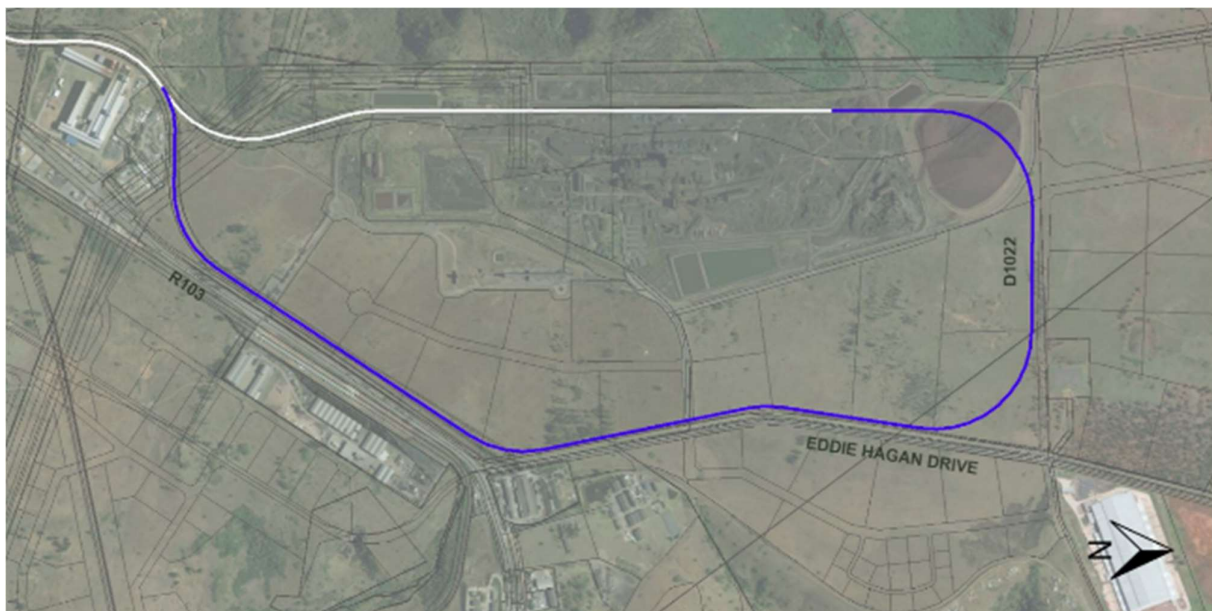


**Figure 51: Scenario 1**  
**Scenario 2**

This scenario is a large loop that follows a similar route to Scenario 1 in utilising the existing siding to the manganese works. The siding line then turns to the east and runs adjacent to Road D1022 and then runs southwards on the western side of Eddie Hagan Drive before reconnecting to the existing line at Safal Steel. In addition to utilising the existing manganese works siding, this scenario also makes use of 1.6 km of the dismantled track formation previously mentioned. North-South running grades are favourable at the southern end but gradually climb to 3.5% in the northern section.

Limitations / conflicts include:

- Crossing of two entrance roads to the works.
- Northern tailings dam / dump encroachment at CRW.



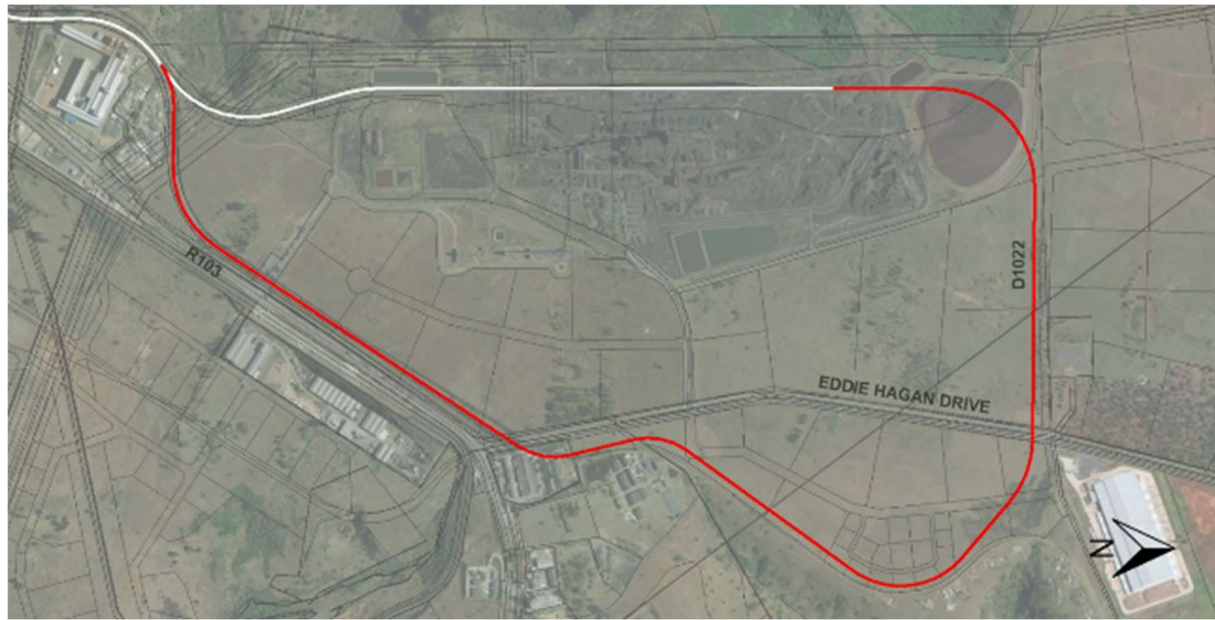
**Figure 52: Scenario 2**  
**Scenario 3**

Like Scenario 2, the large loop follows the same route except that the return side of the siding extends over Eddie Hagan Drive and follows the old demolished siding southwards back to the existing line connection at Safal Steel. The route crosses over Eddie Hagan Drive twice with the southern crossing utilising an existing rail-over-road bridge. In addition to utilising the existing manganese works siding, this scenario also makes use of 3.5 km of the dismantled track formation and existing bridge previously mentioned. North-South

running grades are similar to Scenario 2 and are favourable at the southern end but gradually climb to 3.5% in the northern section.

Limitations / conflicts include:

- Crossing of southern entrance road to the works.
- Crossing of Eddie Hagan Drive at Makro Distribution Centre.
- Northern tailings dam / dump encroachment at CRW.
- Some encroachment of Metallica Chemicals property.



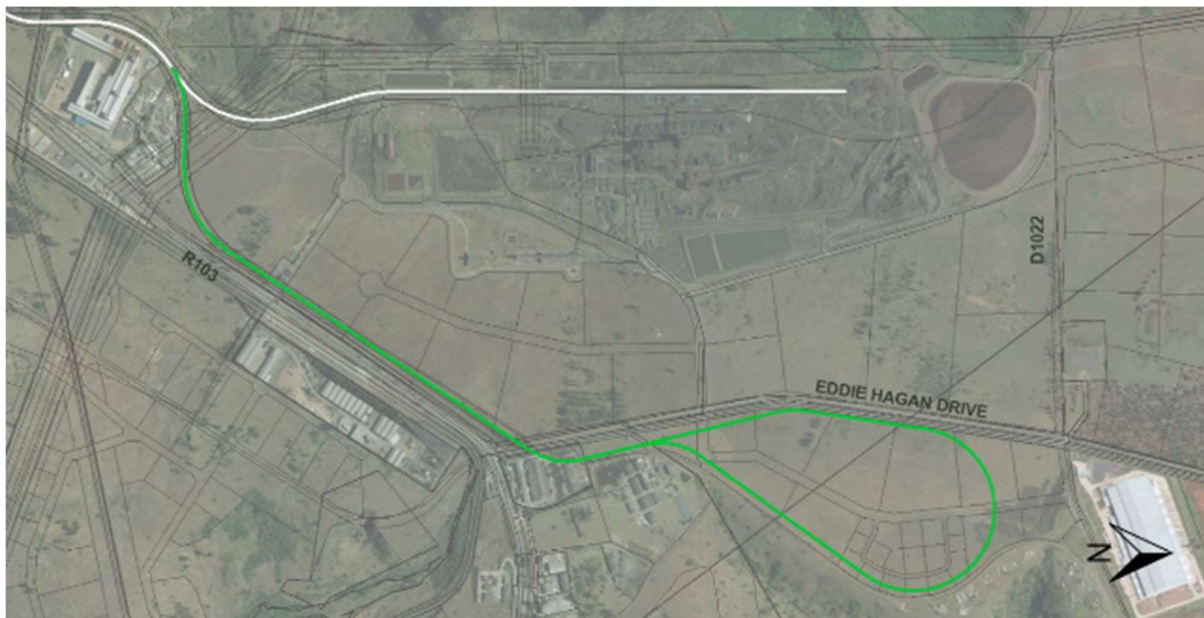
**Figure 53: Scenario 3**

#### **Scenario 4**

Scenario 4 is considered to be a small teardrop shaped balloon that utilises the dismantled track formation and existing bridge previously mentioned. The return leg of the balloon runs adjacent to Eddie Hagan Drive, on the eastern side of the road. North-South running grades are similar to Scenario 2 and are favourable at the southern end but gradually climb to 3.5% in the northern section.

Limitations / conflicts include:

- Crossing of southern entrance road to CRW.
- Some encroachment of Metallica Chemicals property.



**Figure 54: Scenario 4**

## **10.6 Urban Design**

This section identifies high-level urban design elements which should be used to guide future proposals and inform decision making throughout the study area. The urban design elements together with the landscape design elements are intended to complement each other to create attractive liveable spaces.

Firstly, it is critical to design a good mobility network which can connect and enable. This network allows for strong connection to the N3, proposed KwaXimba interchange and Eddie Hagan Drive whilst connecting the Cato Ridge development with the existing town. A healthy symbiosis can as such be established. The hierarchy of streets furthermore enables the formation of various parts and precincts which allows for areas with similar character and use.

