Final Environmental Impact Assessment Report for the Cornubia Retail Park

A Report for Tongaat Hulett Developments

8 August 2013

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Tongaat Hulett DEVELOPMENTS

Royal HaskoningDHV
Enhancing Society Together

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Humayrah Bassa

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Durban

Review: Prashika Reddy

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Signature

Approval: Malcolm Roods

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Signature

PUBLIC REVIEW OF THE FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Royal HaskoningDHV (RHDHV) would like to thank all Interested and Affected Parties (I&APs) for their continued participation and input into this Environmental Impact Assessment (EIA) process. The comments received to date have proven invaluable to this process and we do appreciate your time and effort.

The Draft Environmental Impact Assessment Report (EIAR) has been made available for comment for a period **of *40 days*** from Monday **20 May 2013** until Friday **28 June 2013**. All comments which were received have been critical in the finalisation of this final EIAR. The comments received to date are included in a Comments and Responses Report which is provided in **Appendix D**.

The final EIAR will be available for a further commenting period of 21 days after which it will be submitted to the Department of Agriculture and Environmental Affairs (DAEA) for acceptance. The details of the assessing officer for this application is provided below:

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I&APs are therefore notified of the availability of the final EIAR and the opportunity to review the final document for a further period of 21 days from Thursday **8 August 2013** to Wednesday **28 August 2013** prior to submission to the Department. Comments must be submitted to:

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DUE DATE FOR COMMENT ON FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

WEDNESDAY 28 AUGUST 2013

Executive Summary

Introduction and Background

Tongaat Hulett Developments propose to develop approximately 48 hectares of land in Mount Edgecombe into a Retail Park. The proposed site is currently a greenfields site under sugarcane cultivation. The proposed site falls within the overall, Municipality approved Cornubia Development Framework. The project will consist of large scale retail and commercial buildings developed on earth-worked platforms to cater to the surrounding region. The project includes the construction of new roads and upgrading to existing road networks as well as the installation of new services including gravity sewer lines, water pipelines, electrical cabling and stormwater attenuation.

It is further proposed that the existing Mount Edgecombe Refuse Transfer Station will be relocated. A waste management licence has been applied for the relocation of the waste transfer facility and a Basic Assessment study is being undertaken to address the waste specific requirements only. All infrastructural requirements of the new Station, including proposed access roads which traverse wetlands are addressed as part of this EIA as well as to enable the construction of the new facility on existing greenfield land.

The above proposal is based upon a Development Framework Plan (Figure 1-3) for the entire Cornubia Project which was approved and adopted by the eThekwini Municipality for the whole of Cornubia in 2011. Due to the extent of the development, it will be developed on a phased basis. This EIA Application Process is for the Retail Park component only which is separate to the Phase 1 (DM/Amend/0189/08 - *complete*) and Phase 2 (DM/0030/2012 - *current*) EIAs and the Mount Edgecombe Refuse Transfer Station relocation Basic Assessment (DM/WML/0041/2012 - *current*).

The need to isolate this portion of the Cornubia Framework Plan relates to the fact that it is a very small component, it is clearly defined in the Framework plan and there are already committed investors who would like to develop the properties as soon as possible. As the development is aligned with the Framework Plan it is proposed that it is expedited in order to enable this significant new investment to be made.

Regulatory Environmental Requirements

The KwaZulu-Natal Department of Agriculture and Environmental Affairs (KZN DAEA), is the lead authority and any EIA process in KwaZulu-Natal needs to be authorised by this Department in accordance with the National Environmental Management Act (NEMA) (No 107 of 1998)(as amended).

The EIA Regulations (2010) under the NEMA consist of three categories of activities namely: Listing Notice 1 Activities (GNR. 544 of 2010) which require a Basic Assessment study, Listing Notice 2 Activities (GNR. 545 of 2010) which require both a Scoping and an EIA study for authorisation and Listing Notice 3 Activities (GNR 546 of 2010) which requires a Basic Assessment study to be undertaken in specific geographical areas.

The activities associated with the proposed project amongst others triggered activities contained in GNR 545 and as such a Scoping and EIA process will be undertaken for the development.

Public Participation Process

Royal HaskoningDHV (previously known as SSI Engineers and Environmental Consultants) are conducting the Public Participation Process (PPP) for this project. In recent years Tongaat Hulett Developments has actively

promoted a participatory approach to their property development projects, with the understanding that the socio-political and economic context as well as environmental legislation requires this public approach. Interested and affected parties are invited to "inform and be informed" about developments in order to achieve the most participation as possible. It is also noted that engaging stakeholders even before developments are built can be seen as best environmental practice. It is for this reason that the PPP which forms part of the EIA becomes the basis of a long-term stakeholder engagement process.

Environmental Impact Assessment Report and Purpose of the Report

In line with the requirements of the NEMA EIA Regulations, this EIA Report provides a detailed description of the pre-development environment, specifically in terms of the biophysical and socio-economic environment of the study area. Furthermore, the report provides a comprehensive description of the activities as well as numerous specialist studies undertaken for the EIA Phase and Public Participation Process (PPP), as well as the way forward in the form of conclusions, recommendations and a draft Environmental Management Programme (EMPr).

To ensure the completeness of the EIA and Draft EMPr, specialists surveyed the area to identify the potential impacts of the project on the area. The following specialist studies were conducted for the Cornubia Retail Park Project and are included within the Appendices of this EIA report:

SPECIALIST STUDY	ORGANISATION
Agricultural Potential Assessment	Mottram & Associates
Vegetation Assessment	SiVest
Wetland Assessment	SiVest
Geotechnical Assessment	Drennan Maud & Partners
Cultural Heritage Assessment	eThembeni Cultural Heritage
Traffic Impact Assessment	SMEC South Africa

In addition to the above specialist studies, the following reports have been prepared in support of the EIA study:

SPECIALIST STUDY	ORGANISATION
Planning Report	IYER Urban Design Studio
Engineering Services Report	SMEC South Africa
Stormwater Management Plan	SMEC South Africa
Electrical Services Report	Bosch

Additions/revisions from the draft EIAR to the final EIAR have been underlined for ease of reference to the reader.

Alternatives

Given the fact that a lengthy and detailed process was followed by the applicant in partnership with the eThekwini Municipality which produced a Development Framework Plan that was finally adopted by the Municipality, no offsite alternatives have been investigated. However, two site layout alternatives were presented in the Environmental Scoping Phase – Alternative Site 1 (preferred alternative) which includes land owned by the South African Sugar Association (SASA) and Alternative Site 2 which excludes land owned by the SASA. Alternative Site 1 has previously been presented through this EIA process whilst Tongaat Hulett Development and SASA continued negotiations regarding the development of the SASA owned land (as the preferred alternative) for the Cornubia Retail Park, however as a result of a lack of finality to the negotiations, layouts have been amended to reflect the alternative which excludes SASA owned land – referred to as the revised preferred alternative.

As the EIA process has progressed, it is now deemed unlikely that an agreement will be reached between Tongaat Hulett Developments and SASA, however negotiations are ongoing, hence the inclusion of this alternative option into the EIAR, albeit the least preferred.

As the EIA process has progressed, no agreement between the parties has been forthcoming and it now expected that SASA are no longer interested in a joint type of development and will proceed with their own plans for their property. This option (least preferred) including the SASA landholdings is however retained for continuity and comprehensiveness.

The site alternative does relate to the need to relocate the existing Mount Edgecombe Refuse Transfer Station as such is not considered at a framework scale and hence was not fully considered in the Development Framework Plan. In this regard two site alternatives have been assessed and presented – Alternative Site 1 which is the preferred option and proposes the relocation of the Station to the immediate east of its current location along with the realignment to an existing road and the Alternative Site 2 which proposes the relocation of the Station to the north-east of its current location and includes the construction of two new temporary access roads which traverse a wetland.

Based on the comparative assessment of the two site options and the impact identification and assessment, it is evident that there is a minor difference in the impacts for the preferred and alternative sites (-125 for the Alternative Site 1 – including SASA owned land, compared to -122 for the Alternative Site 2 – excluding SASA owned land), the only significant impact being a greater area of land being sterilised for development in Alternative Site 1. In terms of the sites presented for the Mount Edgecombe Refuse Transfer Station (and associated road access), the comparative assessment of the two site options and the impact identification and assessment illustrates that there is a significant difference in the impacts for the preferred and alternative sites (-83 for the Alternative Site 1 (preferred site), compared to -108 for the Alternative Site 2) due primarily to the greater impact the access road for the Alternative Site 2 will have on a wetland. In addition, the Alternative Site 2 is incompatible to future planned land uses in the adjacent area which is proposed to be zoned as a residential area.

The application is therefore for a new phase of the Cornubia Integrated Human Settlement development for which there is an adopted (by the eThekwini Municipality) Development Framework Plan that covers the core open space system, primary road and access network and land uses. Whilst the Framework Plan is not to be seen as a detailed Master Plan, these major elements have been considered at the framework level as part of the initial EIA process for Cornubia Phase 1.

The eThekwini Municipality is responsible for decisions pertaining to land use within the Municipality and hence there is no further reason to consider alternative land use options. Furthermore, given that the entire Development Framework is to be developed over time, there is no rationale to consider alternative site locations.

The No-Go option involves retaining the existing land use i.e. agriculture. The property would remain under sugarcane cultivation, and would continue to operate as a working sugarcane farm. The Cornubia site and its soils offer reasonable value agricultural potential but the context and prime location of the development within the broader region necessitates the transformation of the land use for the greater societal good. Tongaat Hulett, who currently farm this land, have been proactive with regard to the 'replacement' of agricultural land lost (which loss will be gradual over a number of years) in more, long term appropriate locations.

It should also be noted that the current farm estate has already been impacted upon by the Phase 1 development and as development increases there will be increasing pressures and the associated difficulties of farming land that is surrounded by development.

Environmental Impact Assessment

The impact of the project activities was determined by identifying the environmental aspects and then undertaking an environmental risk assessment to determine the significant environmental aspects. The environmental impact assessment has considered all phases of the project namely, construction phase and operational phase. It is not anticipated that the proposed infrastructure will be developed in the short-medium term and the date of decommissioning is unknown. Therefore, the decommissioning impacts have not been considered.

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. During the EIA, the impact of the Cornubia Retail Park Development and associated Mount Edgecombe Refuse Transfer Station Construction on the biophysical and socio-economic environments was assessed. From the assessment, it was determined which parts of the two environments will be more significantly affected as compared to others. It was this assessment that allowed the EAP to make an informed analysis and provide an opinion of the proposed development.

Conclusion

In line with the requirements of the NEMA EIA Regulations (2010)(as amended), this EIA Report has provided a description of the Development Framework as it applies to the Cornubia Retail Park and the Mount Edgecombe Refuse Transfer Station. In addition, an explanation of the activities undertaken during the EIA Phase and PPP was also provided. Importantly the report addresses the impacts identified during the scoping phase that were anticipated for the development, as well as providing mitigation measures to ensure for the environmentally sustainable development of Cornubia.

This EIA study has found that there will be a loss to wetland habitats as a result of the proposed development. It is proposed that 3.54 ha of degraded wetland area is proposed to be infilled in order to enable the creation of a sufficiently large platform area that will accommodate the extensive development proposed in line with the Development Framework Plan. This calculation also includes the loss of wetland area to accommodate the access road to the district road for the Mount Edgecombe Refuse Transfer Station.

Under a hypothetical rehabilitated scenario, the proposed infilling of these wetlands are assessed to be of moderate significance. This study concludes that the proposed loss of wetland habitats is acceptable provided

the proponent undertakes the rehabilitation of adjacent off-site wetlands to offset for this loss. It is noted that the Cornubia Development Framework that was produced considered the overall open space system and took account of the development's socio-economic imperatives in terms of land requirements but also considered the existing wetlands and vegetation. The proposed open space system that has been planned will, for the development as a whole, provide a significant new ecological benefit. It is further noted that the Framework Plan is currently being confirmed in detail with the EIA process underway for the balance of the development.

It is also noted that the wetlands on this site cannot be considered in isolation and that they are part and parcel of the overall Cornubia Integrated Human Settlement. The overall development includes a significant quantum of open space and wetland rehabilitation and against which the loss of wetlands on this site need to be considered and included as necessary. In this regard however, it is noted that the remainder of Cornubia (outside of Phase 1 and this Retail Park) is currently in it's own EIA process (Cornubia Phase 2 EIA) where the final quantum of open space and wetland rehabilitation will be confirmed. It will then be possible to confirm the overall nett gain to be achieved across the whole development including this Retail Park.

It is the intention that in terms of the greater Cornubia Framework Plan, agreed in principle with the eThekwini Municipality, all remaining wetland units not identified as being lost by the implementation and construction of the greater Cornubia Framework Plan within the Cornubia Phase 2 area will be rehabilitated. The latest layouts indicate that the area of wetland available for rehabilitation is approximately 153.88 ha, 32.92 ha more than the minimum 120.96 ha, as per the 1:3 offset ratio. Thus the overall wetland losses can be can be considered to be adequately offset and the significance of the impact reduced to acceptable levels. The wetland units nominated for rehabilitation to offset the loss associated with the Retail Park Development fall within Cornubia Phase 2 and total 11.4 ha.

Therefore, while the infilling of wetland habitats is proposed as part of this EIA application, rehabilitation of remaining wetlands and the establishment of open spaces are also proposed within subsequent phases of Cornubia. Therefore, the Wetland and Open Space Rehabilitation Plan for the entire Cornubia Development which is currently being formalized and will be submitted to the Department of Water Affairs in September 2013 as part of an integrated Water Use Licence Application for the remainder of Cornubia (Phase 2 and the Retail Park) must be considered in this application and cannot be discounted.

When considering the development of the Cornubia Retail Park, it is important to note the overall Development of Cornubia. The proposed Retail Park cannot be viewed in isolation and the cumulative impacts of the overall development have been assessed in this report. Similarly, the proposed wetland offsets and rehabilitation should also be viewed holistically.

Consequently, an integrated Water Use Licence Application for the proposed infilling of wetland areas is currently being undertaken for Cornubia as a whole and will be submitted to the Department of Water Affairs for decision-making.

There is currently no significant vegetation or ecological impediments that should prevent the proposed development from being given Environmental Authorisation. Notwithstanding these conclusions, a licence from the Department of Agriculture, Forestry and Fisheries will be required for the removal (and potential relocation) of the *Sideroxylon inerme* and a permit will be required from Ezemvelo KZN Wildlife for the relocation of the *Scadoxus puniceus* individuals occurring on the sites, and the collection of the *S. inerme* seed, propagation and replanting of these individuals within the drainage line and associated buffer to the east of Retail Park is necessary. This will enable relocation of indigenous species to the nursery which is to be established for the Cornubia Development.

Should the proposed mitigation measures be implemented correctly, the Cornubia Retail Park will be a viable development and be able to meet its 'responsibility' in line with it's contribution towards the Cornubia Integrated Human Settlement. The location of the development is in line with the planning intent as the study

area is in a prime location for the nature of uses proposed. The development could serve as a catalyst to induce future private sector investment within this area and will generate much needed employment opportunities for people of Cornubia and surrounds. Since the Medium Density residential development is already under construction with approximately 2 500 units envisaged in the short term, the development of the study area may contribute in creating much needed employment opportunities in the area. Initial feasibility studies indicated that the precinct would be able to provide a number of short and permanent jobs as well as contribute significantly to the rates base of the City. This is particularly pertinent given that there are already investors committed to proceeding with the development.

In terms of the options presented for the new location of the Mount Edgecombe Refuse Transfer Station, it is noted that the approved Cornubia Framework Plan does not indicate a possible location for this Station, other than identifying the area where the existing Station is located as a General Business use zone. It is further noted that the nature of the Retail Park development does not allow for the Station to continue operations at its current location. The Alternative Site 1 (preferred site alternative) is situated closer to mixed-use sites rather than in the heart of a future residential area (as is the case for the alternative site 2) and therefore would potentially be a preferred location. The preferred site has no pure residential uses within 150 m from its location apart from mixed-use residential apartments and is situated closer to mixed-use commercial and industrial sites, reducing the possible odour and/ or visual nuisances. Whilst the preferred site is within a strategic zone for potential future business /retail uses, its location is deemed as adequate by the urban planners and the Station can be accommodated with this area.

Further to this, the location of the Station in this zone is in close proximity to the existing facility. The preferred site is also well located along a higher order road, Dube East in close proximity to the Cornubia Boulevard intersection.

From an ecological perspective, both sites have a reasonable buffer (30 m) against the inadvertent pollution of contaminated stormwater into the wetlands and stream; however the Alternative Site 2 will require two new temporary access roads to be constructed which will traverse a wetland and will therefore have impacts. This preferred site (Alternative Site 1) will require a short, temporary new access road to an existing district road which will have minimal impacts on the wetland. For these reason, the Alternative Site 1 is deemed to be favourable and is the preferred option.

The findings conclude that there are no environmental fatal flaws that could prevent the proposed Cornubia Retail Park Development and the associated relocation of the Mount Edgecombe Refuse Transfer Station provided that the recommended mitigation and management measures contained in the EMPr are implemented.

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Glossary

Activity (Development)	An action either planned or existing that may result in environmental impacts through pollution or resource use. For the purpose of this report, the terms 'activity' and 'development' are freely interchanged.
Alternatives	Different means of meeting the general purpose and requirements of the activity, which may include site or location alternatives; alternatives to the type of activity being undertaken; the design or layout of the activity; the technology to be used in the activity and the operational aspects of the activity.
Applicant	The project proponent or developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.
Biodiversity	The diversity of animals, plants and other organisms found within and between ecosystems, habitats, and the ecological complexes.
Construction	The building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.
Cumulative impact	The impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Decommissioning	The demolition of a building, facility, structure or infrastructure.
Direct Impact	Impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally quantifiable.
Ecological Reserve	The water that is necessary to protect the water ecosystems of the water resource. It must be safeguarded and not used for other purposes. The Ecological Reserve specifies both the quantity and quality of water that must be left in the national water resource. The Ecological Reserve is determined for all major water resources in the different water management areas to ensure sustainable development.
Ecosystem	A dynamic system of plant, animal (including humans) and micro-organism communities and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.
Environment	In terms of the National Environmental Management Act (NEMA) (No 107 of 1998)(as amended), "Environment" means the surroundings within

	which humans exist and that are made up of: a) the land, water and atmosphere of the earth; b) micro-organisms, plants and animal life; c) any part or combination of (i) of (ii) and the interrelationships among and between them; and d) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Environmental Assessment	The generic term for all forms of environmental assessment for projects, plans, programmes or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments and risk assessments.
Environmental Authorisation	An authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.
Environmental Assessment Practitioner (EAP)	The individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.
Environmental Impact	Change to the environment (biophysical, social and/ or economic), whether adverse or beneficial, wholly or partially, resulting from an organisation's activities, products or services.
Environmental Impact Assessment (EIA)	In relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application as defined in NEMA.
Environmental Issue	A concern raised by a stakeholder, interested or affected parties about an existing or perceived environmental impact of an activity.
Environmental Management	Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.
Environmental Management Programme (EMPr)	A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. This EMPr focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.
Fatal Flaw	An event or condition that could cause an unanticipated problem and/or conflict which will could result in a development being rejected or stopped.
General Waste	General waste means waste that does not pose an immediate hazard or threat to health or to the environment, and includes - i. domestic waste; ii. building and demolition waste; iii. business waste; and iv. inert waste.

Groundwater	Water in the ground that is in the zone of saturation from which wells, springs, and groundwater run-off are supplied.
Hazardous Waste	Hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Hydrology	The science encompassing the behaviour of water as it occurs in the atmosphere, on the surface of the ground, and underground.
Indirect Impacts	Indirect or induced changes that may occur as a result of the activity. These types if impacts include all of the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
Integrated Environmental Management	A philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation and management of any proposal (project, plan, programme or policy) or activity - at local, national and international level - that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may include environmental assessment tools (such as strategic environmental assessment and risk assessment), environmental management tools (such as monitoring, auditing and reporting) and decision-making tools (such as multi-criteria decision support systems or advisory councils).
Interested and Affected Party (I&AP)	Any person, group of persons or organisation interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.
Mitigate	The implementation of practical measures designed to avoid, reduce or remedy adverse impacts or enhance beneficial impacts of an action.
No-Go Option	In this instance the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.
Overburden	Layers of soil and rock covering a coal seam. In surface mining operations, overburden is removed prior to mining using large equipment. When mining has been completed, it is either used to backfill the mined areas or is hauled to an external dumping and/or storage site.
Public Participation Process	A process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters.
Rehabilitation	A measure aimed at reinstating an ecosystem to its original function and state (or as close as possible to its original function and state) following activities that have disrupted those functions.

Scoping	The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addresses in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.
Sensitive Environments	Any environment identified as being sensitive to the impacts of the development.
Significance	Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. magnitude, intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic).
Stakeholder Engagement	The process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities.
Sustainable Development	Development which meets the needs of current generations without hindering future generations from meeting their own needs.
Watercourse	Defined as: a) a river or spring; b) a natural channel or depression in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.
Wetland	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.

Acronyms

ADD – Average Daily Demand

ADF – Average Daily Flow

BNG – Breaking New Ground

BRU – Bio Resource Unit

CBD – Central Business District

CIBE – Cornubia Industrial and Business Estate

CMA – Catchment Management Agency

DAEA – Department of Agriculture and Environmental Affairs

DAFF – Department of Agriculture, Fisheries and Forestry

DWA – Department of Water Affairs

EA – Environmental Authorisation

EAP – Environmental Assessment Practitioner

ECO – Environmental Control Officer

EIA - Environmental Impact Assessment

EIAR – Environmental Impact Assessment Report

EMPr - Environmental Management Programme

ENPAT – Environmental Protection Atlas

ESR - Environmental Scoping Report

ETA – eThekwini Traffic Authority

eTM – eThekwini Municipality

I&AP - Interested and Affected Party

IDP – Integrated Development Plan

KZN – KwaZulu-Natal

LAP – Local Area Plan

LOS – Level of Service Right

MSL – Mean Sea Level

NEM:WA – National Environmental Management – Waste Act (No 59 of 2008)

NEMA – National Environmental Management Act (No 107 of 1998)

NFA – National Forests Act (No 84 of 1998)

NUDC – Northern Urban Development Corridor

NWA – National Water Act (No 36 of 1998)

POS – Plan of Study

PPE – Personnel Protective Equipment

PPP – Public Participation Process

RHDHV – Royal HaskoningDHV

RoD – Record of Decision

RoW – Right-of-way

SASA – South African Sugar Association

SDF – Spatial Development Framework

SMP – Stormwater Management Plan

SWAP – Stormwater Attenuation Pond

THD – Tongaat Hulett Developments

TIA – Traffic Impact Assessment

TRL – Traffic Road Layout

VAT – Value Added Tax

WML – Waste Management Licence

WULA – Water Use Licence Application/Authorisation

WWTW – Waste Water Treatment Works

1 INTRODUCTION

1.1 Background

Royal HaskoningDHV (RHDHV) was appointed by Tongaat Hulett Developments (THD) to act as an independent Environmental Assessment Practitioner (EAP) for the environmental authorisation application for the proposed Cornubia Retail Park Development.

As part of the greater Cornubia Mixed-Use Phased Development, and the first commercial investment opportunity within Cornubia, THD propose to establish the Cornubia Retail Park, a retail development in Mount Edgecombe, KwaZulu-Natal. Cornubia is located within the eThekwini Municipality (eTM) and is situated north of Durban (Figure 1-1). The size of the proposed development is approximately 48 hectares in extent. The development site is located in Mount Edgecombe, adjacent to Flanders Drive and the M41 (Figures 1-2).

Figure 1-1: Locality Map of the Cornubia Retail Park Site

Figure 1-2: Locality Map of the Study Area

The proposed site falls within the overall, Municipality approved Cornubia Development Framework (Figure 1-3). The approved Cornubia Framework measures approximately 1 331 hectares in extent and is a benchmark 'Integrated Human Settlement' development, to be developed within the parameters of the National Department of Human Settlement's Breaking New Ground initiative (BNG). The development is undertaken through a partnership between the eTM and THD. The framework for Cornubia aims at developing a 'mixed use' urban settlement comprising a range of complementary land uses. Given the scale of the project, it is intended to establish a 'New Town' within the northern corridor of the eTM. One of the key objectives of the framework and significant in the context of this project is, "to contribute to building, consolidating and integrating the social and economic base of the region as well as create employment, investment and economic opportunities for the people of the area"[1].

The Development Framework was developed taking into account current social and economic conditions which both THD and the eTM seek to influence positively, informed by the need to ensure that the development contributes to the integration and effectiveness of the City's urban structure, form and functioning, particularly in respect of the northern region. The Development Framework of Cornubia responds powerfully to the key challenges and policy thrusts articulated by National Government. It provides for a higher density,

[1] *Extracted from the Cornubia Retail Park Planning Report (2013) prepared by Iyer Urban Design Studio and included as Appendix C8.*

mixed-use and mixed income development that significantly responds to housing demand across a broad spectrum of market segments.

Due to Cornubia's strategic location, it provides a unique and significant opportunity to create meaningful and viable new east-west and north-south linkages and the integration of peripheral areas into the urban economy, as well as address the integration of the City and redress imbalances of apartheid planning. The planning and development of Cornubia is therefore not solely about Cornubia but involves, fundamentally, the surrounding region. Cornubia is not the only area in northern Durban earmarked for development, and especially when viewed in a longer term (5 years plus) horizon, the relationships between the potential mix of land uses and those that will be applicable at Umhlanga Ridge, Sibaya, Dube Tradeport/ La Mercy International Airport, Tongaat and beyond, are pertinent in the planning of Cornubia.

The Development Framework provides a clear indication of the developer's land use intentions for the site. The framework plan should not be seen as the definitive layout or final detailed plan for the development, but should only be used to create an understanding of the conceptual framework for the ultimate development of Cornubia and the Retail Park specifically. This Retail Park development is the first commercial phase of the Cornubia Integrated Human Settlement and is a vital component thereof from the perspective of new employment and economic opportunities. National investors are already in place and committed to proceeding with the R1.24 billion investment. The Retail Park development will then provide a major catalyst to further investment and development within the commercial precinct of the development.

This Environmental Impact Assessment (EIA) process will confirm if there are any fundamental issues to preclude the proposed development from proceeding along the broad, conceptual basis as outlined in the framework and will also deal with the assessment of the detailed, specific issues and impacts on a micro level.

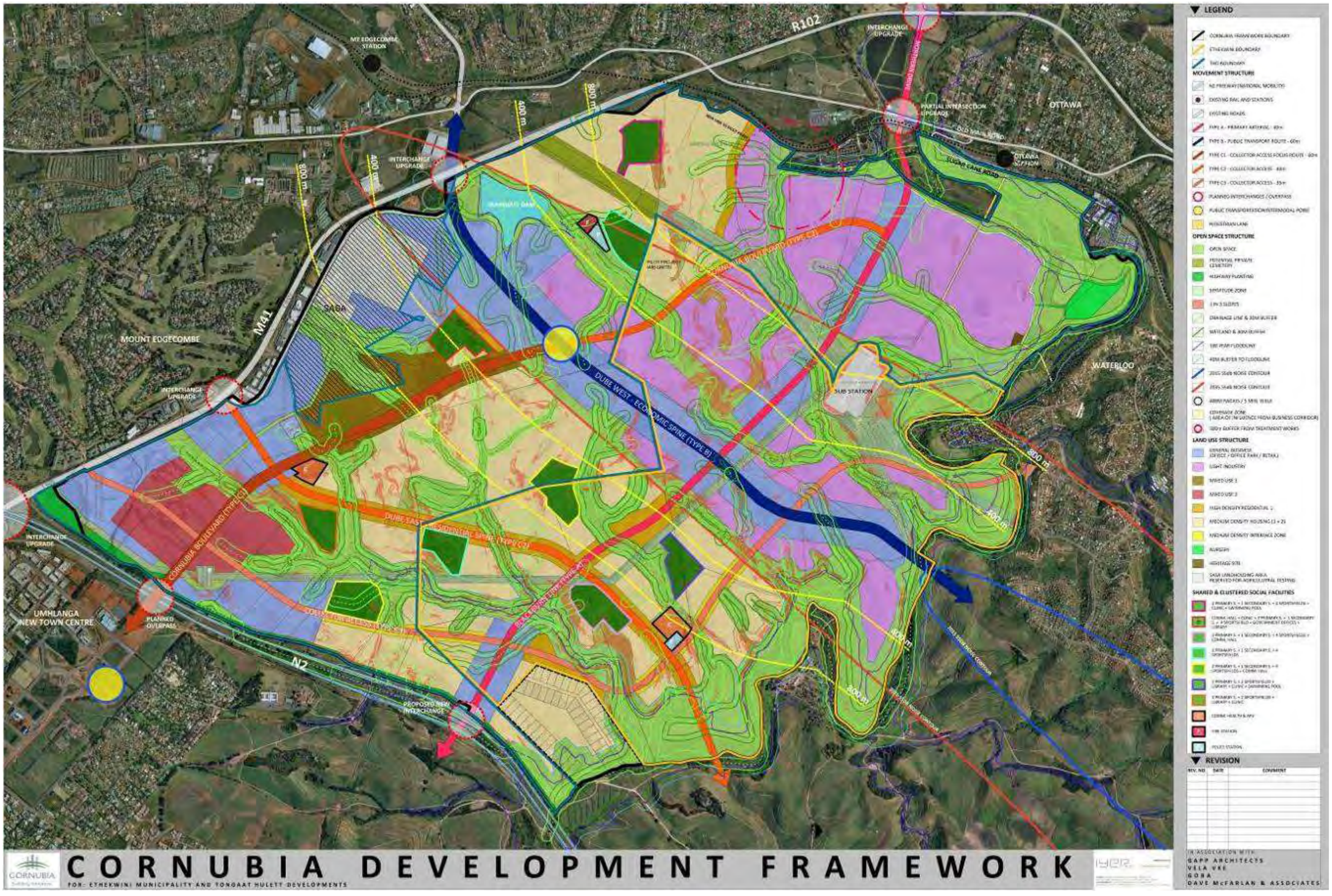


Figure 1-3: Broad Approved Development Framework for the Entire Cornubia Project

Due to the extent of the Cornubia Mixed-Use Development, it will be developed on a phased basis. The Environmental Authorisation for Phase 1 (DM/Amend/0189/08) has been issued and construction has commenced leading the way for the commencement of the environmental authorisation processes for Phase 2 (in process) (DM/0030/2012) and the Cornubia Retail Park (the subject of this EIA) (Figure 1-4).

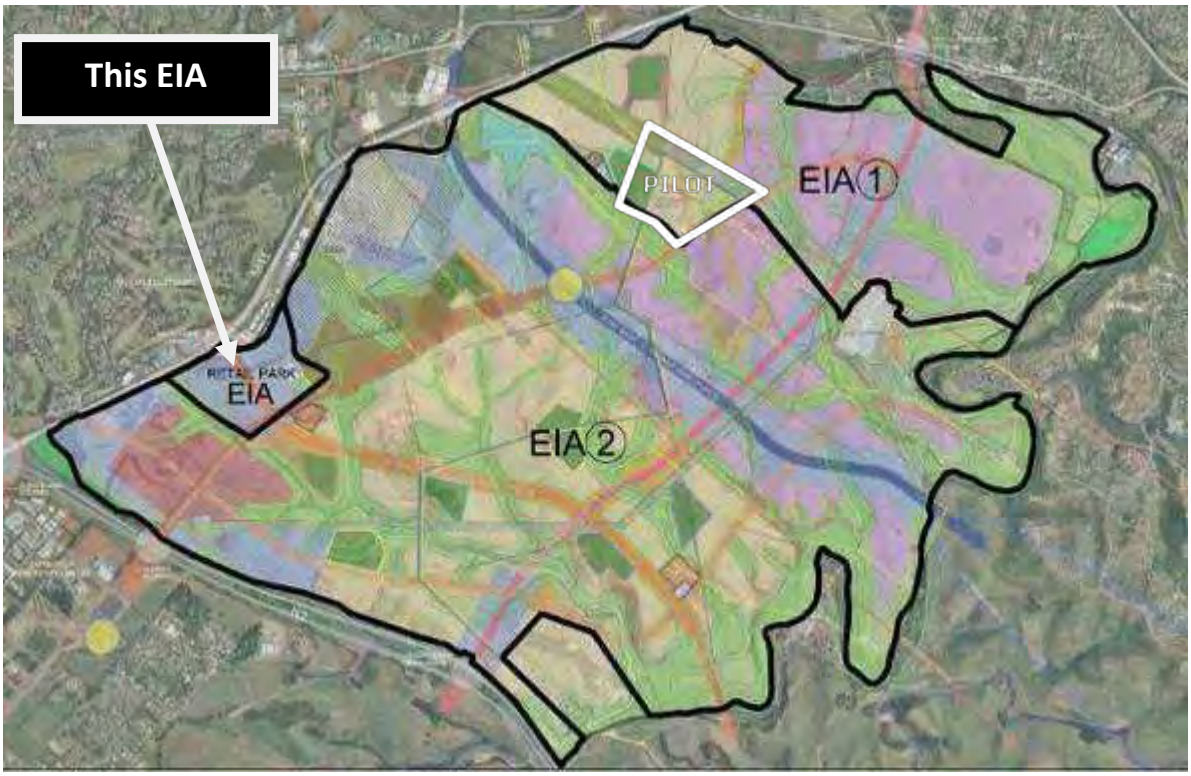


Figure 1-4: The Phasing of the Environmental Authorisation Processes

The proposed Cornubia Retail Park will consist of large-scale retail and commercial buildings developed on earth-worked platforms to cater to the surrounding region. The project includes the construction of new roads and limited upgrading to existing road networks, the installation of new (and/or upgraded) services including gravity sewer lines, water pipelines, electrical cabling and stormwater attenuation.

The above is based upon the broad Development Framework Plan (refer to Figure 1-3) for the entire Cornubia Project which was approved and adopted by the eTM for the whole of Cornubia in 2011.

In addition, it is proposed that the existing Mount Edgecombe Refuse Transfer Station which is currently operated by the eTM and falls within the Cornubia Retail Park site be relocated within Cornubia. The Mount Edgecombe Refuse Transfer Station operates under an existing permit, permit number 16/2/7/U202/D3/Z1/P505 which was issued on the 30th of September 2005 by the Department of Water Affairs and Forestry (DWAF).

The intention of the proposed Environmental Impact Assessment (EIA) Process is to obtain environmental authorisation for the proposed Cornubia Retail Park Development as well as for the infrastructural requirements for the proposed relocation and construction of the new Mount Edgecombe Refuse Transfer Station. This includes the proposed access road to the new Station. It does not include the Waste Management Licence (WML) Application for

the proposed relocation of the Mount Edgecombe Refuse Transfer Station for which a separate Basic Assessment (DM/WML/0041/2012) process is underway for the waste specific aspects of the Application.

1.2 Environmental Legal Requirements

The following key legislation is pertinent to the proposed project:

- National Environmental Management Act (No 107 of 1998)(as amended)
- National Environmental Management: Waste Act (No 59 of 2008)
- National Water Act (No 36 of 1998)
- National Forests Act (Act No 84 of 1998)
- Conservation of Agricultural Resources Act (Act No.43 of 1983)
- National Environmental Management Biodiversity Act (Act No. 10 of 2004)
- KZN Nature Conservation Ordinance (15 of 1974)
- National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
- National Heritage Resources Act (No 25 of 1999)
- National Environmental Management: Air Quality Act (No 39 of 2004)
- National Veld and Forest Act (Act 101 of 1998)
- Hazardous Substance Act (No 15 of 1973) and Regulations
- National Building Regulations and Building Standards Act (Act No. 103 of 1997)
- Occupational Health and Safety Act (No 85 of 1993)

In order to obtain authorisations from the relevant authorities, a number of regulatory processes need to be followed. A parallel approach to conducting these processes is currently being undertaken. The following regulatory processes are being undertaken.

1.2.1 National Environmental Management Act (No 107 of 1998)(as amended)

The National Environmental Management Act (NEMA) provides environmental governance by providing principles for decision-making on matters that affect the environment and defines the principles that apply to the organs of state involved in that decision-making. The Act sets out the legal and procedural requirements for environmental compliance. Regulations under the Act define activities that may not commence without prior approval from the competent authority.

The KwaZulu-Natal Department of Agriculture and Environmental Affairs (KZN DAEA), is the competent authority for this EIA process and the development needs to be authorised by this Department in accordance with the NEMA (as amended).

The EIA Regulations (2010) under the NEMA consist of three (3) categories of activities namely: Listing Notice 1 Activities (GNR. 544 of 2010) which require a Basic Assessment study, Listing Notice 2 Activities (GNR. 545 of 2010) which require both a Scoping and an EIA study for authorisation and Listing Notice 3 Activities (GNR 546 of 2010) which requires a Basic Assessment study for specific activities in identified sensitive geographical areas. The KZN DAEA EIA branch is responsible for the authorisation of these activities. The activities associated with this development, for which environmental authorisation is required are as follows:

Table 1-1: Listed activities triggered according to Listing Notices 1 And 2 of the EIA Regulations (2010)

LISTED ACTIVITIES		
LISTING NOTICE 1 (GN R.544)		
Activity 9	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or stormwater – i. with an internal diameter of 0,36 metres or more; or ii. with a peak throughput of 129 litres per second or more, excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage, or stormwater drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of a watercourse.	The proposed project includes the construction of water pipelines (linking to the surrounding reticulation), sewer line and stormwater attenuation for both the Retail Park and the Mount Edgecombe Refuse Transfer Station. It is anticipated that the pipelines will exceed 1 000 metres in length and will be within 32 m of a watercourse (wetlands).
~~**Activity 10**~~	~~The construction of facilities or infrastructure for the transmission and distribution of electricity –~~ ~~i. outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or~~ ~~ii. inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.~~	This activity is no longer applicable and is being withdrawn.
Activity 11	The construction of: i. canals; ii. channels; iii. bridges; iv. dams; v. weirs; vi. bulk storm water outlet structures; vii. marinas; viii. jetties exceeding 50 square metres in size; ix. slipways exceeding 50 square metres in size; x. buildings exceeding 50 square metres in size; or xi. infrastructure or structures covering 50 square metres or more	The proposed project will see construction of infrastructure such as sewer lines within 32 m of a watercourse (wetlands). Furthermore, the project will involve the construction of earth-worked platforms, portions of which will occur over watercourses (wetlands). It is also proposed that roads for both the Retail Park as well as the access roads for the Mount Edgecombe Refuse Transfer Station will traverse wetland area. In addition, it is proposed that stormwater will be attenuated *via* an attenuation pond located within Wetland Unit A6. Therefore this activity is

LISTED ACTIVITIES		
	where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	applicable for the following infrastructure located within a watercourse or within 32 m of a watercourse: • Earth-worked platforms for the Cornubia Retail Park; • Access roads for the Cornubia Retail Park; • Access road to the existing district road (for Alternative 1 and 2) or access road to the Mount Edgecombe Refuse Transfer Station (for Alternative 2); and • Water pipeline and sewer line.
Activity 13	The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres.	The Retail Park may involve the storage of dangerous goods above these thresholds during the construction and operational phase.
Activity 18	The in-filling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from: i. a watercourse; ii. the sea; iii. the seashore; iv. the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater; but excluding where such infilling, depositing , dredging, excavation, removal or moving; a. is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or b. occurs behind the development setback line.	The proposed project will require the in-filling of wetlands for the following: • Earth-worked platforms for the Cornubia Retail Park • Access roads for the Cornubia Retail Park • Access road to the Mount Edgecombe Refuse Transfer Station • Water pipeline and sewer line.
Activity 22	The construction of a road, outside urban areas, i. with a reserve wide than 13.5 m or; ii. where no reserve exists where the road is wider than 8 metres; or iii. for which an environmental authorisation was obtained for the route	The proposed project includes the construction of new roads in regions where there is no road reserve. The road reserve is expected to be greater than 13.5 m.

LISTED ACTIVITIES		
	determination in terms of activity 18 in Notice 545 of 2010.	
Activity 47	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre – i. where the existing reserve is wider than 13,5 metres; or ii. where no reserve exists, where the existing road is wider than 8 metres - Excluding widening or lengthening occurring inside urban areas.	The proposed project includes upgrading to existing road networks.
LISTING NOTICE 2 (GN R.545)		
Activity 15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: i. linear development activities; or ii. agriculture or afforestation where activity 16 in this Schedule will apply.	The client proposes to develop approximately 48 hectares of land at Mount Edgecombe into a Retail Park of approximately 170 000 square metres of bulk floor area. The proposed site is currently a greenfields site under sugarcane cultivation. The project will consist of large scale retail and commercial buildings developed on earth-worked platforms to cater to the surrounding region.
Activity 18	The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before 03 July 2006 and which have not been authorised by a competent authority in terms of Environmental Impact Assessment Regulations, 2006 or 2009, made under section 24(5) of the Act and published in Government Notice No. R. 385 of 2006- i. it is a national road as defined in section 40 of the South African Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998); ii. it is a road administrated by a provincial authority; iii. the road reserve is wider than 30 metres; or iv. the road will cater for more than one lane of traffic in both directions.	The project includes the construction of new roads and limited upgrading to existing road networks. This includes upgrades to a provincial road.

1.2.2 National Environmental Management: Waste Act (No 59 of 2008)

In addition, to the EIA process being undertaken for the Cornubia Retail Park, the intention is to receive a Waste Management Licence (WML) for the relocation of the existing Mount Edgecombe Refuse Transfer Station. This WML will cover the demolition of the existing facility as well as the construction of the new facility. Activities have been applied for in terms of the National Environmental Management: Waste Act (NEM:WA). Activities which are triggered are as follows:

Table 1-2: Listed activities triggered according to NEM:WA

LISTED ACTIVITIES		
GNR 718 CATEGORY A ACTIVITIES		
Activity 1	The storage, including the temporary storage, of general waste at a facility that has the capacity to store in excess of 100m^3 of general waste at any one time, excluding the storage of waste in lagoons.	The proposed project includes the construction of a facility which will store general waste which has the capacity in excess of 100 m^3 of such waste at any given time.
Activity 18	The construction of facilities for activities listed in Category A of this Schedule (not in isolation to associated activity).	The proposed project includes the construction of a facility which will trigger Activity 1 of Category A.
Activity 20	The decommissioning of activities listed in this Schedule.	The proposed project includes the decommissioning of an existing facility which will trigger Activity 1 of Category A.

Category A activities of NEM:WA requires a Basic Assessment process. A separate Basic Assessment study is therefore, currently in progress for the WML Application (DM/WML/0041/2012). The KZN DAEA Pollution and Waste Management Branch are responsible for the authorisation of this application.

1.2.3 National Water Act (No 36 of 1998)

The National Water Act (NWA) is a legal framework for the effective and sustainable management of water resources in South Africa. Central to the NWA is recognition that water is a scarce resource in the country which belongs to all the people of South Africa and needs to be managed in a sustainable manner to benefit all members of society. The NWA places a strong emphasis on the protection of water resources in South Africa, especially against its exploitation, and the insurance that there is water for social and economic development in the country for present and future generations.

Water use in South Africa is managed through a water use authorisation process, which requires that every water use is authorised by the Department of Water Affairs (DWA) or an established Catchment Management Agency (CMA), once the water requirements for the Reserve have been determined. A water use must be licensed unless it is listed in Schedule 1, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources and geographical areas.

As a result of the nature of the proposed development and the requirement for extensive platforming, portions of vegetation and degraded wetland are required to be infilled. As such a Section 21 (c) & (i) Water Use Licence (WUL) Application will need to be made to the DWA for the infilling of these wetlands. The NWA defines the identified water uses under Section 21 as follows:

> *(c) impeding or diverting the flow of water in a watercourse; and*
>
> *(i) altering the bed, banks, course or characteristics of a watercourse.*

The NWA defines a water resource to be a watercourse, surface water, estuary or groundwater (aquifer). Included under surface water are manmade water channels, estuaries and watercourses. Therefore, Section 21 (c) and (i) applications are required for the water use. An integrated WUL Application (iWULA) for the remainder of Cornubia (Phase 2 and the Retail Park) is currently being conducted and will be submitted to the DWA in the next few months (expected date of submission is in August 2013). The project team have been regularly engaging with the DWA on the requirements of this submission.

1.2.4 National Forests Act (Act No. 84 of 1998)

According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that;

> *'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'*.

In essence the National Forests Act (NFA) prohibits the destruction of indigenous trees in any natural forest without a licence.

In terms of the NFA and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act, 1984 (Act No. 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants will require a licence. In the case of the current assessment a Department of Agriculture, Forestry and Fisheries (DAFF) licence will be required for the proposed removal of the *Sideroxylum inerme* (White Milkwood).

1.2.5 KZN Nature Conservation Ordinance (15 of 1974)

Protected indigenous plants in general are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In KZN the relevant statute is the 1974 Provincial Nature Conservation Ordinance. In terms of this Ordinance, a permit must be obtained from Ezemvelo KZN Wildlife to remove or destroy any plants listed in the Ordinance. A permit will be required to remove/relocate the *Scadoxus puniceus* (Paintbrush Lily) individuals growing within the site.

SiVEST, the Vegetation specialists appointed for this project, are currently undertaking the permit/licensing requirements from DAFF and Ezemvelo KZN Wildlife on behalf of THD.

1.3 Approach to the EIA Studies

As outlined in Section 1.2 above, the required environmental studies include the undertaking of an Environmental Impact Assessment (EIA) process. This process is being undertaken in two phases:

- Phase 1 – Compilation of an Environmental Scoping Report (ESR) including Plan of Study (PoS) for EIA - *complete*; and
- Phase 2 – Compilation of an Environmental Impact Assessment Report (EIAR) and Environmental Management Programme (EMPr) – *complete.*

These reports must be submitted to the KZN DAEA and other relevant authorities for review, comment and authorisation – *current*.

1.3.1 Environmental Scoping Study

Scoping is the process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.

The Environmental Scoping Report (ESR) provided a description of the receiving environment and how the environment may be affected by the existing development. Desktop studies involving the use of existing information, and ground-truthing through site visits, were used to highlight and assist in the identification of potential significant impacts (both social and biophysical) associated with the project. Additional issues for consideration were extracted from feedback from the public participation process, which commenced at the beginning of the Scoping phase, and will continue throughout the duration of the project.

All issues identified during this phase of the study have been documented within the final ESR which was submitted to the KZN DAEA Environmental Impact Assessment Branch for decision-making. The KZN DAEA Environmental Impact Assessment Branch accepted the final ESR on 21 December 2012 (Appendix A).

1.3.2 Environmental Impact Study

This final Environmental Impact Assessment Report (EIAR) will aim to achieve the following:

- to provide an overall assessment of the social and biophysical environments of the affected area by the proposed project;
- to undertake a detailed assessment of the preferred site/alternatives in terms of environmental criteria including the rating of significant impacts;
- to identify and recommend appropriate mitigation measures (to be included in an Environmental Management Programme [EMPr]) for potentially significant environmental impacts; and
- to undertake a fully inclusive public participation process to ensure that I&AP issues and concerns are recorded and commented on and addressed in the EIA process.

Figure 1-5: Environmental Studies Flowchart

1.3.2.1 Environmental Impact Assessment Report

This final EIAR has been compiled in accordance with the accepted Plan of Study and incorporates the findings and recommendations from the Scoping Study as well as specialist studies conducted for the project.

In addition, this final EIAR is being compiled according to the guidelines provided in Government Notice R.543 of the EIA Regulations (2010) and contains the following:

Table 1-3: EIAR requirements according to Section 31 of GN. R.543

EIAR REQUIREMENTS ACCORDING TO SECTION 31 OF GN. R.543	SECTION IN REPORT
31(2)(a) Details of - (i) the EAP who compiled the report; and (ii) the expertise of the EAP to carry out an environmental impact assessment	1.5
31(2)(b) A detailed description of the proposed activity	2
31(2)(c) A description of the property on which the activity is to be undertaken and the location of the activity on the property	2.1 & 2.3
31(2)(d) A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity	5
31(2)(e) Details of the public participation process conducted	7
31(2)(f) A description of the need and desirability of the proposed activity	3
31(2)(g) A description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity	4 & 9.16
31(2)(h) An indication of the methodology used in determining the significance of potential environmental impacts	8
31(2)(i) A description and comparative assessment of all alternatives identified during the environmental impact assessment process	4.5 & 9.31
31(2)(j) A summary of the findings and recommendations of any specialist report or report on a specialised process	6
31(2)(k) A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures	9
31(2)(l) An assessment of each identified potentially significant impact, including - (i) cumulative impacts; (ii) the nature of the impact; (iii) the extent and duration of the impact; (iv) the probability of the impact occurring; (v) the degree to which the impact can be reversed; (vi) the degree to which the impact may cause irreplaceable loss of resources; and (vii) the degree to which the impact can be mitigated	9

EIAR REQUIREMENTS ACCORDING TO SECTION 31 OF GN. R.543	SECTION IN REPORT
31(2)(m) A description of any assumptions, uncertainties and gaps in knowledge	8.6
31(2)(n) A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	11.1
31(2)(o) An environmental impact statement which contains - (i) a summary of the key findings of the environmental impact assessment; and (ii) a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives	10
31(2)(p) A draft environmental management programme containing the aspects contemplated in regulation 33	Appendix E
31(2)(q) Copies of any specialist reports and reports on specialised processes complying with regulation 32	Appendix C (C1-C10)
31(2)(s) Any other matters required in terms of sections 24(4)(a) and (b) of the Act	Not applicable

1.3.2.2 Environmental Management Programme

A draft EMPr (Appendix E) has been compiled for the construction and operational phases for the Cornubia Retail Park. The draft EMPr has been compiled as a stand-alone document from the EIA Report and has been submitted to the KZN DAEA. The draft EMPr has been compiled in accordance with the EIA Regulations (2010). The draft EMPr provides the actions for the management of identified environmental impacts emanating from the project and a detailed outline of the implementation programme to minimise and/or eliminate the anticipated negative environmental impacts. The draft EMPr provides strategies to be used to address the roles and responsibilities of environmental management personnel on site, and a framework for environmental compliance and monitoring.

The EMPr includes the following:

- Details of the person who prepared the EMPr and the expertise of the person to prepare an EMPr;
- Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in the EIAR, including environmental impacts or objectives in respect of operation or undertaking of the activities, rehabilitation of the environment and closure where relevant;
- A detailed description of the aspects of the activity that are covered by the draft EMPr;
- An identification of the persons who will be responsible for the implementation of the measures;
- Where appropriate, time periods within which the measures contemplated in the draft EMPr must be implemented;
- Proposed mechanisms for monitoring compliance with the EMPr and reporting thereon;
- An environmental awareness plan; and
- Procedures for managing incidents which have occurred as a result of undertaking the activity and rehabilitation measures.

1.3.2.3 Specialist Studies

To ensure the completeness of the EIA and draft EMPr, specialists surveyed the area to identify the potential impacts of the project on the area. The following specialist studies have been conducted for the Cornubia Retail Park Project:

Table 1-4: List of specialist studies

SPECIALIST STUDY	ORGANISATION
Agricultural Potential Assessment	Mottram & Associates
Vegetation Assessment	SiVest
Wetland Assessment	SiVest
Geotechnical Assessment	Drennan Maud & Partners
Cultural Heritage Assessment	eThembeni Cultural Heritage
Traffic Impact Assessment	SMEC South Africa

In addition to the above specialist studies, the following reports have been prepared in support of the EIA study:

Table 1-5: List of supporting reports

SPECIALIST STUDY	ORGANISATION
Planning Report	IYER Urban Design Studio
Engineering Services Report	SMEC South Africa
Stormwater Management Plan	SMEC South Africa
Electrical Services Report	Bosch

1.4 Details of the Project Proponent

The details of the project applicant are as follows:

Table 1-6: Project applicant contact details

APPLICANT	TONGAAT HULETT DEVELOPMENTS
Representative	Bheki Shongwe
Physical Address	305 Umhlanga Rocks Drive La Lucia 4015
Postal Address	PO Box 22319 Glenashley 4022
Telephone	+27 31 5601900
Facsimile	+27 86 679 9243
E-mail	Bheki.Shongwe@tongaat.com

1.5 Details of the Environmental Assessment Practitioner

Royal HaskoningDHV has been appointed as an independent EAP by THD to undertake the appropriate environmental studies for this proposed project. The professional team of Royal HaskoningDHV has considerable experience in the environmental management and EIA fields.

Royal HaskoningDHV has been involved in and/or managed several of the largest Environmental Impact Assessments undertaken in South Africa to date. A specialist area of focus is on the assessment of multi-faceted projects, including the establishment of linear developments (national and provincial roads, and power lines), bulk infrastructure and supply (e.g. wastewater treatment works, pipelines, landfills), electricity generation and transmission, the mining industry, urban, rural and township developments, environmental aspects of Local Integrated Development Plans (LIDPs), as well as general environmental planning, development and management.

It must be noted that as of 21 August 2012, SSI Engineers and Environmental Consultants (Pty) Ltd has adopted a new brand, changing its trading name from SSI to Royal HaskoningDHV.

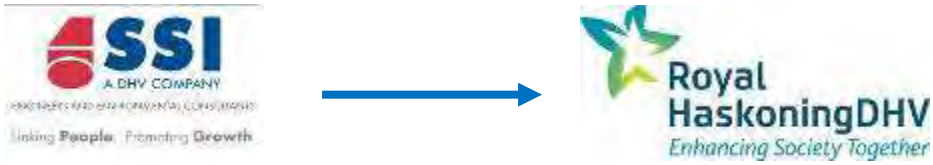


Table 1-7: Details of the EAP

CONSULTANT	RHDHV	RHDHV
Contact Persons	Humayrah Bassa	Malcolm Roods
Postal Address	PO Box 55 Pinetown 3610	PO Box 55 Pinetown 3610
Telephone	031 719 5551	011 798 6442
Facsimile	031 719 5505	031 719 5505
E-mail	humayrah.bassa@rhdhv.com	malcolm.roods@rhdhv.com
Qualification	MSc Environmental Science	BA (Hons) Geography and Environmental Management
Expertise	Humayrah Bassa is an Environmental Consultant with experience in various facets of environmental management. These include conducting environmental impact assessments and the public participation process; compiling environmental impact reports; developing environmental	Malcolm Roods is the Service Line Head for the Environmental Management and Compliance Service Line within RHDHV and has approximately 11 years of experience in environmental legislation and processes. He also has extensive experience in the compilation and review of environmental reports. He is

CONSULTANT	RHDHV	RHDHV
	management programmes; compiling water use licence applications; conducting environmental control officer duties; and conducting legal compliance audits.	certified as an Environmental Assessment Practitioner (EAP) with the Interim Certification Board for EAPs of South Africa.

A Company Profile and the Curriculum Vitae (CV) of the respective EAPs can be found in Appendix I.

1.6 Structure of the Report

The report has been structured to comply with the format required by the EIA Regulations (2010)(as amended). The contents are as follows:

Table 1-8: Report structure

CHAPTER	CONTENT
Chapter 1 Introduction	Introduction an overview of the proposed project, the proponent and EAP, and the approach to the integrated regulatory process
Chapter 2 Project Description	Includes a description of the proposed activities
Chapter 3 Need & Desirability	Outlines the need for and motivation of the proposed project
Chapter 4 Project Alternatives	Consideration of alternatives (design/layout, site and do-nothing) for the project
Chapter 5 Baseline Description of the Study	A description of the biophysical and social environment
Chapter 6 Specialist Reports	An overview of the findings of the various specialist reports undertaken for this project
Chapter 7 Public Participation Process	Overview of the public participation process conducted to date
Chapter 8 Environmental Impact Assessment Approach	Methodology used in the assessment of significant impacts
Chapter 9 Potential Environmental Impacts	A description of the environmental impacts on the biophysical and social environment and a rating of these impacts
Chapter 10 Environmental Impact Statement	A statement as to the significance of the environmental impacts assessment
Chapter 11 Conclusions and Recommendations	Conclusions and recommendations of the Environmental Impact Study

2 PROJECT DESCRIPTION

The Cornubia Retail Park is a proposed new commercial development of approximately 170 000 bulk sq metres of retail and will be the first commercial development within Cornubia following the Cornubia Industrial and Business Estate. It is proposed that the development will consist of four 'block' sites (Figure 2-1). The proposed development aims to establish a high quality environment for retail and office uses. This will be achieved through the creation of a high quality retail precinct defined by boulevards, landscaping and buildings that define the edges (Figure 2-2).

Figure 2-1: Cornubia Retail Park – the Immediate Context

Figure 2-2: The Cornubia Retail Park Precinct

Figure 2-2 illustrates the proposed platforms with embankments denoted in red. It is proposed that the development will consist of large scale retail and commercial buildings developed on earth-worked platforms to cater to the surrounding region. The development provides for larger scale "big box" outlets in keeping with some of the current trends along the spine. As mentioned previously (refer to Section 1), the existing Mount Edgecombe Refuse Transfer Station currently located on Ptn 9 of Erf 27 will be relocated further north and a separate WML Application is being undertaken for the waste related impacts of the proposed relocation. However, all infrastructural requirements of the relocation are covered as part of this EIA application.

The proposed Cornubia Retail Park Development and associated relocation of the Mount Edgecombe Refuse Transfer Station includes the construction of new roads and upgrading to existing road networks, the installation of new (and/or upgraded) services including gravity sewer lines (linking to the north into the existing Ohlanga/Phoenix bulk infrastructure), water pipelines (linking to the surrounding reticulation), electrical cabling (from the Gateway substation) and stormwater attenuation.

A lengthy urban design process was undertaken following the findings of the various specialist studies. The environmental attributes and sensitivities on site informed the ultimate design of the project and as such, few layout alternatives have been proposed. Given the nature of the existing topography and uses proposed, the primary starting point has been the integration of the various aspects of design into the process. In this regard, the first stage of the design focused on establishing a uniform grade across each site which enabled greater design integration between the roads and the site. The existing wetlands over Erf 602 and Portion 7 of Erf 27 were going to be infilled as the heads of these wetlands were severed by the Cornubia Boulevard and were confirmed as being too small to be functional on their own. Furthermore they do not form part of the larger open space system. This will be elaborated in greater detail in Section 6.5.

2.1 Site Locality and Context

The study area for this project is illustrated in Figures 2-3 and 2-4 and includes the Cornubia Retail Park site as well as the potential road impact area and area for relocation of the Mount Edgecombe Refuse Transfer Station. The study area is situated in Mount Edgecombe, adjacent to Flanders Drive. It lies approximately 25 km from the Durban Central Business District (CBD) and is bordered by the Cornubia Phase 2 site.

Figure 2-3: Cornubia Retail Park Boundary

Figure 2-4: Aerial Image of the Study Area

The study area has been identified in the approved Cornubia Framework Plan for general business development. The sites western boundary is within the South African Sugar Association's (SASA) land holding, whilst its southern boundary lies alongside the M41. Directly opposite the study area is the Mount Edgecombe Country Club and Golf Estate. The Flanders Drive business and showroom uses lies along the stretch of the M41. To the north west of the site lies the Cornubia Industrial and Business Estate (CIBE) which is being spearheaded by THD, and Phase 1a planned by the eTM. This is an approved 486 site medium density residential housing development. Both of these projects are currently under construction. Phase 1b is a future residential development with approximately 2 267 sites and will follow the completion of Phase 1a[2]. These developments are illustrated in Figure 2-5.

Figure 2-5: The Cornubia Retail Park in Relation to the Approved Cornubia Phase 1

[2] *Extracted from the Cornubia Retail Park Planning Report (2013) prepared by Iyer Urban Design Studio and included as Appendix C8.*

In terms of the Cornubia Development Framework plan, the Retail Park is bordered by the future Cornubia Boulevard road arterial, a future north-south Road link between Flanders Drive and Cornubia Boulevard and a portion of the core open space system.

2.2 Ownership

The study area is located on land which is majority owned by THD. A portion of the study area for one of the site alternatives presented in Section 4 is owned by the SASA (Figure 2-6). The intention was that both THD and SASA develop the land together.

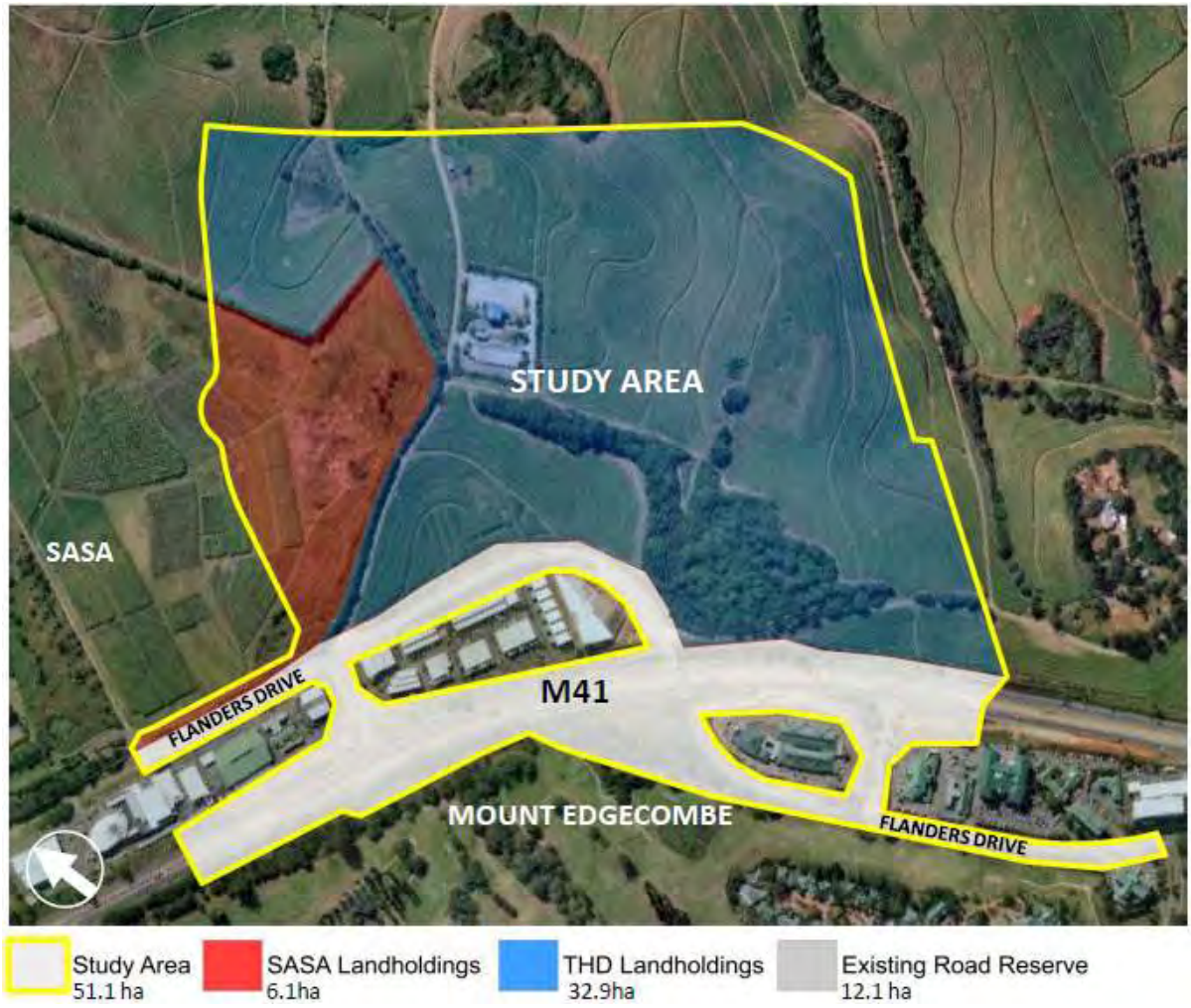


Figure 2-6: Cornubia Retail Park Landholdings

2.3 Zoning

The site is zoned as agriculture and is currently under sugarcane cultivation. The Cornubia Retail Park is located within the eThekwini Magisterial District and consists of numerous subdivisions or land parcels. Below is a list of properties located within the Retail Park site:

Table 2-1: List of Properties

PROPERTY DESCRIPTION	SG 21 DIGIT CODE
RETAIL PARK PROPERTIES	
Remainder of Erf 15 Mt Edgecombe	N0FU02170000001500000

PROPERTY DESCRIPTION	SG 21 DIGIT CODE
Ptn 1 of Lot 21 No. 1529 Mt Edgecombe	N0FU02170000152900001
Remainder of Portion 4 of Lot 31 No. 1560	N0FU02170000156000004
Erf 27 Cornubia	N0FU02170000002700000
Rem of 50 of 8 of Lot 31 No. 1560	N0FU02170000015600008
POTENTIAL ROAD IMPACT AREA	
Erf 23 Mt Edgecombe	N0FU02170000002300000
Erf 22 Mt Edgecombe	N0FU02170000002200000
Rem of Ptn 3 of Erf 10 Mt Edgecombe	N0FU02170000001000003
Ptn 9 of Erf 142 Mt Edgecombe	N0FU02170000014200009
Erf 25 Mt Edgecombe	N0FU02170000002500000
Erf 47 Mt Edgecombe	N0FU02170000004700000
Ptn 4 of Erf 37 Mt Edgecombe	N0FU02170000004700000
Rem of Erf 38 Mt Edgecombe	N0FU02170000003700004
Rem of Erf 143 Mt Edgecombe	N0FU02170000003800000
Ptn 1 of Rem of Erf 15 Mt Edgecombe	N0FU02170000014300000
Remainder of Erf 15 Mt Edgecombe	N0FU02170000001500001
AREA FOR SEWER LINE AND ELECTRICAL LINE INFRASTRUCTURE	
Rem of Ptn 1 of Lot 20 No. 1557	N0FU02170000155700001
Ptn 8 of the Farm Lot 21 No 1529	N0FU02170000152900008
Ptn 9 of the Farm Lot 21 No. 1529	N0FU02170000152900009
Ptn 11 of the Farm Lot 21 No 1529	N0FU02170000152900011
Erf 142 Mount Edgecombe	N0FU02170000014200000
Erf 3194 Mount Edgecombe	N0FU02170000319400000
Ptn 57 (of 21) of the Farm Lot 31 No 1560	N0FU02170000156000057
Ptn 50 (of 8) of the Farm Lot 31 of No 1560	N0FU02170000156000050
Rem of Ptn 8 of the Farm Lot 31 No 1560	N0FU02170000156000008
Rem of Ptn 6 (of 4) of the Farm Lot 31 No 1560	N0FU02170000156000006
Ptn 5 of the Farm Lot 31 No 1560	N0FU02170000156000005
POTENTIAL AREA FOR WASTE TRANSFER STATION AND ASSOCIATED INFRASTRUCTURE	
Ptn 1 of Lot 21 No. 1529 Mt Edgecombe	N0FU02170000152900001
Rem of 13 of Lot 31 No. 1560	N0FU02170000156000013
Rem of 14 of Lot 31 No. 1560	N0FU02170000156000014
Rem of 15 of Lot 31 No. 1560	N0FU02170000156000015
Rem of 16 of Lot 31 No. 1560	N0FU02170000156000016
Rem of 50 of 8 of Lot 31 No. 1560	N0FU02170000015600050

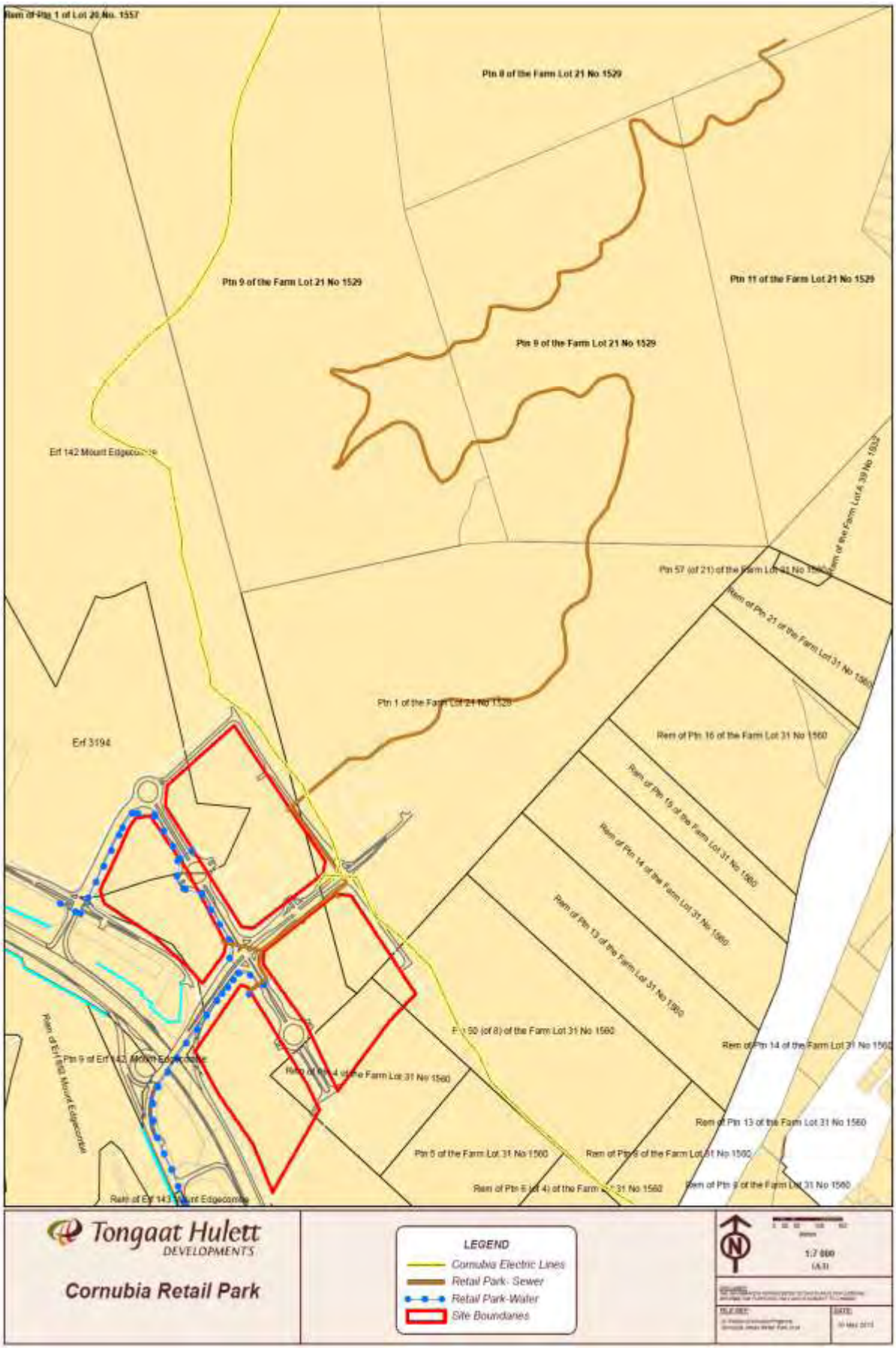


Figure 2-7: List of Properties Affected by the Sewer Line and Electrical Line

2.4 Accessibility[3]

Movement within the precinct at a district level is illustrated in Figures 2-8 and 2-9. An interchange upgrade is proposed at the M41-Mount Edgecombe and the N2 in order to compensate for the increased traffic demands within the region. This interchange upgrade is due to commence in May and has EIA approval. It is also proposed that the Flanders Drive and Dube East interchange will be upgraded to accommodate this new development as well as future development anticipated from the overall Cornubia Project and broader corridor to the north. Cornubia Boulevard will serve as the primary movement network and will contain in the first phase the Bus Rapid Transit (BRT) network. This is significant as it will provide commuters with an alternative, efficient and reliable mode of transport in accessing opportunities within Cornubia and the Retail Park specifically.

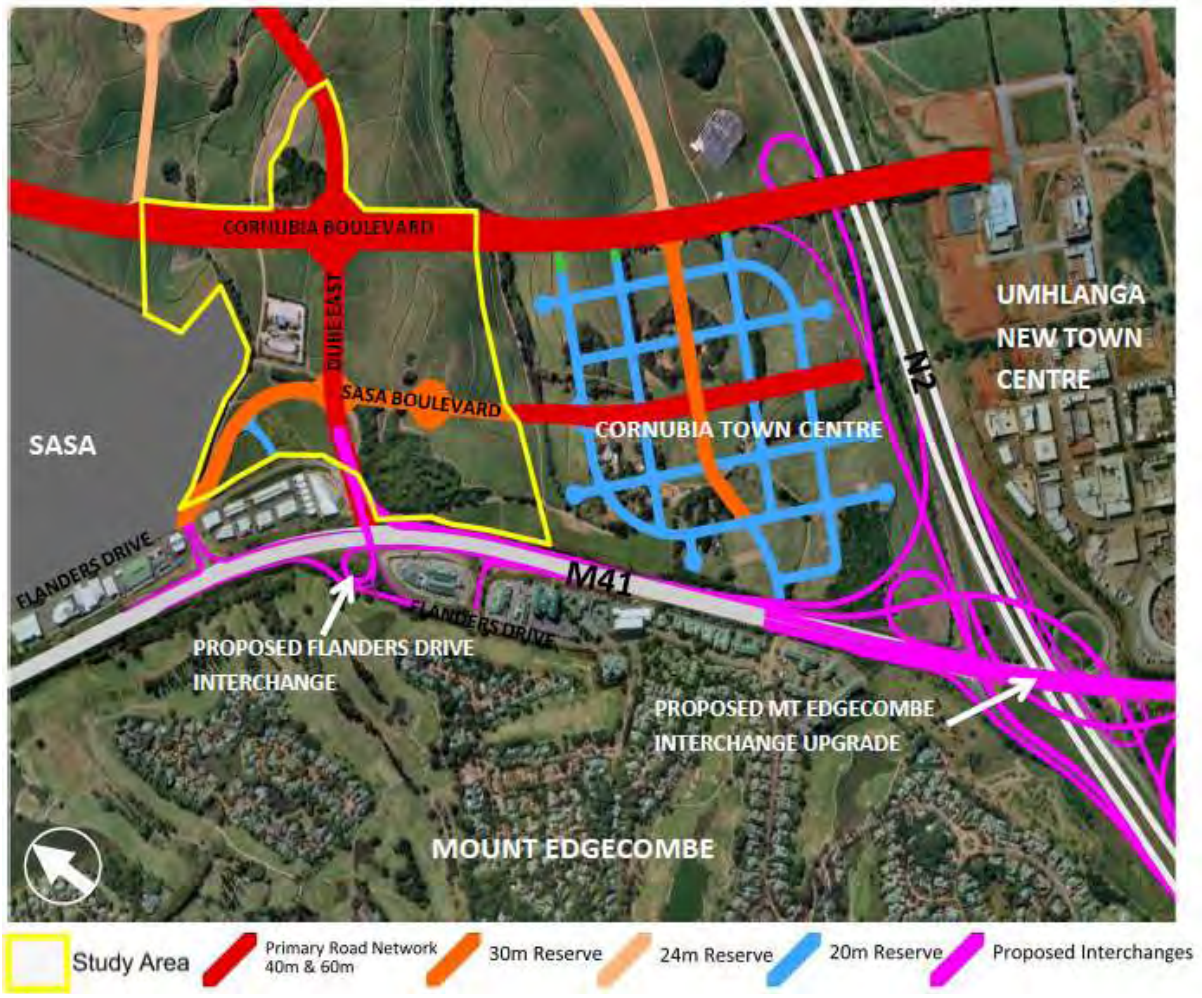


Figure 2-8: Movement within the Cornubia Retail Park Precinct at a District Level – Alternative Excluding SASA Owned Land

[3] *The information provided in this section (and subsequent section: Section 2.4-2.8) has been obtained from the Cornubia Retail Park Planning Report (2013) prepared by Iyer Urban Design Studio and provided in Appendix C8.*

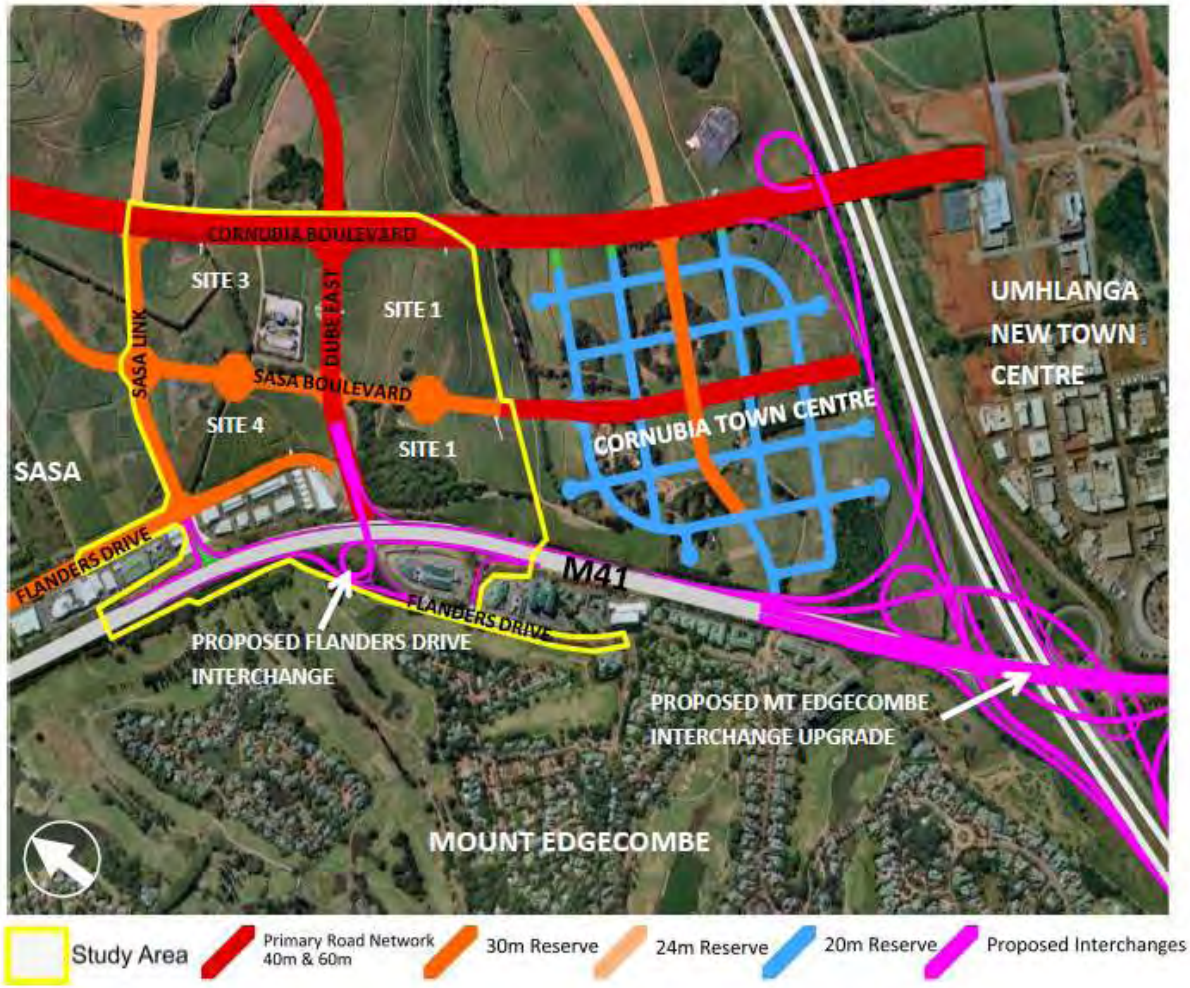


Figure 2-9: Movement within the Cornubia Retail Park Precinct at a District Level – Alternative Including SASA Owned Land

The M41 runs along the study areas southern boundary which is still to be developed and the Cornubia Boulevard runs along the northern boundary. Cornubia Boulevard will ultimately connect with Blackburn Road. Dube East will split the site centrally and will eventually connect to the northern areas when Cornubia is ultimately developed. To access the study area in the short term, the roads on the plan provided in Figure 2-9 will need to be constructed as part of this development proposal. This may occur in an incremental manner whereby the roads will be built in the first phase according to the immediate requirements.

A 3-dimensional box servitude with a minimum ground clearance of 5.5 m is proposed over a portion of SASA boulevard as depicted in Figures 2-10 and 2-11. This will enable the development to transverse over the road but allow the Municipality certain rights to maintain and place services along the road within the box servitude limitations. The extent and details of the 3D box servitude will be outlined in the rezoning application.

Figure 2-10: Proposed Roads to be Constructed in the Short-Term – Alterative Excluding SASA Owned Land and Excluding Access Road for the Mount Edgecombe Refuse Transfer Station

Figure 2-11: Proposed Roads to be Constructed in the Short-term – Alternative including SASA Owned Land and Excluding Access Road for the Mount Edgecombe Refuse Transfer Station

Furthermore, an upgrading of the Flanders Drive and Dube East Interchange will be required. A portion of Dube East will be built which will link into Flanders Road Bridge over the M41. Dube East will tie into a portion of the Cornubia Boulevard route. SASA Boulevard which will run parallel to the M41 and intersect Dube East will provide the main ingress and egress points into the various sites.

The road design conforms to all geometric design standards as set out by the eThekwini Traffic Authority (ETA). The design are also in line with the Traffic Impact Assessment (TIA) undertaken for the overall Cornubia Development and the Cornubia Retail Park TIA undertaken by SMEC South Africa (refer to Appendix C6) and will be elaborated on further in Section 2.9.9.

2.5 Land Use and Controls

'General Business' is the primary land use for the development of the Cornubia Retail Park. This is in accordance with the approved Cornubia Development Framework (Figure 1-3). The 'General Business' use permits retail, office and business type of developments.

The remaining uses are Mixed Use 1, along Cornubia Boulevard which permits retail and residential uses. The site identified for the Mount Edgecombe Refuse Transfer Station has been identified for administration. The Cornubia Retail and Businesses Park zone will fall under Special Zone 19 referred to as the Cornubia Town Centre.

There has been incredible interest to develop the Cornubia Retail Park sites for retail /'big box' developments due to its prime location and the additional potential that it could serve as a potential major node when the Cornubia Development is ultimately developed. A major property group plans to develop the portion denoted as Erf 601 (Figure 2-12) for retail development.

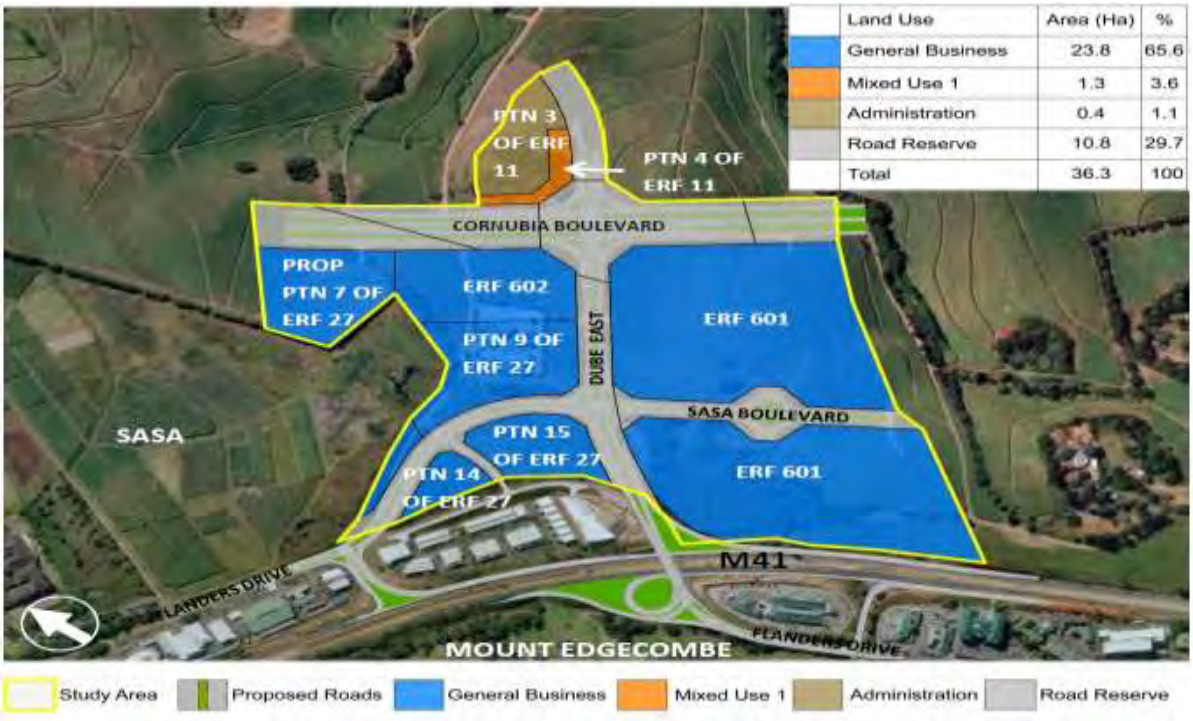


Figure 2-12: Proposed Land Use for the Cornubia Retail Park Site

The total site measures, 36.3 ha in extent. The General Business use totals 23. 8 ha which is 65.6% of the total study area. Mixed Use 1 equates to 3.6% of the study area with administration occupying only 1% of the study area. The balance of the site consists of road reserves which equates to 30%.

2.6 Bulk Schedule

The table below indicates the total overall bulk for the study area. The table is indicative and for information purposes only as bulk in this precinct will be in a "Rights Bank" and therefore FAR and individual bulk allocated per site will vary across the individual sites. The total bulk anticipated from the overall development will be restricted to approximately 170 000 m^2 (refer to Table 2-2). This will enable the flexibility of allocating bulk between each site with the total bulk not to be exceeded. Height will determined according to the Mean Sea Level (MSL) however it is envisaged that height will be in the region of four to five storeys within this zone. These town planning controls and final bulks will be finalised in the Planning and Development Act (PDA) application and precinct plan stage that will follow this EIA process and will include additional design controls.

Table 2-2: Cornubia Retail Park Bulk Schedule[4]

SUB NO.	GROSS AREA (ha)	AVERAGE F.AR	BULK (m^2)	LAND USE
PTN 3 OF ERF 11	1.30	0.3	3 896	Administration
PTN 4 OF ERF 11	0.42	1.5	6 312	Mixed Use 1
PTN 7 OF ERF 27	2.08	0.6	12 492	General Business
ERF 602	2.43	0.6	14 590	General Business
PTN 9 OF ERF 27	2.36	0.6	14 148	General Business
PTN 14 OF ERF 27	0.56	0.6	3 334	General Business
PTN 15 OF ERF 27	1.34	0.6	8 016	General Business
ERF 601	16.00	0.7	107 213	General Business
TOTAL	**26.48**		**170 001**	

Parking Requirements will utilise a sliding scale approach as used in the Umhlanga New Town centre Precinct and will be in accordance with ETA standards for parking provision.

In the overall and approved Cornubia Framework Plan, a bulk of 1,169,280m^2 was proposed. The Cornubia Retail Park site yields approximately 170 000 m^2 of bulk which is 14.5% of the proposed total commercial bulk envisaged for Cornubia.

2.7 Urban Form

The proposed built form layout for the site is presented in Figures 2-13 and 2-14.

[4] *Table is for indicative and information purposes only – a rights bank will apply.*

Figure 2-13: Proposed Urban Form for the Development – Alternative Excluding SASA Owned Land

Figure 2-14: Proposed Urban Form for the Development – Alternative Including SASA Owned Land

The footprint is aligned along prominent corners and site interfaces. Parking is proposed centrally within the site as is the case with Erf 601. Parking requirements for the Cornubia Retail Park will be in accordance with ETA standards for parking provision.

It is proposed retail/ warehouse developments will occur on the remaining sites within the study area. The desired approach is to retain the primary building frontage along key routes and the secondary built form i.e. the warehousing component at the rear concealed from these routes. The intension of this development is to create a value retail precinct that will enhance the Umhlanga retail node. Additional built form design controls will be established in the precinct plan design stage.

2.8 Development Vision

The proposed Cornubia Retail Park plan is a land use framework which is in line with the approved Cornubia Development Framework presented in Section 1. The development framework for the precinct surrounding the site is presented in Figure 2-15.

Figure 2-15: Surrounding Development Framework Plan

The above framework illustrates how the strip along the M41 from the N2 freeway up to Dube West will be ultimately developed.