A connected and functional green corridor is essential. The green corridors are conducive elements for the creation of a non-motorised network for safe movement of pedestrians and cyclists. Although this proposed development is predominantly industrial, landscaping plays a vital role in not only providing recreational space, but it also plays an important role in the attenuation of polishing of storm water as it flows along the draining lines.

## **10.7 Phasing**

A development of this scale would require phasing to break it down into manageable components to make it more affordable and better suited to respond to market demand. A phased approach will furthermore assist the upfront capital investment requirements and would enable the unlocking of land into the market in a calculated manner.

The phasing and resultant land use take-up requires careful thought and reasoning in order to ensure that the rollout of the development remains financially viable and physically implementable, with each successive phase working as a single entity on its own within the larger context of the entire development. Additionally, it is important to identify catalytic sites (anchors) which will attract investors / developers to purchase land within the proposed development. Ideally, these catalytic sites should be located in the various phases in order to increase market rentals.

The information from the traffic impact assessment was utilised in order to determine the maximum number of trip generation before infrastructure upgrading is required. This ensures maximum traffic volume with minimum capital spending on required infrastructure and a large enough portion of land to be developed. The traffic impact assessment indicates a 20-year period for the entire development. This results in four phases.

### **Phase 1 – South of the N3:**

Phase 1 is earmarked south of the N3 along the R103. This phase comprises of commercial sites, the Motel site as well as some industrial sites. Potential land owners for some of these sites have already been identified.

**Phase 2 – North of the N3 west of Eddie Hagan Drive:**

It is anticipated that with the increased development of Phase 1 additional demand will be required and approximately 75ha north of the N3 has been identified for Phase 2. According to the traffic impact assessment, road upgrades along Eddie Hagan Drive will be required to unlock any development north of the N3. Therefore, the portion of land furthest south has been identified as Phase 2. This will ensure shortest distance of roads to be upgraded to unlock the land.

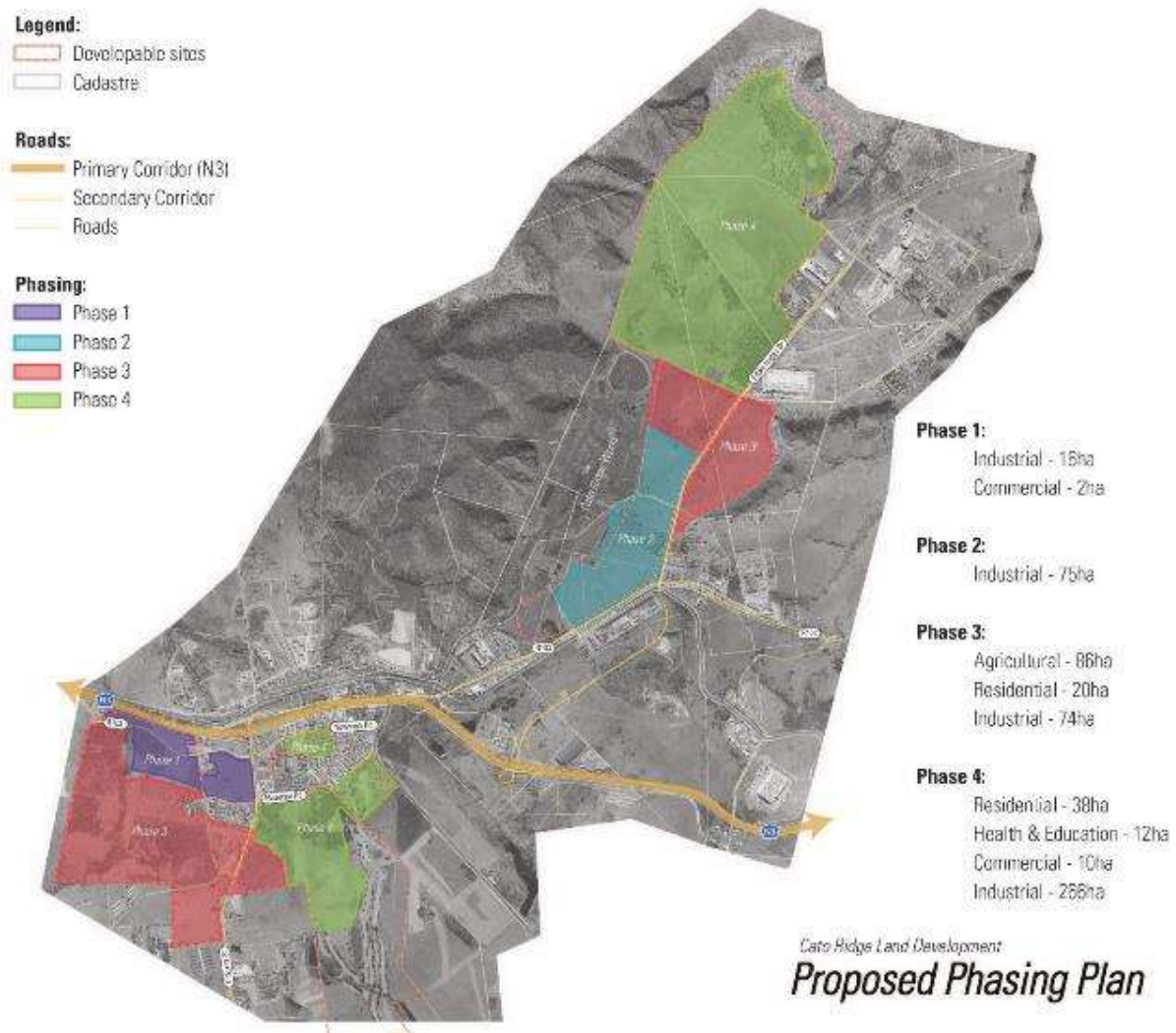
**Phase 3 – North and south of the N3:**

Phase 3 comprise of approximately 180ha. It is anticipated that the Phase 2 development will attract additional demand and as such the land north and east of Phase 2 has been earmarked for Phase 3. Additionally, the agricultural land and some residential areas south of the N3 has also been included in Phase 3.

**Phase 4 – North and south of the N3:**

The remaining portions of land, approximately 326ha, forms Phase 4. This phase is a mix between residential, community facilities, commercial activities as well as the remaining industrial land to the far north of the study area.

It should be noted that these phases provides a guide in terms of how the development should be rolled-out, however, if potential investors require specific portions of land, an updated traffic impact assessment should be completed to determine the level of infrastructure upgrading required to unlock that portion of land.



**Figure 55: Proposed Phasing Plan**

## 10.8 Recommendations

For the phasing to be finalised, a traffic count and a traffic study is required that would model the expected trip generation which will determine the required infrastructure upgrades. Thereafter, the financial model needs to input its findings into a multi-criteria analysis that will determine the most favourable portions of land upon which to begin developing. This will then need to be reconciled again a further traffic impact study which will determine the break-even point to which development can occur until major upgrades are required.

Further specialist input will be required as more detail studies are conducted, particularly with regards to the environmental sensitivities which will affect the developable area.

Once the detailed studies have been concluded and the initial portions of land for implementation have been identified, the town planning application can be finalised and submitted for approval.

# 11 Traffic Impact Assessment

Ordinarily the first phases of the Traffic Impact Assessment (“TIA”) would be undertaken during the Feasibility portion of the development cycle. However, given the critical nature of the required roads upgrades in Cato Ridge – particularly the KwzXimba interchange - it was deemed necessary to undertake the modelling at an earlier stage to understand the development capacity of the roads.

The TIA was undertaken for the entire Cato Ridge development area and addresses the access requirements, the traffic impact, capacity and road safety implications of the proposed development. The assessment was compiled in accordance with eThekweni Transport Authority’s TIA checklist which can be found in the front matter of the full report.

This section of the report will provide a summary of the key findings of the TIA.

## 11.1 Road Network Analysed

The following roads were included into the analysis for consideration:

|                        |          |                                                                                     |
|------------------------|----------|-------------------------------------------------------------------------------------|
| <b>Road Name</b>       | N3       |  |
| <b>Road Width</b>      | 36.0m    |                                                                                     |
| <b>Number of lanes</b> | 5        |                                                                                     |
| <b>Jurisdiction</b>    | SANRAL   |                                                                                     |
| <b>Class</b>           | R1       |                                                                                     |
| <b>Surface</b>         | Blacktop |                                                                                     |

|                        |          |                                                                                      |
|------------------------|----------|--------------------------------------------------------------------------------------|
| <b>Road Name</b>       | R103     |  |
| <b>Road Width</b>      | 10.0m    |                                                                                      |
| <b>Number of lanes</b> | 2        |                                                                                      |
| <b>Jurisdiction</b>    | KZN DoT  |                                                                                      |
| <b>Class</b>           | R2       |                                                                                      |
| <b>Surface</b>         | Blacktop |                                                                                      |

|                        |                      |                                                                                       |
|------------------------|----------------------|---------------------------------------------------------------------------------------|
| <b>Road Name</b>       | MR 385 (Uitkomst St) |  |
| <b>Road Width</b>      | 8.0m                 |                                                                                       |
| <b>Number of lanes</b> | 2                    |                                                                                       |
| <b>Jurisdiction</b>    | KZN DoT              |                                                                                       |
| <b>Class</b>           | R3                   |                                                                                       |
| <b>Surface</b>         | Blacktop             |                                                                                       |

|                        |         |                                                                                       |
|------------------------|---------|---------------------------------------------------------------------------------------|
| <b>Road Name</b>       | D 246   |  |
| <b>Road Width</b>      | 7.0m    |                                                                                       |
| <b>Number of lanes</b> | 2       |                                                                                       |
| <b>Jurisdiction</b>    | KZN DoT |                                                                                       |
| <b>Class</b>           | R4      |                                                                                       |
| <b>Surface</b>         | Gravel  |                                                                                       |