The higher intensity uses will be developed at the Cornubia Town Centre. Surrounding the core and including the study area as well as along Dube West and at the intersection of

Dube West and Cornubia Boulevard will be developed for General Business Uses. The remainder of the precinct will be developed for High Density Residential and retail uses.

The proposed development of the site will serve as catalyst to induce other private sector investment such as residential, business parks, office and retail uses. This together with the industrial and residential development that is happening further north within Cornubia, could ultimately transform the M41 into a significant development corridor.

Figure 2-16 illustrates the indicative urban form proposed for the areas surrounding the site, ultimately transforming this area into a thriving node.

Figure 2-16: Proposed Urban Form for the Surrounding Region

Reference is made to the extensive core open space system across the entire development and where there has been a focus to consolidate the system in various corridors in order to provide appropriate space and land to enable large-scale development to take place – examples are the Cornubia Industrial and Business Estate and the Cornubia Retail Park.

2.9 Engineering Services[5]

The proposed Cornubia Retail Park Services Layout is presented in Figure 2-17.

[5] *The information provided in this section has been obtained from the Cornubia Retail Park Engineering Services Report (2013) prepared by SMEC South Africa and provided in Appendix C9.*

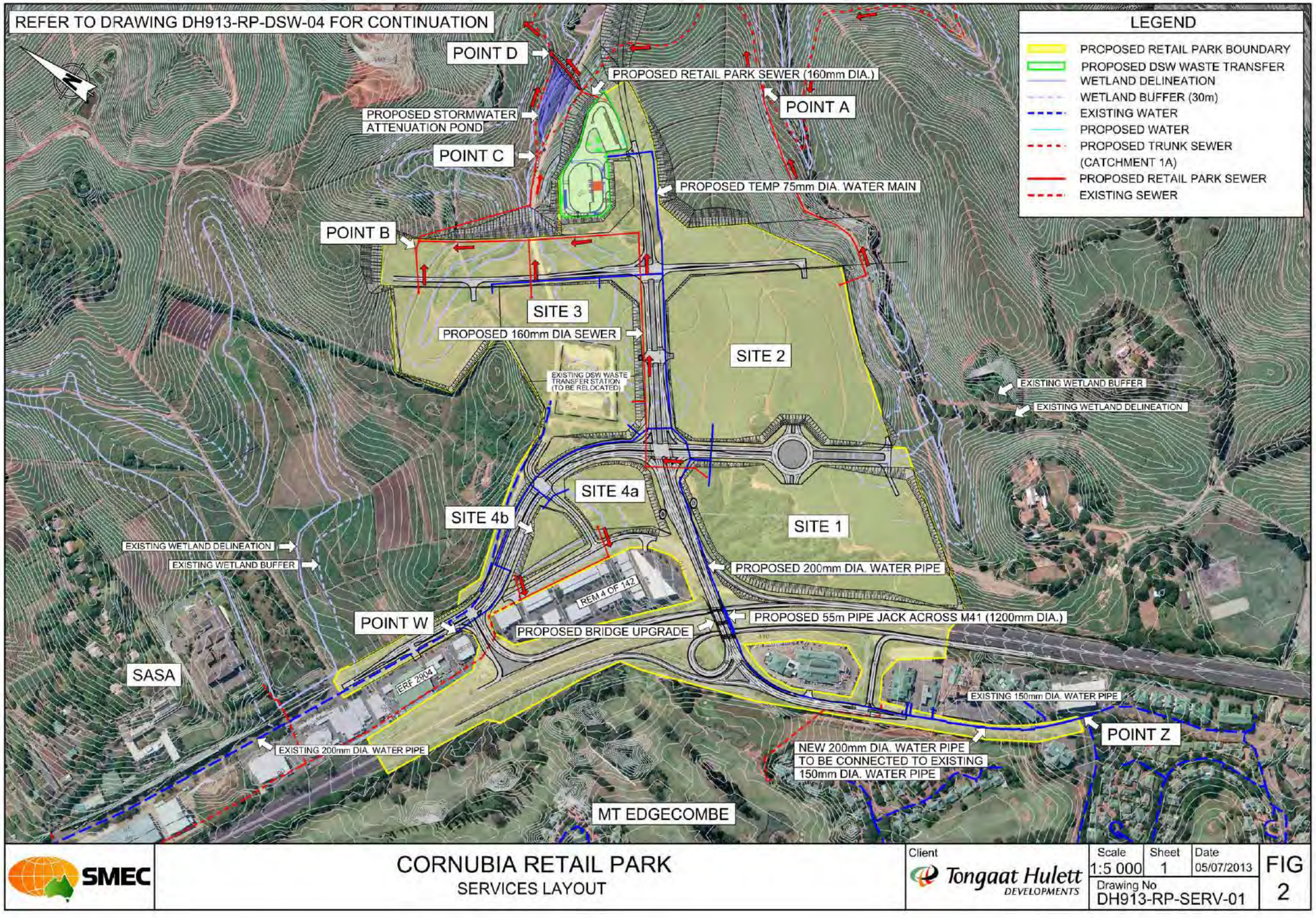


Figure 2-17: Cornubia Retail Park Services Layout

2.9.1 Water

The estimated water average daily demand (ADD) for the Cornubia Retail Park once fully developed will be 1.22 Ml/day.

2.9.1.1 Short Term Water Supply

The closest existing water mains (both fed from the Phoenix No 1 reservoir) to the Cornubia Retail Park are as follows:

a) 200 mm diameter water main (in Flanders Drive West) which terminates at a fire hydrant at POINT W in the north east corner of Erf 2904.

b) 150 mm diameter water main (in Flanders Drive East) which terminates with an end cap at POINT Z.

It is proposed that aforementioned two water mains be connected between POINTS W and Z by a new 200 mm diameter water main which will be located in the following road reserves:

- SASA Link South
- SASA Boulevard West
- Dube East

Where it crosses the M41 pipe jacking of a minimum length of 55 m will be required. Once the existing Mount Edgecombe Refuse Transfer Station has been relocated, as proposed, the existing 75 mm diameter supply pipe will be abandoned and a new temporary 75 mm diameter water main installed along the proposed Dube East road to the new Mount Edgecombe Refuse Transfer Station site.

2.9.1.2 Ultimate Water Supply

Water for the Cornubia Retail Park will ultimately be provided by a new supply main from the new Blackburn Reservoir (Approximately 2 km north of the Cornubia Retail Park), which in turn will be supplied by the proposed Northern Aqueduct. Both the Blackburn Reservoir and Northern Aqueduct are scheduled for completion by December 2014.

Confirmation of water supply has been obtained from the eThekwini Municipality as indicated in Appendix G.

2.9.2 Sewerage

The proposed Cornubia Retail Park Sewer Plan is presented in Figures 2-17 (above) and 2-18 (below).

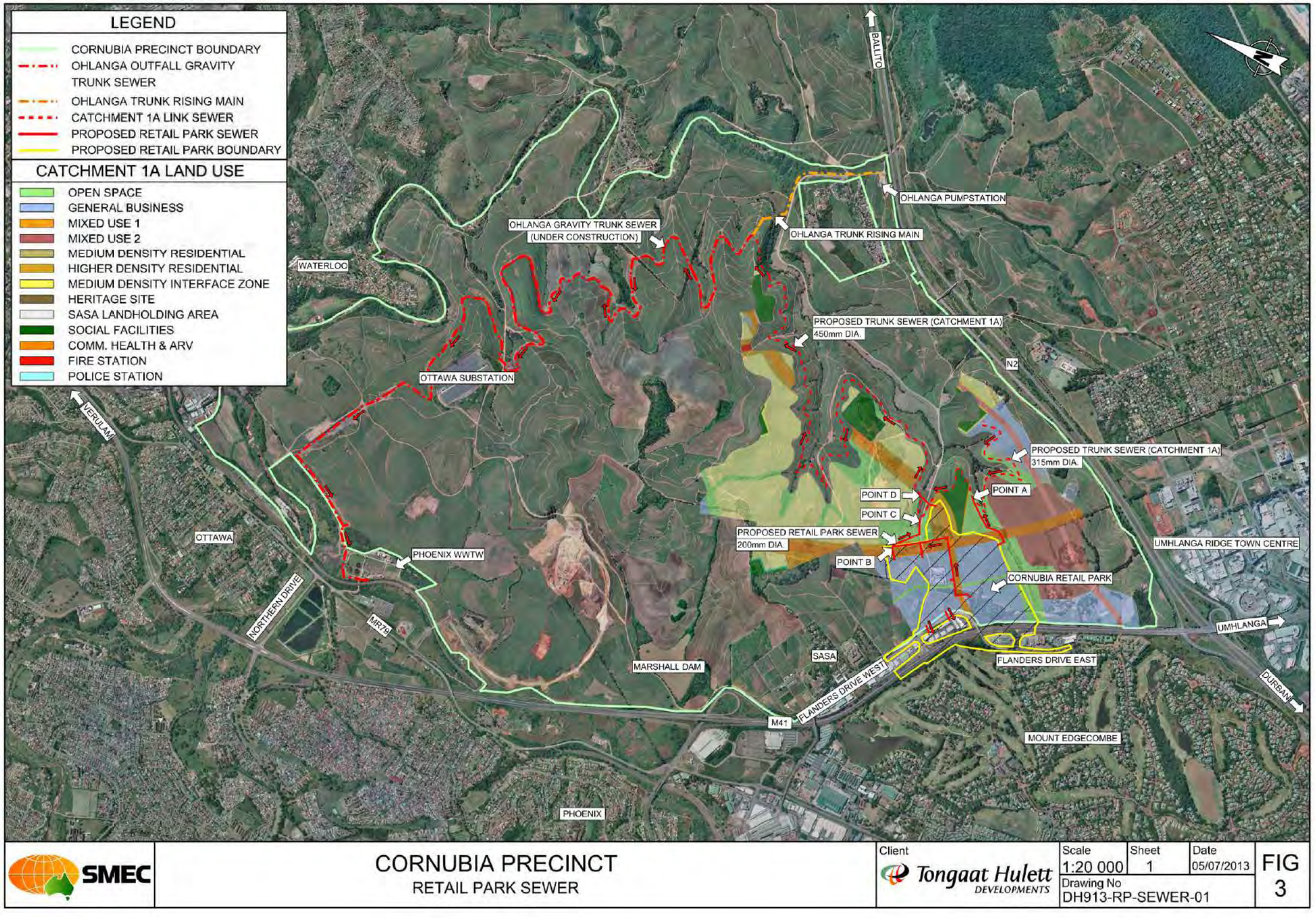


Figure 2-18: Cornubia Retail Park Sewer Plan

The estimated sewer average daily flow (ADF) of 0.98 M/day will be generated by the Cornubia Retail Park once fully developed. The Cornubia Retail Park lies in Sewer Catchment 1A which in future will be served by a 315/450 mm diameter proposed trunk sewer which gravitates in a north easterly direction towards the Ohlanga Gravity Trunk Sewer (currently under construction).

The sewer effluent generated from Site 2 will gravitate in a new 160 mm diameter pipe and connect into aforementioned Catchment 1A proposed trunk sewer at POINT A. The sewer connections for Sites 1, 3 and 4 will all be 160 mm diameter and will reticulate in the road networks converging at POINT B (at the intersection of Cornubia Boulevard West and SASA Link North). From POINT B, a 200 mm diameter pipe will gravitate to and connect into aforementioned Catchment 1A proposed trunk sewer at POINT C.

A 160 mm diameter gravity main will also be constructed to serve the relocated Mount Edgecombe Refuse Transfer Station and connect into the Catchment 1A trunk sewer at POINT D.

The sewer connections for sites 4a and 4b will all be 160 mm diameter and will reticulate across Flanders Drive west connecting into existing sewer.

The aforementioned Ohlanga Gravity Trunk Sewer (currently under construction) gravitates to the Phoenix Waste Water Treatment Works (WWTW). eTM Wastewater Section has confirmed that, as of December 2012, the Phoenix WWTW was at full capacity. The planned upgrading of the WWTW from 25 Ml/day to 50 Ml/day has commenced and completion is expected in April 2015.

In the event that upgrading of the sludge treatment capacity is not complete by the time the Cornubia Retail Park development commences operation, an agreement/arrangement is in place that the sludge be removed from the Phoenix WWTW.

Confirmation of capacity to accept sewerage has been obtained from the eThekwini Municipality as indicated in Appendix G.

2.9.3 Stormwater

The stormwater management requirements have been addressed in a separate SMEC report entitled “Stormwater Management Plan (SMP) for Cornubia Retail Park” (refer to Appendix C7).

Attenuation will take the form of detention storage. All platforms will designed with slopes that fall in an easterly direction eventually gravitating to a stormwater attenuation pond (SWAP) in the valley line at the eastern side of the development. Platforms for sites 4a and 4b will be designed with slopes that fall in a westerly direction, gravitating to an onsite attenuation pond (SWAP), and ultimately connecting into existing stormwater in Flanders Drive.

All internal stormwater reticulation will be designed in accordance with the layout and sizes of the various stormwater elements as determined by the SMP and the relevant applicable standards. The design of the stormwater attenuation will be subject to approval by the eThekwini Coastal and Drainage Section.

THD and their professional team including the contractor, will be held responsible for ensuring that the requirements of the SMP are met and complied with. The owner / developer and his professional team will be held responsible for the performance of all stormwater control measures implemented on site under their jurisdiction and the impact such works may have on downstream properties within the Cornubia Retail Park.

2.9.4 Roads[6]

2.9.4.1 Main Access

The Cornubia Retail Park Development will be accessed of the M41 Highway and Flanders Drive West. The overall Cornubia Development is due to be constructed in phases, with Phase 1 due for completion in 2016. Currently a pilot project consisting of 486 housing units is under construction at the north-west boundary of the Cornubia Development. Neither the pilot site nor the industrial development will have an internal link to the proposed Cornubia Retail Park in the short-medium term.

The TIA indicates the need for the upgrade of Flanders Drive West and access onto the M41 Highway. The construction of "Dube East" is clearly dealt with in the TIA and provided for within the Cornubia Development Framework. The Cornubia Retail Park development provides an early catalyst for these upgrades which will facilitate further new development within the Cornubia development and beyond.

The Cornubia Development Framework has identified a number of new upgrades to existing interchanges and access points into and out of Cornubia. The timing of such construction and / or upgrades will be dependent upon development demands with the primary focus areas being to the existing N2 / M41 Mount Edgecombe interchange which SANRAL are in process of commencing and the R102 / Northern Drive intersection which will be required for the completion of the Cornubia Phase 1 development. Access to the proposed development will therefore be *via* the following roads as per the Development Framework Plan:

- Flanders Drive East for vehicles from Mount Edgecombe East;
- Flanders Drive West for vehicles from Mount Edgecombe West;
- M41 eastbound for vehicles from Phoenix;
- M41 westbound for vehicles from N2 north (Tongaat) and Umhlanga; and
- N2 south / M41 Interchange for vehicles from the south (Durban).

The required upgrades (due to the ultimate development of Cornubia and broader region) of the left-off, left-on ramps to the M41 at Link Road will be determined and the details and potential phasing options that will provide only for the Retail Park in the short-term will be assessed.

The TIA indicates the need for and justification for the upgrade of Flanders Drive West and access onto the M41 Highway. The construction of "Dube East" is clearly dealt with in the

[6] *This section must be read in conjunction with Figure 2-13 and the TIA for the Cornubia Retail Park compiled by SMEC South Africa and can be found in Appendix C6.*

TIA and provided for within the Cornubia Development Framework. The Cornubia Retail Park development provides an early catalyst for these upgrades which will facilitate further new development within the Cornubia development and beyond.

2.9.4.2 Road Infrastructure[7]

Road infrastructure pertaining to the access for the Mount Edgecombe Refuse Transfer Station is detailed in Section 4.

The TIA recommends upgrades and improvements to and requirements for the internal and external road infrastructure as a result of the Cornubia Retail Park Development.

External access to the proposed development is *via* the following roads as per DH913-RP-SERV-01 (Figure 2-17) and the Development Framework Plan:

- Flanders Drive East for vehicles from Mount Edgecombe East;
- Flanders Drive West for vehicles from Mount Edgecombe West and SASA;
- M41 eastbound for vehicles from Phoenix;
- M41 westbound for vehicles from N2 north (Ballito), N2 south (Durban) and Umhlanga; and
- N2 South / M41 Interchange for vehicles from the south (Durban).

The assessment takes into consideration the external road network in the immediate vicinity of the proposed Cornubia Retail Park Development, as well as the proposed internal road network.

New road infrastructure configurations are presented below and are dealt with in detail in the TIA.

- Intersection One - M41 and Link Road Intersection (M41 on / off ramp)

  The proposed configuration of the intersection of the M41 and Link Road is illustrated in Figure 2-19. The left-turn movement (northbound) onto the M41 no longer exists due to the proposed M41 / Dube East / Flanders Drive Interchange.

[7] *This entire section has been amended with the updated TIA.*

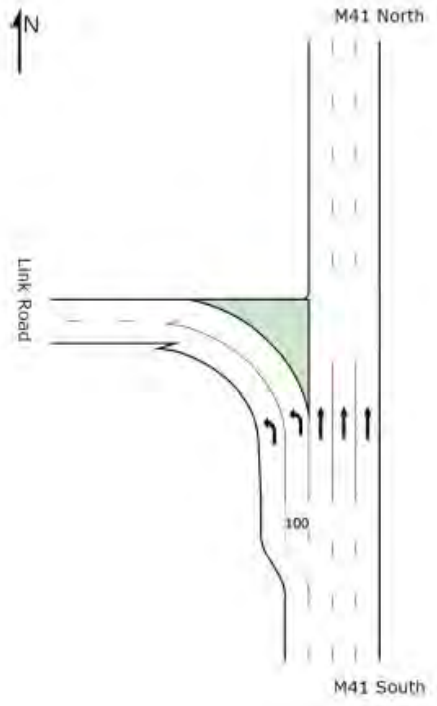


Figure 2-19: Future Layout of the M41 and Link Road Intersection

- Intersection Two - Link Road and Flanders Drive Intersection

  The proposed configuration of the signalised intersection of Link Road and Flanders Drive is illustrated in Figure 2-20.

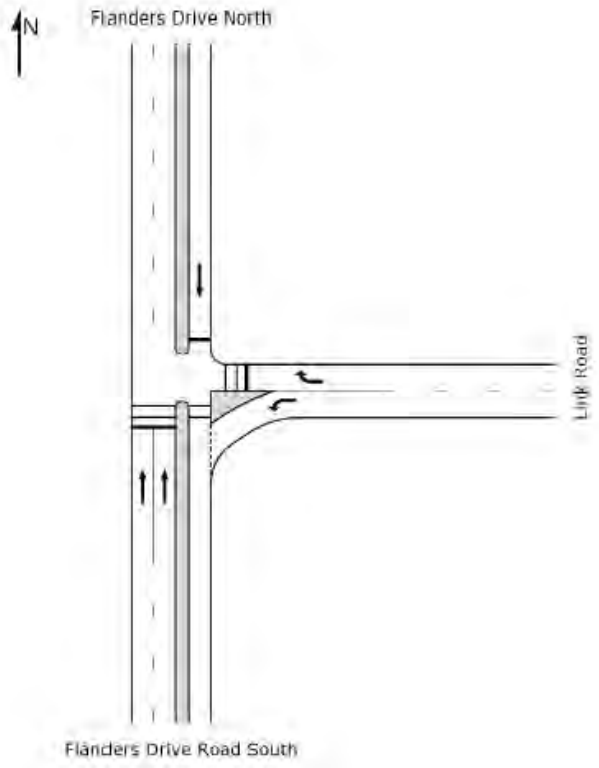


Figure 2-20: Future Layout of the Flanders Drive/ Link Road Intersection

- Intersection Three - M41 and Flanders Drive Intersection (M41 on / off ramp)

  The proposed configuration of the intersection of the M41 and Flanders Drive is illustrated in Figure 2-21.

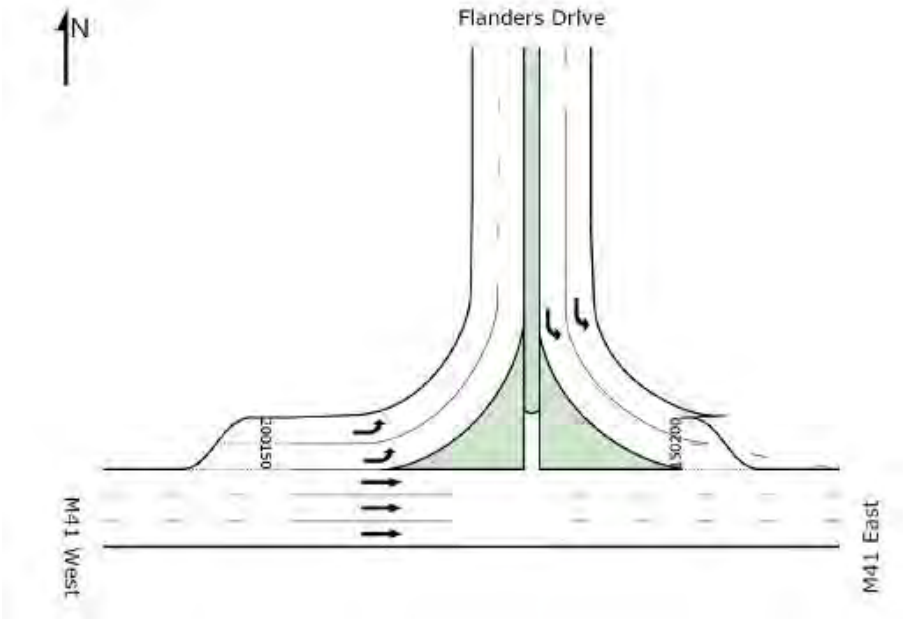


Figure 2-21: Future Layout of the Flanders Drive/ M41 Intersection

- Intersection Four - Flanders Drive and Flanders Drive (to / from M41) Intersection

  The intersection of Flanders Drive and Flanders Drive (to / from M41) is illustrated in Figure 2-22. The proposed future layout of the intersection includes a signalised intersection and major capacity enhancements.

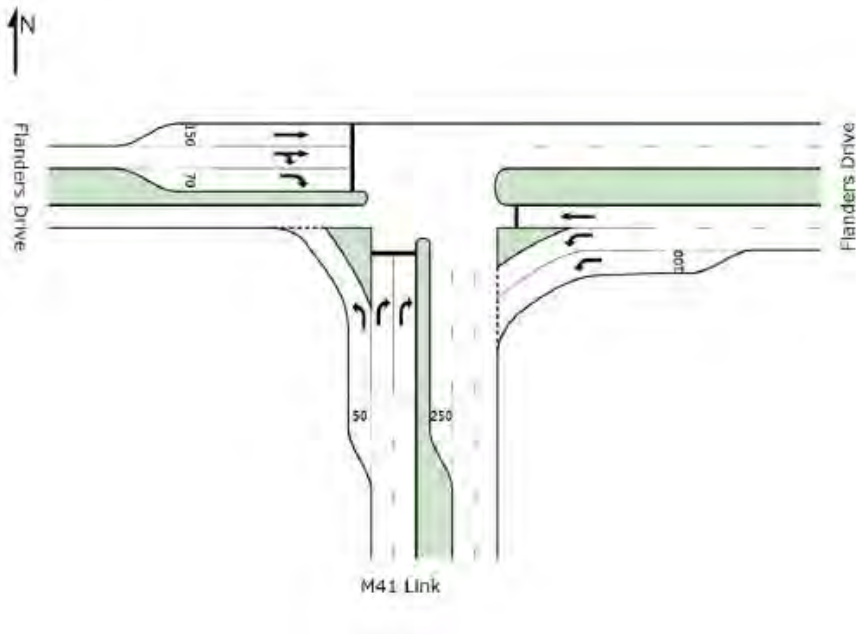


Figure 2-22: Future Layout of the Flanders Drive and Flanders Drive (to / from M41) Intersection

- Dube East / SASA Boulevard Intersection

  The intersection of Dube East and SASA Boulevard is illustrated in Figure 2-23 and is new. Due to the volume of vehicles using this intersection it is proposed that this intersection be signalised.

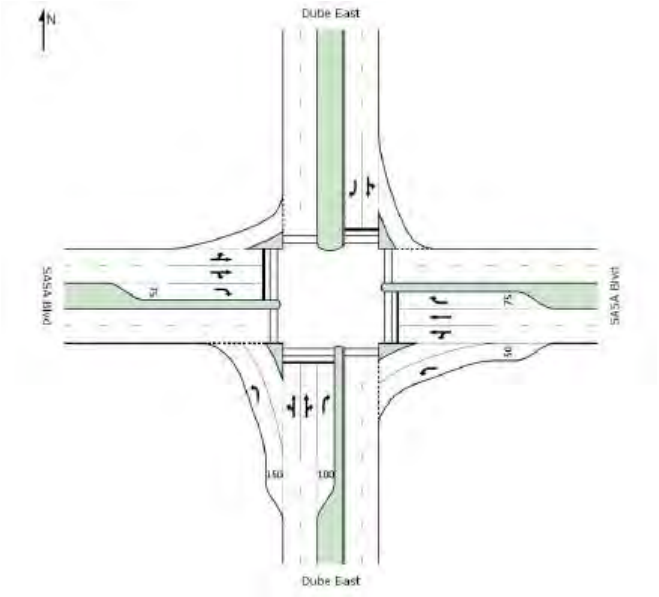


Figure 2-23: Future Layout of the Dube East / SASA Boulevard Intersection

- SASA Boulevard Roundabouts

  The layout of the SASA Boulevard Roundabout which provides access to Site 1 and Site 2 of the proposed Cornubia Retail and Business Park development is displayed in Figure 2-24. It should be noted that the analysis of roundabouts in Sidra are not always a true reflection of actual or expected conditions on site and therefore micro-simulation modelling has been completed to assess the LOS for these roundabouts.

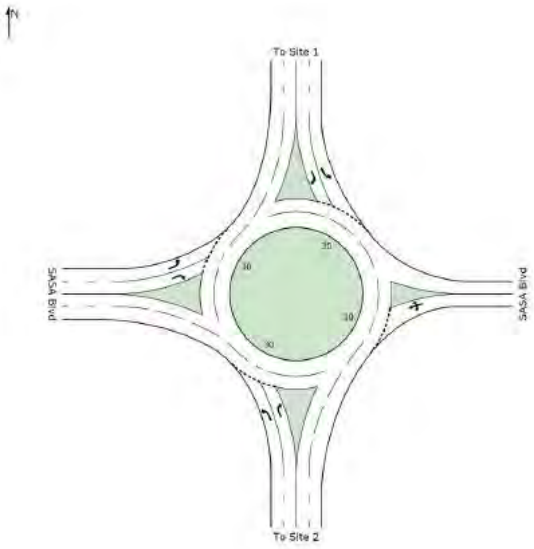


Figure 2-24: Future Layout of SASA Boulevard Roundabout A

- SASA Boulevard / Flanders Drive and Access Road

  The access to sites 3, 4a, 4b and the existing warehouse / industrial operation (located on Flanders Drive) is provided in Figure 2-25.

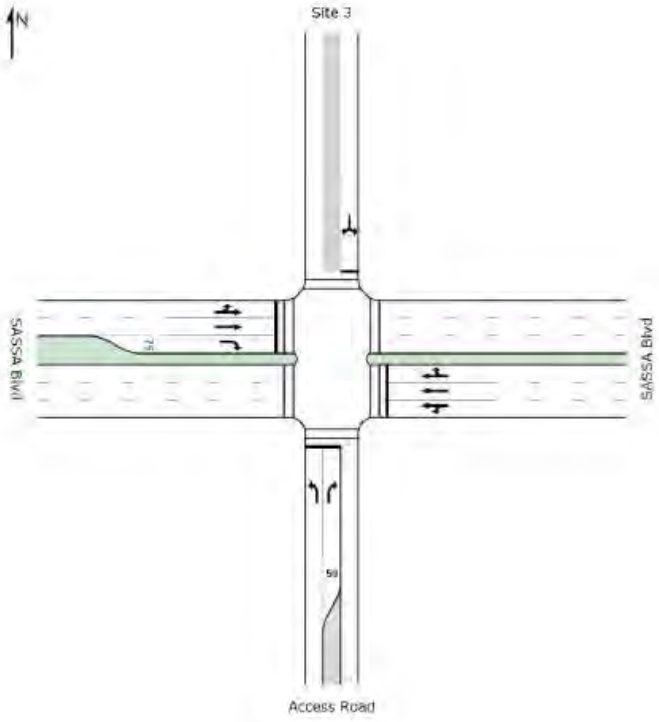


Figure 2-25: SASA Boulevard / Flanders Drive Access Road

- Proposed M41 / Flanders Drive / Dube East Interchange

  The existing road infrastructure accessing the M41, in the vicinity of the proposed Retail Park development site, is already operating at capacity. Direct access to and from the M41 into Flanders Drive / Dube East is required in order to accommodate both the short-term and long-term development generated traffic as well as background traffic volumes.

  The M41 / Flanders Drive Interchange was initially planned to be upgraded to a conventional diamond interchange at which time the existing access to the M41 (Umhlanga bound) would be closed.

  Due to the N2 / M41 Interchange upgrade, the on-ramp from the M41 onto the N2 northbound will have to be tested by combining the existing 2040 model developed for the interchange upgrade with the micro-simulation model developed for this development. More details are provided in the TIA.

  A conventional diamond interchange was no longer feasible due to spacing constraints between on and off ramps as previously planned, and it became necessary to consider alternatives that would cater for the background traffic, development generated and ultimate scenarios. The solutions have been tested in conjunction with the interchange development to obtain an ultimate integrated solution.

A number of possible geometric layouts were considered and the preferred option is illustrated in Figure 2-26, offering the most effective balance between cost and level of service:

- Free-flow Partial Parclo Layout (M41 off-ramp)
- M41 (northbound) on-ramp off Flanders Drive with a stop-control where the M41 on-ramp meets Flanders Drive / Dube East
- M41 free-flow on-ramp (southbound) off Dube East

The traffic conditions at these ramps have been assessed and detailed information provided in the TIA presented in Appendix C6.

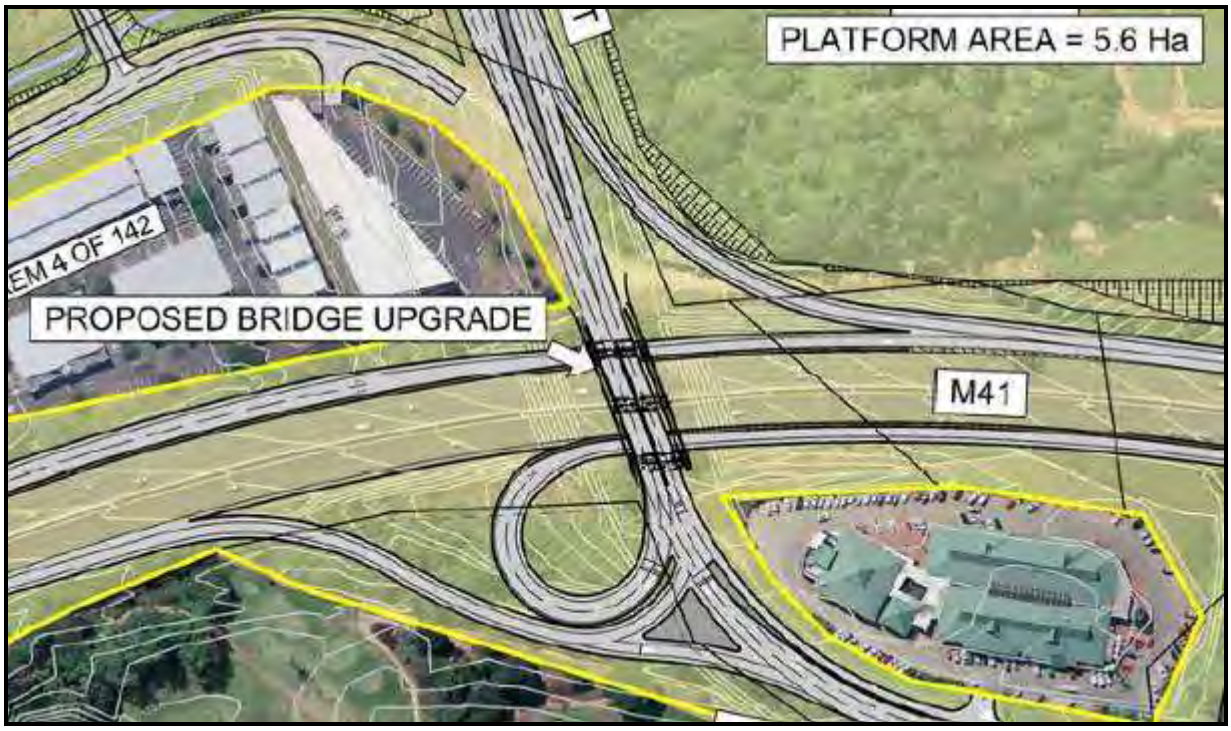


Figure 2-26: The Proposed M41 / Flanders Drive / Dube East Interchange

2.9.4.3 Access to existing developments

- Erf 2904 currently has two access points onto Flanders Drive West, a western access and eastern access. Due to the upgrades of the intersection of Flanders Drive and the east bound on/off ramps from the M41, the eastern access is too close to the intersection and requires closure.

- REM 4 of 142 has two access points onto Flanders Drive West which links up with Flanders Drive East via the existing bridge over the M41. As illustrated in Figure 2-17, the link is removed. Access to REM 4 of 142 will be *via* an access road between Sites 4a and 4b. The two existing accesses will remain.

2.9.4.4 Bus Bays

Two existing bays on the M41 will need to be removed while 2 new bays will be constructed along Dube East.

2.9.5 Telecommunications

The various telecommunication service providers will provide service to the Retail Park provided adequate demand can recover the cost of the capital infrastructure installed. Provision will be made for road crossings by means of telecommunication ducts. Progress updates of the development will be made known to the various service providers ensuring adequate service is provided for the end user.

2.9.6 Electrical[8]

Existing electrical infrastructure in the region include the Ottawa major substation located to the north-west of the Cornubia Retail Park and the Gateway substation located in Umhlanga Ridge Town Centre which is located opposite the proposed development. The eThekwini Electricity have registered servitudes for all transmission lines entering and leaving the Ottawa substation, as well as proposed servitudes for future 275 kV transmission and 132 kV sub-transmission lines. Furthermore, at present there is an electrical supply at 11 kV for distribution and 400 V for reticulation available in close proximity to the Cornubia Retail Park, however, these cannot support the demand of the development.

2.9.6.1 Bulk Load Estimate

The bulk load estimates are presented in Table 2-3.

Table 2-3: Bulk load estimates

LAND USE	BULK AREA (m^2)	VA/m^2	LOAD (kVA)
Commercial/Retail	170,580	80	13,646
TOTAL LOAD			**13,646**

The potential electrical load at the major substation/s after the diversity factor applied will be in the order of 10.92MVA.

2.9.6.2 Proposed Electrical Infrastructure

- Sub-Transmission (132/11 kV)

  The existing major substation is only able to cater for 8 MVA of the total anticipated 10.92MVA load for the total bulk area proposed. The balance of the capacity can be

[8] *The information provided in this section has been obtained from the Cornubia Retail Park Development EIA Electrical Services Report (2013) prepared by Bosch Projects and provided in Appendix C10. This section must be read in conjunction with this report.*

obtained when the substation is upgraded to 60 MVA by adding two additional 30 MVA transformers and more 11 kV circuit breakers. Should the eThekwini Electricity require changing the source of supply to another substation in the future due to operational reasons, the costs thereof will be borne by the eThekwini Electricity.

- Servitudes

  There are no further sub-transmission servitudes that will be required for the Cornubia Retail Park Development. It is envisaged that the 11 kV cables will be used to supply the development, will be run within the new road reserves as well as under the existing N2 carriageway. A wayleave agreement will need to be in place for the auger-bore under the N2 carriageway.

- Distribution

  Three new 11 kV distribution substations will ultimately be required, however only two can be supplied from the existing infrastructure. The distribution substations will be planned and positioned within the first building of the development. These locations will be determined by electrical load centres. 11 kV cable routes will be planned to run adjacent to or be in close proximity to each proposed site within the road reserve thereby allowing sales and transfers of each site to take place. Details of proposed distribution infrastructure are provided in the Electrical Services Report presented in Appendix C10.

- Reticulation

  The internal electrical reticulation of retail developments (within the broader development) will be undertaken by each developer to meet his specific requirements. THD will be responsible for the costs of the 11 kV bulk supply to the boundary of these developments.

- Street Lighting

  Presently, there is no street lighting within the Cornubia Retail Park Development but these will need to be implemented as the construction of the roads occurs.

Confirmation of electrical supply has been obtained from the eThekwini Municipality as indicated in Appendix G.

2.10 Mount Edgecombe Refuse Transfer Station

As mentioned previously, in order to facilitate the development of the Cornubia Retail Park, it is proposed that the existing Mount Edgecombe Refuse Transfer Station which is currently operated by the eTM and falls within the Cornubia Retail Park site be relocated within Cornubia. This EIA application deals with the infrastructural requirements pertaining to the new Station.

The current station is situated along the Flanders Quarry Access Road, 200 metres from the Flanders Drive and Flanders Quarry Road junction. The existing facility is situated on Erf 27 Cornubia. The SG21 Digit Code is N0FU02170000002700000. The facility is 10 039 m^2 in

extent and is constructed according to the dimensions provided in Figure 2-27. It is proposed that this facility will be deconstructed and demolished. The rehabilitation of the existing Station as per condition 12 of the existing WML will not be required as it is proposed that the site will be cleared for the construction of the Cornubia Retail Park.

Figure 2-27: Dimensions of the Existing Mount Edgecombe Refuse Transfer Station

The existing facility has a capacity of 205 tons/day. The new facility will have an ultimate design with the same capacity. It will be developed gradually with an initial capacity of 160 tons/day and an ultimate operational capacity of 205 tons/day. The new facility will be constructed prior to the old facility being decommissioned to avoid any job losses and to ensure waste transferral services are not interrupted within the area.

A broad area for the relocation of the Mount Edgecombe Refuse Transfer Station was considered (Figure 2-28).

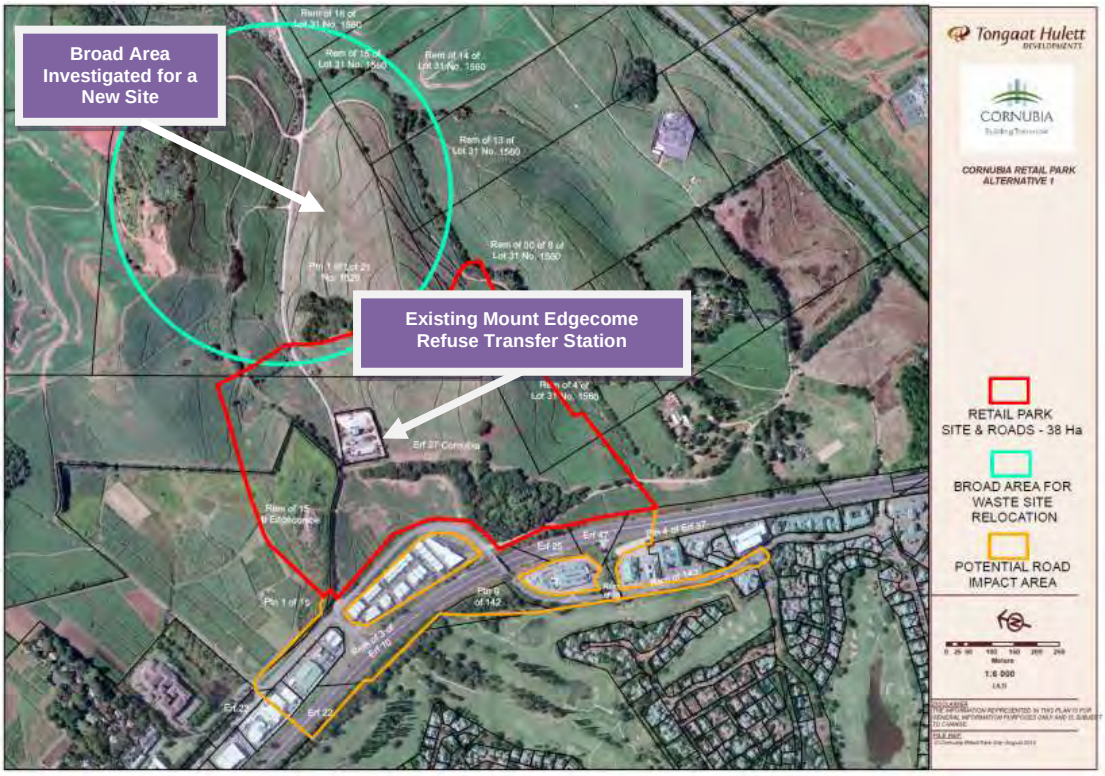


Figure 2-28: Broad Area Considered for the Relocation of the Mount Edgecombe Refuse Transfer Station

It is proposed that the Mount Edgecombe Refuse Transfer Station is relocated to one of two sites within the broader Cornubia Development (refer to Section 4: Project Alternatives). Once various aspects such as topography, geology, water resources such as wetlands, vegetation, etc. were considered, two possible sites were identified for the new Station. These sites are situated on Ptn 1 of Farm Lot 21 No. 1529, Sugar Cane Road, Blackburn, 4339. The SG21 Digit Code is N0FU02170000152900001.

Access to Alternative Site 1 (preferred alternative) will be obtained from the extension of Dube East. At the same time a temporary new road access will be required onto the existing district road that provides access to the Blackburn development. This will be removed and rehabilitated as part of the open space network once Dube East has been constructed as part of the Cornubia Phase 2 development. Access to Alternative Site 2 would be obtained through the construction of a long temporary access road that will cross a wetland. Access to the existing district road will also be required for access to the Blackburn development. Alternative Site 2 is not desirable and it is not envisaged that this road will be necessary. The access roads and alternative sites will be presented in Section 4.

The proposed layout of the preferred site is presented in Figure 2-29. The following forms the basic infrastructural requirements for the transfer station:

- Access control and weighbridge.
- Receiving and compactor building.
- Materials Recovery Building.
- Compactor.
- Moving frames for loading and offloading containers on the compactor.

- Stormwater System.
- Weighbridge.
- Change-rooms and ablution facilities for staff.

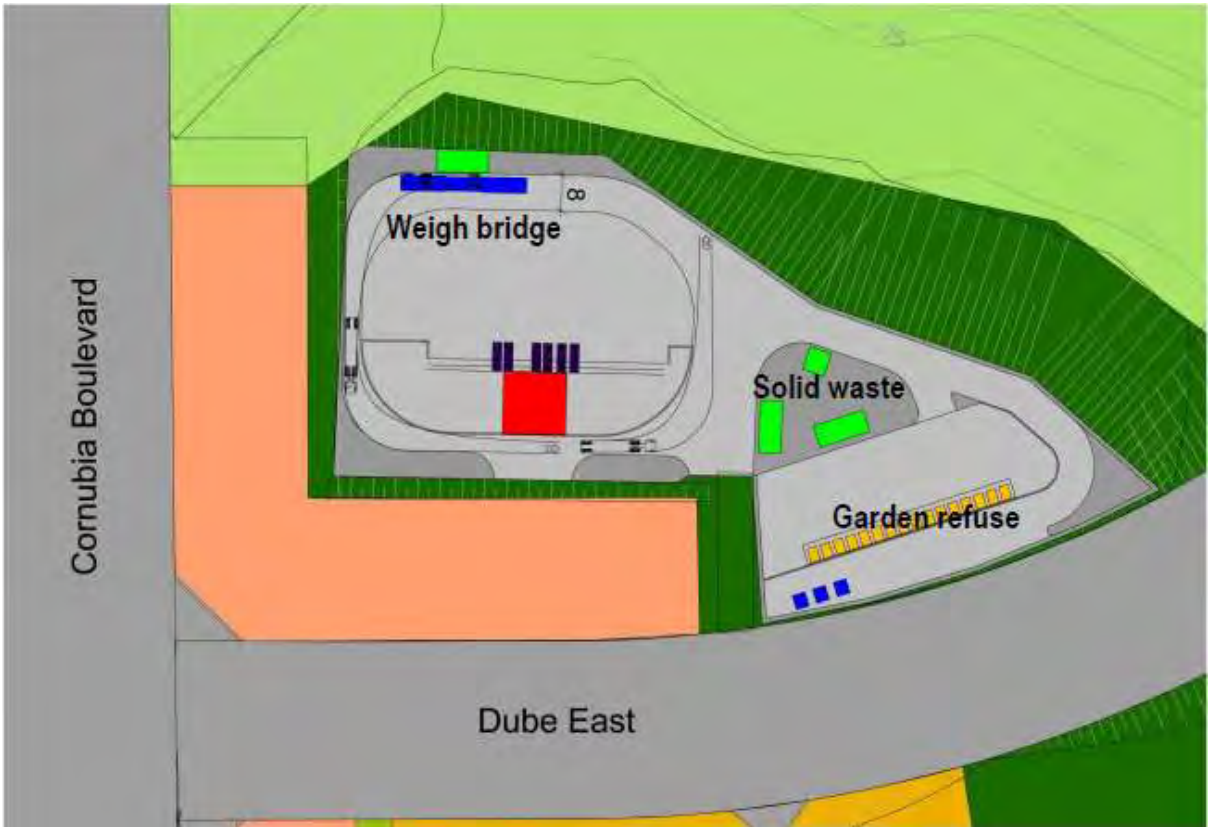


Figure 2-29: Proposed Layout of the Preferred Location for the New Transfer Station

Durban Solid Waste has accepted the Alternative Site 1 option and layout for the Mount Edgecombe Refuse Transfer Station relocation and proof of this acceptance is provided in Appendix H.

3 NEED AND DESIRABILITY

The Retail Park is the first pure commercial investment opportunity within the Cornubia Integrated Human Settlement and will provide an important catalyst for further investment and development in support of the extensive new housing under construction.

The Cornubia Retail Development will form part of Special Zone 19 of the Cornubia Development. This zone applies to the Cornubia Town Centre development which consists of the commercial, mixed use component of the Cornubia Integrated Human Settlement. The purpose of this zone is to accommodate a wide range of shopping, business, commercial, residential, social and Business Park activities, in such a way that the uses contribute towards the creation of a dynamic, harmonious and well balanced town centre of the highest aesthetic, landscaping and urban design quality.

The proposed Retail Park is a new investment of R1.24 billion. It has the potential to provide more than 2 000 construction related employment opportunities and more than 1 500 permanent employment opportunities. In addition, it is expected that R20 million in new rates per annum will be received from the development and over R300 million in annual taxes and Value Added Tax (VAT).

The proposed Retail Park responds to the prime accessibility and visibility of the emerging corridor creating a positive interface for Cornubia. The prime location of the Cornubia Retail Park site with Durban together with the diverse mix of uses creates an ideal opportunity for the people within Cornubia and those that surround this area to access a full set of urban and economic opportunities. There is substantial interest shown for retail and commercial offerings in the region. There has been strong interest by private sector for business and retail park development within Cornubia particularly along the M41 on land that is predominantly under Tongaat Hulett ownership.

The high visibility and good location along the M41 makes the Retail Park site highly desirable. The study area therefore is strategically placed and plays an important role in the future growth of the corridor. Due to the development undertaken to date, there are no opportunities available for such a destination retail development in the surrounding area. The development will therefore complement the existing retail and commercial development on the Umhlanga Ridge and serve to create a broader economic node for the region.

Figure 3-1: The Prime Location of Cornubia

Similarly to the Cornubia Industrial and Business Estate in regard to the significance of the confidence shown in Cornubia from a private sector and investment perspective, the Cornubia Retail Park provides a major additional impetus and further confirmation of the confidence and expectation in the potential of Cornubia as an Integrated Human

Settlement. The benefit of this major investment, in this location is substantial and will only serve to position Cornubia as an aspirational and exciting development to be part of.

The location of the Cornubia Retail Park Project is ideally positioned to ensure that the following key objectives can be achieved:

- Make a key contribution to building, consolidating and integrating the social and economic base of the northern portion of eThekwini;
- Ensure a sustainable mixed use, inclusionary mixed income development that maximises economic opportunities for future residents and investment;
- Create value by maximising the potential of the land through public-private partnerships so that the development of the land delivers a positive and a balanced economic, environmental and social return that is both financially sustainable and contributes to redressing inequalities; and
- To use the opportunity for creating substantial black economic empowerment opportunities in property development ownership and urban management.

3.1 Integrated Development Plan, Spatial Development Framework and Local Area Plan

Durban's Spatial Development Framework (SDF), as established through the Integrated Development Plan (IDP) process, firmly seeks to reinforce the development intensification and improved functioning of the existing "T" shaped development areas. The SDF depicts the thrust of the IDP indicating the eTM investment intentions and development management approach.

It is suggested that the SDF will respond to key spatial drivers that will determine investment within Durban. Umhlanga is considered as an urban investment opportunity and is located strategically along the existing "T" axes. The SDF acknowledges a northward investment thrust to accommodate the Dube Trade Port as a key spatial driver in the Northern Region. The SDF identifies Cornubia as an investment opportunity area and is located within the defined Urban Development Corridor.

In terms of eThekwini's IDP, the Cornubia site it is situated within the urban edge/boundary of the City, in one of the three "zones of planning", the "urban core", which is intended to be characterised by well-resourced development, with high density urban form and high value infrastructural investment. The project will be grounded in the principles of the City's IDP, and will specifically articulate the following programmes identified in the plan:

- Community empowerment and development;
- Job creation;
- Enterprise development;
- Good governance; and
- Environmental management.

The eTM has also, in the past year, adopted the Northern Urban Development Corridor Plan (NUDC) for the region between Phoenix in the south and Tongaat in the north. The NUDC itself is split into a number of Local Areas of which Cornubia falls within the Verulam/Cornubia Local Area Plan (LAP).

The LAP indicates that the key primary role for Cornubia as follows:

> *"A New Town to accommodate local mixed use, mixed density and mixed income urban living areas".*

The proposed Cornubia Retail Park therefore aligns with this role for Cornubia and is aligned with the adopted Development Framework Plan.

In summation, the location of the development is in line with the planning intent as the study area is in a prime location for the nature of uses proposed. The development could serve as a catalyst to induce future private sector investment within this area and will generate much needed employment opportunities for people of Cornubia and surrounds. Since the Medium Density residential development is already under construction with approximately 2 500 units envisaged in the short term, the development of the study area may contribute in creating much needed employment opportunities in the area. Initial feasibility studies indicated that the precinct would be able to provide a number of temporary and permanent jobs as well as contribute significantly to the rates base[9].

Furthermore, it is necessary to relocate the existing Mount Edgecombe Refuse Transfer Station to allow for the development of the proposed Cornubia Retail Park. The 'no-go' option which involves the existing Station to continue operating at its current location will limit the development potential of the Retail Park.

4 PROJECT ALTERNATIVES

In terms of the EIA Regulations, Section 28 (1) (c) feasible alternatives are required to be considered as part of the environmental investigations. In addition, the obligation that alternatives are investigated is also a requirement of Section 24(4) of the NEMA (as amended). An alternative in relation to a proposed activity refers to the different means of meeting the general purpose and requirements of the activity (as defined in Government Notice R.543 of the EIA Regulations, 2010), which may include alternatives to:

- the property on which or location where it is proposed to undertake the activity;
- the type of activity to be undertaken;
- the design or layout of the activity;
- the technology to be used in the activity;
- the operational aspects of the activity; and
- the option of not implementing the activity.

[9] *Extracted from the Cornubia Retail Park Planning Report (2013) prepared by Iyer Urban Design Studio and included as Appendix C8.*

4.1 Site Alternatives

4.1.1 Cornubia Retail Park

The nature of the proposed development, being large-scale retail destination, specifically requires good access and good visibility to key road networks and an extensive, level platform. Furthermore, any proposed development within Cornubia is required to align, in broad terms, with the adopted Development Framework Plan. Given these two critical constraints together with the extent of land required, the potential site locations for such a development, within the broader region are limited and within Cornubia itself, even more so.

During the early stages of the Scoping study and EIA that culminated into the compilation of the final ESR and draft EIAR, it was proposed that the Alternative Site 1 which includes land owned by SASA be considered as the preferred alternative. As no formal agreement has been reached between THD (the project applicant) and SASA, the final preferred alternative is the option which excludes SASA owned land (revised preferred alternative).

The SASA will proceed with their own plans for their property at a later stage.

4.1.1.1 Alternative Site 1

Alternative Site 1 for the proposed project includes the site option which includes SASA owned land (Figures 4-1 and 4-2).

Figure 4-1: Location of Alternative Site 1 for the Cornubia Retail Park

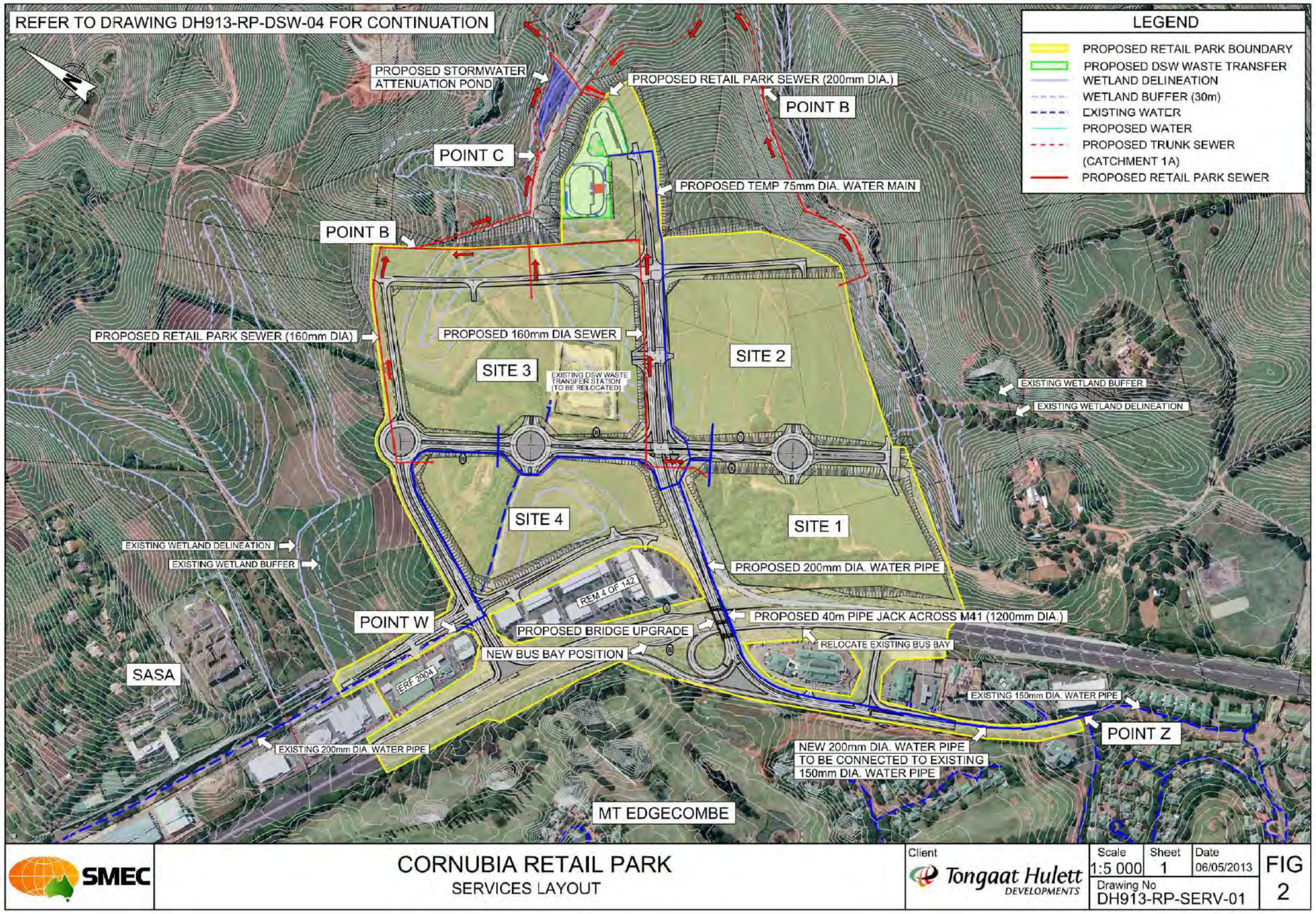


Figure 4-2: Layout of Alternative Site 1 for the Cornubia Retail Park

4.1.1.2 Alternative Site 2 (Revised Preferred Alternative)

The alternative site for the proposed project excludes SASA owned land (Figures 4-3 and 4-4).

Figure 4-3: Location of Alternative Site 2 for the Cornubia Retail Park

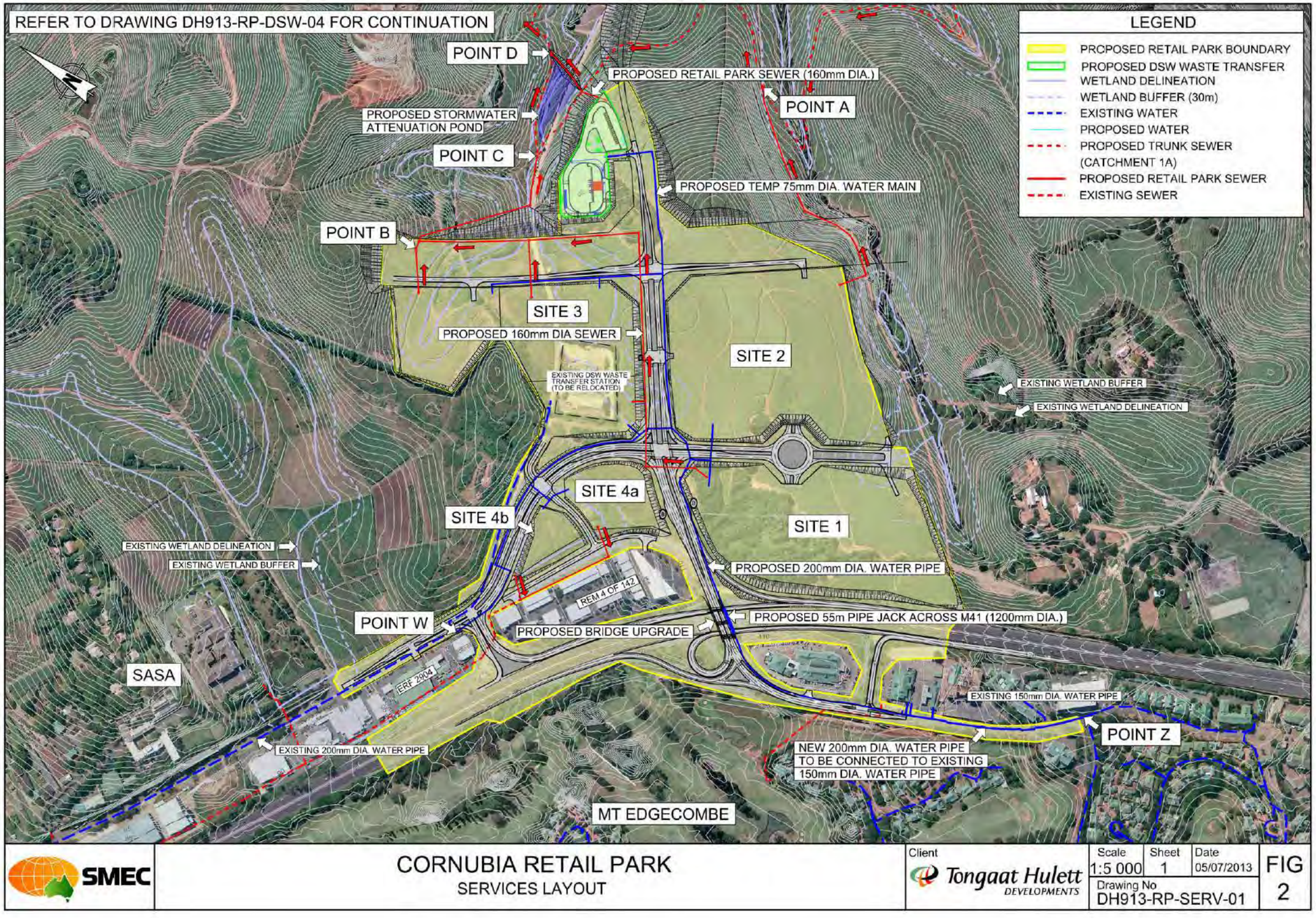


Figure 4-4: Layout of Alternative Site 2 for the Cornubia Retail Park

4.1.2 Mount Edgecombe Refuse Transfer Station

Two site alternatives have been considered for the new site. The construction of the new facility will be a like-for-like development. Therefore, the dimensions of the new facility will be identical to the existing facility. The land identified for the construction of the new facility (preferred and alternative) is zoned as Agricultural Land (sugarcane).

The following generic criteria provide guidance on the specific engineering, operation, and transportation conditions that were considered when identifying the potential sites for the new Station to ensure that they are feasible from technical, environmental, and economic perspectives. These criteria addressed the following issues:

Table 4-1: Criteria for the identification of a new site

CRITERIA	PREFERRED SITE	ALTERNATIVE SITE
Central location to collection routes: To maximize waste collection efficiency, transfer stations should be located centrally to waste collection routes. As a rule of thumb in urban and suburban areas, transfer stations should be no more than 15 kilometres away from the end of all collection routes. Beyond that distance, collection routes might need to be altered to enable refuse to be collected and deposited at the transfer station within one operating shift.	Site is central to collection routes and only 200 m away from the existing site.	Site is central to collection routes and less than 1 km away from the existing site.
Access to major transportation routes: The transfer station should have direct and convenient access to truck routes, major arterials, and highways (or rail or barge access, if appropriate). For large metropolitan areas, direct access to rail lines or barges will significantly reduce the number of large transfer trailers leaving the station and travelling area roads. It is preferable to avoid routing traffic through residential areas because traffic generated by transfer stations contributes to congestion; increased risk to pedestrians; increased air emissions, wear on roads; and might contribute to litter problems.	Site is easily accessible to the M41 and the N2.	Site in close proximity to the M41 and the N2. A new access road will need to be constructed to connect to these routes.
Site size requirements: The area required for specific transfer stations varies significantly, depending on the volume of waste to be transferred, rates at which waste will be delivered, the functions to be carried out at the site, and the types of customers the facility is intended to serve. Locating a site of sufficient size is critical to	Site is within the same development footprint as the existing site which has been adequate for the requirements of the facility.	Site is slightly smaller than the existing site which has been adequate for the requirements of the facility.

CRITERIA	PREFERRED SITE	ALTERNATIVE SITE
operating efficiencies and minimizing impacts on the surrounding community. Engineering input can establish preliminary size criteria based on a conceptual design.		
Sufficient space for onsite roadways, queuing, and parking: Transfer stations typically have onsite roadways to move vehicles around various parts of the transfer site. Waste collection trucks can be up to 40 feet long. Transfer trailers that move waste to a disposal facility are typically 15 to 25 meters long. These vehicles need wide roadways with gradual slopes and curves to manoeuvre efficiently and safely. Also, the site will need space for parking transfer vehicles and to allow incoming and outgoing traffic to form lines without backing up onto public roads.	Site is within the same development footprint as the existing site which has been adequate for the space requirements of the facility.	Site is slightly smaller than the existing site which has been adequate for the space requirements of the facility.
Truck and traffic compatibility: Transfer stations often receive surges of traffic when collection vehicles have finished their routes. Transfer station traffic varies locally, but tends to peak twice a day. The first peak is often near the middle of the day or shift, and the second at the end of the day or shift. Therefore, the best sites for transfer stations are located away from areas that have midday traffic peaks and/or school bus and pedestrian traffic.	Site located adjacent to future commercial land uses.	Site located adjacent to future residential land uses.
Space for recycling, composting, and public education: A transfer station could be sited in areas also conducive to recycling or composting activities. Many transfer stations are designed to enable residents and businesses to drop off recyclables and yard waste in addition to trash. Some transfer stations incorporate education centres or interpretive trails focusing on waste prevention. These types of facilities offer increased utility to the community.	Sufficient space provided for.	Sufficient space provided for.
Buffer space: To mitigate impact on the surrounding community, a transfer station should be located in an area that provides separation from sensitive adjoining land uses such as residences. Buffers can be natural or constructed and can take many forms, including open spaces, fences, sound walls, trees, berms, and landscaping.	Site located adjacent to future commercial land uses. Buffers in the form of landscaping and fencing will be provided for.	Site located adjacent to future residential land uses. Buffers in the form of landscaping and fencing will be provided for.
Gently sloping topography: Transfer stations often are multilevel buildings that	Topography is sufficient for the station.	Topography is sufficient for the station.

CRITERIA	PREFERRED SITE	ALTERNATIVE SITE
need to have vehicle access at several levels. Completely flat sites need ramps or bridges constructed to allow vehicle access to upper levels (or areas excavated to allow access to lower levels). Sites with moderately sloping terrain can use topography to their advantage, allowing access to the upper levels from the higher parts of the natural terrain and access to lower levels from the lower parts. Sites with steep slopes might require extra costs associated with earthmoving and retaining walls.		
Access to utilities: Transfer stations generally require electricity to operate equipment, such as balers and compactors; lighting; water for facility cleaning, restrooms, and drinking; and sanitary sewer systems for waste-water disposal. Some smaller transfer stations use wells for water supply, and some, especially in more rural settings, use septic systems or truck.	Utilities provided for via the construction of the adjacent Cornubia Retail Park.	Access to utilities will be more problematic in the short-term.

4.1.2.1 Alternative Site 1 (Preferred Alternative)

The site is situated on Ptn 1 of Farm Lot 21 No. 1529, Sugar Cane Road, Blackburn, 4339. The SG21 Digit Code is N0FU02170000152900001. The co-ordinates for the facility are depicted in Figure 4-5. The preferred option is situated 200 m east of the existing Station (Figure 4-6). The Station is proposed to be 10 601.4 m^2 in extent.

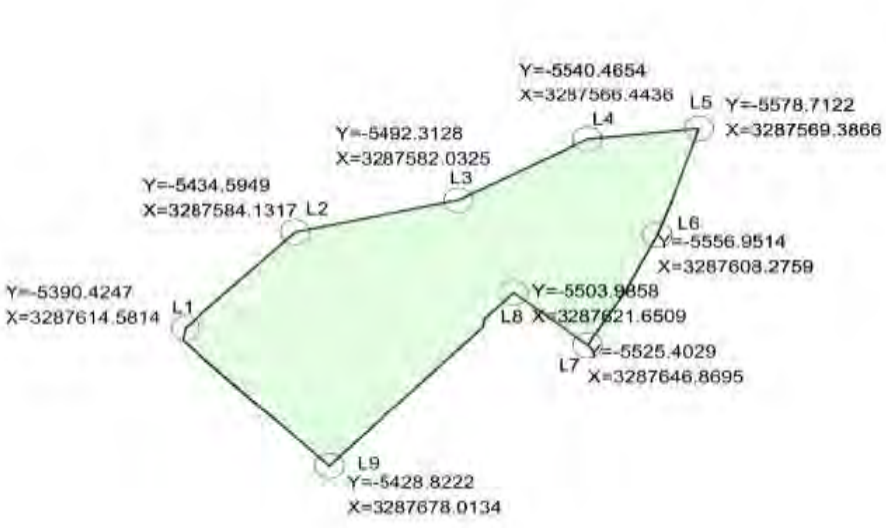


Figure 4-5: Co-ordinates for Alternative Site 1 (WGS 84)

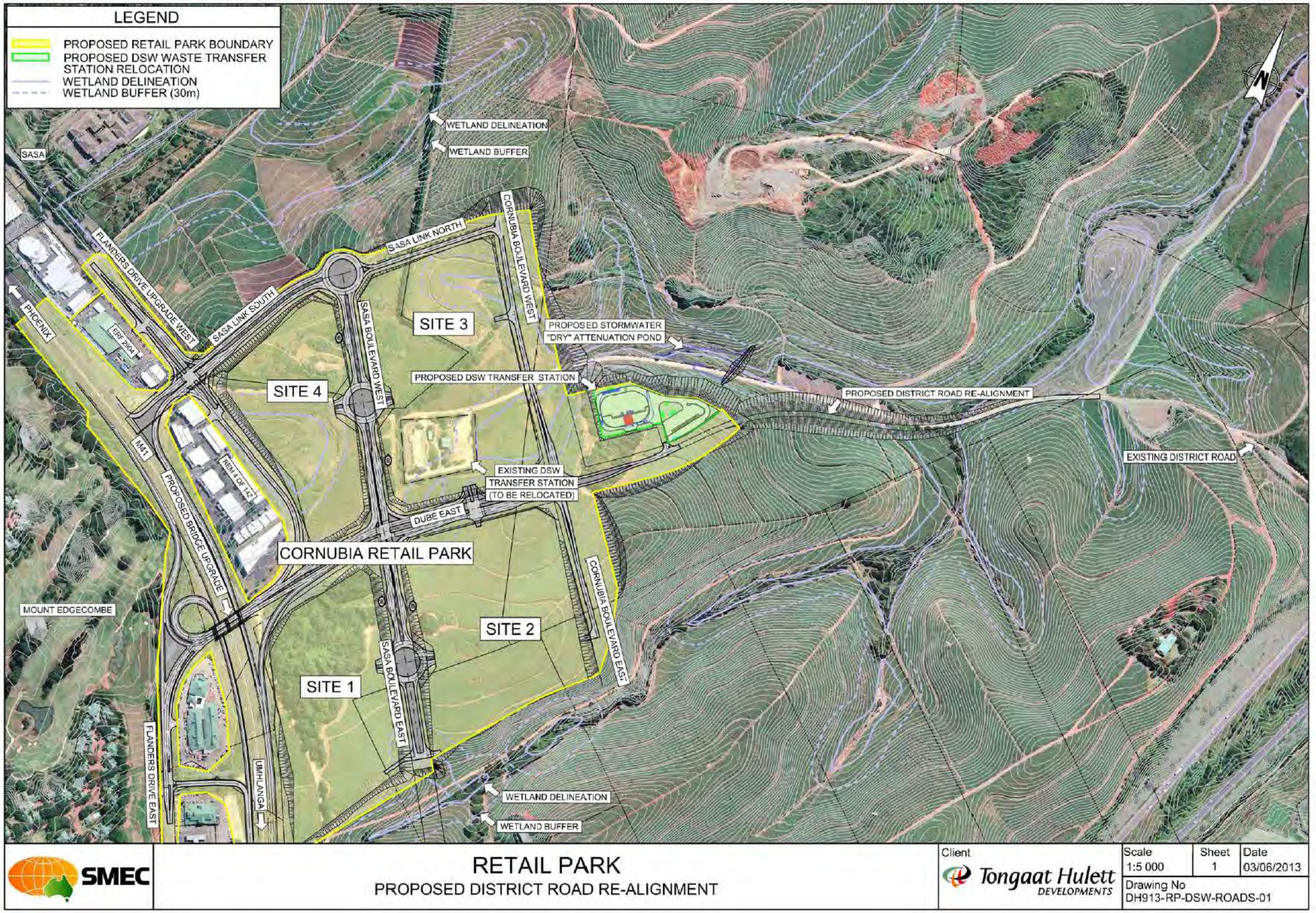


Figure 4-6: Alternative Site 1 and Access Road for the Proposed New Location of the Mount Edgecombe Refuse Transfer Station

The site does not require the infilling of any wetlands and falls outside of the Cornubia Development Framework approved 30 m wetland buffers. The site does however border on dense vegetation. A vegetation assessment has been undertaken and it has been found that the bush clump cannot be classified as an indigenous forest with vegetation consisting of predominantly alien invasive vegetation.

Access to the site will be obtained from the extension of Dube East directly to the north of the Retail Park. A temporary road access to the existing district road will be required in order to enable continued access to the Blackburn settlement. This temporary access road will require infilling of a disturbed wetland but once the new road infrastructure in the remainder of Cornubia is constructed, the temporary access road will be removed and rehabilitated as part of the open space corridors.

All mitigatory and rehabilitative measures proposed by the specialists will be adhered to as outlined in the Sections that follow.

The site is located at the intersection of the planned Cornubia Boulevard and Dube East Intersection (Figure 4-7). This area is a highly valuable parcel of land, given its location and proximity to all future General Business and Retail development proposal. As can be seen on the plan to the right, directly opposite the facility, in blue, is the Retail Park site with the mixed use, Town Centre uses indicated as a light red hatch in close proximity. Directly opposite the new proposed Station, is a social facility cluster with Mixed Use 1 sites proposed at the intersection of Dube East and Cornubia Boulevard, serving as an interface to the Mount Edgecombe Refuse Transfer Station. The Mixed Use 1 sites will contain office and retail activities but could also include residential apartments if deemed desirable.

There are therefore no pure residential sites in very close proximity to the proposed Refuse Transfer Station with the closest one, 150 m away across a wetland zone. Whilst the facility is within a strategic zone for potential business/retail uses, its location is deemed as adequate by the urban planners and the facility can be accommodated with this area. The location of the Station in this zone is in close proximity to the existing Station.

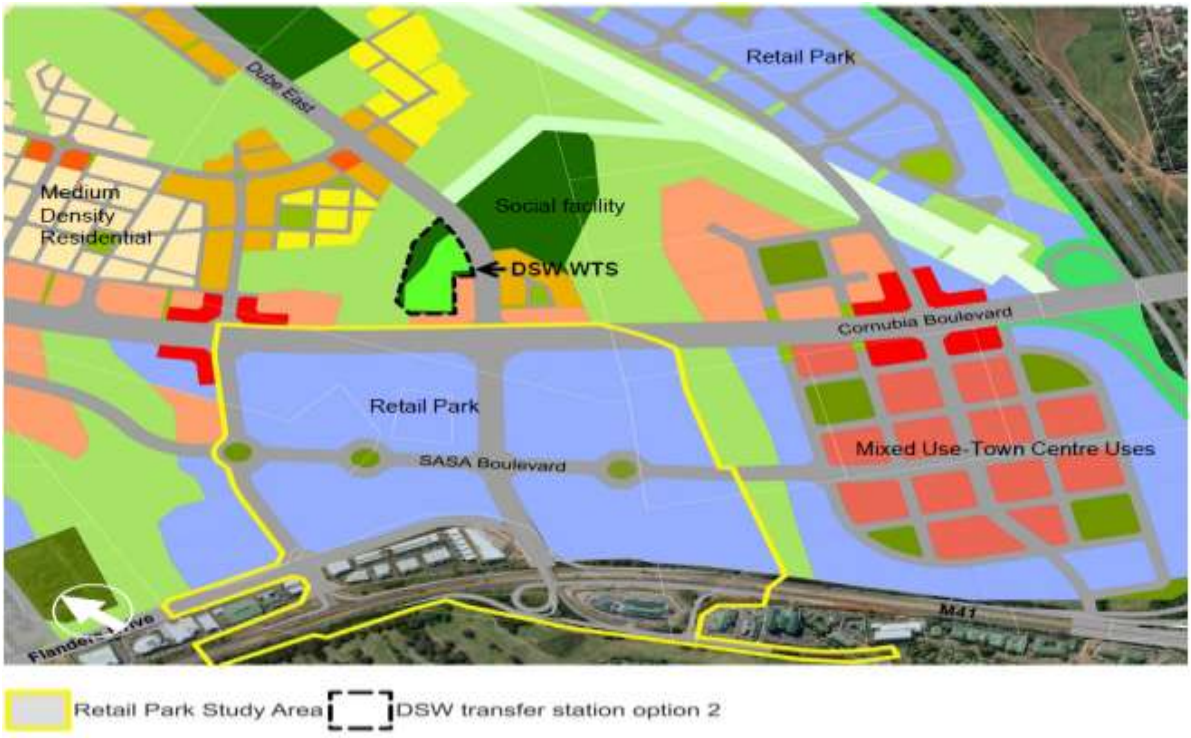
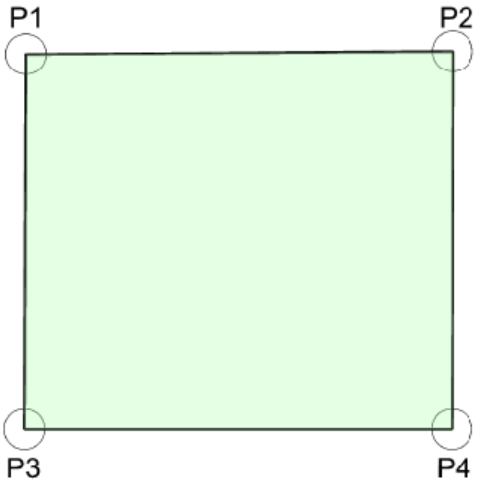


Figure 4-7: Alternative Site 1 of the new Mount Edgecombe Refuse Transfer Station in Comparison to Adjacent Future Land Uses

4.1.2.2 Alternative Site 2

The site is situated on Ptn 1 of Farm Lot 21 No. 1529, Sugar Cane Road, Blackburn, 4339. The SG21 Digit Code is N0FU02170000152900001. The co-ordinates for the facility are depicted in Figure 4-8. The proposed alternative site 2 is located to the north-east of the existing Station (Figure 4-9). The Station is proposed to be 9 800 m^2 in extent.



DSW CO-ORDINATES		
POINT	CO-ORDINATES (m) (WGS 84)	
	Y	X
P1	-5 728.6065	3 287 213,9617
P2	-5 831.8727	3 287 232,6796
P3	-5 711.2566	3 287 304.1584
P4	-5 814.5838	3 287 323.6056

Figure 4-8: Co-ordinates for Alternative Site 2 (WGS 84)

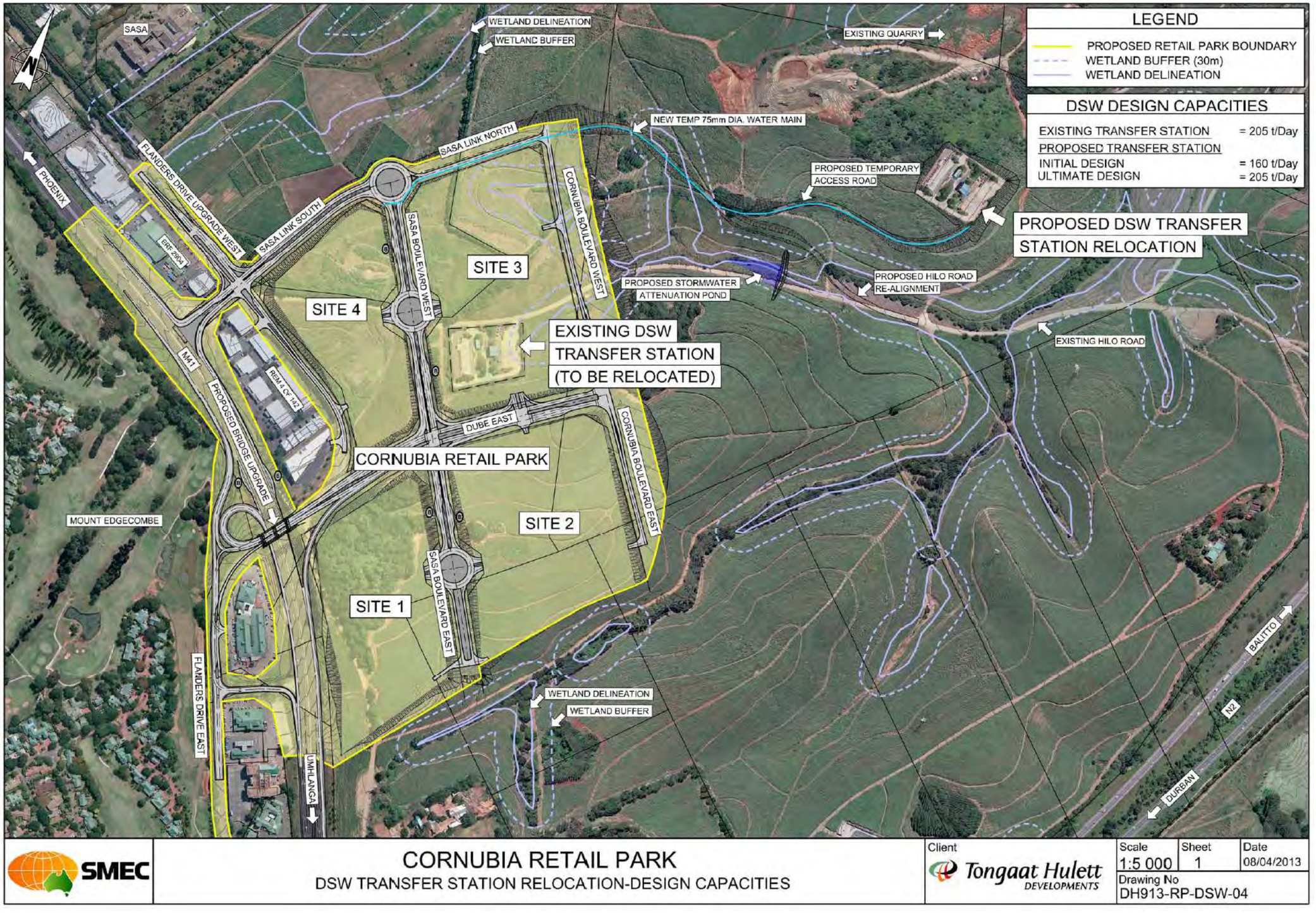


Figure 4-9: Alternative Site 2 and Access Road for the Proposed New Location of the Mount Edgecombe Refuse Transfer Station

The site is presently inaccessible to vehicles. This will require a temporary access road to be constructed for short-term access until the ultimate development of the Cornubia Phase 2 site. The access road is proposed to be 660 m in length. This will escalate costs and potential environmental impacts. Furthermore, the proposed access road will require the infilling of wetland area as it is proposed to cross over an existing wetland unit. In addition, the site also borders on dense vegetation. Wetland and vegetation assessments have been undertaken and all mitigatory and rehabilitative measures proposed by the specialists will be adhered to as outlined in the Sections to follow.

The Alternative site is proposed along Dube East, bordering a social facility Cluster (Figure 4-10). The proposed uses around this Station is Medium Density Residential - GAP/Social Housing indicated as a yellow hatch and in the orange hatch is High Density Residential – GAP/Social housing. Whilst the location is seemingly a good location, it straddles the Flanders Quarry boundary extent, in particular what is classified as an undevelopable area as any development within the "undevelopable" area will be subject to very high bulk earthwork costs. This will require removal of dumped elements such as old piles, large tree trunks and chunks of concrete to an unknown depth, followed by filling of suitable material to the required platform level. Essentially, it is possible to develop within this area however there are cost implications and further studies may be required. Due to the high earthwork costs, the engineers have earmarked the Flanders Quarry as an undevelopable area.

The planned residential area located in proximity to this Station is not desirable due to the limited noise pollution associated with such Stations. Visually, mitigation measures such as tree planting/screening of the Station from the residential area can be employed. Also as indicated in Figure 4-10, the residential backyards of sites can front the boundaries of the Station and thereby visually, it would not pose a problem as the units will face the roads.

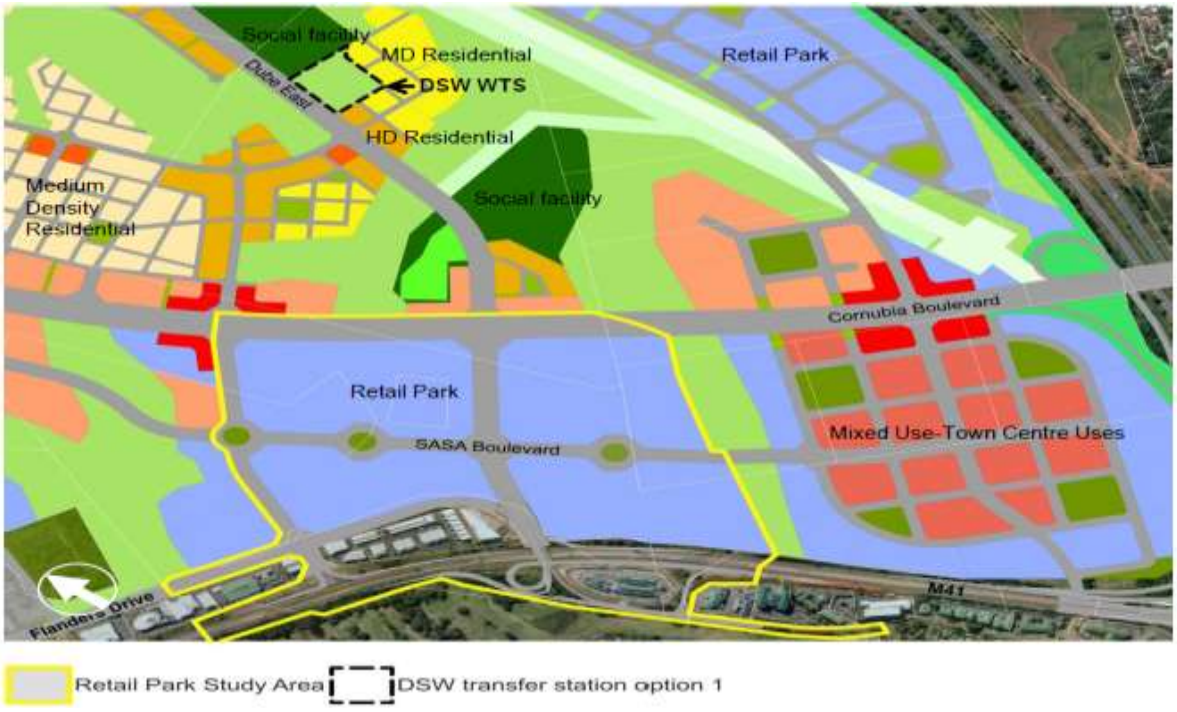


Figure 4-10: Alternative Site 2 of the New Mount Edgecombe Refuse Transfer Station in Comparison to Adjacent Future Land Uses

4.2 Land Use Alternatives

From a land use perspective, given that there is an adopted Development Framework in place, there is no need to consider alternative land uses unless there are extenuating or mitigatory circumstances which there are not. It is therefore necessary to ensure that the land use proposed is aligned with the Framework plan, which it is.

Specific layout alternatives pertaining to road alignment and services layouts are presented based on the site alternatives in Sections 2 and 4.1 above.

4.3 Operational Alternatives

THD are committed to ensuring that the development is sustainable and adheres to stringent environmental management procedures. With this is mind, operational methods and approaches must adhere to best-practise alternatives, which this EIA process seeks to achieve. The EIA phase seeks to establish best-practise approaches for the following:

- Water management;
- Land management;
- Waste management;
- Energy management;
- Biodiversity;
- Air quality management;
- Rehabilitation and closure.

These aspects are detailed in the EMPr, where applicable.

4.4 No-go Alternative

This option involves retaining the existing land use, i.e. agriculture. The property would remain under cane cultivation, and would continue to operate as a working sugarcane farm. The current waste transfer facility will continue operation as well. The location and situation of Cornubia also dictates that it be appropriately and sustainably developed to uses and activities which offer the best value, returns and benefits to the city.

In addition, the no-go alternative for the relocation of the Mount Edgecombe Refuse Transfer Station has also been considered (i.e. the existing Station will continue operations at its current location). This will limit the development potential of the Cornubia Retail Park. Further to this, the option of decommissioning the existing Station and not constructing the new Station is not feasible or practical due to the important function that the Station provides.

Refuse transfer stations play an important role in a community's total waste management system, serving as the link between a communities solid waste collection programme and a final waste disposal facility. While facility ownership, sizes, and services offered vary significantly among transfer stations, they all serve the same basic purpose — consolidating waste from multiple collection vehicles into larger, high-volume transfer vehicles for more economical shipment to distant disposal sites. In its simplest form, a transfer station is a

facility with a designated receiving area where waste collection vehicles discharge their loads.

The waste is compacted, then loaded into larger vehicles (usually transfer trailers, but intermodal containers, railcars, and barges are also used) for long-haul shipment to a final disposal site - typically a landfill, waste-to-energy plant, or a composting facility. No long-term storage of waste or treatment of waste occurs at a transfer station; waste is quickly consolidated and loaded into a larger vehicle and moved off site, usually in a matter of hours.