|                   |                   |  |
|-------------------|-------------------|--|
| <b>Road Name</b>  | Old Georgedale Rd |  |
| <b>Road Width</b> | 6.5m              |  |

|                        |           |                                                                                     |
|------------------------|-----------|-------------------------------------------------------------------------------------|
| <b>Number of lanes</b> | 2         |  |
| <b>Jurisdiction</b>    | eThekweni |                                                                                     |
| <b>Class</b>           | 4         |                                                                                     |
| <b>Surface</b>         | Blacktop  |                                                                                     |

|                        |                             |                                                                                     |
|------------------------|-----------------------------|-------------------------------------------------------------------------------------|
| <b>Road Name</b>       | MR 423 (Eddie Hagan Drive)) |  |
| <b>Road Width</b>      | 9.5,                        |                                                                                     |
| <b>Number of lanes</b> | 2                           |                                                                                     |
| <b>Jurisdiction</b>    | KZN DoT                     |                                                                                     |
| <b>Class</b>           | R3                          |                                                                                     |
| <b>Surface</b>         | Blacktop                    |                                                                                     |

|                        |          |                                                                                     |
|------------------------|----------|-------------------------------------------------------------------------------------|
| <b>Road Name</b>       | D 1022   |  |
| <b>Road Width</b>      | 6.0m     |                                                                                     |
| <b>Number of lanes</b> | 2        |                                                                                     |
| <b>Jurisdiction</b>    | KZN DoT  |                                                                                     |
| <b>Class</b>           | U4b      |                                                                                     |
| <b>Surface</b>         | Blacktop |                                                                                     |

|                        |            |                                                                                      |
|------------------------|------------|--------------------------------------------------------------------------------------|
| <b>Road Name</b>       | Ridge Road |  |
| <b>Road Width</b>      | 6.5m       |                                                                                      |
| <b>Number of lanes</b> | 2          |                                                                                      |
| <b>Jurisdiction</b>    | eThekweni  |                                                                                      |
| <b>Class</b>           | 5          |                                                                                      |
| <b>Surface</b>         | Blacktop   |                                                                                      |

## 11.2 Traffic Counts

The existing weekday AM and PM peak hour traffic volumes on the surrounding road network were obtained from classified traffic counts undertaken by Bala Survey & Research.

Classified traffic counts were undertaken from 06:00 to 18:00 to determine the weekday AM and PM peak hour traffic flows. All movements by vehicle type were recorded in 15-minute intervals. The results and analysis of the above traffic counts are contained in the appendix.

\*Note: Some historical counts were required to be sourced due to the Covid-19 lockdown. These counts were sourced from Bala Survey & Research and projected accumulatively at 3% per annum to the year 2020. Where the projections did not provide a realistic current date scenario, the 2019 and 2020 counts from the adjacent intersection volumes were applied.

The AM peak hour occurred from 06:30 to 07:30 and the PM peak hour occurred from 16:15 to 17:15 on the surrounding road network.

The locations of the traffic counts are shown in the figure below.



**Figure 56: Traffic count locations**

### 11.3 Existing traffic volume analysis

The existing peak hour traffic volumes from the traffic counts were analysed. The SIDRA computer software was used to analyse the traffic conditions with and without development generated traffic at the affected intersections. The underlying objective of intersection analysis is to quantify the performance of an intersection with regard to specified traffic volumes and environmental conditions. This traffic operational performance can be measured in terms of 'Level of Service' ("LOS"). Six levels of service exist, ranging from A to F. LOS A represents the best operating conditions (free-flow conditions and no delay or congestion) whereas LOS F represents the worst, (breakdown conditions with congestion and very long delays). LOS D is deemed the minimum acceptable level of service.

### 11.4 Summary of existing analysis

#### 11.4.1 Intersection Analysis

The table below summarises the outcomes of the intersection analysis based on the existing traffic volumes that are currently on the road network.

| Intersection                                               | Existing Operations<br>(Acceptable/Not<br>Acceptable) | Upgrade<br>Required<br>(Yes/No) | Capacity<br>Available<br>(Yes/No) |
|------------------------------------------------------------|-------------------------------------------------------|---------------------------------|-----------------------------------|
| Old Georgedale Road and MR385                              | Acceptable                                            | No                              | Yes                               |
| Old Georgedale Road and D246                               | Acceptable                                            | No                              | Yes                               |
| Old Georgedale Road & Doornrug Road (R103) &<br>Ridge Road | Acceptable                                            | No                              | Yes                               |

|                                                                        |            |    |     |
|------------------------------------------------------------------------|------------|----|-----|
| MR385 and R103 and Doornrug Road                                       | Acceptable | No | Yes |
| MR385 and Mazeppa Road                                                 | Acceptable | No | Yes |
| R103 and Assmang and Shiptech Petroleum Access                         | Acceptable | No | Yes |
| N3 and R103 on Ramp                                                    | Acceptable | No | Yes |
| N3 and R103 (south of Interchange)                                     | Acceptable | No | Yes |
| N3 and R103 (north of Interchange)                                     | Acceptable | No | Yes |
| Doornrug Road and School Road                                          | Acceptable |    | Yes |
| Eddie Hagen Drive and Access to Assmang Cato Ridge Works               | Acceptable | No | Yes |
| Eddie Hagen Drive and MR423 and Abattoir Street and Drakensberg Street | Acceptable | No | Yes |
| R103 and Allsop Road                                                   | Acceptable | No | Yes |
| R103 and Eddie Hagen Drive                                             | Acceptable | No | Yes |

**Table 12: Summary of existing intersection analysis**

## 11.4.2 Road Link Capacity Analysis

The table below computes and summarises the road link capacity on the key roads in the road network.

| Road Link Capacity Analysis |                              |                                |                              |                                |                             |
|-----------------------------|------------------------------|--------------------------------|------------------------------|--------------------------------|-----------------------------|
| Road Name                   | Max peak hour two-way volume | Max peak hour two-way capacity | Max Peak Hour one-way volume | Max Peak Hour one-way capacity | Capacity Available (Yes/No) |
| R103                        | 776 veh/h                    | 1500 veh/h                     | 401 veh/h                    | 1000 veh/h                     | Yes                         |
| MR385(Uitkomst St)          | 648 veh/h                    | 1500 veh/h                     | 392 veh/h                    | 900 veh/h                      | Yes                         |
| D 246                       | 30 veh/h                     | 1300 veh/h                     | 16 veh/h                     | 800 veh/h                      | Yes                         |
| Old Georgedale Rd           | 99 veh/h                     | 642 veh/h                      | 73 veh/h                     | 450 veh/h                      | Yes                         |
| MR 423 (Eddie Hagan Drive)) | 769 veh/h                    | 1500 veh/h                     | 534 veh/h                    | 1000 veh/h                     | Yes                         |
| D 1022                      | 444 veh/h                    | 1300 veh/h                     | 369 veh/h                    | 800 veh/h                      | Yes                         |

**Table 13: Existing road link capacity analysis**

\*Note: Capacity of Old Georgedale calculated as per ETA manual as class 4 residential road. In the future, with development, the function of this road may change to urban.

## 11.5 Development Proposal

### 11.5.1 Implementation horizons

The proposed development will be implemented in phases over the next 15 years. The following indicates the implementation horizons per phases of the development:

| Implementation Horizons |                     |                |
|-------------------------|---------------------|----------------|
| Phase                   | Implementation Year | Scenario Years |
| 1                       | 2020                | Current        |
| 2                       | 2025                | 5 Year         |
| 3                       | 2030                | 10 Year        |

**Table 14: Implementation horizons**

The trips generated by the development were distributed onto the existing road network to determine the traffic impact.

The traffic generated by the proposed Phase 1 development was distributed based on the distribution pattern as per the 2020 background traffic flows and local knowledge.

## 11.6 Summary of Phase 1 Analysis

### 11.6.1 Intersection Analysis

The table below summarises the outcomes of the intersection analysis based on the existing traffic volumes that are currently on the road network.

| Intersection                                                           | With Phase 1 Operational<br>(Acceptable/Not<br>Acceptable) | Upgrade<br>Required<br>(Yes/No) | Further additional<br>Capacity Available<br>(Yes/No) |
|------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------|------------------------------------------------------|
| Old Georgedale Road and MR385                                          | Not impacted by Phase 1                                    |                                 |                                                      |
| Old Georgedale Road and D246                                           | Not impacted by Phase 1                                    |                                 |                                                      |
| Old Georgedale Road & Doornrug Road (R103) & Ridge Road                | Acceptable                                                 | No                              | Yes                                                  |
| MR385 and R103 and Doornrug Road                                       | Acceptable                                                 | No                              | No                                                   |
| MR385 and Mazeppa Road                                                 | Not impacted by Phase 1                                    |                                 |                                                      |
| Doornrug Road and School Road                                          | Not impacted by Phase 1                                    |                                 |                                                      |
| N3 and R103 (south of Interchange)                                     | Acceptable                                                 | No                              | No                                                   |
| N3 and R103 (north of Interchange)                                     | Acceptable                                                 | No                              | No                                                   |
| N3 and R103 on Ramp                                                    | Acceptable                                                 | No                              | Yes                                                  |
| R103 and Allsop Road                                                   | Acceptable                                                 | No                              | Yes                                                  |
| R103 and Assmang and Shiptech Petroleum Access                         | Acceptable                                                 | No                              | No                                                   |
| R103 and Eddie Hagen Drive                                             | Acceptable                                                 | No                              | No                                                   |
| Eddie Hagen Drive and Access to Assmang Cato Ridge Works               | Acceptable                                                 | No                              | No                                                   |
| Eddie Hagen Drive and 65301 Trek                                       | Acceptable                                                 | No                              | Yes                                                  |
| Eddie Hagen Drive and MR423 and Abattoir Street and Drakensberg Street | Acceptable                                                 | No                              | Yes                                                  |
| <b>Site Access</b>                                                     |                                                            |                                 |                                                      |
| Old Georgedale/Site Access 1                                           | Acceptable                                                 | Yes                             | Yes                                                  |
| Ridge/Site Access 2                                                    | Acceptable                                                 | Yes                             | Yes                                                  |
| R103/Access 3/Access 4                                                 | Acceptable                                                 | Yes                             | Yes                                                  |
| 65301 Trek/Access 5                                                    | Acceptable                                                 | Yes                             | Yes                                                  |