Only a facility that receives some portion of its waste directly from collection vehicles, then consolidates and reloads the waste onto larger vehicles for delivery to a final disposal facility, is considered a transfer station. Therefore, it can be seen that there is a distinction between a transfer station and a landfill site or waste treatment facility.

The nationwide trend in solid waste disposal has been toward construction of larger, more remote, regional landfills. Economic considerations, heavily influenced by regulatory and social forces, are compelling factors leading to this result. The primary reason for using a transfer station is to reduce the cost of transporting waste to disposal facilities. Consolidating smaller loads from collection vehicles into larger transfer vehicles reduces hauling costs by enabling collection crews to spend less time travelling to and from distant disposal sites and more time collecting waste. This also reduces fuel consumption and collection vehicle maintenance costs, plus produces less overall traffic, air emissions, and road wear. In addition, a transfer station also provides:

- An opportunity to screen waste prior to disposal.
- Flexibility in selecting waste disposal options.
- An opportunity to serve as a convenience centre for public use.

4.5 Comparative Assessment of Alternatives

An assessment of the environments likely to be affected by the identified alternatives is included in the table below. This is a comparative assessment and includes the "no-go" option.

Table 4-2: Comparative assessment of alternatives

ALTERNATIVE	ASSESSMENT
Site Alternatives	
Alternative Site 1 – Cornubia Retail Park	• Includes SASA owned land. • Retail Park aligned with Cornubia Framework Plan. • Refer to Table 10.2.
Alternative Site 2 – Cornubia Retail Park	• Excludes SASA owned land. • Retail Park aligned with Cornubia Framework Plan. • Refer to Table 10.2.
Alternative Site 1 – Mount Edgecombe Refuse Transfer Station	• Proposes the Mount Edgecombe Refuse Transfer Station is relocated to the east directly adjacent to the Retail Park. • Access to the new Mount Edgecombe Refuse Transfer Station from Dube East; new temporary road required to retain access to existing district road to Blackburn settlement.

ALTERNATIVE	ASSESSMENT
	• Mount Edgecombe Refuse Transfer Station adjacent to future commercial land uses. • Refer to Table 10.2.
Alternative Site 2 – Mount Edgecombe Refuse Transfer Station	• Proposes the Mount Edgecombe Refuse Transfer Station is relocated further away to the north-east. • New temporary access to the new Mount Edgecombe Refuse Transfer Station is required; new temporary road required to retain access to existing district road to Blackburn settlement • Mount Edgecombe Refuse Transfer Station adjacent to future residential land uses. • Refer to Table 10.2.
Land Use Alternatives	
No land use alternatives	• From a land use perspective, given that there is an adopted Development Framework in place and that the proposed land use conforms with the Framework, there is no need to consider alternative land uses unless there are extenuating or mitigatory circumstances which there are not. It is therefore necessary to ensure that the land use proposed is aligned with the Framework plan. • Specific layouts (eg. road and services) relating to the alternate site layouts are presented.
Operational Alternatives	
The EMPr details operational best practise approaches adopted.	
No-Go Option	
This option involves retaining the existing land use – agriculture. The property would remain under cane, and would continue to operate as a working sugarcane farm. The current waste transfer facility will continue operation as well. The location and situation of Cornubia also dictates that it be appropriately and sustainably developed to uses and activities which offer the best value, returns and benefits to the city.	

5 BASELINE DESCRIPTION OF THE STUDY AREA

BIOPHYSICAL

5.1 Climate

The Cornubia area is coastal with a summer rainfall and a warm humid climate throughout the year. No frost occurs within the project area and is thus ideal for most crops including sub-tropical crops. Mean annual precipitation is 989 mm and mean annual potential evaporation is 1659 mm.

Table 5-1: Climate data from SASA Experiment Station, Mount Edgecombe

	TMX	TMN	DBA	WBA	RHA	DBP	WBP	RHP	SUN	RAIN	EVP	WND
	ºC	ºC	ºC	ºC	%	ºC	ºC	%	h	mm	mm/d	km/d
Jan	27.3	19.7	23.8	21.0	77.3	26.2	22.2	69.9	6.0	126.7	5.6	163.9
Feb	27.5	19.9	23.7	21.2	79.5	26.6	22.6	69.9	6.4	122.0	5.4	152
Mar	27.0	19.3	22.7	20.5	80.9	26.0	22.0	69.4	6.6	105.1	4.6	136.9
Apr	25.6	16.7	20.3	18.2	80.8	24.6	20.3	66.2	7.0	67.1	3.7	114.7
May	24.2	13.7	17.3	14.9	75.9	23.2	18.2	60.6	7.3	50.7	2.9	94.9
Jun	22.7	11.4	14.4	11.6	69.8	21.7	16.0	53.6	7.4	30.9	2.5	90.7
Jul	22.4	11.1	14.2	11.4	70.6	21.4	15.7	53.8	7.5	31.5	2.7	101.4
Aug	22.8	12.3	16.0	13.4	74.1	21.7	16.6	58.6	7.0	40.2	3.2	128.9
Sept	23.3	14.4	18.4	15.7	74.8	22.0	17.7	64.4	6.0	65.8	3.8	156.7
Oct	24.1	16.2	20.2	17.3	74.1	22.6	18.6	67.7	5.6	93.5	4.4	178.0
Nov	25.2	17.7	21.9	18.8	74.0	23.7	19.9	69.8	5.6	107.6	4.9	177.6
Dec	26.6	19.1	23.3	20.3	75.1	25.2	21.3	70.0	5.9	115.0	5.5	170.3
Mean	**24.9**	**16.0**	**19.7**	**17.0**	**75.6**	**23.7**	**19.3**	**64.5**	**6.5**	**79.7**	**4.1**	**138.8**

Legend:

TMX	Maximum temp	**WBP**	Wet bulk 14:00
TMN	Minimum temp	**RHP**	Relative humidity 14:00
DBA	Dry bulb 8:00	**SUN**	Sunshine hours
WBA	Wet bulk 8:00	**RAIN**	Rainfall
RHA	Relative humidity 8:00	**EVAP**	A-pan evaporation
DBP	Dry bulk 14:00	**WND**	Wind run

5.2 Geology and Soils[10]

The entire area is underlain by the sedimentary bedrock of the Ordovician Vryheid Formation with two intrusions of the Jurassic intrusive dolerite bedrock of the Karoo Supergroup. One major intrusion has been identified in the north eastern corner of the area and a minor intrusion in the central western part of the area. It must be noted that further dolerite may appear underneath the exposed Vryheid sandstones as well as sandstone bedrock which may appear underneath the exposed dolerite.

5.2.1 Top Soils and Colluviam

The slopes are in general covered by brown, colluvial sandy clays and clayey sands, extending to depths of up to 1.30 m below present ground level.

[10] *The following information has been extracted from the Preliminary Geotechnical Assessment undertaken for the entire Cornubia Retail Park Development undertaken by Drennan, Maud and Partners and can be found in Appendix C2.*

5.2.2 Dolerite

The dolerite intrusions appear in the entire scale of reddish colours from violet over red to orange. The dolerite is locally high to completely weathered and covered by residual clays or clayey sandy soils of depths varying from less than 1.0 m to in excess of the 5.00 m reach of the track mounted 20 t excavator depending on the mineral composition of the intrusive rock and the exposure to the weathering processes.

5.2.3 Vryheid Formation

The micaceous sandstones and sandy siltstones of the Vryheid Formation are in general grey, laminated to thinly interbedded and very close to medium wide fractured by multiple joint sets. The weathered sandstone bedrock alternates locally with sandy siltstones and silty fine grained sandstones, which appears and will behave more like a classic shale bedrock than a classic sandstone. The general dip direction is south to south west at a low dip angle of 5-10 degrees.

The soils derived from the weathered Vryheid Formation generally comprise of yellow brown, grey and orange, sandy silty clays and extend in areas, to depths below the 5.0 m reach. Ferricrete does occur locally within the residual sedimentary clays of the Vryheid Formation.

5.2.4 Slope Stability

The bedrock Vryheid Formation underlying the area is laminated to thinly bedded and in general closely joined and inherently unstable if cut where the bedding dips out of the slope or embankments are over steepened. Having intrusive dolerite bodies within the area, the sedimentary bedrock of the Vryheid Formation has most likely been shifted during Jurassic event. This may have resulted in locally very different structural features, which only will be discovered in the borehole cores or during the earthworks.

No present or past conditions of instability were observed, however, due to the dense cane in the area, some areas on potential instability may have been masked.

5.2.5 Retail Park Summary

The geology dataset from the eTM GIS database indicates that for the Retail Park specifically, the northern corner of the site is underlain by Vryheid Shale, the western half of the site by Vryheid sandstone, and the southern corner and central-eastern parts by Karoo dolerite. The Environmental Protection Atlas (ENPAT) indicates that the soils should comprise one of more vertic, melanic, red-structured horizons and in the northern half and red-yellow apedal, freely draining soils in the southern half. Soils sampled across the site comprised silty to clayey sand and sandy to silty clays[11].

[11] *Information obtained from the Cornubia Retail Park Wetland Assessment (2013) prepared by SiVEST and provided in Appendix C5.*

5.3 Agricultural Potential[12]

Cornubia was formerly part of Blackburn Estate, which in turn was part of the Natal Sugar Estates and has been producing sugarcane for decades.

5.3.1 Climate

The site is characterised by a coastal climate with a summer rainfall and a warm humid climate throughout the year. No frost occurs in these areas. The climate is ideal for most crops including subtropical crops. This area's Bio Resource Unit (BRU) has a climatic capability rating of C1, with little or no limitations for crop production. For the purpose of determining crop water requirements, effective rainfall is taken as 80% of the total rainfall. The rainfall distribution and the corresponding temperatures verify the area experiencing a summer rainfall and warm humid conditions through all seasons. Crop evaporation is significantly less than evaporation measured from a Class-A evaporation pan, so for planning purposes subtracting 20% will provide a practical estimate. If perennial crops are to be produced under optimum conditions then supplementary irrigation is essential. Due to the terrain and proximity to the coast these areas experience windy conditions, predominately from the NE and SE.

5.3.2 Current Situation

The land is predominantly under sugarcane production. Most production is under dryland (rainfed) conditions. Three sugarcane varieties are being cultivated namely, 376, N27 and N12. There exists very good infrastructure with respect to buildings, roads, equipment and staff. All equipment appeared in a good well maintained condition, which is indicative of good motivated management.

5.4 Topography and Land Use[13]

Apart from the prominent features mentioned below, the entire site is currently under sugarcane cultivation. The topography and land use is detailed per site platform.

- Site 1: The prominent feature is a hillock at an elevation of 127 m surrounded by 3 hectares of densely vegetated trees and bush (refer to Section 5.5). The proposed average platform level for the site is 118 m.
- Site 2: The site is dominated by a hillock at an elevation of 131 m with the lowest elevation of 97 m in the north west corner. The proposed average platform level for the site is 109 m.

[12] *Information extracted from the Agricultural Potential Study of Cornubia undertaken by Mottram and Associates cc. and provided in Appendix C1.*

[13] *Information extracted from the Cornubia Retail Park Engineering Services Report prepared by SMEC South Africa and can be found in Appendix C9..*

- Site 3: As previously mentioned, the existing Mount Edgecombe Refuse Transfer Station is located on this site. The highest elevation on the site is at 113 m while the lowest level is at 89 m. The proposed average platform level for the site is 105 m.

- Site 4: Generally the flattest of the four sites with a maximum elevation of 109 m and a minimum elevation of 94 m. The proposed average platform level for the site is 105 m.

5.5 Vegetation and Fauna[14]

The vegetation has been assessed as part of the overall Cornubia Development Framework plan and the significant components have been included into the core open space system. The existing vegetation on the Retail Park is not part of the core open space system.

The majority of the proposed site for the Cornubia Retail Park development (Figure 5-1) has been significantly transformed. It appears as if historically there was some limited indigenous woody vegetation that occurred within the boundary of the woody area. The area in question is the easterly most finger of woody vegetation, which runs parallel to the road that services the Mount Edgecombe Stables. The remainder of the area appears to have been an old Homestead (rubble and building platforms located within the woody area). The vegetation occurring within this woody area is dominated by species of tree which are traditionally associated with the original homesteads developed on sugarcane estates *i.e.* ornamental alien species.

The vegetation recorded and the nature of the alien species identified adds further weight to the assumption that this area was originally a homestead. The following species were commonly encountered within this area; *Phytolacca dioica* (Pokeberry Tree), *Bougainvillea sp. Macfadyena unguis-cati* (Cat's Claw Creeper), *Plumeria sp*. (Frangipani) and *Jacaranda mimosifolia* (Jacaranda). The other alien species which were extremely prevalent were: *Chromolaena odorata* (Triffid Weed), *Senna sp. Lantana camara* (Lantanas), *Rubus cuneifolius* (Sand Blackberry), *Rivina humilis* (Coral Berry), *Litsea glutinosa* (Indian Laurel) and *Ipomoea purpurea* (Common Morning Glory).

In terms of indigenous plant species occurring within this area, most of the species have established themselves as a result of their fruit being extremely attractive to monkeys, bird and bat species. The most commonly occurring species were*; Ficus burkei, Ficus natalensis*, *Sideroxylon inerme*, *Maytenus undata*, *Gymnosporia grandifolia, Turraea floribunda, Clausena anisata, Schotia brachypetala, Ekebergia capensis, Dovyalis rhamnoides* and *Capparis fascicularis var. zeyheri. Sideroxylon inerme* is a Nationally Protected tree species according to the National Forests Act (Act No. 84 of 1998).

A number of the indigenous trees identified are large specimens, which provide an ecological resource base, particularly for the provision of fruit, roosting and nesting opportunities.

[14] *Information extracted from the Cornubia Retail Park and M41 Interchange Vegetation Assessment by SiVEST (refer to Appendix C4).*

In addition to tree species having arrived via seed dispersal there are several large *Ficus burkei* individuals which have been planted along existing roadways. Based on their size it is evident that these trees were planted a long time ago.

It must be noted that given their position within the landscape they have been impacted upon by various disturbances. The three most significant being: the exposure of these trees to regular sugarcane fires, which have damaged the trunks of these trees quite significantly; the stripping of bark for medicinal use; and the continual movement of vehicles past these trees which have had branches removed or damaged.

The area for the sites identified for the relocation of the Mount Edgecombe Refuse Transfer Station is of limited biodiversity and conservation value. The majority of the areas are not under sugarcane cultivation and are dominated by alien invasive species with only very few indigenous species. The majority of which are considered to be opportunistic species and not later successional species, which would constitute biological integrity and provide evidence for these areas having been historically forest. In essence the areas are a direct result of the agricultural practices occurring around them. A complete list of species identified in the areas is provided in the Vegetation Assessment included in Appendix C4.

Figure 5-1: Trees within the Cornubia Retail Park

In addition to the vegetation identified, the following faunal species can be found within the Marshall Dam area near the site and the main artificial drainage channel of the area:

- Painted Reed Frog (*Hyperolius marmoratus marmoratus*);
- Bronze Caco (*Cacosternum nanum*);
- African Darter (*Anhinga rufa*); and
- Weaver Species.

5.6 Water Resources[15]

5.6.1 Regional

The Cornubia Projects fall within the Mvoti to Mzimkulu Water Management Area and specifically within the Mgeni Key area and Mdloti and Tongati Key area. The responsible water authority for the catchment and sub-catchment of the project area is the DWA, KZN Region.

5.6.2 Local and Surface Water

The site is primarily planted with sugarcane, with the exception of the most prevalent drainage lines and areas of permanent wetland, or where soil or topography is unsuitable for sugarcane production. There are no rivers or streams which flow within the Retail Park site itself.

The proposed retail development is located within the western edge of Quaternary Catchment U30B and within the upper reaches of a right-bank tributary of the Ohlanga River referred to as catchment A in the original wetland study.

5.6.3 Drainage Lines

The project site comprises two south-west to north-east trending, moderately sloping ridgelines and associated hilltops located within the northern and southern sections of the site. The ridgelines are separated by a drainage divide (watershed) running perpendicular to the ridgelines.

East of the drainage divide is a moderately broad, moderately sloping valley that is characterised by a number of broad valley head landforms that intersect the ridgelines. The main part of the valley is characterised by a broad, gently sloping valley bottom area. West of the drainage divide is the remnants of a broad, gently sloping valley head landform. This valley was in-filled for the development for the Mount Edgecombe commercial node located between Flanders Drive and the M41. The north-eastern boundary of the site is bordered by a steep sided, relatively narrow valley. The two south-west - north-east draining valley systems form part of the upper reaches of a larger system that is a right-bank tributary of the Ohlanga River.

[15] *The information provided in this section has been obtained from the Cornubia Retail Park Wetland Assessment (2013) prepared by SiVEST and provided in Appendix C5.*

No true streams are located within the project site and under natural conditions it is speculated that, historically, wetland ecosystems were prominent within the valley bottom and valley head areas. These wetlands have since been cleared for sugarcane cultivation. Additionally, artificial drainage channels have been created which efficiently remove water from these valley bottom areas. The valley along the north-eastern boundary of the project site likely comprised a mix of wetland and streams.

At present, the drainage within the project site and surrounds has been severely modified. This modification stems from the diversion and canalisation of flow into central channels through the formation of artificial drainage channels, gully formation or channel incision.

5.6.4 Wetlands

All of the wetlands within the entire Cornubia development have been assessed and the important components included in the core open space system of the Development Framework plan. The wetlands on the Retail Park are not part of the core open space system.

There are eight wetland units present on the Retail Park site with a further two wetland units located along the south-eastern boundary of the project site. The locations of the ten wetland units within and in the vicinity of the project site are presented in Figure 5-2. A list of the wetland units and their hydro-geomorphic type are provided in Table 5-2.

Table 5-2: List of the wetland units in the vicinity of the project site and their hydrogeomorphic designation

WETLAND HGM UNIT	HYDRO-GEOMORPHIC TYPE (UNDER NATURAL CONDITIONS)
A6	Channelled valley bottom wetland
A6b	Channelled valley bottom wetland
A6c	Valley head seep and un-channelled valley bottom wetland
A7	Un-channelled valley bottom wetland
A7a	Valley head seep
A7b	Valley head seep
A10, A11	Channelled valley bottom wetland
A11a	Valley head seep
B1	Valley head seep

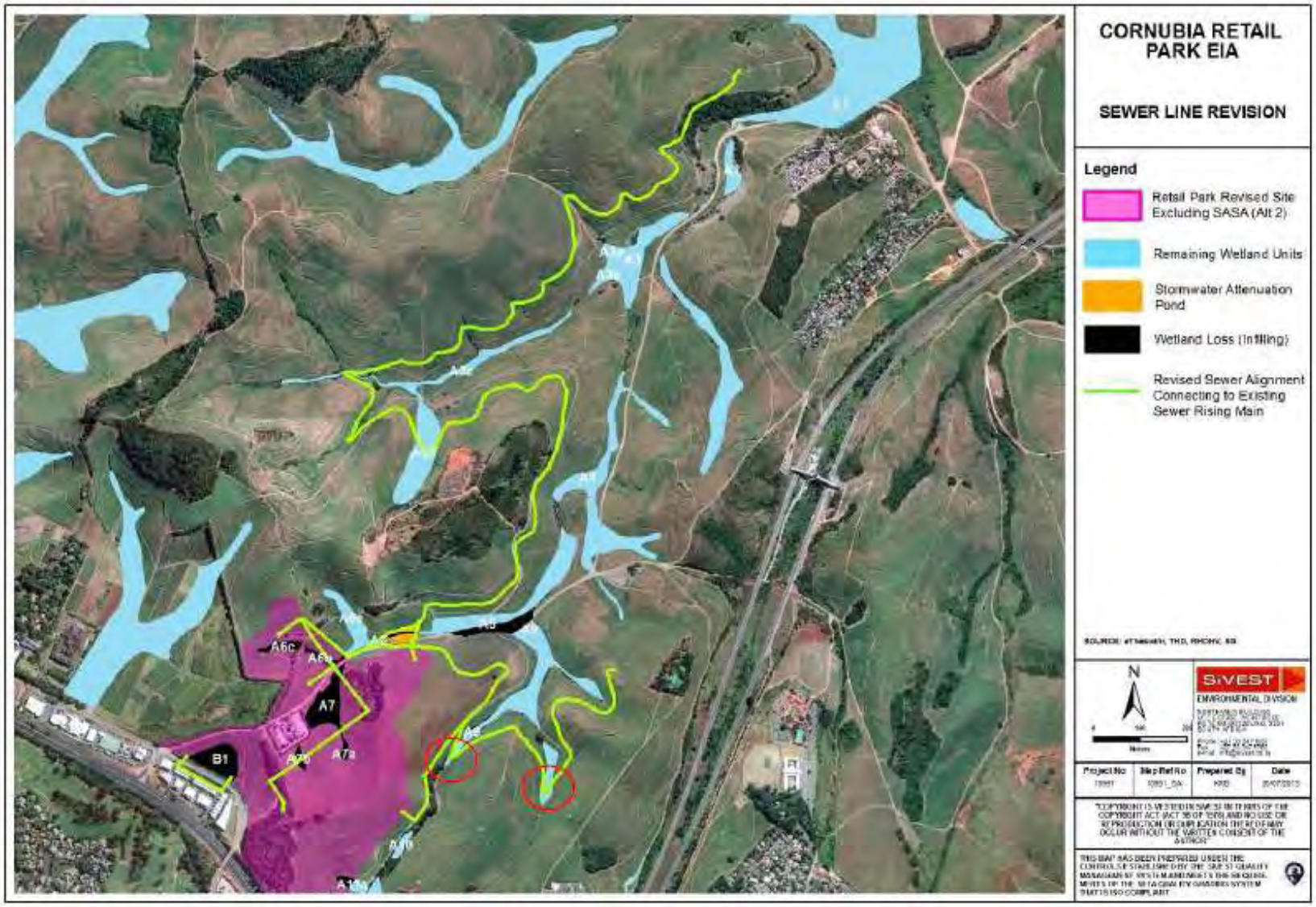


Figure 5-2: Wetland Units within the Study Site

SOCIAL

5.7 Visual Considerations

The site is located within an agricultural landscape, with some retail land uses occurring along the Flanders Drive access to the site. The visual changes that will occur with the development of the site for retail purposes are envisaged to be in accordance with the current land use of that region and should not stand out or be of any concern.

5.8 Noise Considerations

Cognisance of noise contours has been taken in the development of the Cornubia Framework Plan for which the Retail Park falls within. Whilst it is not envisaged that there will be significant increases in noise during the operational phase of the proposed development, increases in noise levels during the construction phase have been considered and assessed.

5.9 Heritage Considerations

There are no sites of cultural heritage significance identified with the Cornubia Retail Park site.

5.10 Socio-Economic Profile of the Receiving Environment

The receiving area includes areas surrounding the Cornubia Retail Park site which is predominantly the Mount Edgecombe region situated North of Durban in Umhlanga. The 2001 Census indicates that the population of Umhlanga at the time was 15 387 people with the majority (74.9%) of these being white in ethnicity.

In close proximity to the site is an existing equestrian facility. Whilst the facility is not a permanent feature the applicant is agreeable to it continuing to operate for as long as possible. The issue of access during and after construction will need to be considered and dealt with.

The proximity to the areas of Phoenix, Ottawa and Waterloo also needs to be noted and the extensive needs within these areas. New development in the area that offers opportunities to alleviating some of these challenges needs to be facilitated and supported.

Equally there are a number of existing businesses in close proximity to the site and which may be impacted upon by the necessary road upgrades. Issues around access to these businesses have been considered.

6 SPECIALIST REPORTS

The findings and recommendations of the specialists and reports of specialised processes have been incorporated in this chapter. The following studies have been undertaken as part of this EIA process:

- Agricultural Potential Study (Appendix C1)
- Geotechnical Assessment (Appendix C2)
- Heritage Assessment (Appendix C3)
- Vegetation Assessment (Appendix C4)
- Wetland Assessment (Appendix C5)
- Traffic Impact Assessment (Appendix C6)
- Stormwater Management (Appendix C7)

6.1 Agricultural Potential Study

The Cornubia site and its soils do offer high value agricultural potential but the context and location of the development within the broader region necessitates the transformation of the land use for the greater societal good. Tongaat Hulett, who currently farm this land, have been proactive with regard to the 'replacement' of agricultural land that has been lost (which loss will be gradual over a number of years) in more, long term appropriate locations such as within the Ilembe District Municipality.

From an interest perspective, or potentially small-scale intensive perspective, given the appropriate circumstances and opportunities, there may be the following crop opportunities:

- Sugarcane;
- Bananas;
- Macadamia nuts;
- Grasses for instant lawn, including pastures;
- Vegetable crops;
- Commercial timber;
- Medicinal plants and trees; and
- Cut flowers and potted plants, including indigenous trees.

The advantages and disadvantages of these crops are explained in more detail in Section 8 of the specialist report.

After considering all the cropping and land use options, the development of this area into medium density residential and light industrial areas could:

- Significantly improve the socio-economic situation of the local communities nearby, and in time that of the other communities;
- Create sustainable employment to a larger group of people; and
- Indirectly improve trade in nearby shopping areas.

In the scenario of proposed, and apparently accepted, development of the northern corridor, it could be more important to create such an infrastructure that runs parallel to the low density high income residential areas on the east side of the N2 highway than continue with only sugarcane production. This would improve the socio-economic situation of the local and nearby communities. The flora of the natural bush areas would be protected but the fauna will be negatively affected.

The impact of such a development on the immediate surrounding township areas and agricultural estates would be beneficial in that:

- The value of the surrounding estates could rise, depending upon their individual potentials with respect to agriculture;
- Wages and salaries should not be negatively affected, but rather stabilised;
- Indirectly the market for their current produce, other than sugarcane, will expand, especially perishable crops; and
- Families of their current labour forces could be gainfully employed at the development, thus improving their standard of living and education.

From purely a sugar production perspective, as noted above, there will be no nett loss suffered by the Maidstone Sugar Mill or Tongaat Hulett and in fact, with initiatives such as the Operation Vuselela which is a partnership between Tongaat Hulett and the Department of Economic Development that will lead to the planting of over 3 300 hectares of fallow land with sugarcane. Already in 2010, Tongaat Hulett rehabilitated nearly 6 000 hectares of land for sugarcane production and is targeting substantial additional area over the next few years. It is noted that in the 2012/13 season over 11 500 hectares of new cane has been planted.

6.2 Geotechnical Assessment

The development proposes platforms created by cutting the hill tops and spurs and creating fill embankments on the lower slopes for development. The geotechnical assessment indicates that the proposal is feasible; however there are a few challenges/ constraints which need to be taken into consideration.

6.2.1 Development Constraints

6.2.1.1 Slope Stability

The bedrock Vryheid Formation underlying the area is laminated to thinly bedded and in general closely jointed and inherently unstable if cut where the bedding dips out of the slope or embankments are over steepened. Having intrusive dolerite bodies within the area, the sedimentary bedrock of the Vryheid Formation has most likely been shifted during the Jurassic event. This may have resulted in locally very different structural features, which will only be discovered in the borehole cores or during earthworks.

No present or past conditions of instability were observed, however, due to the dense cane in the area, some areas on potential instability may have been masked.

6.2.1.2 Wetland and Conservation

None of the valley lines show any features of wetlands, nor do any of the valley lines within the area play any significant role for the surrounding flood management.

6.2.1.3 Subsoil Seepage

Subsoil seepage was only observed in TP 14 within the south western valley line. However, during periods of high rainfall, seepage may occur at the contact of the upper colluvial soils and underlying residual clay soils or weathered bedrock. In addition, some seepage may occur at dolerite contact with the Vryheid Formation bedrock across the area.

6.2.1.4 Excavatability

The three seismic traverses shot with a 12-channel signal enhanced refraction seismograph across the proposed cut areas of the two eastern proposed platforms indicate that both the weathered dolerite and the weathered sandstone have low velocities less than 700 m/s to a depth of between 12.0 m and 14.0 m. Thus, they classify as Class I materials, which are considered to be very easy trenchable and are considered rippable using a D7G ripper type.

6.2.1.5 Founding Conditions

The creation of major cut and fill platforms are proposed, by removing the main hill tops and ridges and creating fill embankments on the lower slopes. The founding conditions will individually depend on the materials cut into and the nature of the fill embankments created. Founding conditions on cut platforms taken into bedrock are expected to be good in general, whereas the founding conditions on the proposed fill platforms will have to be assessed individually depending on the proposed structures.

6.2.2 Development Recommendations

6.2.2.1 Cuts

The cutting of all hill tops and spurs to one level for each platform does not require any cut embankments. However, should any cut slopes be created due to a change in the planning, these should in general be restricted to a slope angle of 1:2 (26^{o}). Stepper slopes between 1:1 and 1:1.5, may be created individually, at the discretion of the Engineer. The maximum height of any cut slope should not exceed about 3m without being assessed by the Engineer.

It is essential to understand, that the close joint sets and bedding in the Vryheid Formation bedrock may cause instability, where slopes are cut where bedding or joint plans dip out of the slope. These slopes should be assessed individually during the earthworks.

6.2.2.2 Fills

It is proposed to create fill embankments on lower slopes and on the valley lines.

Prior to the placement of any fill, the in-situ subsoil material containing vegetation should be removed. The fills should then be constructed in layers a maximum of 300 mm loose thickness and be compacted to 93% of the materials Max Mod AASHTO Density for clayey materials and 95% of the materials Max Mod AASHTO for sandy materials, prior to the placement of the next layer. The maximum slope angle of any fill should be restricted to 1:1.5 (33^{o}).

It is recommended to use less suitable materials, such as colluviums or materials with high clay contents at the foot of the hills. Alternatively, the fill platforms may be constructed of alternating layers of less suitable materials and more suitable materials, such as bedrock materials (i.e. sandwhich compaction) to minimise settlement and also improve the stability of the fill. Where fill bodies exceed 2 m of total height, it is recommended to cap the fill platforms with 1 m to 2 m of competent fill materials to improve the founding conditions for lightly loaded flexible structures in general.

Where the natural ground slope exceeds a slope angle of 1:6 (10^{o}), the fills should be constructed on surface benched into a suitable in-situ material.

6.2.3 Founding

6.2.3.1 Shallow Founding

Where cut platforms are engineered into competent in-sity materials, shallow strip footing or column base foundations are most likely to be suitable depending on the individual structure.

The maximum allowable bearing pressure of foundations, taken through the residual clayey soils into the weathered bedrock, requiring hard hand picking for excavation, should be restricted to 150 kPa.

Foundations taken into the proposed engineered fill embankment should in general be avoided. However, for lightly loaded flexible structures shallow founding within fill embankments may be suitable after the main settlements of the proposed engineered fills have taken place, depending on the individual structure.

As an alternative founding measure, particularly where the proposed fill embankments are very thick or where structures span the prick of cut and fill on building platforms, suitably deigned reinforced concrete raft foundations are considered as alternative option depending on the individual structure. On cut fill platforms, the raft foundations should be supported on the fill side of the building platform by short auger piles or pad, not necessarily taken down through the fill into competent founding material such as weathered bedrock, but to a predetermined level depending on the structures tolerance to differential movement.

6.2.3.2 Deep Founding

Where rigid structures are proposed and the depth to suitable founding exceeds the practical and economic depth for normal strip footings, as may occur on the fill portion of the building platforms, or, where deep clayey colluvial and residual soils occur, deep founding is required. In this regard, the structures should be supported on ground beams spanning between piled foundations, or deep column base foundations, taken into the weathered bedrock below the residual and alluvial clayey sands, and fill material.

Due to the possibility of high expansive active clayey soils occurring on the Blackburn estate in general, these materials should not be used as fill beneath the surface bed. Imported hard core or suitable in-situ weathered bedrock material is preferred for this purpose.

The floor slabs for the structures should be isolated from all walls, ground beams, columns and foundations to allow for any differential movements as may occur where expansive soils may underlie the site. Similarly, all structures should incorporate regularly placed expansion joints.

6.2.4 Drainage and Erosion Control

6.2.4.1 General

Although not generally prone to erosion, the soils and weathered bedrock in the area can nevertheless be gully or donga eroded by concentrated uncontrolled water flow. It will therefore be necessary to provide adequate stormwater surface drainage as part of the infrastructural development of the area.

Due to the clayey nature of the subsoils on the site, stormwater disposal by means of soak pits is not considered feasible. Stormwater from all roof and paved areas should be piped or collected in surface drains to discharge into a suitably designed stormwater retention system where no efficient stormwater system exists.

6.2.4.2 Subsoil Drainage

Sufficient subsoil drainage may be required locally under the proposed fill embankments to allow excess water within the in-situ soils to be disposed down slope during the consolidation period as well as prevent additional water to accumulate under the fill bodies.

6.2.5 Sanitation

The subsoil conditions prevailing in the area are such that disposal of waste water effluent by means of subsoil percolation through soak pits, septic tanks and or French drain trenches cannot be satisfactorily practised therein.

Regional waterborne sewerage should be installed throughout the area as part of the development, also to prevent any negative environmental impacts on the surroundings.

6.3 Heritage Assessment

Four heritage resources occur within the overall Cornubia Development area. The remains of two structures older than 60 years should be fenced to protect them from inadvertent damage; alien vegetation should be controlled chemically; and consideration given to providing on-site interpretation of the buildings' history and significance. A group of graves should be fenced to protect them from inadvertent damage and one archaeological site requires a permit from Amafa aKwaZulu-Natali for its alteration or destruction.

None of the identified heritage resources occur within the Cornubia Retail Park site.

The proposed development will transform the site from agriculture to retail. It is recommended that this project may proceed with the proposed heritage resource mitigation. If permission is granted for the development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and notify Amafa

aKwaZulu-Natali should any heritage resources, as defined in the Act, be discovered during the course of development activities.

6.4 Vegetation Assessment

Existing indigenous vegetation communities and areas of sensitivity were identified and the potential and merits for their incorporation into an Open Space System were considered as part of the Cornubia Development Framework plan.

Given the position of proposed Cornubia Retail Park site in relation to the remainder of the Cornubia site, and the lack of potential Open Space Linkages that were available for utilisation, it was proposed that this portion of the site would not add significantly to the conservation goals of the Municipality and Province and would not add significant value to the overall Open Space System proposed for the Cornubia Development. Therefore this site was identified as an area which had potential to receive development. Following the identification of this site as a site that could receive development at a preliminary level, a detailed site specific vegetation assessment was undertaken.

6.4.1 Cornubia Retail Park Site

The majority of the proposed site for development (Figure 5-1) has been significantly transformed. It appears as if historically there was some limited indigenous woody vegetation that occurred within the boundary of the woody area. The area in question is the easterly most finger of woody vegetation, which runs parallel to the road that services the Mount Edgecombe Stables. The remainder of the area appears to have been an old Homestead (rubble and building platforms located within the woody area). The vegetation occurring within this woody area is dominated by species of tree which are traditionally associated with the original homesteads developed on sugarcane estates *i.e.* ornamental alien species.

The vegetation recorded and the nature of the alien species identified adds further weight to the assumption that this area was originally a homestead. The following species were commonly encountered within this area; *Phytolacca dioica* (Pokeberry Tree), *Bougainvillea sp. Macfadyena unguis-cati* (Cat's Claw Creeper), *Plumeria sp*. (Frangipani) and *Jacaranda mimosifolia* (Jacaranda). The other alien species which were extremely prevalent were: *Chromolaena odorata* (Triffid Weed), *Senna sp. Lantana camara* (Lantanas), *Rubus cuneifolius* (Sand Blackberry), *Rivina humilis* (Coral Berry), *Litsea glutinosa* (Indian Laurel) and *Ipomoea purpurea* (Common Morning Glory).

In terms of indigenous plant species occurring within this area, most of the species have established themselves as a result of their fruit being extremely attractive to monkeys, bird and bat species. The most commonly occurring species were*; Ficus burkei, Ficus natalensis*, *Sideroxylon inerme*, *Maytenus undata*, *Gymnosporia grandifolia, Turraea floribunda, Clausena anisata, Schotia brachypetala, Ekebergia capensis, Dovyalis rhamnoides* and *Capparis fascicularis var. zeyheri. S. inerme* is a Nationally Protected tree species according to the National Forests Act (Act No. 84 of 1998).

A number of the indigenous trees identified are large specimens, which provide an ecological resource base, particularly for the provision of fruit, roosting and nesting opportunities.

In addition to tree species having arrived via seed dispersal there are several large *Ficus burkei* individuals which have been planted along existing roadways. These trees were planted along time ago based on their size.

It must be noted that given their position within the landscape they have been impacted upon by various disturbances. The three most significant being: the exposure of these trees to regular sugarcane fires, which have damaged the trunks of these trees quite significantly; the stripping of bark for medicinal use; and the continual movement of vehicles past these trees which have had branches removed or damaged.

In order for the site to be able to accept the scale of Retail Development proposed, the entire site will require levelling to form platforms. The result of this will be that all the current vegetation will require removal, with no opportunities available to avoid the loss of the individual indigenous tree species.

6.4.1.1 Motivation and Mitigation for species loss

From a floral biodiversity conservation perspective, the vegetation community which is established on the site is of low to very low value. The reasons being:

- This area cannot be classified as an indigenous forest, as the majority of the indigenous species are relatively small and shrubby in nature, with the exception of the planted indigenous individuals. The structure of the woody area is not stratified as in pristine coastal forest, with herbaceous species be almost entirely excluded by shrubby alien species;
- The under-storey for the majority of the woody area is sterile, most notably in areas dominated by *L. glutinosa*;
- Many of the individual indigenous species have fruit which is palatable to vectors such as birds and bats, and have therefore been re-introduced, through this process, however, recruitment has been low and is restricted to areas on the periphery of the alien dominated stands;
- Alien plant species dominated community structure;
- The Cornubia Retail Park site is a reservoir for the on-going supply and distribution of alien seed and propagules within the site and beyond its boundaries;
- It was noted during the field survey that White eared Barbets were foraging in the *L. glutinosa* even though the *S. inerme* was in fruit and a number of the *Ficus* sp. were presenting figs, which provides evidence that these bird species are playing an important role in the dispersal of seed into areas surrounding the current site. The dispersal of the undesirable seed is thus contributing to the degradation and lowering of biodiversity and Ecological Goods & Services (EG&S) delivery of surrounding areas through alien invasive plant encroachments;

- No ecological integrity and very limited delivery of EG&S are currently afforded by this site;
- No linkages or landscape connectivity exists with any other significant indigenous forest patches therefore the sustainability of this zone is questionable, should the rehabilitation of the said area be enforced;
- The core open space system identified in the Cornubia Development Framework plan is extensive and offers opportunities to creating significant new indigenous habitat that will add a lot more value than disturbed portions of relict vegetation;
- Indigenous trees which are persisting are being damaged by fire, bark stripping and vehicular damage;
- *L. glutinosa* releases allello-pathic chemicals into the soil which retards and prevents recruitment of indigenous (competitor) species.
- As this site is dominated by *L. glutinosa*, the ongoing management, control and the costs in man power and in terms of re-establishing the vegetation community cannot be justified when considering;
    - The development potential;
    - Potential loss of surrounding small indigenous forest fragments, resulting from *L. glutinos*a seed dispersal, and;
    - The opportunity cost should the development not occur.

6.4.1.2 Recommendations

The following recommendations are thus proposed:

- Should the proposed development be authorised, a qualified botanist must undertake a plant relocation plan for the numerous *Scadoxus puniceus* individuals still persisting in the under storey prior to construction commencing. These individuals should be uplifted and planted in the wetland and associated buffer located on the eastern boundary of the proposed Cornubia Retail Development Park. There are a number of existing *S. puniceus* individuals already growing within this area and location and therefore it is a suitable position to relocate the uplifted individuals to.
- The utilisation of similar indigenous woody vegetation grown in a nursery environment within the proposed new development footprint. This will, will replace the loss of the vegetation that was removed as a result of platform creation;
- The remaining Open Space Areas on Phase 1 of the Cornubia Development have already been subjected to a rehabilitation plan, which will be a template for further developments and a condition of the Environmental Authorisation;
- The large indigenous tree species, which given the current development plan are not be able to be incorporated into the layout should be removed, however, it is recommended that seed be collected from all of the species and utilised as a seed source for the

rehabilitation of other areas on the site, which have been identified as rehabilitation areas; and

- In terms of *S. inerme,* a permit / licence will be required from the DAFF as this species will require cutting down.

In terms of the interchange vegetation assessment that was undertaken, the study concluded that the vegetation communities assessed were of limited ecological value. Further, the area is relatively isolated from any other Open Space Areas and is dominated by alien invasive species.

6.4.2 Interchange Area

The majority of the plant species that were identified on site are alien plant species, some of which are invasive, others of which are simply introduced species which do not pose any threat in terms of invasion or encroachment.

The most common species which were identified on site were as follows: *Litsea glutinosa*, *Eucalyptus grandis, Nerium oleander* (double flowered cultivar), *Chromolaena odorata, Lantana camara, Solanum mauritianum, Montanoa hibiscifolia* and *Albizia lebbeck*.

Two distinct vegetation types were identified onsite.

- Secondary Disturbed Grassland

  The secondary grassland occurs on a small portion of the southerly study area identified on the map attached, and on the northerly portion (north of M 41) of the study site. The southerly portion of grassland is extremely moribund, with the graminoid portion of the grassland being significantly reduced as a result of the spread of *Lantana camara, Chromolaena odorata* and *Solanum mauritianum*. A further factor which is impacting on this portion of secondary grassland decreasing in size is the presence of extremely tall woody vegetation which forms a corridor between the grass dominated portion of the site and the Mount Edgecombe Golf Course fence line.

  In terms of the grassland area, it has been highly impacted upon as a result of the establishment of the road and overpass. Based on onsite observations, it is the specialists prediction that this area was seeded historically with the standard NPA Grass mix, with species such as *Digitaria eriantha, Chloris gayana* and *Cynodon dactylon* being the most common. An *Acacia sieberiana* has established itself on the bridge abutment, and it is recommended that this species is also planted, as *A. sieberiana* is not commonly occurring in such close proximity to the coast. On the northerly side of the M 41 the dominant tree species within the grasslands are *Albizia lebbeck, Spathodea campanulata* and *Leucaena leucocephala*. All of these species are alien invasive species and therefore the removal of said species will be beneficial in controlling alien invasive species in the direct vicinity.

- Woody Vegetation

  The majority of the woody vegetation on site is alien invasive vegetation, with *Litsea glutinosa* being the most common. Given the massive seed setting ability of the species, the majority of the under-storey of the woody area is dominated by this species.

  There are a limited number of indigenous woody species which have established themselves within the artificial drainage canal that was created as a result of the road construction. The following indigenous plant species were identified; *Kraussii floribunda, Dalbergia obovata, Dalbergia armata, Acokanthera oppositifolia, Dovyalis rhamnoides, Gymnosporia buxifolia, Protorhus longifolia* and *Trichilia emetica*. All of these species are not associated with well established forest, even though they may persist within Old Forest fragments. It is our opinion that these species have established themselves by chance, given that their seeds are commonly vectored into new areas by birds and bats, through the ingestion of their palatable fruit.

  In addition to the woody vegetation which separates the interchange from the Mount Edgecombe Golf Course and Residential Estate, there is a planted row of trees, which have an under-storey of established weedy species, invasive indigenous species and alien invasive species. This row of trees is a single species dominated row, with the species being *Samanea saman*. These trees have been growing for a relatively long period. This assumption is made based purely on their size. At the end of the planted row, closest to the interchange another alien species, namely *Tabebuia pallida* has also established itself and grown into a large tree.

  On the easterly side of the interchange the vegetation is dominated by *Nerium oleander*. This species is normally considered an alien invasive species. However, the individuals growing on this portion of the assessment area are double cultivar varieties and are thus not invasive as they are sterile cultivars. These species, being introduced ornamental species, play no significant role in any ecological processes and therefore the loss of these species will not be significant.

The proposal will see the change from a currently degraded road verge to an additional lane in each direction as well as some alterations to the current bridge structure in order to allow free flow of traffic and prevent congestion at this interchange. The upgrading of the interchange and additional lane are required for the Cornubia Development, and not solely for the Retail Park.

6.4.2.1 Motivation and Mitigation for loss of Species

Given the current state of the vegetation which occurs on this site, the conservation value of the site is extremely low. The following reasons are provided to substantiate this finding:

- The majority of the vegetation is a combination of alien invasive species and for the most part indigenous pioneer species;
- The grassland areas are all secondary, based on the graminoid assemblage identified;

- On the southerly side of the M 41 the secondary grassland area is being encroached upon by woody alien invasive species, namely, *L. camara, L. glutinosa, S. mauritianum, P. guajava* and *M. azedarach*;

- Woody vegetation predominantly comprising, *L. leucocephala* and to a lesser extent *A. lebbeck* is encroaching into the open secondary grassland areas to the north of the M 41.

- The woody vegetation flanking the bridge area and extending along Flanders Road on the east and along the M 41 on the west is almost completely alien species dominated, with very few vestigial indigenous species.

6.4.2.2 Recommendations

The following recommendations are proposed:

- The individual *S. puniceus* which is protected under provincial legislation should be uplifted and replanted in an area where development will not take place. The area that would be suitable to receive this individual is the drainage line and associated buffer located to the east and adjacent the Cornubia Retail Park site;

- If possible, and if necessary, in order to alleviate any issues of traffic interfering with the Golf Course, the specialist recommends that sufficient space exists, that a barrier / screen of indigenous tree species is planted in order to separate the two land uses, and;

- This barrier may act as a movement zone for faunal species, but given the available area it is unlikely that this will have any significant ecological benefits.

6.4.3 Area for the Relocation of the Mount Edgecombe Refuse Transfer Station

Having assessed the entire area, it was found that the vegetation is of limited biodiversity and conservation value. The majority of the areas, not under sugarcane cultivation, are dominated by alien invasive species with only very few indigenous species. The majority of which are considered to be opportunistic species and not later successional species, which would constitute biological integrity and provide evidence for these areas having been historically forest. In essence the area is a direct result of the agricultural practices occurring around it.

6.4.4 Trunk Sewer Line

The specialist has found that the proposed alignment of the Trunk Sewer through the forest patch is a satisfactory alignment if the recommendations are able to be met and complied with as the disturbance has already been imparted to this area and the excavation and pipe placement should not be a significant issue if undertaken correctly and under the guidance of a qualified ecologist / botanist.

6.4.5 Specialist Summation

It is the therefore the specialists' conclusion that the current areas identified to receive the Mount Edgecombe Refuse Transfer Station development (excluding the proposed Open

Space Areas will not have a significant negative impact, as the current vegetation is not contributing at any level to biodiversity and / or conservation goals of the province. The development of this area will result in the removal of large source populations of alien vegetation which is deemed to be a significant positive impact. The resultant rehabilitation of the Open Space Areas will contribute significantly higher levels of Goods and Services delivered to the Ohlanga River, also deemed to be a significant positive benefit. Should the proposed Open Space Network be rehabilitated to the levels that are being mooted, the goods and services that the Open Space System will deliver will far outweigh the current levels.

The specialist further concludes that for both the proposed Retail Park site and the proposed M 41 Interchange upgrade, there is currently no significant vegetation or ecological impediments that should prevent the proposed developments from being given Environmental Authorisation. Notwithstanding these conclusions, a licence from DAFF will be required for the removal of the *S. inerme* and a permit will be required from Ezemvelo KZN Wildlife for the relocation of the *S. puniceus* individuals occurring within the two sites, and the collection of the *S. inerme* seed from the Retail Park site, propagation and replanting of these individuals within the drainage line and associated buffer to the east of the site.

6.5 Wetland Assessment

As noted in Section 5.6.4 above, the wetlands within the entirety of Cornubia have been assessed and considered as part of the Cornubia Development Framework plan which resulted in an extensive open space system being provided for that would include the rehabilitation of the currently degraded wetlands. The Retail Park wetlands, given their current state, the fact that the future major arterial Cornubia Boulevard will be constructed along the northern border of the site resulting in the site being isolated from the rest of the development and the fact that the nature and type of the development identified in the Framework plan for this site requires the creation of extensive platforms, are not part of the Cornubia open space system. Notwithstanding that however, it is necessary to assess the direct impact of the loss of wetland area for both the Retail Park and the engineering services including, but not limited to, the sewer line and access roads for the Mount Edgecombe Refuse Transfer Station.

It is also noted that an EIA is currently underway for the remainder of Cornubia where the open space system will be confirmed and finalised and where any requirements arising out of the Retail Park wetland impacts will be dealt with.

The specialist concludes that the proposed development, as per the preferred layout, will result in the loss of 3.75 ha of wetland area and the destruction of existing marginal frog populations and bird habitat. The wetland units to be directly impacted by the proposed development either in the form of infilling, sewer line crossings or the access roads for the Mount Edgecombe Refuse Transfer Station, were all assessed to be in a moderately-poor state and of moderately-low importance from an ecosystem services delivery perspective.

Nevertheless, when infilling is proposed, it is also important to determine the importance of the wetland units under a rehabilitated scenario as the infilling of a wetland represents a loss of the opportunity to regain ecosystem functionality and the associated ecosystem

functions that may be valuable to society. In this case, the wetland units to be lost under the hypothetical rehabilitation scenario were still only assessed as being of moderate importance, the most important system being that of Wetland Unit A7.

It is understood that the location and layout alternatives for the proposed Retail Park are limited. Thus, wetland offsets are the only way of offsetting and mitigating the impacts of the proposed wetland infilling. All wetland units within the Retail Park Developmental Footprint will be lost and thus there is no opportunity to offset the loss of wetlands within Retail Park Site. As a result the wetland loss associated with the Retail Park must be offset within the greater Cornubia Development Area and Phase 2 specifically. Even though development has been phased, from an environmental perspective the Cornubia Site needs to be viewed as a single entity. This holistic view will allow improved management of wetland resources and will also encourage consistency in terms of rehabilitation and management techniques.

Initially, utilising the hectare equivalents approach, the hectare equivalents proposed to be lost was calculated to be 1.1205 ha. At an offset ratio of 1:2, it was recommended that 2.24 ha equivalents be regained through the rehabilitation of Wetland Units A5, A6 and A8.

However, following the receipt of comments from key stakeholders it has been decided to implement an area for area approach using a 1:3 offset ratio, as recommended by Ezemvelo KZN Wildlife. The detail with regard to the wetland offset calculations is presented in Section 6.5.1 below. The calculations include the wetland impacts of a number of potentially significant stormwater, sewer crossing and access road impacts which were also identified, described and assessed.

The wetland assessment has assessed the impacts of the proposed temporary access roads for each of the proposed sites for the Mount Edgecombe Refuse Transfer Station as presented in Figure 6-1.

The specialist has found that Alternative Site 1 is preferable as there is an existing road and the realignment of this road has marginal impacts on the wetland system. Alternative Site 2 is not desirable as there will be significant wetland loss to accommodate the new access road. Whilst Alternative Site 1 is found to be acceptable, the road crossing must be designed in such a way so that the wetland is crossed at right angles to the direction of flow. The following mitigation measures specific to the access road have also been included in the EMPr.

The wetland boundaries either side of the road crossing must be demarcated using shade cloth or snow fencing prior to the construction commencing. Disturbance to the wetland soils along the road crossing footprint must be restricted to an established construction right-of-way (ROW) corridor. The ROW corridor within the wetland should be as narrow as practically possible and should be demarcated and fenced off during the site setup phase. The construction ROW should comprise the road and embankment footprint only. All wetland areas outside of the demarcated ROW must be considered no-go areas. With regards to wetland crossings only, the road fill foundation and base should be permeable to water flow to ensure low flow seepage is maintained and that water does not dam up behind the road during heavy rainfall.

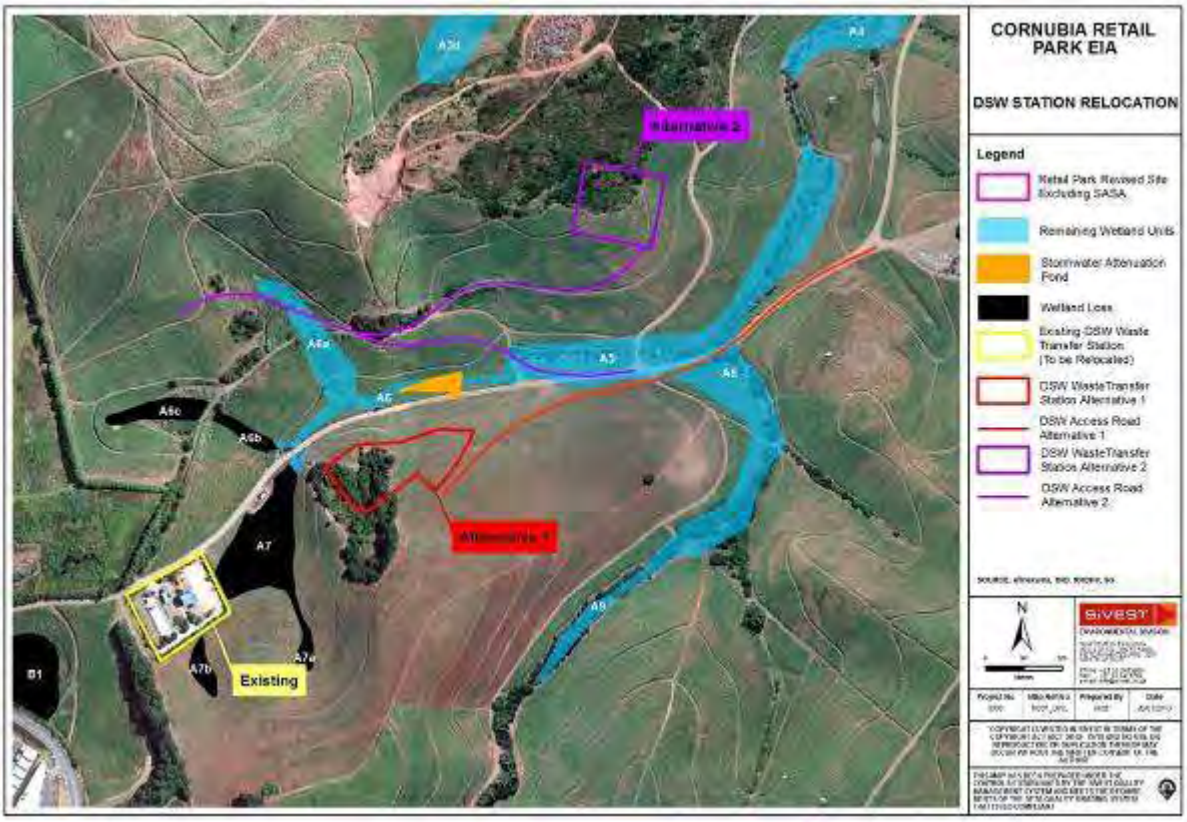


Figure 6-1: Proposed Wetland Crossings for Each of the Access Roads Proposed for Each Site Alternative for the Mount Edgecombe Refuse Transfer Station

The specialist has further found that remaining Wetland Units A6, A9, A8 A3d and A3c are proposed to be crossed by the planned sewer line (Figure 6-2). This sewer line will connect to the existing Sewer Rising Main (near wetland unit A1) which runs to the North West. In addition, a number of stream channels (riparian zones) and drainage lines are also planned to be crossed. The crossings near the actual retail development are concentrated within planned disturbances (e.g. platform creation, attenuation pond etc.). It is proposed that these disturbances are undertaken concurrently to reduce impacts and allow rehabilitation to be initiated as soon as possible.

The following mitigation measures specific to the sewer pipeline have also been included in the EMPr.

Disturbance to the wetland soils along the sewer pipeline route(s) must be restricted to an established construction ROW corridor. The width of the ROW corridor within the wetlands must be as narrow as practically possible and should be demarcated and fenced off during the site setup phase. The construction ROW for trenched crossings should comprise the following:

- a one-way running track of a maximum width of 3 m,
- a pipeline trench zone of a maximum width of 2 m; and
- an up-slope subsoil stockpile corridor of a maximum width of 1.5 m.

The construction ROW for pipe bridge crossings should comprise the following:

- a one-way running track of a maximum width of 3 m; and
- pipe bridge pier construction zones.

The ROW should be established by topsoil along the construction ROW being stripped and stored outside of the wetlands in designated stockpiles areas. These turfed topsoil stockpiles must be regularly wetted to ensure that the clayey soils remain moist. The location of these topsoil stockpiles must be agreed upon by the ECO prior to construction commencing. Once the ROW is established, all wetland areas outside of the demarcated ROW must be considered no-go areas. This also includes the access ROW's. All pipes and equipment must be stored outside of the wetland areas in a stockpile area approved by the ECO. Any water entering the trench must be pumped out of the trench and into a filtering system, such as a silt trap/hay-bale trap. A dewatering site must be identified and should be on flat ground away from the edge of the channel and preferably in a well vegetated area. Once the pipe is laid into the trench, the subsoils should be reinstated in the same order they were excavated.

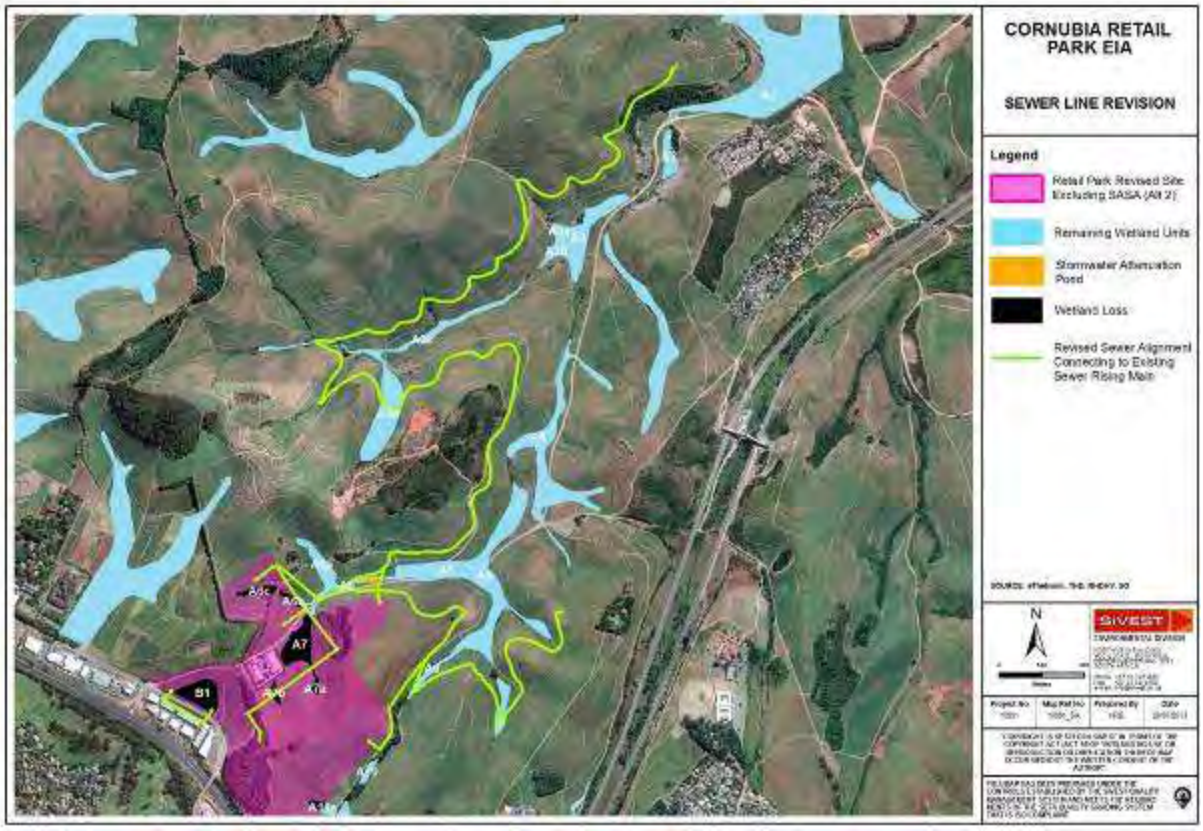


Figure 6-2: Rising Sewer Main Wetland Crossings

A final map indicating the area of wetland to be lost as a result of the development is provided in Figure 6-3.

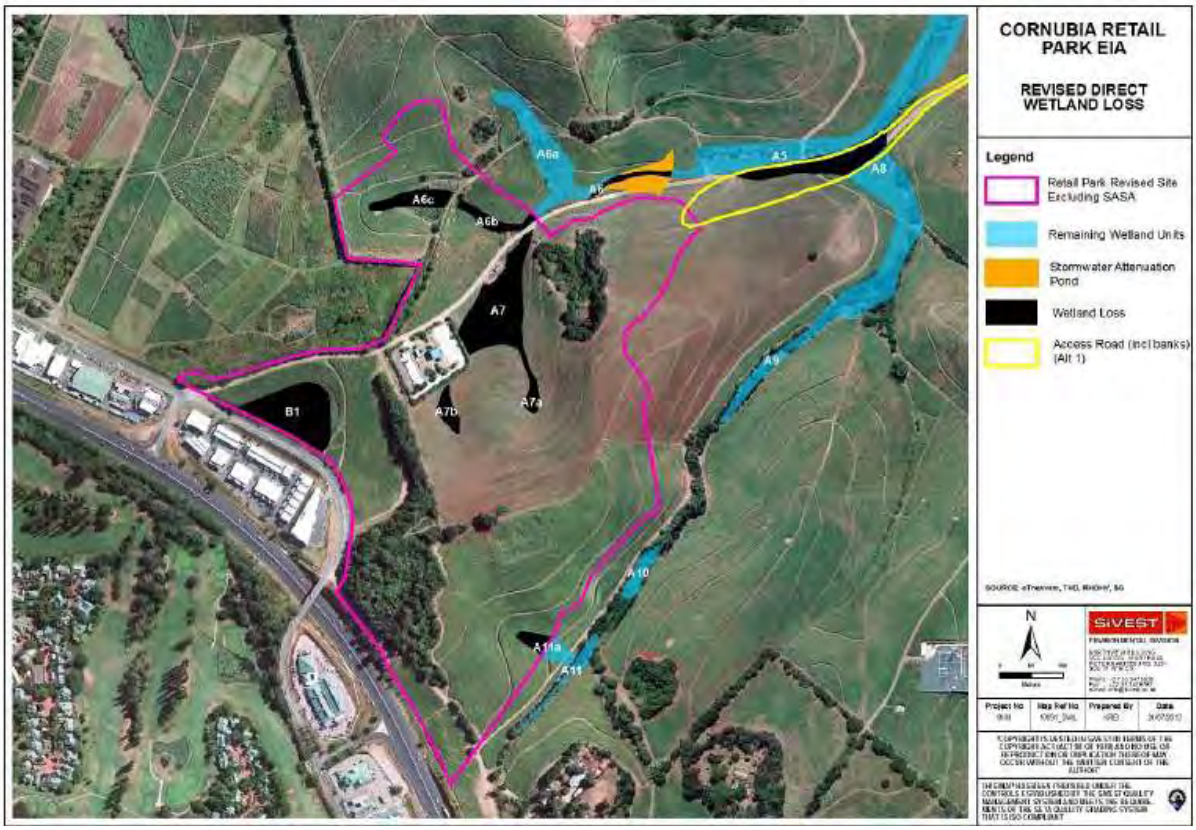


Figure 6-3: Overall loss of wetland areas

The overall impacts of the Retail Park activities on the downstream, wetland systems was assessed as being moderately-low and acceptable provided that the mitigation measures recommended for each impact are strictly adhered to. In addition, it is important to note that such impacts, particularly the water quality impacts, will also contribute to the gradual reduction in the water quality of the Ohlanga River and Estuary if the mitigation measures provided are not implemented effectively. This further highlights the importance of strictly adhering to the recommendations provided in the specialist report and summarised in Section 6.5.1.

6.5.1 Mitigations and Recommendations:

The option to develop or infill wetland areas and mitigate the loss through the use of wetland offsets is generally considered the last resort option in environmental planning. Before such an option is proposed, it is best practice to first consider the following mitigation hierarchy in decision-making:

- Avoid or prevent the impact (avoidance)
- Reduce or minimise the impact (mitigation)
- Repair or remedy the damage caused by an impact
- Offset or compensate for the impact or loss

In this case, it is understood that the Cornubia Development Framework, including the location of the retail park, has been accepted in principle by the eThekwini Municipality and that the current plan has been the product of an extensive planning process.

In addition, it is also understood that a single, large platform is required for the proposed retail development and that the conservation of some of the wetland units within the development footprint is not feasible. Therefore, as no site and layout alternatives are possible, the impact can only be mitigated through the rehabilitation of wetland offsets, which must take place on the wetland areas within the remainder of the Cornubia Development Framework.

For wetland offsets, the no-nett wetland loss principle is generally accepted as best practice when dealing with the issues of wetland loss. This means that wetland loss must be replaced by wetland gain so that the nett wetland loss is zero. The replacement of wetlands at a ratio of 1:1 is generally regarded as being insufficient to mitigate wetland loss as wetland rehabilitation cannot reproduce wetlands. Internationally, a minimum ratio of 1:1.5 is generally required to achieve 1:1 compliance on the ground. However, this minimum ratio is only considered appropriate in situations where rehabilitation has a low risk of failure, especially if the wetlands in question are degraded and of low conservation value from an ecosystem services perspective. After receiving comments from key stake holders it has been decided to implement an area for area approach using a 1:3 offset ratio, as recommended by Ezemvelo KZN Wildlife. The area for area approach involves rehabilitating or reinstating an area of wetland equal to the wetland area being lost at the required offset ratio.

Using this approach the offsetting of the 3.75 ha of wetland lost to the retail development, 10.62 ha would need to be rehabilitated at an offset ratio of 1:3 as summarised in Table 6-1 below.

Table 6-1: Proportion of wetland units to be infilled

WETLAND UNIT	IMPACT SCORE	HEALTH SCORE	AREA LOST (ha)	1:3 ha OFFSET
A5	-	-	0.6156	1.8468
A6	6.6	3.4	0.0466	0.1398
A6b	6.5	3.5	0.1525	0.4575
A6c	5.9	4.1	0.2975	0.8925
A7	6.2	3.8	0.9260	2.778
A7a	4.6	5.4	0.1918	0.5754
A7b	5.3	4.7	0.1533	0.4599
A8	-	-	0.0574	0.1722
A11a	4.7	5.3	0.1325	0.3975
B1	6.9	3.1	0.9677	2.9031
Totals			**3.54**	**10.62**

Although the overarching greater Cornubia Development area has been phased, the impacts, losses and potential rehabilitation of all wetland areas must be considered in order to adequately assess the cumulative impacts. Table 6-2, below summarises the current wetland losses and rehabilitation potential for the entire greater Cornubia Development area.

Table 6-2: Proportion of wetland units to be infilled

PHASE	WETLAND AREA (ha)	WETLAND LOSS (ha)	REQUIRED WETLAND AREA TO BE REHABILITATED AT THE 1:3 OFFSET RATIO	WETLAND AREA TO BE REHABILITATED
Cornubia Phase 1	53.9	7.54	22.62	46.36
Cornubia Phase 2	150.77	29.24	87.72	107.52
Cornubia Retail Park	7.08	3.54	10.62	0*
Totals	**211.75**	**39.65**	**120.96**	**153.88**

All wetland units within the Retail Park Development Footprint will be lost and thus there is no opportunity to offset the loss of wetlands within Retail Park Site. As a result the wetland loss associated with the Retail Park must be offset within the greater Cornubia Development Area and Phase 2 specifically. Even though development has been phased, from an environmental perspective the Cornubia site and particularly the Retail Park needs to be viewed as a single entity. This holistic view will allow improved management of wetland resources and will also encourage consistency in terms of rehabilitation and management techniques.

*The wetland units nominated for rehabilitation to offset the loss associated with the Retail Park Development and temporary access road fall within Cornubia Phase 2 but are directly adjacent to the Retail Park site. Therefore, Table 6-2 above indicates that there will be no offsets within the Retail Park site specifically; however as a minimum requirement 10.62 ha of offsets are required within Phase 2 to satisfy the 1:3 offset ratio for the Retail Park. Eight wetland units within Phase 2 but adjacent to the Retail Park site have been identified for rehabilitation and the total area for this rehabilitation is 11.4 ha which is included in the total amount of 107.52 ha for Phase 2 presented in Table 6-2 above. The wetland units nominated for rehabilitation are presented in Figure 6-4 and include units A3c, A3d, A4, A5, A6, A6a, A8 and A9.

It is the intention that all remaining wetland units within the Phase 2 Cornubia Development will be rehabilitated. As per Table 6-2, the area of wetland available for rehabilitation is 153.88 ha, approximately 32.92 ha more than the minimum 120.96 ha, as per the 1:3 offset ratio. Thus the overall wetland losses can be can be considered to be adequately offset and the significance of the impact reduced to acceptable levels.

It must be noted that an iWULA is currently underway for the remainder of Cornubia (Phase 2 and the Retail Park) which will address the specific wetland loss and rehabilitation areas in greater detail.

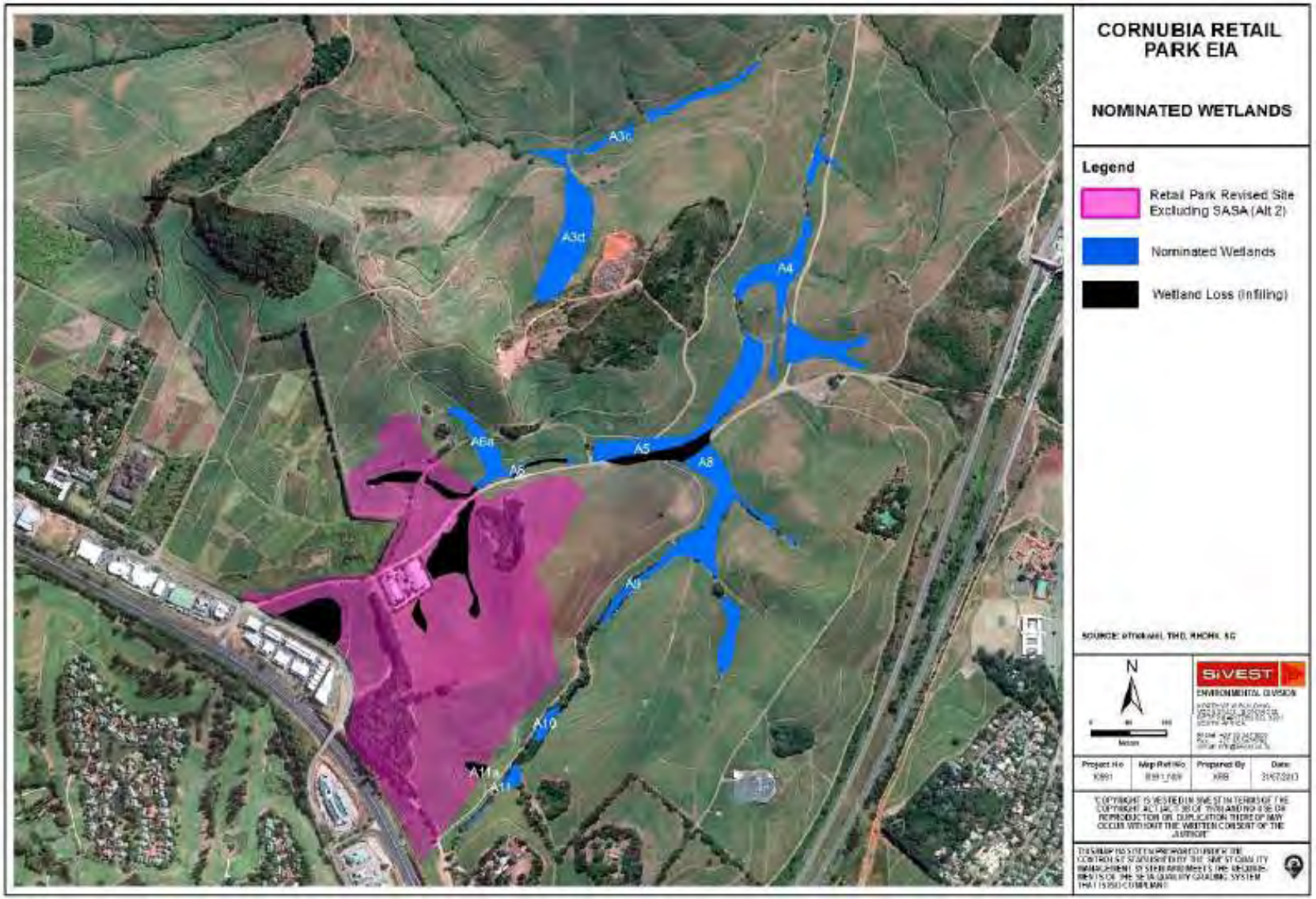


Figure 6-4: Wetland Units Nominated for Rehabilitation

6.6 Traffic Assessment

Existing traffic volumes on the road network immediately surrounding the site were obtained from traffic counts undertaken on Thursday 21 July 2011 at the following intersections:

1. M41 and Link Road intersection (M41 on / off ramp);
2. Link Road and Flanders Drive intersection;
3. M41 and Flanders Drive intersection (M41 on / off ramp);
4. Flanders Drive (east-west) and Flanders Drive (north-south) intersection; and
5. Flanders Drive and Siphosethu Road intersection.

The locations of the intersections in relation to the proposed development are pictured in Figure 6-5.

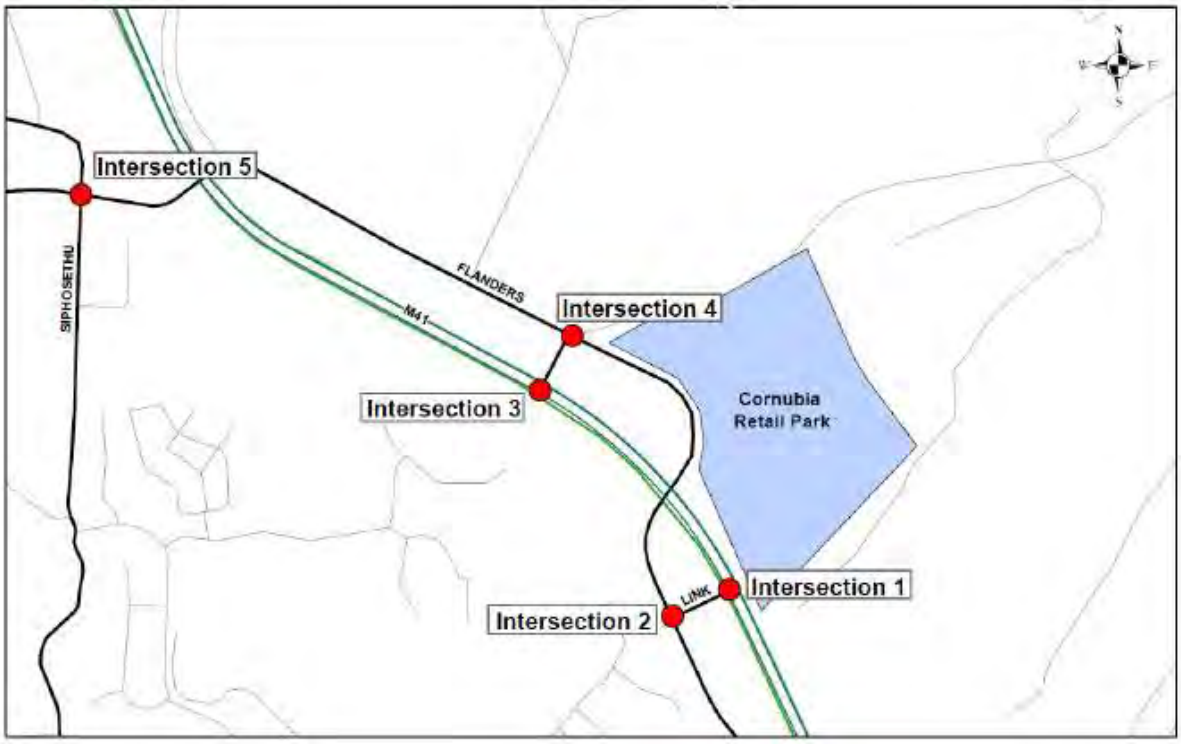


Figure 6-5: Locations of Traffic Counts

The following summarises the findings of the TIA, to which is elaborated on in the TIA (Appendix C6):

- The existing M41 / Link Road left-off / left-on ramp was analysed with existing traffic flows and it was found that it operates well in isolation. The Link Road / Flanders Drive intersection, east approach (from the M41) operates at a level of service right (LOS) F under existing conditions.

- The existing M41 / Flanders Drive left-off / left-on ramp was also analysed with existing traffic flows and it was found that this intersection too operated well in isolation. The Flanders Drive / M41 south approach (from the M41) operates at a LOS F.

- Trip generation calculations for the proposed development showed that it will generate 2014 external vehicle trips in the morning peak hour and 3858 external vehicle trips in the afternoon peak hour, with a 50 : 50 directional split per peak hour.
- The retail park generates 68 public transport bus trips in the morning peak hour and 102 public transport bus trips in the afternoon peak hour for middle and low income users.
- The existing traffic flows in the base year (2011), were escalated to the target year 2015 by 2,5% per annum and added to the flows generated by the development. The combined flows were assigned to the 2015 proposed road network.
- Cognisance was taken of the Proposed Cornubia Development future planning initiatives and it was considered that these could be accommodated in the future and that they would be beneficial to the development.
- It is envisaged that occupation of the development will be in a phased approach.
- The proposed Cornubia Retail Park Development road infrastructure requirements were modelled in VISSIM taking into consideration the proposed Mount Edgecombe Interchange. The two models were merged to establish the integration and impact in terms of LOS and weaving. The proposed development is not expected to impact negatively on road safety or pedestrian movements.
- The proposed development is not expected to impact negatively on road safety or pedestrian movements.

6.6.1 Recommendations[16]

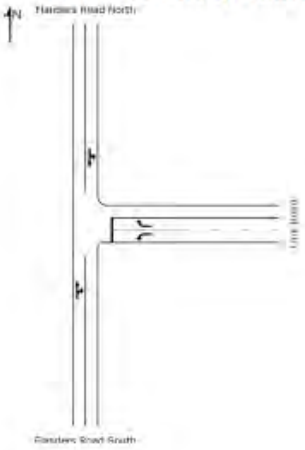
It is recommended that the proposed Cornubia Retail Park Development be approved in terms of the expected traffic impact of the development which is in line with the overall Cornubia Development Framework Plan and Transportation Study. The technical details for a number of specific upgrades to existing intersections have been confirmed and include the following:

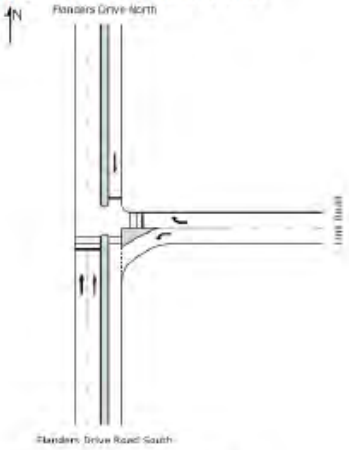
6.6.1.1 External Road Network

The external road network was analysed for both the existing traffic flows and the 2015 background plus development generated traffic volumes. The upgrade requirements for the external road network are listed below:

[16] *This entire section has been updated with the revised TIA.*

Flanders Drive / Link Road Intersection Upgrade Requirements

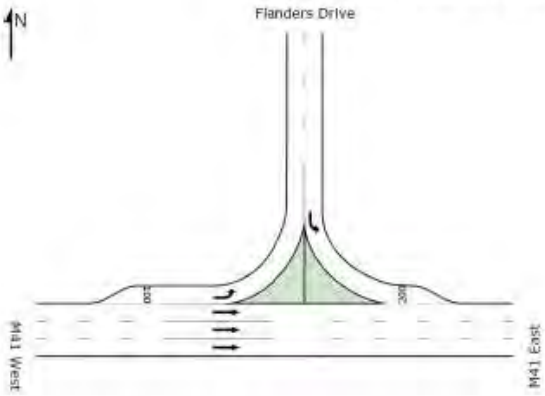


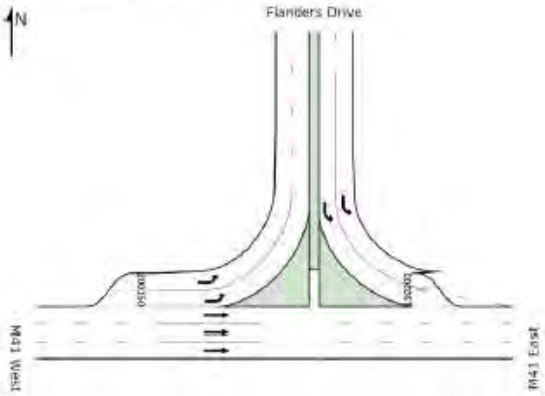


Signalised Intersection

Flanders Drive Northbound Approach:	- additional straight lane
Flanders Drive Southbound Approach:	- additional exit lane
Link Road:	- right- turn slip lane

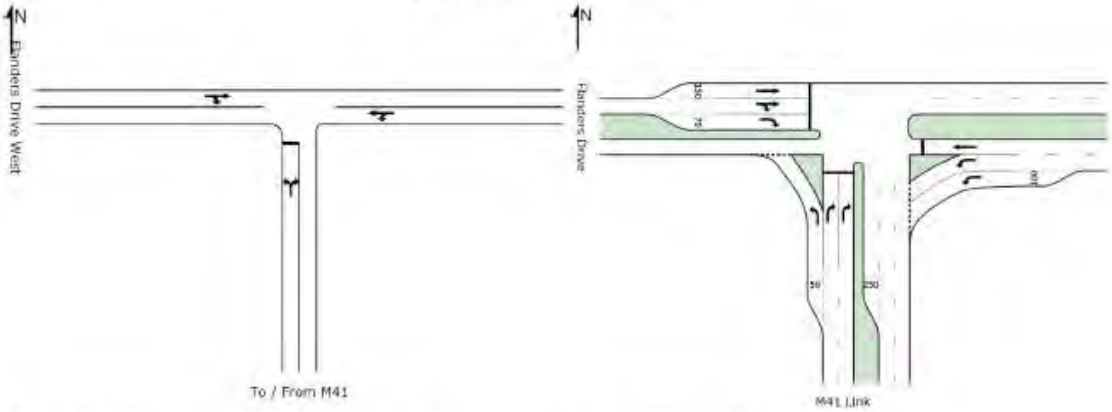
M41 / Flanders Drive (to / from M41)





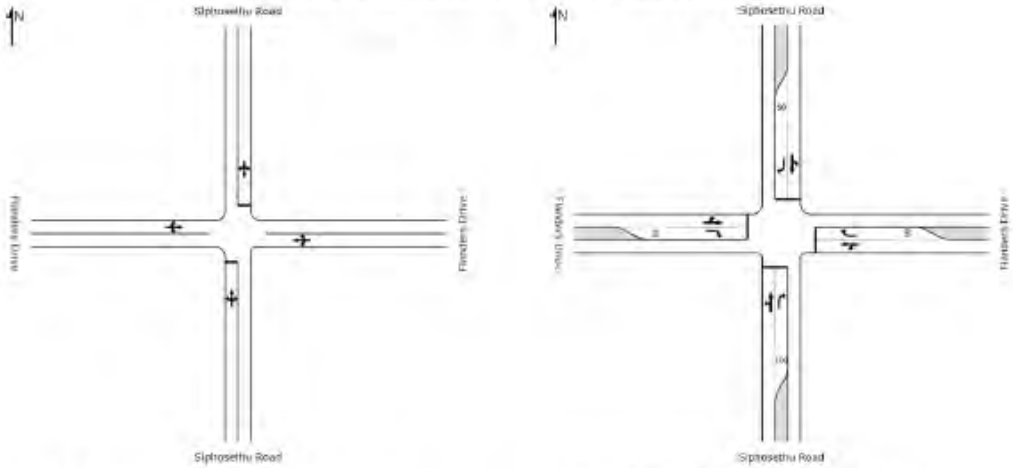
Flanders Drive (to / from M41):	-additional left- turn / on-ramp lane
M41 west:	-additional 200m left-turn / off-ramp lane
M41 east:	-additional 150m taper lane

Flanders Drive / Flanders Drive (to / from M41) / Loading Access / No Name Road (Signalised Intersection)



Flanders Drive (to / from M41) apparoach:	-two right-turn lanes -50m left turn slip lane -two additional exit lanes
Flanders Drive eastbound approach:	-100m left-turn continuous slip lane -dedicated left-turn slip lane under yield condition
Flanders Drive westbound approach:	-shared straight and right-turn lane -70 m right-turn lane

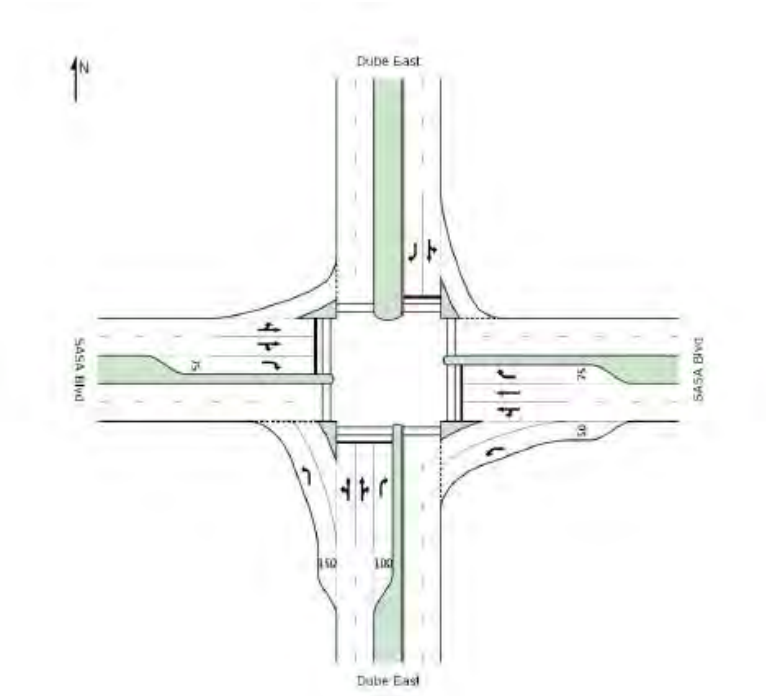
Flanders Drive / Siphosethu Road (Signalised Intersection)



Siphosethu Road northbound approach:	-shared straight and left-turn lane -50m right-turn lane
Siphosethu Road southbound approach:	-shared straight and left-turn lane -50m right-turn lane
Flanders Drive eastbound approach:	-shared straight and left-turn lane -50m right-turn lane
Flanders Drive westbound approach:	-shared straight and left-turn lane -50m right-turn lane

6.6.2 Internal Road Network Layout

Dube East / SASA Boulevard - The proposed internal road network has been reviewed, assessed and analysed in both SIDRA and VISSIM.



6.6.3 M41 / Flanders Drive / Dube East Interchange

This interchange provides the primary access point into the Retail Park in the short term but it will also serve an important regional piece of infrastructure providing access into the remainder of Cornubia and beyond.

The preferred option has been analysed in Sidra and modelled in VISSIM integrating the Mount Edgecombe Interchange upgrades. The proposed option generates an acceptable level of service. A Traffic Road Layout (TRL) is required to identify the amount of space required outside of the existing road reserves.

Based on the expected traffic flow at this interchange, the signalised partial parclo option would provide a better level of service and less delay for each movement. It is however recommended that a cost comparison in terms of land required, environmental impact and construction cost be prepared to further assess whether the improved service level can justify the increased cost.