**Table 15: Summary of Phase 1 intersection analysis**

## **11.6.2 Road Links**

### **Capacity Analysis**

The table below computes and summarises the road link capacity on the key roads in the road network.

| <b>Road Link Capacity Analysis</b> |                                     |                                       |                                     |                                       |                                  |
|------------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|----------------------------------|
| <b>Road Name</b>                   | <b>Max peak hour two-way volume</b> | <b>Max peak hour two-way capacity</b> | <b>Max Peak Hour one-way volume</b> | <b>Max Peak Hour one-way capacity</b> | <b>Upgrade Required (Yes/No)</b> |
| R103 north of N3                   | 1445 veh/h                          | 1500 veh/h                            | 755 veh/h                           | 1000 veh/h                            | No                               |
| R103 south of N3                   | 1093 veh/h                          | 1500 veh/h                            | 669 veh/h                           | 1000 veh/h                            | No                               |
| MR385(Uitkomst St)                 | 680 veh/h                           | 1500 veh/h                            | 382 veh/h                           | 900 veh/h                             | No                               |
| D 246                              | 30 veh/h                            | 1300 veh/h                            | 16 veh/h                            | 800 veh/h                             | No                               |
| Old Georgedale Rd                  | 291 veh/h                           | 642 veh/h                             | 171 veh/h                           | 450 veh/h                             | No                               |
| MR 423 (Eddie Hagan Drive)         | 1444 veh/h                          | 1500 veh/h                            | 1006 veh/h                          | 1000 veh/h                            | No                               |
| D 1022                             | 444 veh/h                           | 1300 veh/h                            | 369 veh/h                           | 800 veh/h                             | No                               |

**Table 16: Existing road link capacity analysis**

\*Note: Capacity of Old Georgedale calculated as per ETA manual as class 4 residential road. In future phases the function of this road may change to urban. This will increase the capacity of traffic that this road can accommodate.

## **Recommendations**

The following road link upgrades are required to support Phase 1:

- Trek 65301 from Eddie Hagan Drive to the Development access road. (Access 5)
  - Lanes: Single lane in each direction
  - Length = 500m
- Access road to site 506. This is to commence at Old Georgedale Road, traverse through site 538 and end at the site access of site 506.
  - Lanes: Single lane in each direction
  - Length = 180m

## **11.7 Full Development Infrastructure Requirements for Future Planning**

The road infrastructure requirements for the full development is directly related to the development bulks and land uses that are developed. As a baseline, implementation horizons have been proposed. This proposal is based on:

- Minimum road infrastructure should be required to kick start the development in the immediate future. Hence the current road network has been loaded to its maximum capacity before road upgrades will be needed.

- Future phases to be implemented in line with a realistic timeline of road upgrades that should be implemented from an institutional perspective in line with the Cato Ridge LAP as well as KZN DoT and SANRAL planning while ensuring maximum economic benefit is received from unlocking the land parcel to the developer.
- A cost contribution method required from all stakeholders for the road upgrades.

The proposed development will be implemented in phases over the next 15 years. The following indicates the upgrade types and implementation horizons per phases of the development:

| Implementation Horizons |                                                                                            |                     |                |
|-------------------------|--------------------------------------------------------------------------------------------|---------------------|----------------|
| Phase                   | Type of road upgrade                                                                       | Implementation Year | Scenario Years |
| 1                       | Roads required only for site access                                                        | 2020                | Current        |
| 2                       | Upgrade of key distribution roads, existing interchange and access roads                   | 2025                | 5 Year         |
| 3                       | Introduction of a basic diamond Kwa Ximba interchange, distribution roads and access roads | 2030                | 10 Year        |
| 4                       | Upgrade of Kwa Ximba interchange to full capacity, distribution roads and access roads     | 2035                | 15 year        |

**Table 17: Upgrades types and Implementation horizons**

The table below provides the development bulks that can be accommodated with ongoing road upgrades as per the 4 phases described above. The following comments are to be noted:

- The required road upgrades are to be confirmed during TIA stage (design) for each phase once phasing is confirmed.
- The costing is based on industry standard rates. An accurate costing can only be prepared during design stage with a BoQ.
- All lanes are 3.5m wide.
- The costing includes basic roadside stormwater but excludes any major stormwater infrastructure required.
- The proposed Kwa Ximba interchange makes up 50% of the estimate.
- During TIA stage of the future phases for the future planning cost contributions will have to be derived from all stakeholders. This includes:
  - The developer;
  - KZN DoT;
  - SANRAL;
  - eThekweni Municipality; and
  - Surrounding private developers.

## 12 Bulk Infrastructure

This section of the report presents an assessment of the existing civil, electrical and solid waste infrastructure within and surrounding the land development area. It also describes planned and proposed infrastructure upgrades, as well as the associated high-level cost estimates. These cost estimates are very high-level, detailed analysis and more accurate costs will be presented at feasibility and/or design stages. Therefore, the following should be noted:

- The cost estimates are based on proposed concept design layouts and concept solutions and it is acknowledged that detail design alterations may have an impact on the cost;
- The rates used are based on the current industry norm, should there be any lag between the date of this report and the design and construction stage, rates will need to be escalated; and
- The estimate is merely for planning and budgeting purposes and should be reviewed and updated during the design stages.

### 12.1 Water Supply

Water is supplied to the northern portion of the Cato Ridge Area via the 22ML Cato Ridge Reservoir and the 10ML Abattoir Reservoir. The available capacity of these can only be verified upon a development application to the eThekweni, but it is likely that an additional reservoir will be required to enable the development of Cato Ridge. The area to the south of the N3 is supplied by the 45ML Umlaas Road Reservoir.

The required average annual daily demand is estimated at 36ML per day. Due to the inconsistent water supply via the western aqueduct, it is also recommended that a reservoir be provided in this area, particularly for firefighting requirements. Allowance is typically made for 48 hours of storage (6244ML in total) but depending on the phasing of the developments this can either be allocated as smaller reservoirs to provide additional flexibility and redundancy.

The space planning must make provision for at least two ground reservoirs, with a space of roughly 50m x 50m likely to be sufficient for each. Also, as the majority of the developable area is quite flat, provision must be made for 2x elevated water towers of at least 2ML to provide sufficient water pressure for domestic usage as well as firefighting during peak times.

#### 12.1.1 Water Costing Estimates

A summary of the PFS water reticulation cost estimates for the proposed development is presented in Table 18.

**Table 18: Water Cost Estimates**

| Services Report Cost Estimate (For Budget and Estimates Only Purposes) |                        |
|------------------------------------------------------------------------|------------------------|
| Description                                                            | Amount (R)             |
| Water Reticulation                                                     |                        |
| 28 675m of waterline                                                   |                        |
| Site Clearance                                                         | R1,063,425.00          |
| Excavation                                                             | R4,455,276.00          |
| Bedding                                                                | R2,047,395.00          |
| Medium pressure pipeline                                               | R8,339,820.00          |
| Pipework Specials and Valve Chambers                                   | R5,349,618.00          |
| 2 x 22ML Ground Reservoirs                                             | R60,000,000.00         |
| 1 x 2ML Elevated Towers + Pumpstation                                  | R88,000,000.00         |
|                                                                        |                        |
| <b>Subtotal 1: Water Reticulation</b>                                  | <b>R169,255,534.00</b> |

## 12.2 Sewerage

The closest viable wastewater treatment works to the proposed development is the Hammarsdale Wastewater Treatment Works ("WWTW"). The Works has been de-rated from a 27ML Capacity to 9ML. The additional capacity can be reactivated, but the municipality would require a good economic justification due to the high capital cost of the refurbishment.

eThekwini is also planning to build a new gravity bulk sewer line that will connect the Cato Ridge/ Harrison Flats area to Hammarsdale. The timelines for implementation are 7 – 8 years due to the extensive environmental, water use licence and MMFA processes required. There are also plans to further upgrade the WWTW to 42ML in future should developments justify it. eThekwini municipality have indicated that it is vital for them to have agreements in terms of the phasing of the development so that they can adequately plan for future capacity upgrades.

The best solution in the interim is to utilise the available capacity at the WWTW located at Frey's foods. Initial discussions with Frey's indicate their willingness to accommodate sewage from the proposed development. Some refurbishment will be required to the plant, but the exact details and capacity are protected by a non-disclosure agreement. It is recommended that future developers sign an NDA with Frey's foods that will allow the negotiations in this regard to commencing.

### 12.2.1 Sewer Costing Estimates

A summary of the sewer reticulation cost estimate for the proposed development is presented in Table 19.