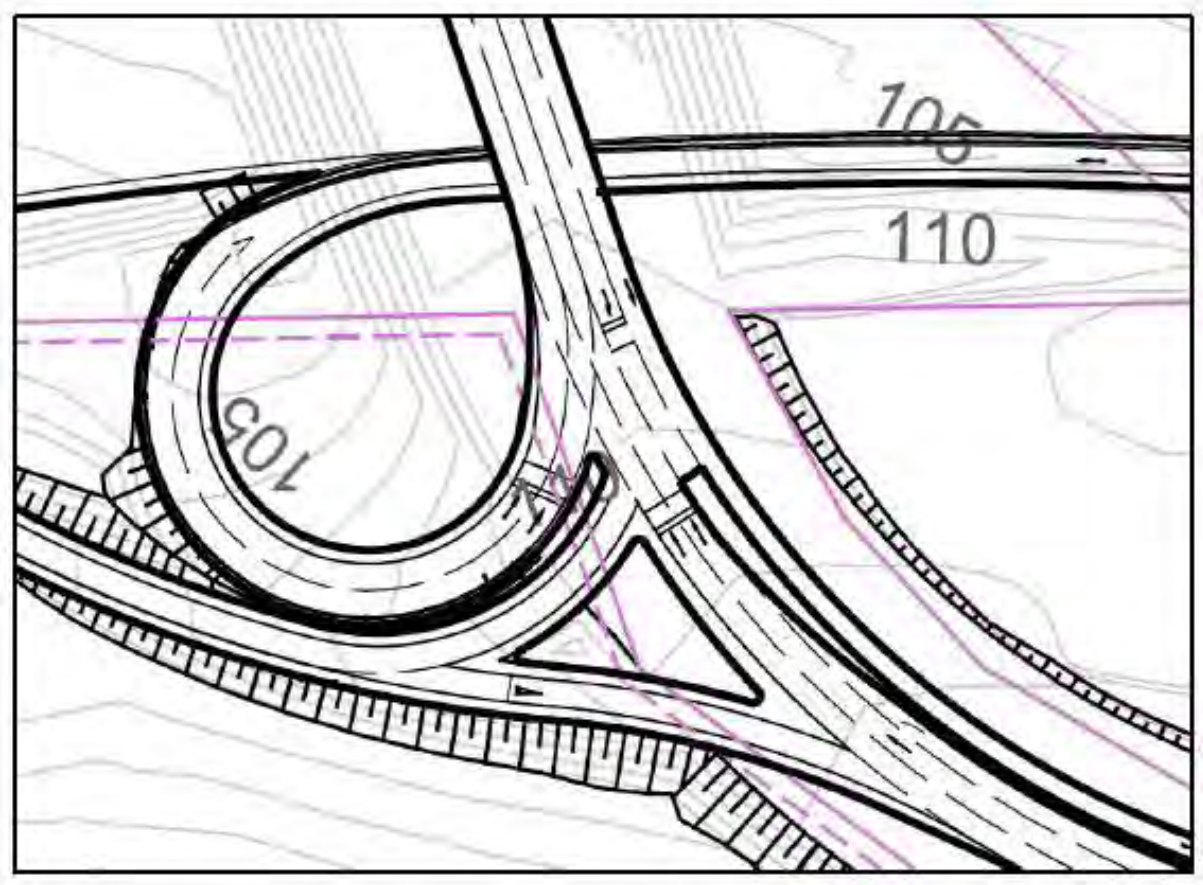


Figure 6-6: The M41 / Flanders Drive / Dube East Interchange Configuration

6.7 Stormwater Management[17]

6.7.1 Impacts of Developments on Existing Catchments

The impacts of the proposed development on the environment will range from negative to positive depending on the degree of planning, design and methods of implementation. Measures put in place should contribute to the mitigation of the negative impacts of development.

Expected consequences of unmitigated development include an increase in hardened areas, reduced infiltration areas, loss of vegetation and evapo-transpiration potential. There will be an overall increase in surface run-off, an increase in the speed of run-off and peak flow rates.

6.7.2 Mitigation of Development Consequences

The recommendations in the specialist studies highlight the importance of adequate attention to the following key issues:

[17] *The information in this section has been taken from the Stormwater Management Plan for the Cornubia Retail Park prepared by SMEC South Africa and can be found in Appendix C7.*

a) Improved wetland functionality and zero nett-loss approach on wetland areas.
b) Protection of the natural watercourses to prevent pollution, erosion and retain run-off.
c) Promotion of subsoil infiltration where possible.
d) Provision of indigenous vegetation along watercourses and stabilization of banks.
e) Provision of in-stream installations at selected sites to trap first-flush pollution and nonsoluble trash and litter entering the stormwater system.
f) Attention to development of on-site use rainfall attenuation and provisions for reducing run-off by in-catchment and on-site evaporation and evapo-transpiration.
g) Local flood risk reduction by selection of appropriate design standards for culverts and stormwater attenuation facilities.
h) Implementation of adequate on-site and localized stormwater management practices.
i) Attenuation of flood peaks to predevelopment levels at the 2% (50-year) and the 10% (10- year) risk level.
j) Provide new permeable areas with sufficient flood attenuation and evaporation provision.
k) Rehabilitation and upgrading of open spaces following conversion from sugarcane.

These issues must be carried through the Stormwater Management Plan to the Wetland and Open Space Rehabilitation Plan.

The Stormwater Management Plan described below lists many practical on-site controls to address these fundamentals issues. However, this does not exclude any technology that can be shown to be effective in controlling run-off while supporting the proposed spatial development intensity levels and contributing positively to the environment.

To fully mitigate the negative impacts of development:

a) The potential increase in flood peaks must be mitigated to at least pre-development levels by the provision of sufficient stormwater attenuation facilities at micro and macro levels.
b) The potential increase in flood volumes must be mitigated where possible by subsoil infiltration, retention of run-off in on-site facilities for irrigation use and unsaturated wetland areas where evaporation and infiltration can help to reduce flood run-off rates.
c) Installations must be provided to contain pollution as close to source as possible and in a practical location for servicing by Department of Solid Waste.

6.7.3 Critical Aspects

Stormwater drainage is a crucial aspect in the development of the Cornubia Retail Park and will require careful planning, designing and managing.

The proposed stormwater attenuation pond should be designed for the 50-year storm event and located at an appropriately selected site. Site selection must take account of the necessary geotechnical, environmental and topographical conditions, including wetland conservation.

In addition to macro stormwater measures, micro-stormwater measures should be implemented. The form of this attenuation will be dependent on a number of factors such as topography (natural and artificial slopes), the zoning of the site and soil conditions present. A limited stormwater pipe network should be provided for stormwater reticulation to safely convey minor stormwater runoff to the attenuation facility.

To ensure that water quality is not compromised, silt and trash traps will need to be provided within the system. Where conditions permit, open ditches, drains and channels should be used instead of pipes. Attention must be given to the erodibility of channels where flow velocities are high and appropriate lining provided. Forms of lining will vary from natural vegetation to stone pitching and reinforced concrete linings.

The proposed development should not adversely impact on the environments of the development node and surrounding areas in terms of erosion and sediment deposition, but the frequency of flooding and the total runoff volume will increase unless adequate provision can be made to maintain the current natural rate of stormwater attenuation and infiltration in the sub-catchments.

A stormwater systems model should be developed during the detailed design phase to determine peak flood flow rates and flood levels and assess the collective impacts of development on runoff patterns. The outputs from the modelling will provide the input data required for the design of culverts, channels and other stormwater infrastructure associated with the proposed developments.

For areas flowing into the development area, potential future development in these sub-catchments should be considered and any requirements for stormwater attenuation should be identified. Similarly, for stormwater flowing out of the development area may impact on the downstream watercourse and this must be considered and measures taken to ensure any upstream development does not result in an increased flood damage risk downstream.

Areas within the proposed development that bound on stormwater attenuation areas, near road crossings, watercourse confluences and water features could be subject to flooding. In these situations no development should take place below the outfall levels of water attenuation areas, plus an appropriate freeboard allowance.

Overland flow may be encouraged where possible, but should be avoided in the specific areas identified. These are typically where roads will capture and concentrate cross flows at the local low points in the roads. Plans must take into account probable impact of flow from these points of concentration on the downstream environment.

Steeper stormwater channels will require protection from erosion through the use of appropriate channel lining, or controlled drops to dissipate flow energy.

All natural and unlined channels should be inspected for adequate binding of soil by sustainable ground cover. Stone pitching should be used to reinforce channel inverts on steep slopes. Existing wetlands and stormwater attenuation areas should be protected from encroachment by the development.

6.7.4 Proposed Stormwater System

Sustainable drainage systems (SuDS) are designed to reduce the potential impact of new and existing developments with respect to surface water drainage discharges. SuDS use the following techniques:

a) Source control
b) Permeable paving such as pervious concrete
c) Stormwater attenuation
d) Stormwater infiltration
e) Evapo-transpiration (e.g. from a green roof)

Stormwater runoff from sites 4a and 4b will discharge into the existing Flanders Drive / M41 stormwater system. The additional stormwater runoff volume generated as a result of the development of these sites will be attenuated on site.

The increased post –development runoff from the balance of the sites will be attenuated at a dry pond at the eastern side the development (as indicated in Figure 6-7).

Maximizing the flow path length is encouraged to maximize the attenuation in the micro stormwater system. Stormwater will be released from the development into existing drainage systems at pre-development (1 in 10 and 1 in 50 year) flow rates.

From the results of the preliminary Rational Method calculations for the development, it is evident from these results that one of the negative impacts of the development is a substantial increase in the peak stormwater run-off flows for both the 1 in 10 and 1 in 50 year return periods.

The increase in peak run-off will primarily be mitigated by the proposed dry stormwater attenuation pond. However, the introduction of supplementary SuDS technologies during the detailed design phase is encouraged.

The attenuation installations will reduce the post-development peak runoffs for the 1 in 10 and 1 in 50 year storms to pre-development levels. With this in mind, it is recommended that the hydraulic characteristics of the stormwater network is analyzed (using EPASWMM or similar software) during the detail design phase of the project. This analysis will accurately determine the attenuation volumes and outlet configuration required to reduce the peak outflows to pre-development levels.

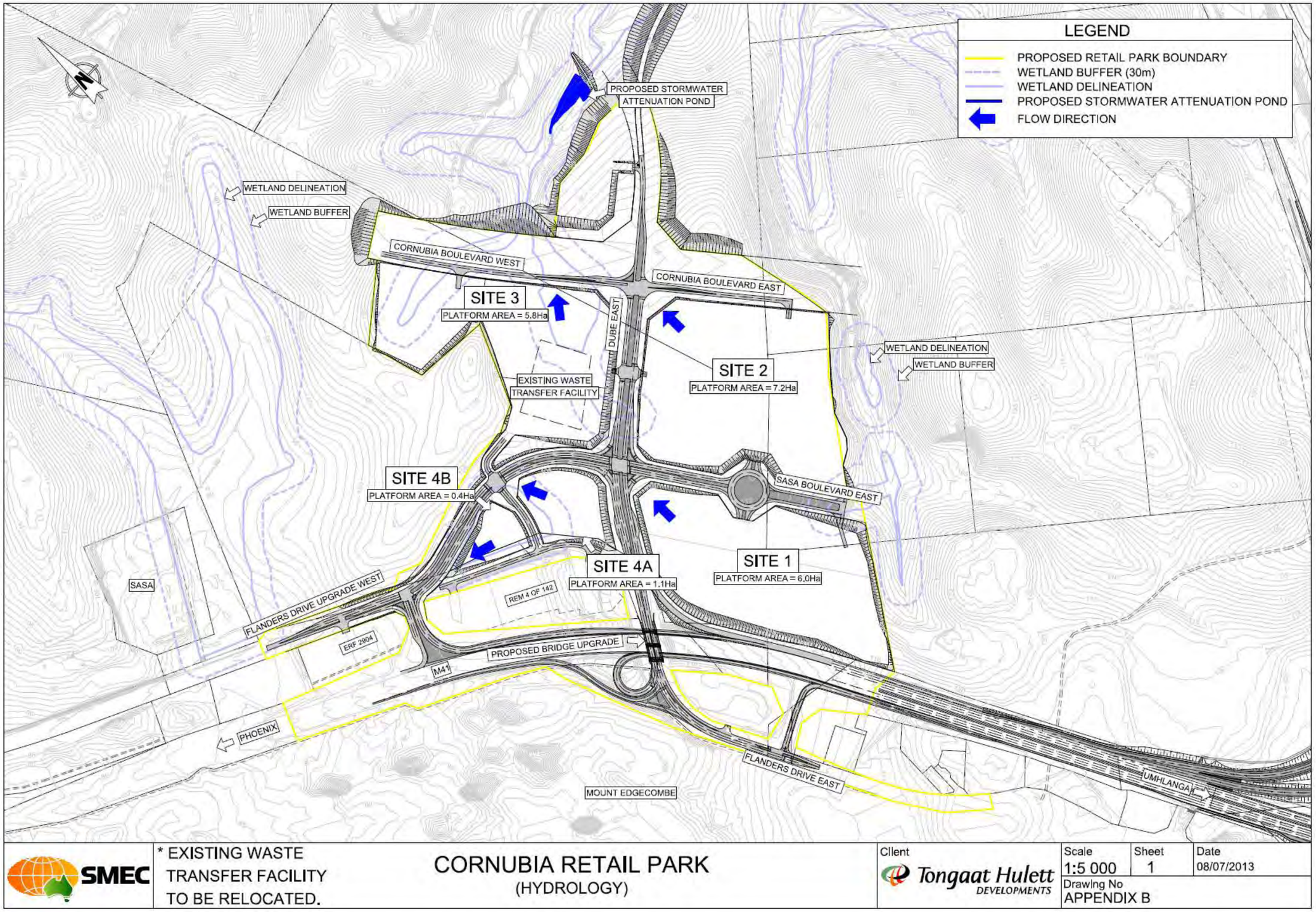


Figure 6-7: Proposed Stormwater System

7 PUBLIC PARTICIPATION PROCESS

Public participation is a process that is designed to enable all I&APs to voice their opinion and/ or concerns which enables the practitioner to evaluate all aspects of the proposed development, with the objective of improving the project by maximising its benefits while minimising its adverse effects. I&APs include all interested stakeholders, technical specialists, and the various relevant organs of state who work together to produce better decisions. The primary aims of the public participation process are:

- to inform I&APs and key stakeholders of the proposed application and environmental studies;
- to initiate meaningful and timeous participation of I&APs;
- to identify issues and concerns of key stakeholders and I&APs with regards to the application for the development (i.e. focus on important issues);
- to promote transparency and an understanding of the project and its potential environmental (social and biophysical) impacts (both positive and negative);
- to provide information used for decision-making;
- to provide a structure for liaison and communication with I&APs and key stakeholders;
- to ensure inclusivity (the needs, interests and values of I&APs must be considered in the decision-making process);
- to focus on issues relevant to the project, and issues considered important by I&APs and key stakeholders; and
- to provide responses to I&AP queries.

The public participation process must adhere to the requirements of Regulations (GNR 543) under the NEMA. The public participation process for the Cornubia Retail Park EIA process will be undertaken according to the stages outlined below.

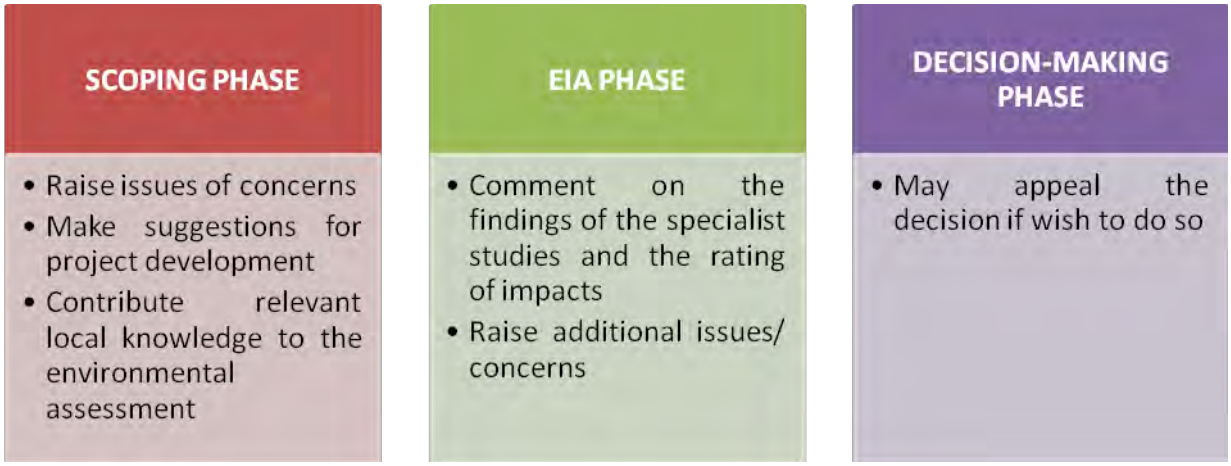


Figure 7-1: Responsibilities of I&APs in the Different Stages of the Project

Royal HaskoningDHV is conducting the Public Participation Process (PPP) for the Cornubia Retail Park Project. In recent years THD has taken a much more participatory approach to their property development projects, with the understanding that the socio-political and

economic context of the times invites this more public approach. Communities that surround the developments are invited to "inform and be informed" about developments through the establishment of fora in order to achieve the most positive impacts possible. It is also noted that engaging stakeholders even before developments are built can achieve the best impacts. It is for this reason that the PPP that forms part of the EIA becomes the basis of a long-term stakeholder engagement process.

For the purposes of the scoping phase, the PPP aims to ensure that the full range of stakeholders is informed about the Cornubia Retail Park and its complex profile throughout the period in question. In order to achieve this, a number of key activities have taken place and will continue to take place. These included the following:

- The identification of stakeholders is a key deliverable at the outset, and it is noted that there are different categories of stakeholders that must be engaged, from the different levels and categories of government, to relevant structures in the NGO sector, to the communities adjacent to the Cornubia Retail Park;
- The development of a living and dynamic database that captures details of stakeholders from all sectors;
- The convening of focussed and general meetings with stakeholders at different times throughout the EIA process (and beyond);
- The engagement of public leaders to whom the public generally turn for information, keeping such individuals well informed about process and progress;
- The fielding of queries from I&APs and others, and providing appropriate information;
- The convening of specific stakeholder groupings/fora as the need arises;
- The preparation of reports (both baseline and impact assessment) based on information gathered throughout the EIA via the PPP and feeding that into the relevant decision-makers;
- The PPP could include distribution of various types of pamphlets and other information packs; and
- Where appropriate site visits may be organised, as well as targeted coverage by the media.

Specifically the Cornubia Retail Park PPP has entailed the following activities.

7.1 Authority Consultation

The competent authority which is the KZN DAEA is required to provide an environmental authorisation (whether positive or negative) for the project. The KZN DAEA was consulted from the outset of this study, and has been engaged throughout the project process.

Authority consultation included the following activities:

- Submission of an application for environmental authorisation in terms of Section 26 of the EIA Regulations (2010) on 19 July 2012.
- Approval of the application documentation by KZN DAEA was received on 3 August 2012 with the following reference numbers DM/0034/2012 and KZN/EIA/0000802/2012.
- Submission of a final ESR to KZN DAEA Environmental Impact Assessment Branch on 23 November 2012.

- Acceptance of the final ESR by the KZN DAEA Environmental Impact Assessment Branch on 21 December 2012.

The competent authorities issuing decisions regarding the project as well as consultation to date are presented in below.

Table 7-1: Competent authorities and other relevant authorities associated with the project

AUTHORITY	ROLE	LICENCE/APPROVAL	CONSULTATION TO DATE
KZN Department of Agriculture and Environmental Affairs Environmental Impact Assessment Branch	Competent Authority for Environmental Authorisation process	Environmental Authorisation	1. Submission of the final Scoping Report 2. Acceptance of the final Scoping Report on 21 December 2012 (Appendix A)
KZN Department of Agriculture and Environmental Affairs Pollution and Waste Management Branch	Competent Authority for Waste Management Licence	Waste Management Licence	1. Submission of a WML Application 2. Acceptance of the WML Application on 21 November 2012 3. Submission of the final Basic Assessment Report is to be made in August 2013
Department of Water Affairs	Competent Authority for Water Use Licence Application process	Water Use Licence	1. Pre-application meeting for the Water Use Licence Application held at the DWA Regional Office on 30 May 2013 2. Pre-application workshop with representatives from both national and regional DWA held on 11 June 2013
Department of Agriculture, Forestry and Fisheries	Competent Authority for the licence to remove/relocate protected tree species.	DAFF Licence	1. Site Visit undertaken. Interim comment received on 18 October 2012 (Appendix D) 2. Comment received on 27 June 2013 (Appendix D) 3. Site Visit undertaken on 10 July 2013 4. Amended comments received on 22 July 2013 (Appendix D)
Ezemvelo KZN Wildlife	Competent Authority for the permit to remove/relocate	Permit	1. Interim comment received on 29 October 2012 (Appendix D).

AUTHORITY	ROLE	LICENCE/APPROVAL	CONSULTATION TO DATE
	protected indigenous plants.		2. Comment received on 12 July 2013 (Appendix D)
Amafa aKwaZulu-Natali	Heritage Authority	Approval indicating that the application fulfils the requirements of the relevant heritage resources authority as described in Chapter II, Section 38(8) of the NHRA, Act 25 of 1999	1. Interim comment received on 01 November 2012 (Appendix D) 2. Comment received on 10 June 2013 (Appendix D)

7.2 Consultation with Other Relevant Stakeholders

Consultation with other relevant key stakeholders were and will continue to be undertaken through telephone calls and written correspondence in order to actively engage these stakeholders from the outset and to provide background information about the project. These stakeholders included:

Table 7-2: Key stakeholders contacted as part of the public participation process

OWNERS AND OCCUPIERS OF LAND ADJACENT TO THE SITE	
Adrian Coreejes	South African Sugar Association
Sarah Pillay / Rob Grant	Blackburn Estate
Stephan Michaux	Penny Pinchers
Lingum Nayager	Mount Edgecome Virgin Active
Z.E. Van Grenning	Kempster Ford Umhlanga
Deborah Kisten	Fiat and Alfa Umhlanga
R. Nortje	SPAR Mount Edgecombe
B. Cole	Auto Umhlanga
R. Pillay	Engen Island Park
Sarah Kennedy	Mount Edgecombe Stables
Z. Ndaba / Tasnim Arbee / Elaine W.	Softline Pastel & VIP
R. Conradt	Tony Watson
LOCAL AUTHORITY	
Cllr Musa Dludla	Mount Edgecombe Councillor
Diane van Rensburg	eThekwini Municipality
PROVINCIAL AUTHORITY	
Dominic Wieners	Ezemvelo KZN Wildlife
Weziwe Tshabalala	Amafa aKwaZulu-Natali
Carolyn Schwegman	WESSA KZN
Natasha Brijlal Sifiso Miya	KwaZulu-Natal Department of Agriculture and Environmental Affairs
STATE DEPARTMENTS	
Manisha Maharaj	Department of Water Affairs
Roy Ryan	Department of Transport
Thobani Vetsheza	Department of Agriculture, Forestry and

	Fisheries
Nonhlanhla Mnyeni	Department of Agriculture

7.3 Overview of the Scoping Phase PPP

The PPP undertaken / to be undertaken during the Scoping Phase is presented in Figure 7-2.

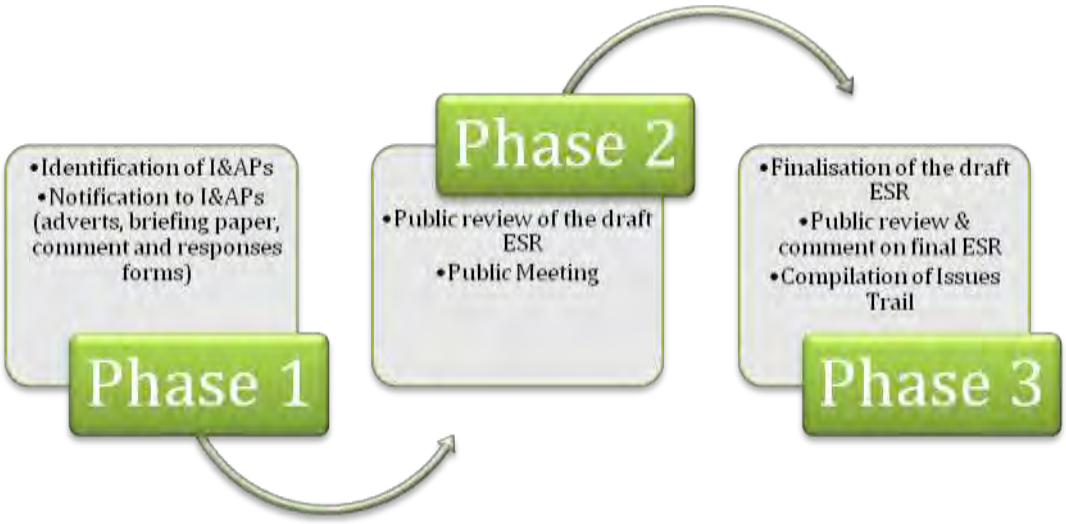


Figure 7-2: Key Phases in the PPP Undertaken During the Scoping Phase

7.3.1 Site Notification

The NEMA EIA Regulations (2010) require that a site notice be fixed at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is to be undertaken and on any alternative sites. The purpose of this is to notify the public of the project and to invite the public to register as stakeholders and inform them of the PP Process. Royal HaskoningDHV (known at the time as SSI Environmental) erected site notices at various noticeable locations around the perimeter of the site (refer to Appendix D).

7.3.2 Advertising

In compliance with the EIA Regulations (2010), notification of the commencement of the EIA process for the project was advertised in a local newspaper, namely the *Northglen News* newspaper on 21 August 2012 (refer to Appendix D). I&APs were requested to register their interest in the project and become involved in the EIA process. The primary aim of these advertisements was to ensure that the widest group of I&APs possible was informed and invited to provide input and questions and comments on the project.

7.3.3 Identification of Interested and Affected Parties

I&APs were identified primarily through an existing database as well as from responses received from the notice boards mentioned above. Electronic notification was sent to key stakeholders and other I&APs on the existing database, informing them of the application for the project, the availability of the draft ESR for review and indicating how they could become involved in the project. The contact details of all identified I&APs are updated on the project database, which is included in Appendix D.

7.3.4 Briefing Paper

A briefing paper or Background Information Document (BID) for the project was compiled in English (refer to Appendix D). The aim of this document is to provide a brief outline of the application and the nature of the development. It is also aimed at providing preliminary details regarding the EIA process, and explains how I&APs could become involved in the project. The briefing paper was distributed to all identified I&APs and stakeholders, together with a registration/comment sheet inviting I&APs to submit details of any issues, concerns or inputs they might have with regards to the project.

7.3.5 Issues Trail

Issues and concerns raised during the public participation process have been/ will be compiled into an Issues Trail (Comments and Response Report). The Issues Trail to date, attached as Appendix D, in which all comments received and responses provided have been captured.

An I&AP raised concern over access to the Mount Edgecombe Stables. THD have agreed to allow for the stables to continue operating and access to the stables is provided for within the planning of the Retail Park.

7.3.6 Public Meeting

The primary aim of the public meeting was to:

- provide I&APs and stakeholders with information regarding the proposed project and associated infrastructure;
- provide I&APs and stakeholders with information regarding the EIA process;
- provide an opportunity for I&APs and stakeholders to seek clarity on the project;
- record issues and concerns raised; and
- provide a forum for interaction with the project team.

A public meeting was held on the 29th of August 2012 at 17h30 at the Mount Edgecombe Country Club.

7.3.7 Public Review of the Draft Scoping Report

An advert was placed in the *Northglen News* newspaper informing I&APs of the application and the availability of the draft ESR and Plan of Study for EIA for review and comment. The advert appeared on 21 August 2012. A copy of the advertisement is included in Appendix D. Additionally, all registered I&APs were notified of the availability of the report in writing.

The draft ESR, together with the Plan of Study for EIA was made available for authority and public review for a total of *60 days* from 5 September 2012 to 5 November 2012. In addition, the report was made available at the following public locations within the study area, which are all readily accessible to I&APs:

- Mount Edgecombe Country Club;
- Tongaat Hulett Developments: 305 Umhlanga Rocks Drive, La Lucia; and
- Royal HaskoningDHV Website: www.rhdhv.co.za

7.3.8 Final Environmental Scoping Report

The final stage in the Environmental Scoping Study entailed the capturing of responses and comments from I&APs on the draft ESR in order to refine the ESR, and ensure that all issues of significance are addressed. The final ESR was then submitted to KZN DAEA for review and decision-making.

7.4 Overview of the EIA Phase PPP

The PPP undertaken / to be undertaken during the Scoping Phase is presented in Figure 7-3.

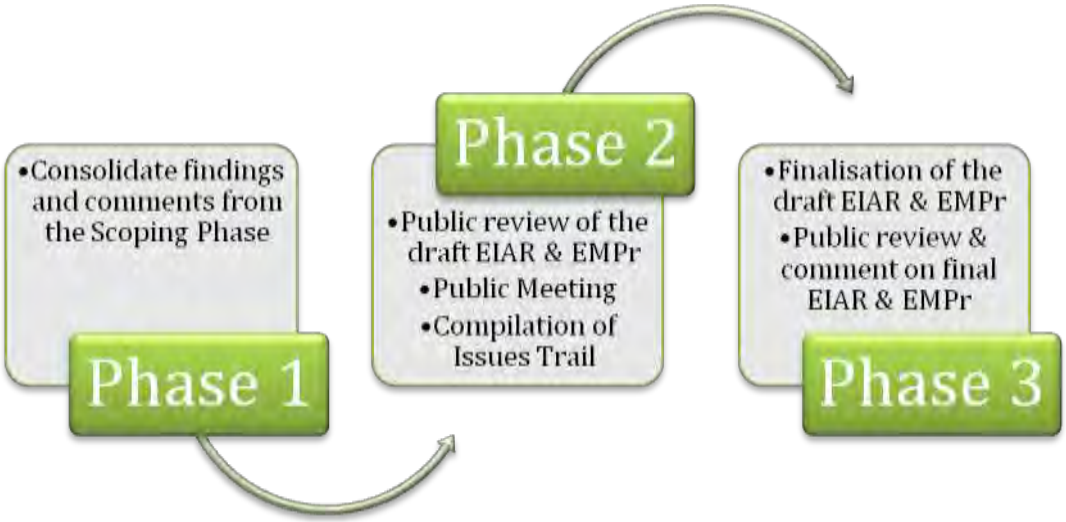


Figure 7-3: Key Phases in the PPP Undertaken During the EIA Phase

7.4.1 Advertising

In compliance with the EIA Regulations (2010), notification of the EIA Phase public meeting and availability of the draft EIAR was advertised in a local newspaper, namely the *Northglen News* newspaper on 24 May 2013 (refer to Appendix D).

7.4.2 Public Review of the Draft Environmental Impact Assessment Report

The draft EIAR has been made available for authority and public review for a total of *40 days* from 20 May 2013 to 28 June 2013. In addition, the report was made available at the following public locations within the study area, which are all readily accessible to I&APs:

- Mount Edgecombe Country Club;
- Tongaat Hulett Developments: 305 Umhlanga Rocks Drive, La Lucia; and
- Royal HaskoningDHV Website: www.rhdhv.co.za

7.4.3 Public Meeting

The primary aim of the public meeting was to:

- provide I&APs and stakeholders with information regarding the proposed project and associated infrastructure;
- provide I&APs and stakeholders with information regarding the EIA process;
- provide an opportunity for I&APs and stakeholders to seek clarity on the project;
- record issues and concerns raised; and
- provide a forum for interaction with the project team.

A public meeting was held on the 13th of June 2013 at 17h30 at the Mount Edgecombe Country Club.

7.4.4 Issues Trail

Issues and concerns raised during the public participation process have been compiled into an Issues Trail. The Issues Trail to date, attached as Appendix D, in which all comments received and responses provided have been captured.

7.5 Environmental Authorisation

On receipt of environmental authorisation (positive or negative) for the project, I&APs registered on the project database will be informed of this authorisation and its associated terms and conditions by correspondence and advertisement.

8 ENVIRONMENTAL IMPACT ASSESSMENT APPROACH

8.1 Introduction

Impact assessment must take account of the nature, scale and duration of effects on the environment, whether such effects are positive (beneficial) or negative (detrimental). Each issue/impact is also assessed according to the project stages from planning, through construction and operation to the decommissioning phase. Where necessary, the proposal for mitigation or optimisation of an impact is noted. A brief discussion of the impact and the rationale behind the assessment of its significance is provided in this Section. The EIA of the project activities is determined by identifying the environmental aspects and then

undertaking an environmental risk assessment to determine the significant environmental aspects. The environmental impact assessment has included all phases of the project namely:

- Construction Phase; and
- Operational Phase.

Due to the nature of the Cornubia Retail Park development it is anticipated that the infrastructure would be permanent, thus not requiring decommissioning or rehabilitation. Maintenance of infrastructure will be addressed under the operational phase. The decommissioning of infrastructure relating to the Mount Edgecombe Refuse Transfer Station will be the same as those for the construction of the Retail Park as this will be undertaken at the same time and therefore, such impacts have been included herein to avoid repetition.

8.2 Impact Assessment Methodology

The potential environmental impacts associated with the project will be evaluated according to it nature, extent, duration, intensity, probability and significance of the impacts, whereby:

- **Nature**: A brief written statement of the environmental aspect being impacted upon by a particular action or activity.
- **Extent**: The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale;
- **Duration**: Indicates what the lifetime of the impact will be;
- **Intensity**: Describes whether an impact is destructive or benign;
- **Probability**: Describes the likelihood of an impact actually occurring; and
- **Cumulative**: In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Table 8-1: Criteria Used for the Rating of Impacts

CRITERIA	DESCRIPTION			
EXTENT	**National (4)** The whole of South Africa	**Regional (3)** Provincial and parts of neighbouring provinces	**Local (2)** Within a radius of 2 km of the construction site	**Site (1)** Within the construction site
DURATION	**Permanent (4)** Mitigation either by man or natural process will not occur in such a	**Long-term (3)** The impact will continue or last for the entire operational life of	**Medium-term (2)** The impact will last for the period of the construction phase, where after	**Short-term (1)** The impact will either disappear with mitigation or will be mitigated

CRITERIA	DESCRIPTION			
	way or in such a time span that the impact can be considered transient	the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	it will be entirely negated	through natural process in a span shorter than the construction phase
INTENSITY	**Very High (4)** Natural, cultural and social functions and processes are altered to extent that they permanently cease	**High (3)** Natural, cultural and social functions and processes are altered to extent that they temporarily cease	**Moderate (2)** Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	**Low (1)** Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
PROBABILTY OF OCCURANCE	**Definite (4)** Impact will certainly occur	**Highly Probable (3)** Most likely that the impact will occur	**Possible (2)** The impact may occur	**Improbable (1)** Likelihood of the impact materialising is very low

Significance is determined through a synthesis of impact characteristics. Significance is also an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Table 8-2: Criteria for the rating of classified impacts

Low impact (4 -6 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
Medium impact (7 -9 points)	Mitigation is possible with additional design and construction inputs.
High impact (10 -12 points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact (12 - 14 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a "very high impact" is likely to be a fatal flaw.

Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse.
It is important to note that the status of an impact is assigned based on the status quo – i.e. should the project not proceed. Therefore not all negative impacts are equally significant.	

The suitability and feasibility of all proposed mitigation measures will be included in the assessment of significant impacts. This will be achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented. Mitigation measures identified as necessary will be included in an EMPr.

9 POTENTIAL IMPACTS ASSOCIATED WITH THE PROJECT

All potential impacts associated by the proposed development through all phases of the development life-cycle have been considered and assessed in this section for both the Retail Park development and the infrastructure for the Mount Edgecombe Refuse Transfer Station at the new sites proposed. These are assessed under the following criteria:

- Geology;
- Topography;
- Hydrogeology;
- Hydrology;
- Soils and Agricultural Potential;
- Vegetation;
- Wetlands;
- Waste;
- Air Quality;
- Odour;
- Noise;
- Heritage;
- Visual;
- Traffic;
- Socio-economic;
- Land Use Planning and Compatibility; and a
- Comparative Assessment of Alternatives.

For many of the specialist fields, the potential impacts for the different project phases for the two site options are relatively the same and have been combined to prevent repetition. Only where the impact ratings are different are the two sites separated in the tables below.

The decommissioning of infrastructure relating to the Mount Edgecombe Refuse Transfer Station relates to risks associated with any construction/deconstruction activities. As such, these will be the same as those for the construction of the Retail Park as this will be undertaken at the same time as the construction activities and therefore, such impacts have been included herein to avoid repetition. The waste specific impacts, including a plan for the disposal of waste from the deconstruction are assessed as part of the WML Application in a separate BAR.

9.1 Geology

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Disturbance of surface geology for development foundations.	1	2	1	2	Negative Low (-6)	• All site disturbances must be limited to the areas where structures will be constructed. • The cut slopes in soil and weathered rock should not be steeper than 1:2 (V:H) and 1:1 in rock. • Where the natural ground slope exceeds a slope angle of 1:6, the fills should be constructed on surface benched into suitable in-situ material. • The fill slopes must not be steeper than 1:1,5m and where more than about 10m in height they should not exceed 1:2 in overall steepness to ensure stability. • The maximum allowable bearing pressure of foundations, taken through the residual clayey soils into the weathered bedrock, requiring hard hand picking for excavation, should be restricted to 150kPa. • Large excavations for the contractor laydown area, storage areas or waste areas are not permitted. • Ensure that contractors and staff are well managed and adhere to the mitigation and management measures.	1	2	1	2	Negative Low (-6)
Gully or donga erosion by concentrated, uncontrolled water-flow.	1	2	2	2	Negative Medium (-7)	• Provide adequate stormwater surface drainage as per the stormwater management plan as part of the infra structural development of the area.	1	1	1	1	Negative Low (-4)

9.2 Topography

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Alteration of topography due to stockpiling of soil, building material and debris and waste material on site.	1	3	2	3	Negative Medium (-9)	• All stockpiles must be restricted to designated areas and are not to exceed a height of 2 metres. • Stockpiles created during the construction phase are not to remain during the operational phase. • The contractor must be limited to clearly defined access routes to ensure that sensitive and undisturbed areas are not disturbed.	1	2	1	3	Negative Medium (-7)

9.3 Hydrogeology

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Shallow groundwater contamination: • Spillage of fuels, lubricants and other chemicals. • Construction equipment, vehicles, workshop and wash bay areas will be a likely source of pollution as a non-point source. • Lack of provision of ablutions that may lead to the creation of informal ablutions.	1	2	2	2	Negative Medium (-7)	• All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time. • Material safety data sheets (MSDSs) are to be clearly displayed for all hazardous materials. • The integrity of the impervious surface and bunded area must be inspected regularly and any maintenance work conducted must be recorded in a maintenance report. • Employees should be provided with absorbent spill kits and disposal containers to handle spillages. • Train employees and contractors on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages. • All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor laydown area. • Employees should record and report any spillages to the responsible person.	1	2	1	2	Negative Low (-6)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
						• An Emergency Preparedness and Response Plan will be developed and implemented should and incident occur. • Access to storage areas on site must be restricted to authorised employees only. • Contractors will be held liable for any environmental damages caused by spillages. • Adequate provision of ablutions for construction employees.					
The consumption of groundwater can lead to the depletion of a natural resource.	1	3	3	2	Negative Medium (-9)	• No unauthorised extraction from boreholes (if any) for the proposed development will be permitted. • No new boreholes may be installed for extraction and consumption purposes without an appropriate water use licence.	1	2	1	1	Negative Low (-5)
OPERATIONAL											
Leaks of untreated water from pipelines may occur and impact on the shallow groundwater quality.	2	1	1	2	Negative Low (-6)	• Any leaks should be fixed immediately and areas rehabilitated as needed.	2	1	1	1	Negative Low (-5)

9.4 Hydrology

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
CONSTRUCTION											
Consumption and use of surface water for construction purposes (i.e. water tankers for dust suppression).	2	2	3	3	Negative High (-10)	• DWA to comment and advice on surface water availability and integrity.	2	2	3	3	Negative High (-10)
Contaminated run-off: • Spillage of fuels, lubricants and other chemicals; • Inadequate stormwater management around the site; the dumping of construction material, including fill or excavated material into, or close to surface water features that may then be washed into these features; • Construction-related activities such as cement batching; • Construction equipment, vehicles and workshop areas will be a likely source of pollution as a non-point source; and • Lack of provision of ablutions that may lead to the creation of 'informal ablutions' within or close to a surface water resource.	2	2	2	1	Negative Medium (-7)	• Bunded areas should be used to store chemicals. • Clean-up of spills as soon as they occur. • Keep construction activities away from the surface water resources. • Adequate provision of ablutions for construction employees. • Wastewater must not be allowed to come into direct contact with exposed soils or run across the site. Vehicles and machinery may not be washed on site. All wastewater must be collected in a sealed container and disposed of by an approved waste contractor. Waybills must be retained for inspection.	2	1	1	1	Negative Low (-5)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
Increased urban run-off.	2	2	2	1	Negative Medium (-7)	• Land disturbance must be minimized in order to prevent erosion and run-off - this includes leaving exposed soils open for a prolonged period of time. As soon as vegetation is cleared (including alien) the area must be re-vegetated if it is not to be developed on in future.	2	1	1	1	Negative Low (-5)
OPERATIONAL											
Increased urban run-off from urban infrastructure and roads.	2	2	2	3	Negative Medium (-9)	• The stormwater management plan must be implemented.	2	1	1	2	Negative Low (-6)
Leaks from pipelines – leaks of untreated water from pipelines may occur.	2	1	1	2	Negative Low (-6)	• Any leaks should be fixed immediately and areas rehabilitated as needed.	1	1	1	2	Negative Low (-5)

9.5 Soils and Agricultural Potential

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
ALTERNATIVE SITE 1 (INCLUDING SASA OWNED LAND)											
CONSTRUCTION											
Removal and compaction of soil during construction activities.	1	2	2	4	Negative Medium (-9)	• Strip topsoil prior to any construction activities. • Reuse topsoil to rehabilitate disturbed areas. • Topsoil must be kept separate from overburden and must not be used for building purposes or maintenance or access roads.	1	1	2	3	Negative Medium (-7)
Disturbance of soils and/or land use potential due to location of construction camp and associated infrastructure.	1	2	2	3	Negative Medium (-8)	• The contractor laydown area must be placed in an area where erven will be developed and not in an area that will be utilised in future as an open space or commercial. • The contractor laydown area may not be placed in or in close proximity to the wetland habitat on site. • No material may be stored or equipment repaired beyond the boundaries of the contractor laydown area.	1	1	3	2	Negative Medium (-7)
Erosion, degradation and loss of topsoil due to construction activities as well surface and stormwater run-off.	1	3	2	3	Negative Medium (-9)	• Minimise the clearance of vegetation to avoid exposure of soil. • Protect areas susceptible to erosion with mulch or a suitable alternative. • Implement the appropriate topsoil and stormwater run-off control management measures as per the EMPr to prevent the loss of topsoil. • Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off.	1	2	2	2	Negative Medium (-7)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Degradation of soil due to exposed areas and roads.	2	3	2	3	Negative High (-10)	• The roads that will no longer be used must be ripped or ploughed and if necessary, appropriately prepared to ensure the re-growth of vegetation. • Any materials that may hamper regrowth of vegetation must be removed prior to rehabilitation and disposed of at and appropriate site.	2	2	3	2	Negative Medium (-9)
Impact on land use and land capability.	2	4	4	4	Negative Very High (-14)	• The agricultural land capability of the Cornubia Project area can be classed as good land for agriculture. Due to the overall Cornubia Development which addresses housing shortages in the eTM, there is a need to align surrounding land uses with this. The approved Cornubia Development Framework identifies the site as a region for 'General Business' which the project aligns with. • With the construction phase activities, constant cognisance of the inherent high erosion risk potential of all soils and sites on the property should be taken and appropriate control and preventative measures put in place. • Note that DAFF have approved the release from agriculture for the entire development.	2	4	4	4	Negative Very High (-14)
ALTERNATIVE SITE 2 (EXCLUDING SASA OWNED LAND)											
CONSTRUCTION											
Removal and compaction of soil during construction activities.	1	2	2	4	Negative Medium (-9)	• Strip topsoil prior to any construction activities. • Reuse topsoil to rehabilitate disturbed areas. • Topsoil must be kept separate from overburden and must not be used for building purposes or maintenance or access roads.	1	1	2	3	Negative Medium (-7)
Disturbance of soils and/or land use potential due to location of construction	1	2	2	3	Negative Medium (-8)	• The contractor laydown area must be placed in an area where erven will be developed and not in an area that will be utilised in future as an open space or commercial.	1	1	1	2	Negative Low (-5)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
camp and associated infrastructure.						• The contractor laydown area may not be placed in or in close proximity to the wetland habitat on site. • No material may be stored or equipment repaired beyond the boundaries of the contractor laydown area.					
Erosion, degradation and loss of topsoil due to construction activities as well surface and stormwater run-off.	1	3	2	3	Negative Medium (-9)	• Minimise the clearance of vegetation to avoid exposure of soil. • Protect areas susceptible to erosion with mulch or a suitable alternative. • Implement the appropriate topsoil and stormwater run-off control management measures as per the EMPr to prevent the loss of topsoil. • Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off.	1	2	2	2	Negative Medium (-7)
Degradation of soil due to exposed areas and roads.	2	3	2	3	Negative High (-10)	• The roads that will no longer be used must be ripped or ploughed and if necessary, appropriately prepared to ensure the re-growth of vegetation. • Any materials that may hamper regrowth of vegetation must be removed prior to rehabilitation and disposed of at and appropriate site.	2	2	2	2	Negative Medium (-8)
Impact on land use and land capability.	2	4	4	4	Negative Very High (-14)	• The agricultural land capability of the Cornubia Project area can be classed as good land for agriculture. Due to the overall Cornubia Development which addresses housing shortages in the eTM, there is a need to align surrounding land uses with this. The approved Cornubia Development Framework identifies the site as a region for 'General Business' which the project aligns with. • With the construction phase activities, constant cognisance of the inherent high erosion risk potential of all soils and	2	4	3	4	Negative Very High (-13)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						sites on the property should be taken and appropriate control and preventative measures put in place. • Note that DAFF have approved the release from agriculture for the entire development.					
ALTERNATIVE SITE 1 (INCLUDING SASA OWNED LAND)											
CUMULATIVE											
Impact on food security.	3	3	3	2	Negative High (-11)	• THD have submitted a plan to address loss of agricultural land to the Department of Agriculture and other areas have been identified with excellent agricultural potential.	3	3	2	1	Negative Medium (-9)
ALTERNATIVE SITE 2 (EXCLUDING SASA OWNED LAND)											
CUMULATIVE											
Impact on food security.	3	3	3	2	Negative High (-11)	• THD have submitted a plan to address loss of agricultural land to the Department of Agriculture and other areas have been identified with excellent agricultural potential.	3	3	1	1	Negative Medium (-8)

9.6 Vegetation

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
ALTERNATIVE SITE 1 (INCLUDING SASA OWNED LAND)											
CONSTRUCTION											
Loss of major vegetation areas for the Cornubia Retail Park.	1	4	3	4	Negative Very High (-12)	• The footprint created by construction activities must be kept to a minimum wherever possible and stripped areas re-vegetated with indigenous vegetation as soon as construction activities cease in that particular area. • Weeds and alien vegetation should be removed and prevented from spreading with control measures. • A qualified botanist should undertake a plant relocation plan for the numerous *Scadozus puniceus* individuals prior to construction commencing. • A licence from the DAFF will be required for the removal of the *Sideroxylum inerme* which is a protected tree and Ezemvelo KZN Wildlife permits will be required for the removal of indigenous plants. • A specialist ecologist will be on site during the construction period to ensure that sensitive areas are not encroached on. • The rehabilitation and landscaping plan prepared for the entire Cornubia development will be applicable and must be implemented.	1	2	2	1	Negative Low (-6)
Impact on riparian zones.	1	2	4	4	Negative High (-11)	• Any work around the watercourse must be considered to be potentially negative and cautionary practices should be employed. • The wetlands and associated riparian zones are proposed to be infilled – see Section 9.7.	1	2	4	4	Negative High (-11)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Removal and use of local flora for firewood.	1	2	2	1	Negative Low (-6)	• No cutting down of trees for firewood. • Utilise commercially sold wood or other sources of energy. • Training of contractors on environmental awareness and the importance of flora.	1	1	1	1	Negative Low (-4)
ALTERNATIVE SITE 2 (EXCLUDING SASA OWNED LAND)											
CONSTRUCTION											
Loss of major vegetation areas for the Cornubia Retail Park.	1	4	3	4	Negative Very High (-12)	• The footprint created by construction activities must be kept to a minimum wherever possible and stripped areas re-vegetated with indigenous vegetation as soon as construction activities cease in that particular area. • Weeds and alien vegetation should be removed and prevented from spreading with control measures. • A qualified botanist should undertake a plant relocation plan for the numerous *Scadozus puniceus* individuals prior to construction commencing. • A licence from the DAFF will be required for the removal of the *Sideroxylum inerme* which is a protected tree and Ezemvelo KZN Wildlife permits will be required for the removal of indigenous plants. • A specialist ecologist will be on site during the construction period to ensure that sensitive areas are not encroached on. • The rehabilitation and landscaping plan prepared for the entire Cornubia development will be applicable and must be implemented.	1	2	1	1	Negative Low (-5)
Impact on riparian zones.	1	2	4	4	Negative High (-11)	• Any work around the watercourse must be considered to be potentially negative and cautionary practices should be employed. • The wetlands and associated riparian zones are proposed to be infilled – see Section 9.7.	1	2	4	4	Negative High (-11)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Removal and use of local flora for firewood.	1	2	2	1	Negative Low (-6)	• No cutting down of trees for firewood. • Utilise commercially sold wood or other sources of energy. • Training of contractors on environmental awareness and the importance of flora.	1	1	1	1	Negative Low (-4)
ALTERNATIVE SITE 1 (INCLUDING SASA OWNED LAND)											
OPERATIONAL/ CUMULATIVE											
Maintaining a nursery site.	2	4	3	4	Positive Very High (+13)	• The overall Cornubia Development proposes the establishment of a nursery in which indigenous vegetation will be relocated to. • The advantages of having an on-site nursery are numerous, with the single most significant factor being that the plants grown in the nursery are already acclimatised to the area in which they will be utilised. • The nursery site will also ensure that the species that are utilised are the correct species for the function that they are to perform, and will ensure that only indigenous species are utilised. • The design and management of the nursery will need to account for the fact that a portion of the nursery site is below the 1:100 year floodline.	2	4	3	4	Positive Very High (+13)
ALTERNATIVE SITE 2 (EXCLUDING SASA OWNED LAND)											
OPERATIONAL/CUMULATIVE											
Maintaining a nursery site.	2	4	3	4	Positive Very High (+13)	• The overall Cornubia Development proposes the establishment of a nursery in which indigenous vegetation will be relocated to. • The advantages of having an on-site nursery are numerous, with the single most significant factor being that the plants grown in the nursery are already acclimatised to the area in which they will be utilised.	2	4	3	4	Positive Very High (+13)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						• The nursery site will also ensure that the species that are utilised are the correct species for the function that they are to perform, and will ensure that only indigenous species are utilised. • The design and management of the nursery will need to account for the fact that a portion of the nursery site is below the 1:100 year floodline.					