**Table 19: Sewer Cost estimates**

| <b>Cato Ridge Sewer Cost Estimate</b>                                                   |                       |
|-----------------------------------------------------------------------------------------|-----------------------|
| <b>Services Report Cost Estimate (For Budget and Estimates Only Purposes)</b>           |                       |
| <b>Description</b>                                                                      | <b>Amount (R)</b>     |
| Sewer Reticulation<br>32 250 of gravity line m, 7 970 m of rising main & 6 pumpstations |                       |
| Site Clearance                                                                          | R1,545,388.75         |
| Excavation                                                                              | R10,189,947.23        |
| Finishing                                                                               | R1,821,250.00         |
| Bedding                                                                                 | R3,981,229.25         |
| Sewers                                                                                  | R15,852,625.00        |
| Manholes, Erf/Service connections and Sewer Ancillaries                                 | R5,724,925.00         |
| Rising Main                                                                             | R9,966,086.50         |
| Pumpstations                                                                            | R10,959,000.00        |
| <b>Subtotal 2: Sewer Reticulation</b>                                                   | <b>R60,040,451.73</b> |
| Contingencies (10%)                                                                     | R6,004,045.17         |
| Professional Fees (10%)                                                                 | R6,004,045.17         |
| <b>Total (Excluding VAT)</b>                                                            | <b>R72,048,542.07</b> |
| VAT (15%)                                                                               | R10,807,281.31        |
| <b>Total (Including VAT)</b>                                                            | <b>R82,855,823.38</b> |

## 12.3 Electricity

This section of the report deals with the identification of existing electrical infrastructure and the available capacity of Eskom networks within the Cato Ridge land development area. This will be inclusive of additional infrastructure requirements to cater for future load requirements and possible infrastructure upgrades as and when required.

The development will encompass residential, commercial, agricultural and industrial loads, with supplies expected to be required over a period of 20 to 30 years dependant on market appetites.

The external electrical reticulation network connection will be taken from the local Eskom sub-transmission and distribution networks and will be handed over to Eskom on completion of the works. The electrical design will adhere to the relevant SANS safety and equipment standards, as well as the NRS 048 quality of supply standard.

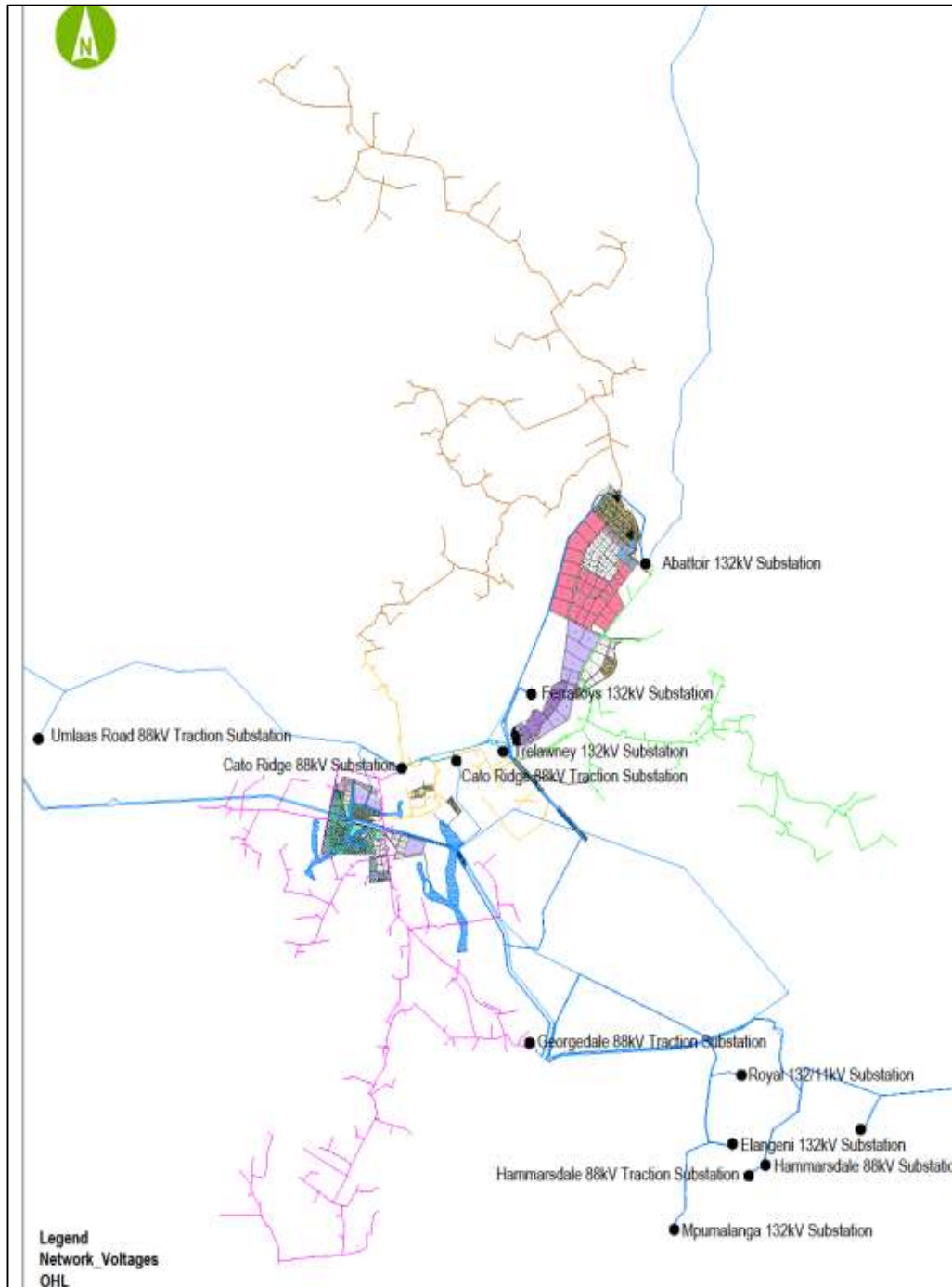
### **12.3.1 Existing electrical networks**

The existing electrical transmission and distribution networks were received from Eskom. Figure 57 illustrates the existing following networks within the land development area.

There are currently three 132kV substations within the development supply zone, these include Abattoir substation, Ferralloys substation and Trelawney substation;

- Two 88kV substations within the development supply zone, these include Cato Ridge substation and Cato Ridge Traction substation.
- Five 11kv network breakers. These network breakers and their supply substation are as follows:
  - Abattoir NB74 and Abattoir NB27 supplied at 11kv from Abattoir 132/11kV substation;
  - Cato Ridge NB1, Cato Ridge NB16 and Cato Ridge NB8 supplied at 11kv from Cato ridge 88/11kv substation;
  - Cato Ridge NB1 and Cato Ridge NB8 have a ring feed supply from the new Trelawney 132/11kv substation; and
  - CRW is currently supplied solely by the CRW 132kV substation with no associated external feeders.

All network breakers are currently approaching capacity, and new feeders will be required to be supplied by the existing transmission substations, or by the implementation of a new substation to cater for the additional loading.



**Figure 57: Existing Networks**

### **12.3.2 Demand load forecast and infrastructure cost estimates**

A geographic load forecast methodology was utilised to identify and forecast expected loads. The total maximum demand is approximately 28.8MVA north of the N3 freeway and 6.7MVA south of the N3 freeway. The total expected maximum demand is 35.5MVA for the entire development, incorporating diversification to achieve this value.

To develop a high-level cost implication for the provision of new or additional capacity, an internal cost estimate exercise was performed by splitting the development into expected zones. The cost was based on the required kVA per zone, the connection cost per MVA, transformer requirement costs and a cost per kVA. It must be emphasized that this estimate is a high-level cost estimate and a more accurate reflection of costs will only be achieved once the development costs have been performed by Eskom.

The cost estimate can be seen in Table 20 below.

**Table 20: Electrical Cost Estimate**

| Zone  | KVA Required | Connection Fee/ MVA | Transformer Size (MVA) | Transformer Cost | R / KVA   | Total                 |
|-------|--------------|---------------------|------------------------|------------------|-----------|-----------------------|
| 1     | 2,910.80     | R93,800.00          | 3                      | R2,300,000.00    | R1,550.00 | R4,950,539.25         |
| 2     | 3,415.14     | R93,800.00          | 5                      | R2,500,000.00    | R1,550.00 | R5,762,272.58         |
| 3     | 16,436.29    | R93,800.00          | 20                     | R7,150,000.00    | R1,550.00 | R26,642,551.86        |
| 4     | 2,837.83     | R93,800.00          | 3                      | R2,000,00.00     | R1,550.00 | R4 792 434.02         |
| 5     | 3,202.88     | R93,800.00          | 4                      | R2,300,000.00    | R1,550.00 | R5 403,256.45         |
| 6     | 6,684.80     | R93,800.00          | 5                      | R4,825,000.00    | R1,550.00 | R11,178,983.51        |
| Total |              |                     |                        |                  |           | <b>R58,730,037.66</b> |

The cost estimate presented above is only an internal costing exercise by the project team, it must be noted that Eskom will only develop a more accurate costing model at a fee of R77,040-00 for applications between 10MVA/MW and 50MVA/MW. Eskom also requires the application to include a phasing schedule for the expected load growth.

The connection for electrical infrastructure external electrical reticulation network for the land development area, will be taken from the local Eskom sub-transmission and distribution networks and will be handed over to Eskom on completion of the works.

The PFS does not account for potential Eskom supply synergies between the Cato Ridge Works that has an installed capacity of 100MVA of which ca 70MVA is currently utilized.

## 12.4 Recommendations/Way forward

In summary, there are several infrastructure constraints that will need to be overcome before development of the full site can truly be unlocked. However, the most pressing of these remains the treatment of sewerage for which a solution may be possible if the required approvals and upgrades can be undertaken at the Frey's site.

Insofar as roads, water and electricity are concerned, there is capacity available (albeit limited in some instances). The availability is dependent on the proposed land use and will be considered on a case by case basis as potential buyers/tenants present their proposals.

The availability and location of the bulk infrastructure will be considered together with the market demand study in order to determine the location and size of the phases of development. To ensure there is provision of sufficient infrastructure and engineering services for the development, the following is required (in a phased approach) for development of the full proposal to take place<sup>17</sup>:

### Traffic and Roads

- An upgrade and extension of the road network will be required to accommodate the anticipated substantial volumes of vehicular traffic;
- A traffic impact assessment will be required during the feasibility stage to understand the existing capacity of the road network.
- The access and circulation system will need to be improved and extended on a phased basis to support land use development and to provide sufficient capacity to cater for associated growth in population. There also needs to be a commitment from all transport stakeholders; national, provincial and municipal.

### Water Supply and sewerage

- To augment water supply capacity, it is recommended that the Cato Ridge development provide a dedicated reservoir for the proposed developments and space planning must make provision for at least two ground reservoirs, with a space of roughly 50m x 50m likely to be sufficient for each.
- It is recommended that the engagements with the municipal water authorities be prioritised in order to clarify the design concept for water supply for the land development area.
- It is recommended that in order to secure the available capacity for WWTW, Assmang engage with Frey's to explore the upgrading of their treatment plant.
- It is also recommended that when space planning allowance is made for separate erven or servitudes for sewerage pump stations to ensure unrestricted access for the municipality to all infrastructure.

### Electricity

- The project team provided a cost estimate for electrical infrastructure by splitting the development into expected zones and based on the required kVA per zone, the connection cost per MVA, transformer requirement costs and a cost per kVA. However, this estimate is a high-level cost estimate and a more accurate reflection of costs will have to be updated once the development costs have been performed by Eskom.

To conclude the infrastructure chapter, it is important to determine the optimum size of the first phases of the development. It is clear that the municipality understands the importance of enabling infrastructure to unlock the potential of the Cato Ridge area and to give effect to the plans of a dry port.

There could be an opportunity to partner with the municipality to collectively facilitate the development of the dry port with the municipalities role to be of a facilitator of funding of infrastructure or through an agreement to incentivise development by discounting certain road upgrade bulk contributions to make the development more feasible.

During the Contextual Risk Workshop in the Concept Phase, assuring infrastructure was named the highest-ranking risk. It is therefore clear that every effort from all stakeholders should be expected to enable the development to proceed because it will benefit all.

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<sup>17</sup> This is an indication of infrastructure upgrades required for development to proceed, but does not assume that Assmang is responsible for these upgrades.

## 13 Waste to Energy Concept

This section aims to address the current and future required capacities for solid waste management (“SWM”) in Cato Ridge, with specific reference to the potential for Alternative Waste Technology (“AWT”) – specifically regarding to energy waste to energy (“WtE”). An assessment of current literature has been used to determine waste management infrastructure capacities available as well as current waste generation rates.

In order to determine the potential for WtE projects the following is required:

- Waste generation data.
- Waste characteristics.

The following are the key factors for considering this technology:

- Diversion of waste from landfill.
- Job creation.
- Regional integration of waste management solutions.
- Sustainable waste management solutions to generate renewable energy.

### 13.1 Background of area

The surrounding land uses within a 5km radius comprises of industrial and residential areas.

It is estimated that eThekweni Municipality currently generates the following volumes of waste (2016 Draft IWMP):

**Table 21 Summary of domestic waste generation rates per income category**

| Income type    | Domestic waste generation rates (kg/person/day) |                      |                         |                    |
|----------------|-------------------------------------------------|----------------------|-------------------------|--------------------|
|                | State of the Environment Report                 | Minimum Requirements | DEAT IWMP (unpublished) | Estimated for 2015 |
| Low            | 0.41                                            | 0.5                  | 0.2 – 0.7               | 0.55               |
| Medium         | 0.74                                            | (0.5)                | 0.7 – 1.9               | 1.25               |
| High           | 1.29                                            | Up to 3.5            | 1.5 – 3.0               | 2.0                |
| <b>Average</b> | <b>0.81</b>                                     | <b>1.5</b>           | <b>1.9</b>              | <b>1.3</b>         |

The current population of Cato Ridge is estimated at 75 000 and this is expected to increase by about 35 000 by 2030 to 110 000.

It is anticipated that using an average waste generation rate of 1.3 kg/p/d, about 97 tons of solid waste per day will be generated from residential areas, industrial areas and commercial establishments such as markets and other informal sectors. It is assumed that Cato Ridge development will generate similar types and volumes of waste. This would increase to 110 tons per day (t/p/d) by 2030 if no alternative processes are implemented for waste reduction.

### 13.2 Waste to energy

The “Waste to Energy” opportunity in South Africa has been identified as one of the Energy for Africa program’s High Potential Opportunities (HPOs). This was selected due to the changing waste management landscape in South Africa.

The existing waste industry in South Africa consists of the collection, landfilling and limited recycling (diversion) of waste. Household waste is typically collected and managed by local municipalities (in some cases by municipal service providers on behalf of the municipality) while commercial and industrial waste is typically collected and managed by private companies.

Most of the waste is disposed at municipal landfill sites (estimated at 90%) except for some commercial and industrial waste that is managed by private companies. Policy and regulatory reforms, environmental pressure,

limited landfill space and increased sustainability awareness is changing the waste landscape in South Africa. Waste management is crucial for the green economy and sustainability goals of both government and the private sector.

The South African government has identified the waste sector as a sector that can contribute to local economic growth and job creation. The National Green Economy Accord (EDD, 2011) recognizes the role that the waste sector, specifically waste reuse, recycling and recovery, can play in South Africa's transition towards a Green Economy.

The policy framework to move waste up the waste management hierarchy away from landfilling towards waste reuse, recycling and recovery have been provided by government through the promulgation of the National Environmental Management: Waste Act (RSA, 2009).

This creates the enabling policy environment for job creation as new projects are implemented by business and industry, new markets become available, new business opportunities recognised, and as new innovations (technological and social) are introduced to the waste sector. The waste sector is, therefore, potentially a meaningful contributor to the South African economy if it is supported and stimulated by government and the private sector.

### **13.3 Legislative Requirements**

Waste management in South Africa is regulated through the National Environmental Management: Waste Act 59 of 2008 (NEMWA). Thus, any option considered must ensure compliance with this legislation and the associated NEMWA Regulations, Norms & Standards. This includes the following:

- National Waste Information Regulations, GN R 625 (August 2012).
- Waste Classification and Management Regulations GN R 634 (August 2013).
- National Norms and Standards for the Assessment of Waste for Landfill Disposal GN R 635 (August 2013).
- National Norms and Standards for Disposal of Waste to Landfill GN R 636 (August 2013).
- List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment, GN R 921 (November 2013) (amended).
- National Norms and Standards for extraction, flaring for recovery of landfill gas; scrapping or recovery of motor vehicle; storage of waste GN R 924 - 926 (November 2013).
- Fees for Consideration and processing of applications for Waste Management Licences and Transfer and Renewal thereof GN R 142 (February 2014).
- National Norms and Standards for the Remediation of Contaminated Land and Soil Quality GN R 331 (May 2014).

Any technology that may generate air emissions is also subject to the requirements of National Environmental Management Act (Act 107 of 1998) ("NEMA") and the National Environmental Management: Air Quality Act (39 of 2004) NEM:AQA.

### **13.4 Technology options**

Types of WtE:

#### **13.4.1 Incineration or Mass Burn**

Waste is burnt at high temperatures in air to ensure complete oxidation of the materials to form gases (mostly CO<sub>2</sub>, water vapour H<sub>2</sub>O, SO<sub>2</sub> and NO<sub>x</sub>) and ash. Temperature control and efficient flue gas scrubbing ensure compliance with air quality standards. Heat generated can be used to generate electricity.

Advantages:

- Known and proven technology for municipal wastes.
- Modern well designed and operated incinerators meet environmental and atmospheric emissions standards.

- Significant volume reduction in waste to be landfilled (ash).
- Electricity generation potential (depending on calorific value of residual wastes)

Disadvantages:

- High capital and operating costs.
- Technical expertise required to operate.
- May require additional fuel if calorific value of waste is low.
- Requires sophisticated gas scrubbing.
- Gas scrubber effluents (liquid, slurry or powder) need to be safely disposed of, although these are small in quantity compared to the quantity of waste being incinerated.

#### **13.4.2 Refuse Derived Fuel (“RDF”)**

Not in itself a thermal treatment process, RDF is the beneficiation of wastes by removing the recyclable and non-combustible elements and then shredding or pelletizing the remaining wastes. This enhances the efficient burning of waste. The RDF is sometimes sold as a fuel source in suitably equipped conventional boilers for heat or electricity generation.

#### **13.4.3 Gasification**

The thermal conversion of organic materials at temperatures between 550°C and 1 540°C, with a limited supply of air or oxygen. The waste does not combust, with the resulting synthetic gas (syngas – a mixture of CO, CO<sub>2</sub>, H<sub>2</sub>, CH<sub>4</sub> and NO<sub>x</sub>, SO<sub>x</sub> and other trace gases) given off having a low to medium calorific value that can be used to generate electricity.

Advantages:

- Modern well designed and operated plants can comply with environmental and atmospheric emission standards.
- Potential for refining to produce alternative fuels for vehicles.

Disadvantages:

- Although not as common as Incineration, the technology using low grade coal is known. However, municipal wastes are not commonly used as a feedstock.
- High capital and operating costs.
- Technical expertise required to operate.
- May require additional fuel if calorific value of waste is low.
- Requires sophisticated gas scrubbing. Gas scrubber effluents (liquid, slurry or powder) need to be safely disposed of, although these are small in quantity compared to the quantity of waste being incinerated.

#### **13.4.4 Plasma Arc Gasification**

A plasma arc using electrodes to initiate very high temperatures (2 200°C to 11 000°C) that drive the gasification reaction. The syngas produced has a high calorific value that can be used to generate electricity.

Advantages:

The technology is known, though mostly for neutralisation of hazardous wastes. However, municipal wastes are not commonly used.

- Generally produces a high value syngas (depending on the feedstock).
- Modern well designed and operated plants.
- Potential for refining to produce alternative fuels for vehicles.

Disadvantages:

- Very high capital and operating costs.

- Technical expertise required to operate.
- May not be energy efficient for municipal wastes.
- Requires sophisticated gas scrubbing, although lower quantities of scrubber effluent produced than other thermal processes. Gas scrubber effluents (liquid, slurry or powder) need to be safely disposed of, although these are small in quantity compared to the quantity of waste being incinerated.

### 13.4.5 Pyrolysis

The thermos chemical decomposition of organic material at elevated temperatures (400°C to 600°C) in the absence of air or oxygen. The syngas produced can be used to generate electricity as in other processes, or can be converted to liquid hydrocarbons, fuel oils or “biodiesel”.

Advantages:

- The technology is known, though mostly small scale.
- Can be used to generate electricity or biodiesel.
- Modern well designed and operated plants can environmental and atmospheric emission standards as a feedstock.
- Potential for refining to produce alternative fuels for vehicles.

Disadvantages:

- High capital and operating costs.
- Technical expertise required to operate.
- Requires sophisticated gas scrubbing. Gas scrubber effluents (liquid, slurry or powder) need to be safely disposed of, although these are small in quantity compared to the quantity of waste being incinerated.

It must be noted that for any of these thermal processes to be viable, it may be necessary to divert a portion of the recyclable materials (e.g. paper, cardboard and plastics for incineration; plastics for gasification or pyrolysis) to become feedstock for the thermal process. This may be seen as counter-productive for the viability of recycling. However, it must be noted that free-market principles apply to recycled material purchase prices. As recycling rates increase, it is likely that the value of certain recyclates may reduce. At the same time, it is generally accepted that the cost of coal-based electricity generation is going to continue to rise. Careful cost-benefit analysis of the systems competing for the material may indicate a case for both recycling and WtE. The situation may arise that the value of waste plastic may have a higher value for WtE than as recycled material.

The WtE experience in South Africa is minimal. It is known that Cape Town has been operating a demonstration pyrolysis plant, and Johannesburg has undertaken a detailed feasibility study into advanced waste management with thermal processes. The feasibility of WtE needs to be investigated in detail as part of its future integrated waste management system ( eThekweni Metropolitan Municipality Integrated Waste Management Plan 2016 Project No. 4024-022).

## 13.5 Minimum thresholds required to consider WtE

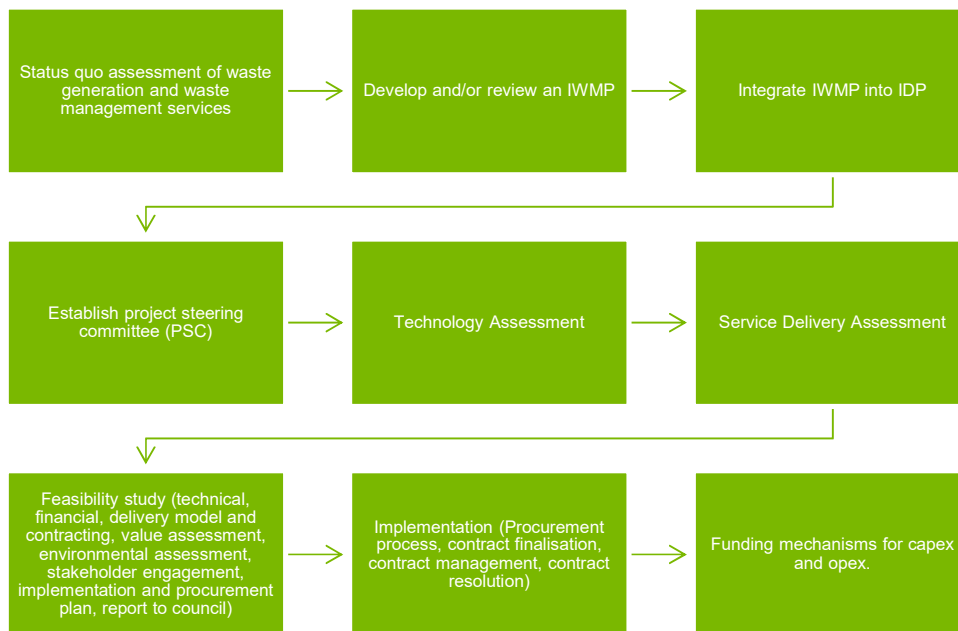
The table below gives an indication of waste volumes needed in order to pursue specific technology options. For calculation of waste volumes the municipality should take current and planned waste reduction programmes into account. Further, the tonnages below might refer to specific waste streams only (as opposed to mixed Municipal Solid Waste). See the legend below the table for further details. (<http://awtguide.environment.gov.za/content/technologies-required-waste-volumes>)

| Key: <span style="background-color: green; color: white; padding: 2px;">X</span> Yes <span style="background-color: gray; color: white; padding: 2px;">X</span> Maybe <span style="background-color: black; color: white; padding: 2px;">X</span> No |                                                               |                                                               |                                                               |                                                               |                                                               |                                                               |                                                               |                                                               |                                                               |                                                               |                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| Volumes:<br>tonnes per<br>annum                                                                                                                                                                                                                      | Shortterm                                                     |                                                               |                                                               | Medium term                                                   |                                                               |                                                               |                                                               | Longterm                                                      |                                                               |                                                               |                                                               |
|                                                                                                                                                                                                                                                      | Open<br>Windrow<br>Composting                                 | Clean<br>MRF                                                  | Dirty<br>MRF                                                  | Incineration                                                  | Aerobic<br>Digestion                                          | In-Vessel<br>Composting                                       | Mechanical<br>Biological<br>Treatment                         | Gasification                                                  | Plasma<br>Gasification                                        | Pyrolysis                                                     | Mechanical<br>Heat<br>Treatment                               |
| 0 to 10 000                                                                                                                                                                                                                                          | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> |
| 10 000 to 50 000                                                                                                                                                                                                                                     | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> |
| 50 000 to 70 000                                                                                                                                                                                                                                     | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  |
| 70 000 to 90 000                                                                                                                                                                                                                                     | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  |
| 90 000 to 130 000                                                                                                                                                                                                                                    | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> |
| 130 000 to 170 000                                                                                                                                                                                                                                   | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: green; color: white;">X</span> |
| 170 000 to 190 000                                                                                                                                                                                                                                   | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: green; color: white;">X</span> |
| 190 000 to 230 000                                                                                                                                                                                                                                   | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: gray; color: white;">X</span>  | <span style="background-color: green; color: white;">X</span> |
| 230 000 to 290 000                                                                                                                                                                                                                                   | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> |
| 290 000 to 490 000                                                                                                                                                                                                                                   | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> | <span style="background-color: black; color: white;">X</span> | <span style="background-color: green; color: white;">X</span> |
| Inputs                                                                                                                                                                                                                                               | A                                                             | B                                                             | C                                                             | D                                                             | A                                                             | D                                                             | E                                                             | D                                                             | F                                                             | D                                                             | G                                                             |

### 13.5.1 Processes for implementation

The following is the process that needs to be followed when considering implementation of WtE projects:

- Status quo assessment of waste generation and waste management services.
- Develop and/or review an IWMP.
- Integrate IWMP into IDP.
- Establish a project steering committee (PSC).
- Technology Assessment.
- Service Delivery Assessment.
- Feasibility study (technical, financial, delivery model and contracting, value assessment, environmental assessment, stakeholder engagement, implementation and procurement plan, report to council).
- Implementation (Procurement process, contract finalisation, contract management, contract resolution).
- Funding mechanisms for capex and opex.



## 13.6 Current waste practices in Cato Ridge

### 13.6.1 Solid Waste Management

Solid Waste Management Goals & Objectives are as follows:

- Waste minimisation strategies need to be developed for the local area that encourages the reuse and recycling of solid waste material generated in the area.
- Solid waste disposal services to be extended into new developments and upgraded settlements.
- The environmental Record of Decision for the Cat Ridge Landfill Site has not been received to determine if this will be an option for waste disposal .

Solid Waste Management System currently in place:

- Solid waste is collected and transported to the nearest solid waste handling site. The nearest general solid waste site is Marianhill.

The table below summarises the landfill sites accessible to Cato Ridge, as well as the classification of the types of waste that the sites are able to accept.

| LANDFILL SITE                                          | DISTANCE FROM CATO RIDGE | COMMENT                                                     |
|--------------------------------------------------------|--------------------------|-------------------------------------------------------------|
| <b>HAMMARSDALE</b><br>(eThekweni Municipality)         | 15km                     | Transfer Station                                            |
| <b>SHONGWENI</b><br>(Private)                          | 21km                     | Hazardous Waste – Closed                                    |
| <b>NEW ENGLAND ROAD</b><br>(The Msunduzi Municipality) | 30km                     | General Waste                                               |
| <b>MARAINHILL</b><br>(eThekweni Municipality)          | 45km                     | General Waste<br>Registered National Conservancy            |
| <b>BISASAR ROAD</b><br>(eThekweni Municipality)        | 50km                     | Garden Refuse and Building Rubble Only.<br>Transfer Station |
| <b>BUFFELSDRAAI</b><br>(eThekweni Municipality)        | 75km                     | General Waste                                               |
| <b>ILLOVU</b><br>(eThekweni Municipality)              | 83km                     | General Waste                                               |
| <b>KWADUKUZA</b><br>(Kwadukuza Municipality)           | 116km                    | Hazardous Waste                                             |

**Figure 58: Landfill Sites in eThekweni & Neighbouring Municipalities**

Harrison Flats has been identified as an area where a future general solid waste landfill site could be established. Until such time as the landfill site has been developed, general waste generated from development must be disposed of to one of the landfill sites listed above.

Hazardous waste generated from heavy industries will need to be disposed of at one of the specialised sites capable of dealing with hazardous waste.

### 13.6.2 Planned infrastructure

Department of Environmental Affairs ("DEA") proposed to develop Cato Ridge Regional landfill on Farm Riet River 851 Portion 25 and 26 in the Outer West region, eThekweni Municipality. The site is situated within the industrial area of Cato Ridge at the following geographical co-ordinates: 29°42'0.30"S and 30°37'29.97"E and is owned by Assmang (Pty) Ltd who operate adjacent the proposed site. The total footprint of the proposed Cato Ridge Regional landfill development will be 229 ha. The projected waste generation to be disposed of at the Cato Ridge Regional Landfill is estimated as 300 tons per day. Only general solid waste will be disposed of at the proposed facility.

A process was undertaken to identify and select sites suitable for landfill development in the eThekweni Municipal Area. Within the west zone four broad "windows of opportunity" (areas potentially suitable for large general waste disposal site development) were identified. These four broad windows were known as Shongweni, Ferralloys/Radnor, Doornrug/Bonny Brae and Lion Park. The window areas were evaluated and specific sites within the broader areas were identified. Sites suitable for landfill development were taken forward for further investigation and subjected to an EIA process to obtain the necessary environmental approvals.

Some of the industries in the locality of the site are as follows:

- Frey's Food Brands (Pty) Ltd (abattoir) is located approximately 1- 1, 2 km east of the proposed site.
- Cobro Concrete is approximately 1.2km south east of the landfill site.
- Pronutria and SRF Flexipak are located on the eastern boundary .

If a WtE facility is to be considered as an alternative option, the waste generated from these industries must be quantified and characterised to determine the suitability as feed for the plant.

## 13.7 Types of waste

Approximately 5000 tons of general waste is generated in the eThekweni Municipal area on a daily basis. As eThekweni have existing landfill facilities which service other areas of the municipality, not all 5000 tons of waste generated daily will be destined for the proposed Cato Ridge Regional Landfill site. For the purposes of this investigation a conservative approach has been adopted and it has been assumed that approximately 3000 tons of compacted waste will be delivered to landfill on a daily basis. The density of the compacted waste is taken as 1000 kg/m<sup>3</sup>, which should be achieved comfortably with the compaction equipment currently in use

at other DSW landfill sites. The proposed landfill has been designed with an airspace capacity of approximately 65 million m<sup>3</sup>. Based on estimated waste generation rates, the proposed landfill will have a life span of approximately 78 years.

## **13.8 Waste to energy in Cato Ridge**

### **13.8.1 WtE in South Africa**

South Africa occupies a central position in the global debate regarding the most effective policy instruments to accelerate and sustain private investment in renewable energy. In 2009, the government began exploring feed-in tariffs ("FITs") for renewable energy, but these were later rejected in favour of competitive tenders. The resulting program, now known as the Renewable Energy Independent Power Producer Procurement Program ("REIPPPP"), has successfully channelled substantial private sector expertise and investment into grid-connected renewable energy in South Africa at competitive prices.

Since November 2011, more than 6 327 MW from 92 renewable energy projects have been awarded at increasingly lower and cost competitive rates. The REIPPPP has attracted investments of R 192.6 billion of which R 53.2 billion was from foreign investors and financiers. The renewable technologies include onshore wind, solar PV, solar CSP, landfill gas, biomass and small hydro and 37 projects are operational, with 1827 MW of on-line capacity.

Companies could benefit from the remaining waste to energy allocations of 86 MW (7 MW – landfill gas, 19 MW - biomass and 60 MW biogas respectively). The IPP participation is typical via a tender and bid process which includes Request for Proposals, bidders conferences, power purchase agreements (PPAs with Eskom), DoE guarantees (effectively provided a sovereign guarantee of payment) and subject to special requirements as per the process. Bids are typically required to contain information on the project structure, legal qualifications, land, environmental, financial, technical and economic development qualifications and bidders need to submit bank letters indicating that financing is locked-in. Bidders are also expected to identify the sites and pay for early development costs at their own risk. Project selection is based on a 70/30 split between price and economic development considerations.

Another opportunity for companies is that the REIPPPP has been extended to offer opportunities for small-scale renewable energy (RE) producers to participate. The small projects procurement approach is designed to promote partnerships between large experienced developers and smaller local entities to facilitate skills transfer and risk sharing. Under the small REIPPPP programme, projects with the capacity to deliver between 1 and 5 MW of generation are considered to contribute a total of 200 MW. The RE energy included under the small REIPPPP programme will be derived from onshore wind, biomass, biogas, landfill gas and small hydro technologies.

### **13.8.2 Long-term and short-term considerations**

The growth potential in the small and medium-scale waste to energy facilities are the first area where companies and solutions could benefit. Typical projects include biogas plants where the energy (electricity, heat and/or gas) is used for own use or where electricity is wheeled through the existing electrical grid to other nearby private buyers. One example of this wheeling type of arrangement is a 4.4 MW biogas plant, situated near Tshwane (Pretoria), that supply electricity to the carmaker, BMW's Rosslyn factory in South Africa. This biogas facility uses a mixture of cow manure from a 30 000 cattle feedlot and organic waste ranging from paper sludge, fruit and vegetable leftovers, fat from restaurants, abattoir waste, yoghurt, dog food and expired carbonated drinks, supplying approximately 25% to 30% of the electricity consumption at BMW's factory. While BMW is purchasing power generated at the biogas plant, the energy is fed into the local grid owned and operated by Eskom, the state power utility, which then connects to the auto plant via the city of Tshwane's electricity distribution network. Tshwane, the local metropolitan area where both factories are located, facilitate the billing process.

An example of waste to energy for own use, is the City of Johannesburg's Northern Water Works project, which treats about 430-million litres of sewage a day. This waste water treatment works ("WWTW") site was the first biogas to energy project in Johannesburg and was developed within the existing WWTW site. The facility produces 4.5 MW of electricity for own use from biogas using cogeneration (or combined heat and power, CHP) gas engines. The electricity produced reduces Johannesburg City's need to purchase more expensive power from Eskom and soften the impact of rising electricity prices. The heat produced will also

improve sludge management and increase biogas production while it showcases the City's commitment to renewable energy.

Many of the existing WWTW plants in the larger cities in South Africa have installed biogas plants, built in the early 1970s, which are currently idle due to poor maintenance and the inadequate training of WWTW staff. There is an opportunity for companies to participate in the refurbishment of these WWTW plants and providing solutions to generate electricity or gas from these plants. The South African Local Government Association (SALGA) and the DoE are currently discussing the feasibility of this energy-efficiency intervention as part of the future energy solution for South Africa.

### **13.9 Recommendations**

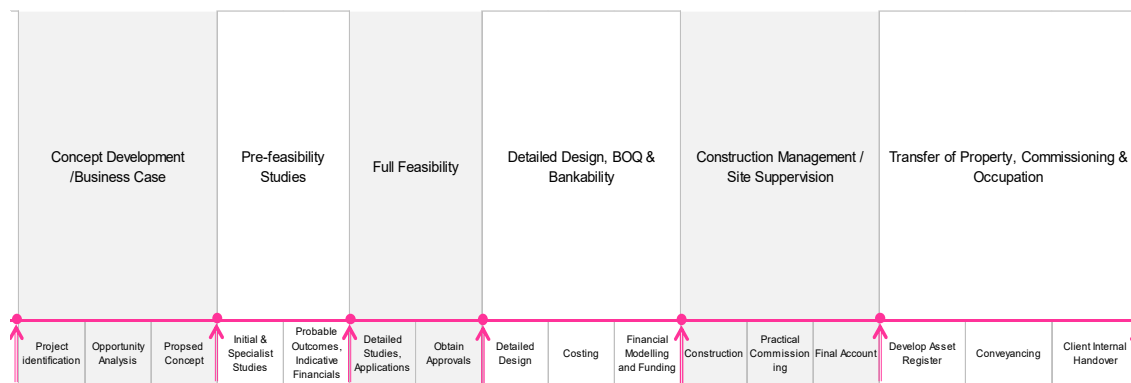
- In order to more conclusively determine the viability of such a site, a feasibility study is required to determine Municipal Solid Waste (MSW) streams and any other potential waste streams in the area that could potentially contribute to providing sufficient feed for a WtE facility. The industries in proximity to the area must be investigated and waste streams quantified and characterised to determine potential suitability for a plant.
- The long-term planning for growth in the area must be established as this will also determine potential for the technology. Accurate population and industry growth and types must be determined.
- Consultation with the Local and Regional Municipality must be initiated to determine their interest in such an alternative to the landfill facility that has been proposed. They have invested already in planning for a new landfill, as this received considerable opposition they may favourably consider alternatives.
- Public consultation should be undertaken to determine what objections will be raised, as there was opposition to the establishment of a landfill by Assmang and the local community.
- Spatial constraints of regionalisation and possible viable siting options must be investigated.

## 14 Way Forward

Assmang has embarked on the process of facilitating land development on their land in the Cato Ridge area. In order to effectively facilitate development, it is necessary that some initial de-risking of the site is undertaken. Being a major land owner, and by undertaking studies to de-risk the land for development, Assmang will advertently kick-start land development and demand for land in the general vicinity.

There is however some uncertainty about the developability of the land owing to environmental sensitivity. These sensitivities can be addressed in the formal EIA process.

For Assmang to initiate demand, it is not necessary for them to partake in the full development lifecycle, as seen in the figure below. To date, Assmang has completed the first two phases of Concept Development and (with this report) Pre-Feasibility for the entire tract of land. These studies have assessed the land to identify fatal flaws and risks and to ring fence an area that is suitable for the first phase of development. It is important that the first phase does not provide an over supply of land to the market, does not trigger any major bulk infrastructure upgrades that may render the development unfeasible. At the same time, the first phase must make enough land available to the market to ignite further demand of the precinct.



**Figure 59: Land Development Lifecycle**

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