9.7 Wetlands

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Permanent loss of wetland as a result of infilling for the construction platforms, sewer pipeline and stormwater infrastructure.	2	4	2	4	Negative Very High (-12)	• Due to the poor condition of the wetlands on site, it is likely that the rehabilitation of remaining wetland areas within Cornubia will compensate for wetlands that are lost. • Offsets have been calculated for subsequent phases and onsite rehabilitation will sufficiently compensate for wetlands that are lost. • A 30 metre buffer zone is recommended around all	2	2	2	2	Negative Medium (-8)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						wetlands where construction activities are in close proximity. • Refer to Section 6.5 and the EMPr for further mitigation.					
Erosion of wetland soils as a result of uncontrolled stormwater run-off generated from the construction sites.	2	4	2	2	Negative High (-10)	• Stormwater run-off should be appropriately managed so as not to alter the timing and intensity of flows entering the wetland under the natural condition. • This will include the use of temporary attenuation ponds and temporary berms or furrows to direct flows to less sensitive areas. • A natural vegetation buffer of 30 m wide should be maintained around all remaining wetlands on/ around site.	2	2	1	2	Negative Medium (-7)
Deposition of excess sediment in wetland system as a result of erosion in the catchment caused by improper stormwater management during earthworks.	2	4	2	3	Negative High (-11)	• Stormwater run-off should be appropriately managed so as not to alter the timing and intensity of flows entering the wetland under the natural condition. • This will include the use of temporary attenuation ponds and temporary berms or furrows to direct flows to less sensitive areas. • It is assumed that if stormwater is properly managed in the catchment during construction, erosion will not become a major problem. • In addition to properly managing stormwater, methods to prevent and contain erosion such as geo-textiles and silt fences should be used on exposed slopes.	2	2	1	2	Negative Medium (-7)
Decrease in water quality as a result of contamination of run-off from construction site.	2	4	2	3	Negative High (-11)	• Care should be taken at construction sites to store hazardous substances, such as fuel, and oil appropriately, not allowing these substances to enter watercourses. • Stormwater run-off should be appropriately managed so	2	2	1	2	Negative Medium (-7)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						as not to alter the timing and intensity of flows entering the wetland under the natural condition. • This will include the use of temporary attenuation ponds and temporary berms or furrows to direct flows to less sensitive areas. • It is assumed that if stormwater is properly managed in the catchment during construction, erosion will not become a major problem. • In addition to properly managing stormwater, methods to prevent and contain erosion such as geo-textiles and silt fences should be used on exposed slopes.					
Direct disturbances to the wetland as a result of the establishment of the sewer pipe crossing.	2	4	2	4	Negative Very High (-12)	• Disturbance to the wetland soils along the route should be restricted to an established right-of-way sewer line corridor for the construction phase. • The right-of-way corridor within the wetlands should be as narrow as practically possible and should be demarcated and fenced off during the site setup phase. • All wetland areas outside of the demarcated right-of-way must be considered no-go areas.	2	2	2	2	Negative Medium (-8)
Impact on Wetland Fauna											
Loss of small frog populations and the marginal bird habitat. These include: • Painted Reed Frog; • Bronze Caco; • African Darter; and • Weaver species.	1	4	1	4	Negative High (-10)	• The infilling of Wetland Unit A6b should be undertaken in winter (non-breeding season). If this cannot be adhered to, an avifaunal specialist must conduct a site visit to the wetlands to provide comment and advice on whether any birds need rescue or relocation. The construction team must undertake search and rescue of fauna on site and relocate to nearby wetland habitats.	1	4	1	4	Negative High (-10)
OPERATIONAL											
Erosion of wetland due to	2	4	2	3	Negative High	• The onsite stormwater systems should discharge	2	2	2	2	Negative

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
increased run-off entering the wetland during peak flows as a result of increased hardened surfaces in the catchment.					(-11)	stormwater into the environment at rates and volumes that are equal to that of the natural condition. This will likely involve the establishment of attenuation ponds to capture run-off. Where possible, these should be located outside of the wetlands and their buffers. • All stormwater outfalls should have some form of energy dissipation such as gabion mattresses or geo-textiles to prevent such erosion from occurring. • In addition, where possible, outfalls should not be placed on steep slopes and should empty into densely vegetated areas before entering into the wetlands. • Stormwater outfalls should not be located within the wetland buffers and outfalls should not be placed above wetlands.					Medium (-8)
CUMULATIVE											
• Impacts on individual wetland (units) across the overall Cornubia site could result in an important cumulative impact on respective catchments. • Pollutants released into numerous wetlands through activities could result in downstream impacts.	3	3	3	2	Negative High (-11)	• Wetland offsets and rehabilitation on remaining wetlands must be undertaken as per the recommendations of the specialist report and Open Space and Wetland Rehabilitation Plan.	2	3	1	2	Negative Medium (-8)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Improvement in the health of wetlands as a result of rehabilitation of the wetland and buffer zones.	2	3	4	4	Positive Very High (+13)	• Wetland units A5, A6 and A8 within the greater Cornubia Development will be rehabilitated to offset for the wetland loss using an offset ration of 1:3.	2	3	4	4	Positive Very High (+13)

9.8 Waste

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Contamination of the surface and site with general waste. General waste produced on site includes: • Office waste (e.g. food waste, paper, plastic); • Operational waste (clean steel, wood, glass); and • General domestic waste (food, cardboards, paper, bottles, tins).	1	2	2	3	Negative Medium (-8)	• An adequate number of general waste receptacles, including bins must be arranged around the site to collect all domestic refuse, and to minimise littering. • Bins must be provided on site for use by employees. • Bins should be clearly marked and lined for efficient control and safe disposal of waste. • Different waste bins, for different waste streams must be provided to ensure correct waste separation.	1	2	1	2	Negative Low (-6)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						• A fenced area must be allocated for waste sorting and disposal on the site. • General waste produced on site is to be collected in skips for disposal at the local municipal waste site. Hazardous waste is not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site. • Under no circumstances is waste to be burnt or buried on site. • Waste bins should be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance. • All general waste must be removed from the site at regular intervals and disposed of in suitable waste receptacle.					
Contamination of the surface and site with general and hazardous waste. Hazardous waste produced on site includes: • Oil and other lubricants, diesel, paints, solvent; • Containers that contained chemicals, oils or greases; and • Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals or bitumen).	1	2	3	3	Negative Medium (-9)	• Hazardous waste is to be disposed at a Permitted Hazardous Waste Landfill Site. The Environmental Manager must have as part of his/her records the waste manifest for each batch based disposal. • Hazardous waste bins must be clearly marked, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid). • A hazardous waste disposal certificate must be obtained from the waste removal company as evidence of correct disposal. • In the case of a spill of hydrocarbons, chemicals	1	1	2	2	Negative Low (-6)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						or bituminous, the spill should be contained and cleaned up and the material together with any contaminated soil collected and disposed of as hazardous waste to minimize pollution risk.					
Generation and disposal of sewage waste of temporary construction toilets.	1	2	3	2	Negative Medium (-8)	• On-site chemical toilets will be provided for domestic purposes during construction phase. • The contractors will be responsible for the maintenance of the chemical toilets. • Should any spills or incidents occur; the material will be cleaned up immediately and disposed off appropriately. • All incidents must be reported to the responsible site officer as soon as it occurs.	1	2	2	2	Negative Medium (-7)
OPERATIONAL											
Generation and disposal of domestic waste by the proposed development.	2	3	3	3	Negative High (-11)	• Waste will be collected by the eTM and disposed of at an appropriate and licensed waste disposal facility.	1	3	2	2	Negative Medium (-8)
Generation and disposal of sewage waste by the proposed development.	2	3	3	3	Negative High (-11)	• All sewage will be sent through to the Phoenix Waste Water Treatment works.	1	3	2	2	Negative Low (-8)

9.9 Air Quality

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
ALTERNATIVE SITE 1 (INCLUDING SASA OWNED LAND)											
CONSTRUCTION											
Dust and emissions during construction generated by debris handling and debris piles, truck transport, bulldozing, general construction.	1	2	2	3	Negative Medium (-8)	• Dust must be suppressed on the construction site and during the transportation of material during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off. • Loads could be covered to avoid loss of material in transport, especially if material is transported off site. • Dust and mud should be controlled at vehicle exit and entry points to prevent the dispersion of dust and mud beyond the site boundary. Facilities for the washing of vehicles should be provided at the entry and exit points. • A speed limit of 40 km/hr should be set for all vehicles travelling over exposed areas. • During the transfer of materials, drop heights should be minimised to control the dispersion of mater being transferred. • The height of all stockpiles on site should be a maximum of 2m. • Use of dust retardant road surfacing if made necessary due to the exceedance of Air Quality Guidelines.	3	1	2	2	Negative Medium (-8)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Generation of fumes from vehicle emissions may pollute the air.	1	2	2	3	Negative Medium (-8)	• All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability in order to prevent smoke emissions	3	1	2	2	Negative Medium (-8)
ALTERNATIVE SITE 2 (EXCLUDING SASA OWNED LAND)											
CONSTRUCTION											
Dust and emissions during construction generated by debris handling and debris piles, truck transport, bulldozing, general construction.	1	2	2	3	Negative Medium (-8)	• Dust must be suppressed on the construction site and during the transportation of material during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off. • Loads could be covered to avoid loss of material in transport, especially if material is transported off site. • Dust and mud should be controlled at vehicle exit and entry points to prevent the dispersion of dust and mud beyond the site boundary. Facilities for the washing of vehicles should be provided at the entry and exit points. • A speed limit of 40 km/hr should be set for all vehicles travelling over exposed areas. • During the transfer of materials, drop heights should be minimised to control the dispersion of mater being transferred. • The height of all stockpiles on site should be a maximum of 2m. • Use of dust retardant road surfacing if made necessary due to the exceedance of Air Quality Guidelines.	2	1	2	2	Negative Medium (-7)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Generation of fumes from vehicle emissions may pollute the air.	1	2	2	3	Negative Medium (-8)	• All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability in order to prevent smoke emissions	2	1	2	2	Negative Medium (-7)

9.10 Odour

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Release of odours as a result of the chemical toilets on site.	1	2	3	2	Negative Medium (-8)	• Chemical toilets must be provided and cleaned on a regular (weekly) basis.	1	1	1	2	Negative Low (-5)

9.11 Noise

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
ALTERNATIVE SITE 1 (INCLUDING SASA OWNED LAND)											
CONSTRUCTION											
During the construction phase there is likely to be an increase in noise pollution from construction vehicles and construction staff.	1	2	3	4	Negative High (-10)	• All construction activities should be undertaken according to daylight working hours between the hours of 07:00 – 17:00 on weekdays and 7:30 – 13:00 on Saturdays. • No construction activities may be undertaken on Sunday. • Provide all equipment with standard silencers. Maintain silencer units in vehicles and equipment in good working order. • All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. • Construction staff working in area where the 8-hour ambient noise levels exceed 60 dBA must have the appropriate Personal Protective Equipment (PPE). • All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).	2	2	2	3	Negative Medium (-9)
ALTERNATIVE SITE 2 (EXCLUDING SASA OWNED LAND)											
CONSTRUCTION											
During the construction phase there is likely to be an increase in noise	1	2	3	4	Negative High (-10)	• All construction activities should be	1	2	2	3	Negative Medium

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
pollution from construction vehicles and construction staff.						undertaken according to daylight working hours between the hours of 07:00 – 17:00 on weekdays and 7:30 – 13:00 on Saturdays. • No construction activities may be undertaken on Sunday. • Provide all equipment with standard silencers. Maintain silencer units in vehicles and equipment in good working order. • All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. • Construction staff working in area where the 8-hour ambient noise levels exceed 60 dBA must have the appropriate Personal Protective Equipment (PPE). • All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).					(-8)

9.12 Heritage

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Disturbance of sites of archaeological, historical and cultural significance.	1	1	1	1	Negative Low (-4)	• There were no sites or objects of archaeological, historical and cultural significance identified, however, if during construction any possible finds are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find. • It is advisable that an information section on cultural resources be included in the SHEQ training given to contractors involved in surface earthmoving activities. These sections must include basic information on: ▪ Heritage; ▪ Graves; ▪ Archaeological finds; and ▪ Historical Structures. • The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures.	1	1	1	1	Negative Low (-4)

9.13 Visual

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
OPERATIONS											
Construction for permanent structures associated with the proposed development (e.g. retail complex) could create temporary un-vegetated areas in the landscape that could create a visual contrast with the natural vegetation.	1	1	1	2	Negative Low (-5)	• This will not be an issue for the section of the site boarded by Flanders Drive and the M41 where commercial/ retail developments are the norm. • The ultimate development of Cornubia will see the entire area developed and the proposal falls within the approved Framework Plan for the area.	1	1	1	1	Negative Low (-4)

9.14 Traffic

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
During the construction and decommissioning phases there is likely to be an increase in traffic from construction vehicles.	1	2	2	3	Negative Medium (-8)	• Construction vehicles are to avoid main roads during peak traffic hours. • All vehicles entering the Site are to be roadworthy. • Seatbelts are to be worn at all times. • When using heavy or large vehicles / equipment, "spotters" are to be present to assist the driver with his blind spots. • Any incident or damage to a vehicle must be reported immediately.	1	1	1	2	Negative Low (-5)
OPERATIONAL											
Traffic along Flanders Drive and the M41 will increase as congestion is presently a concern and people are attracted to the new retail facilities.	2	3	4	4	Negative Very High (-13)	• The proposed M41 interchange will ease the current traffic congestion • All future proposals for road networks as outlined in the TIA must be implanted for existing and new roads.	2	1	1	1	Negative Low (-5)
CUMULATIVE											
Traffic in the region will increase as the residential portion of Cornubia is developed.	2	3	4	4	Negative Very High (-13)	• All future proposals for road networks as outlined in the TIA must be implanted for existing and new roads.	2	1	1	1	Negative Low (-5)

9.15 Socio-economic

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Employment											
The development will result in job creation and provision of employment.	1	3	3	3	Positive High (+10)	• All labour (skilled and unskilled) and contractors should be sourced locally where possible. • A labour and recruitment policy will be developed, displayed and implemented by the contractor. • Recruitment at the construction site will not be allowed. • Where possible, labour intensive practices (as opposed to mechanised) should be practiced. • The principles of equality, BEE, gender equality and non-discrimination will be implemented.	2	4	4	4	Positive Very High (+14)
Population Change											
Job creation during the construction phase could result in the influx of people to the area.	2	2	2	2	Negative Medium (-8)	• If possible all labour should be sourced locally. • Contractors and their families may not stay on site. • No informal settlements will be allowed.	2	1	1	1	Negative Low (-5)
Security and Social Life											
Contractors, the influx of people and	2	4	3	2	Negative High	• The developers need to be actively involved	2	3	2	2	Negative

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
potential job creation will result in the proliferation of social ills and issues such as crime, prostitution, the spread of HIV/AIDS, informal settlements etc.					(-11)	in the prevention of social ills associated with contractors. • If possible all labour should be sourced locally. • Contractors and their families may not stay on site. • No informal settlements will be allowed. • Contractors must be educated about the risk of prostitution and spread of HIV and AIDS. • Strict penalties will be built into tenders to deal with issues such as petty crime, stock theft, fence cutting, trespassing etc. • No poaching of wildlife or selling of firewood will be allowed.					Medium (-9)
Safety											
Public safety during construction.	1	2	2	2	Negative Medium (-7)	• Members of the public adjacent to the construction site should be notified of construction activities in order to limit unnecessary disturbance or interference. • Construction activities will be undertaken during daylight hours and not on Sundays.	1	2	1	1	Negative Low (-5)
Construction staff safety during construction.	1	2	2	3	Negative Medium (-8)	• Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction. • All construction staff must have the appropriate PPE. • The construction staff handling chemicals or hazardous materials must be trained in the use of the substances and the	1	2	2	1	Negative Low (-6)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						environmental, health and safety consequences of incidents. • Report and record any environmental, health and safety incidents to the responsible person.					
OPERATIONAL											
Employment											
The development will result in job creation and provision of employment.	2	3	3	4	Positive Very High (+12)	• The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs. • Jobs for the maintenance of infrastructure and services will be created following the completion of the development. These jobs might be made available to existing labour there creating long term employment. • Service contractors could have access to other developments or projects in the area thereby creating long term employment.	2	3	3	4	Positive Very High (+12)
Energy											
Energy consumption.	2	3	3	3	Negative High (-11)	• It is recommended that renewable energy options and/or alternative energy sources be listed as the preferred options under the conditions of establishment.	2	2	2	2	Negative Medium (-8)

MOUNT EDGECOMBE REFUSE TRANSFER STATION – CONSTRUCTION PHASE FOR INFRASTRUCTURAL REQUIREMENTS ONLY

9.16 Geology

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
CONSTRUCTION											
Disturbance of surface geology for development foundations.	1	2	1	2	Negative Low (-6)	• All site disturbances must be limited to the areas where structures will be constructed. • The cut slopes in soil and weathered rock should not be steeper than 1:2 (V:H) and 1:1 in rock. • Where the natural ground slope exceeds a slope angle of 1:6, the fills should be constructed on surface benched into suitable in-situ material. • The fill slopes must not be steeper than 1:1,5m and where more than about 10m in height they should not exceed 1:2 in overall steepness to ensure stability. • The maximum allowable bearing pressure of foundations, taken through the residual clayey soils into the weathered bedrock, requiring hard hand picking for excavation, should be restricted to 150kPa. • Large excavations for the contractor laydown area, storage areas or waste areas are not permitted. • Ensure that contractors and staff are well managed and adhere to the mitigation and management measures.	1	2	1	2	Negative Low (-6)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Gully or donga erosion by concentrated, uncontrolled water-flow.	1	2	2	2	Negative Medium (-7)	• Provide adequate stormwater surface drainage as per the stormwater management plan as part of the infra structural development of the area.	1	1	1	1	Negative Low (-4)

9.17 Topography

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Alteration of topography due to stockpiling of soil, building material and debris and waste material on site.	1	3	2	3	Negative Medium (-9)	• All stockpiles must be restricted to designated areas and are not to exceed a height of 2 metres. • Stockpiles created during the construction phase are not to remain during the operational phase. • The contractor must be limited to clearly defined access routes to ensure that sensitive and undisturbed areas are not disturbed.	1	2	1	3	Negative Medium (-7)

9.18 Hydrogeology[18]

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Shallow groundwater contamination: • Spillage of fuels, lubricants and other chemicals. • Construction equipment, vehicles, workshop and wash bay areas will be a likely source of pollution as a non-point source. • Lack of provision of ablutions that may lead to the creation of informal ablutions.	1	2	2	2	Negative Medium (-7)	• All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time. • Material safety data sheets (MSDSs) are to be clearly displayed for all hazardous materials. • The integrity of the impervious surface and bunded area must be inspected regularly and any maintenance work conducted must be recorded in a maintenance report. • Employees should be provided with absorbent spill kits and disposal containers to handle spillages. • Train employees and contractors on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages. • All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be	1	2	1	2	Negative Low (-6)

[18] *Leachate and other such waste related impacts during the operational phase relating to the relocation of the Mount Edgecombe Refuse Transfer Station will be assessed as part of the Basic Assessment Process for the Waste Management Licence Application.*

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
						undertaken beyond the contractor laydown area. • Employees should record and report any spillages to the responsible person. • An Emergency Preparedness and Response Plan will be developed and implemented should and incident occur. • Access to storage areas on site must be restricted to authorised employees only. • Contractors will be held liable for any environmental damages caused by spillages. • Adequate provision of ablutions for construction employees.					
The consumption of groundwater can lead to the depletion of a natural resource.	1	3	3	2	Negative Medium (-9)	• No unauthorised extraction from boreholes (if any) for the proposed development will be permitted. • No new boreholes may be installed for extraction and consumption purposes without an appropriate water use licence.	1	2	1	1	Negative Low (-5)

9.19 Hydrology

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
ALTERNATIVE SITE 1											
CONSTRUCTION											
Consumption and use of surface water for construction purposes (i.e. water tankers for dust suppression).	2	2	3	3	Negative High (-10)	• DWA to comment and advise on surface water availability and integrity.	2	2	3	3	Negative High (-10)
Contaminated run-off: • Spillage of fuels, lubricants and other chemicals; • Inadequate stormwater management around the site; the dumping of construction material, including fill or excavated material into, or close to surface water features that may then be washed into these features; • Construction-related activities such as cement batching; • Construction equipment, vehicles and workshop areas will be a likely source of pollution as a non-point source; and • Lack of provision of ablutions that may lead to the creation of 'informal ablutions' within or close to a surface water resource.	2	2	2	1	Negative Medium (-7)	• Bunded areas should be used to store chemicals. • Clean-up of spills as soon as they occur. • Keep construction activities away from the surface water resources. • Adequate provision of ablutions for construction employees. • Wastewater must not be allowed to come into direct contact with exposed soils or run across the site. Vehicles and machinery may not be washed on site. All wastewater must be collected in a sealed container and disposed of by an approved waste contractor. Waybills must be retained for inspection.	2	1	1	1	Negative Low (-5)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
Increased urban run-off.	2	2	2	1	Negative Medium (-7)	• Land disturbance must be minimized in order to prevent erosion and run-off - this includes leaving exposed soils open for a prolonged period of time. As soon as vegetation is cleared (including alien) the area must be re-vegetated if it is not to be developed on in future.	2	1	1	1	Negative Low (-5)
ALTERNATIVE SITE 2											
CONSTRUCTION											
Consumption and use of surface water for construction purposes (i.e. water tankers for dust suppression).	2	2	3	3	Negative High (-10)	• DWA to comment and advise on surface water availability and integrity.	2	2	3	3	Negative High (-10)
Contaminated run-off: • Spillage of fuels, lubricants and other chemicals; • Inadequate stormwater management around the site; the dumping of construction material, including fill or excavated material into, or close to surface water features that may then be washed into these features; • Construction-related activities such as cement batching; • Construction equipment, vehicles and workshop areas will be a likely source of pollution as a non-point source; and • Lack of provision of ablutions that	2	2	2	3	Negative Medium (-9)	• Bunded areas should be used to store chemicals. • Clean-up of spills as soon as they occur. • Keep construction activities away from the surface water resources. • Adequate provision of ablutions for construction employees. • Wastewater must not be allowed to come into direct contact with exposed soils or run across the site. Vehicles and machinery may not be washed on site. All wastewater must be collected in a sealed container and disposed of by an approved waste contractor. Waybills must be retained for inspection.	2	1	1	3	Negative Medium (-7)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
may lead to the creation of 'informal ablutions' within or close to a surface water resource.											
Increased urban run-off.	2	2	2	1	Negative Medium (-7)	• Land disturbance must be minimized in order to prevent erosion and run-off - this includes leaving exposed soils open for a prolonged period of time. As soon as vegetation is cleared (including alien) the area must be re-vegetated if it is not to be developed on in future.	2	1	1	1	Negative Low (-5)

9.20 Soils and Agricultural Potential

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Removal and compaction of soil during construction activities.	1	2	2	4	Negative Medium (-9)	• Strip topsoil prior to any construction activities. • Reuse topsoil to rehabilitate disturbed areas. • Topsoil must be kept separate from overburden and must not be used for building purposes or maintenance or access	1	1	2	3	Negative Medium (-7)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						roads.					
Disturbance of soils and/or land use potential due to location of construction camp and associated infrastructure.	1	2	2	3	Negative Medium (-8)	• The contractor laydown area must be placed in an area where erven will be developed and not in an area that will be utilised in future as an open space or commercial. • The contractor laydown area may not be placed in or in close proximity to the wetland habitat on site. • No material may be stored or equipment repaired beyond the boundaries of the contractor laydown area.	1	1	1	2	Negative Low (-5)
Erosion, degradation and loss of topsoil due to construction activities as well surface and stormwater run-off.	1	3	2	3	Negative Medium (-9)	• Minimise the clearance of vegetation to avoid exposure of soil. • Protect areas susceptible to erosion with mulch or a suitable alternative. • Implement the appropriate topsoil and stormwater run-off control management measures as per the EMPr to prevent the loss of topsoil. • Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off.	1	2	2	2	Negative Medium (-7)
Degradation of soil due to exposed areas and roads.	2	3	2	3	Negative High (-10)	• The roads that will no longer be used must be ripped or ploughed and if necessary, appropriately prepared to ensure the re-growth of vegetation. • Any materials that may hamper regrowth of vegetation must be removed prior to rehabilitation and disposed of at and appropriate site.	2	2	2	2	Negative Medium (-8)
Impact on land use and land capability.	2	4	4	4	Negative Very High (-14)	• The agricultural land capability of the Cornubia Project area can be classed as good land for agriculture. Due to the overall Cornubia Development which addresses housing shortages in the eTM, there is a need to align surrounding land uses with this. The approved Cornubia Development	2	4	4	4	Negative Very High (-14)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						Framework identifies the site as a region for 'General Business' which the project aligns with. • With the construction phase activities, constant cognisance of the inherent high erosion risk potential of all soils and sites on the property should be taken and appropriate control and preventative measures put in place. • Note that DAFF have approved the release from agriculture for the entire development.					
CUMULATIVE											
Impact on food security.	3	3	3	2	Negative High (-11)	• THD have submitted a plan to address loss of agricultural land to the Department of Agriculture and other areas have been identified with excellent agricultural potential.	3	3	1	1	Negative Medium (-8)

9.21 Vegetation

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
ALTERNATIVE SITE 1											
CONSTRUCTION											
Placement of Station near/on areas of dense vegetation will cause loss of vegetation.	1	3	2	4	Negative High (-10)	• The footprint created by construction activities must be kept to a minimum wherever possible and stripped areas re-vegetated with indigenous vegetation as soon as construction activities cease in that particular area. • Weeds and alien vegetation should be removed and prevented from spreading with control measures. • A qualified botanist should undertake a plant relocation plan for the numerous *Scadozus puniceus* individuals prior to construction commencing. • A specialist ecologist will be on site during the construction period to ensure that sensitive areas are not encroached on. • The rehabilitation and landscaping plan prepared for the entire Cornubia development will be applicable and must be implemented.	1	2	1	4	Negative Medium (-8)
ALTERNATIVE SITE 2											
CONSTRUCTION											
Placement of Station near/on areas of dense vegetation and Flanders Quarry will cause loss of vegetation.	1	3	2	3	Negative Medium (-9)	• The overall Cornubia Development proposes the establishment of a nursery in which indigenous vegetation will be relocated to. • The advantages of having an on-site nursery are	1	2	1	3	Negative Medium (-7)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						numerous, with the single most significant factor being that the plants grown in the nursery are already acclimatised to the area in which they will be utilised. • The nursery site will also ensure that the species that are utilised are the correct species for the function that they are to perform, and will ensure that only indigenous species are utilised. • The design and management of the nursery will need to account for the fact that a portion of the nursery site is below the 1:100 year floodline.					

9.22 Wetlands

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
ALTERNATIVE SITE 1											
CONSTRUCTION											
Minimal degradation to wetland as a result of infilling for the access road construction.	2	2	2	3	Negative Medium (-8)	• Due to the poor condition of the wetlands on site, it is likely that the rehabilitation of remaining wetland areas within Cornubia will compensate for wetlands that are lost. • Offsets have been calculated for subsequent	1	2	2	3	Negative Medium (-8)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						phases and onsite rehabilitation will sufficiently compensate for wetlands that are lost. • Refer to Section 5 and EMPr for further mitigation.					
CUMULATIVE											
• Impacts on individual wetland (units) across the overall Cornubia site could result in an important cumulative impact on respective catchments. • Pollutants released into numerous wetlands through activities could result in downstream impacts.	3	3	3	2	Negative High (-11)	• Wetland offsets and rehabilitation on remaining wetlands must be undertaken as per the recommendations of the specialist report and Open Space and Wetland Rehabilitation Plan.	2	3	1	2	Negative Medium (-8)
Improvement in the health of wetlands as a result of rehabilitation of the wetland and buffer zones.	2	3	4	4	Positive Very High (+13)	• Wetland within the greater Cornubia Development will be rehabilitated to offset for the wetland loss using an offset ratio exceeding 1:3.	2	3	4	4	Positive Very High (+13)
ALTERNATIVE SITE 2											
CONSTRUCTION											
Loss to wetland area as a result of infilling for the access roads crossing.	2	3	4	4	Negative Very High (-13)	• Due to the poor condition of the wetlands on site, it is likely that the rehabilitation of remaining wetland areas within Cornubia will compensate for wetlands that are lost. • Offsets have been calculated for subsequent phases and onsite rehabilitation will sufficiently compensate for wetlands that are	2	3	3	4	Negative Very High (-12)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						lost. • Refer to Section 5 and EMPr for further mitigation.					
CUMULATIVE											
• Impacts on individual wetland (units) across the overall Cornubia site could result in an important cumulative impact on respective catchments. • Pollutants released into numerous wetlands through activities could result in downstream impacts.	3	3	3	2	Negative High (-11)	• Wetland offsets and rehabilitation on remaining wetlands must be undertaken as per the recommendations of the specialist report and Open Space and Wetland Rehabilitation Plan.	2	3	1	2	Negative Medium (-8)
Improvement in the health of wetlands as a result of rehabilitation of the wetland and buffer zones.	2	3	4	4	Positive Very High (+13)	• Wetland units A5, A6 and A8 within the greater Cornubia Development will be rehabilitated to offset for the wetland loss using an offset ratio of 1:3.	2	3	4	4	Positive Very High (+13)

9.23 Waste[19]

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Contamination of the surface and site with general waste. General waste produced on site includes: • Office waste (e.g. food waste, paper, plastic); • Operational waste (clean steel, wood, glass); and • General domestic waste (food, cardboards, paper, bottles, tins).	1	2	2	3	Negative Medium (-8)	• An adequate number of general waste receptacles, including bins must be arranged around the site to collect all domestic refuse, and to minimise littering. • Bins must be provided on site for use by employees. • Bins should be clearly marked and lined for efficient control and safe disposal of waste. • Different waste bins, for different waste streams must be provided to ensure correct waste separation. • A fenced area must be allocated for waste sorting and disposal on the site. • General waste produced on site is to be collected in skips for disposal at the local municipal waste site. Hazardous waste is not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site. • Under no circumstances is waste to be burnt or	1	2	1	2	Negative Low (-6)

[19] *Waste specific impacts relating to the relocation of the Mount Edgecombe Refuse Transfer Station will be assessed as part of the Basic Assessment Process for the Waste Management Licence Application.*

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						buried on site. • Waste bins should be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance. • All general waste must be removed from the site at regular intervals and disposed of in suitable waste receptacle.					
Contamination of the surface and site with general and hazardous waste. Hazardous waste produced on site includes: • Oil and other lubricants, diesel, paints, solvent; • Containers that contained chemicals, oils or greases; and • Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals or bitumen).	1	2	3	3	Negative Medium (-9)	• Hazardous waste is to be disposed at a Permitted Hazardous Waste Landfill Site. The Environmental Manager must have as part of his/her records the waste manifest for each batch based disposal. • Hazardous waste bins must be clearly marked, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid). • A hazardous waste disposal certificate must be obtained from the waste removal company as evidence of correct disposal. • In the case of a spill of hydrocarbons, chemicals or bituminous, the spill should be contained and cleaned up and the material together with any contaminated soil collected and disposed of as hazardous waste to minimize pollution risk.	1	1	2	2	Negative Low (-6)
Generation and disposal of sewage waste of temporary construction toilets.	1	2	3	2	Negative Medium (-8)	• On-site chemical toilets will be provided for domestic purposes during construction phase. • The contractors will be responsible for the maintenance of the chemical toilets. • Should any spills or incidents occur; the material	1	2	2	2	Negative Medium (-7)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						will be cleaned up immediately and disposed off appropriately. • All incidents must be reported to the responsible site officer as soon as it occurs.					

9.24 Air Quality

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Dust and emissions during construction generated by debris handling and debris piles, truck transport, bulldozing, general construction.	1	2	2	3	Negative Medium (-8)	• Dust must be suppressed on the construction site and during the transportation of material during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off. • Loads could be covered to avoid loss of material in transport, especially if material is transported off site. • Dust and mud should be controlled at vehicle exit and entry points to prevent the dispersion of dust and mud beyond the site boundary. Facilities for the	2	1	1	2	Negative Low (-6)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						washing of vehicles should be provided at the entry and exit points. • A speed limit of 40 km/hr should be set for all vehicles travelling over exposed areas. • During the transfer of materials, drop heights should be minimised to control the dispersion of matter being transferred. • The height of all stockpiles on site should be a maximum of 2m. • Use of dust retardant road surfacing if made necessary due to the exceedance of Air Quality Guidelines.					
Generation of fumes from vehicle emissions may pollute the air.	1	2	2	3	Negative Medium (-8)	• All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability in order to prevent smoke emissions	2	1	1	2	Negative Low (-6)

9.25 Odour

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Release of odours as a result of the chemical toilets on site.	1	2	3	2	Negative Medium (-8)	• Chemical toilets must be provided and cleaned on a regular (weekly) basis.	1	1	1	2	Negative Low (-5)

9.26 Noise

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
During the construction phase there is likely to be an increase in noise pollution from construction vehicles and construction staff.	1	2	3	4	Negative High (-10)	• All construction activities should be undertaken according to daylight working hours between the hours of 07:00 – 17:00 on weekdays and 7:30 – 13:00 on Saturdays. • No construction activities may be undertaken on Sunday. • Provide all equipment with standard silencers.	1	2	2	3	Negative Medium (-8)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						Maintain silencer units in vehicles and equipment in good working order. • All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. • Construction staff working in area where the 8-hour ambient noise levels exceed 60 dBA must have the appropriate Personal Protective Equipment (PPE). • All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).					

9.27 Heritage

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Disturbance of sites of archaeological, historical and cultural	1	1	1	1	Negative Low (-4)	• There were no sites or objects of archaeological, historical and cultural significance identified, however, if during construction any possible finds are made, the operations must	1	1	1	1	Negative Low (-4)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
significance.						be stopped and a qualified archaeologist be contacted for an assessment of the find. • It is advisable that an information section on cultural resources be included in the SHEQ training given to contractors involved in surface earthmoving activities. These sections must include basic information on: ▪ Heritage; ▪ Graves; ▪ Archaeological finds; and ▪ Historical Structures. • The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures.					

9.28 Traffic

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
During the construction and decommissioning phases there is likely to	1	2	2	3	Negative Medium	• Construction vehicles are to avoid main roads during peak traffic hours.	1	1	1	2	Negative Low (-5)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
be an increase in traffic from construction vehicles.					(-8)	• All vehicles entering the Site are to be roadworthy. • Seatbelts are to be worn at all times. • When using heavy or large vehicles / equipment, "spotters" are to be present to assist the driver with his blind spots. • Any incident or damage to a vehicle must be reported immediately.					

9.29 Socio-economic

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
CONSTRUCTION											
Employment											
The development will result in job creation and provision of employment.	1	3	3	3	Positive High (+10)	• All labour (skilled and unskilled) and contractors should be sourced locally where possible. • A labour and recruitment policy will be	2	4	4	4	Positive Very High (+14)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						developed, displayed and implemented by the contractor. • Recruitment at the construction site will not be allowed. • Where possible, labour intensive practices (as opposed to mechanised) should be practiced. • The principles of equality, BEE, gender equality and non-discrimination will be implemented.					
Population Change											
Job creation during the construction phase could result in the influx of people to the area.	2	2	2	2	Negative Medium (-8)	• If possible all labour should be sourced locally. • Contractors and their families may not stay on site. • No informal settlements will be allowed.	2	1	1	1	Negative Low (-5)
Security and Social Life											
Contractors, the influx of people and potential job creation will result in the proliferation of social ills and issues such as crime, prostitution, the spread of HIV/AIDS, informal settlements etc.	2	4	3	2	Negative High (-11)	• The developers need to be actively involved in the prevention of social ills associated with contractors. • If possible all labour should be sourced locally. • Contractors and their families may not stay on site. • No informal settlements will be allowed. • Contractors must be educated about the risk of prostitution and spread of HIV and AIDS. • Strict penalties will be built into tenders	2	3	2	2	Negative Medium (-9)

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION E	D	I	P	SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION E	D	I	P	SIGNIFICANCE RATING (AFTER MITIGATION)
						to deal with issues such as petty crime, stock theft, fence cutting, trespassing etc. • No poaching of wildlife or selling of firewood will be allowed.					
Safety											
Public safety during construction.	1	2	2	2	Negative Medium (-7)	• Members of the public adjacent to the construction site should be notified of construction activities in order to limit unnecessary disturbance or interference. • Construction activities will be undertaken during daylight hours and not on Sundays.	1	2	1	1	Negative Low (-5)
Construction staff safety during construction.	1	2	2	3	Negative Medium (-8)	• Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction. • All construction staff must have the appropriate PPE. • The construction staff handling chemicals or hazardous materials must be trained in the use of the substances and the environmental, health and safety consequences of incidents. • Report and record any environmental, health and safety incidents to the responsible person.	1	2	2	1	Negative Low (-6)

9.30 Land Use Planning and Compatibility

Where **E** = Extent, **D** = Duration, **I** = Intensity and **P** = Probability of occurrence.

POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
ALTERNATIVE SITE 1											
Located in a region whereby future adjacent land uses will be commercial/ industrial resulting in compatibility with the surrounding land uses and reduced impacts in terms of noise, aesthetics and nuisances on surrounding area.	2	3	2	3	Positive High (+10)	• None proposed.	2	3	2	3	Positive High (+10)
ALTERNATIVE SITE 2											
Located in a region whereby future adjacent land uses will be residential resulting in incompatibility with the surrounding land uses and possible nuisances such as noise.	2	3	2	2	Negative High (-10)	• None proposed.	2	3	2	3	Negative High (-10)

9.31 Comparative Assessment of Alternatives

9.31.1 Cornubia Retail Park and Associated Infrastructure

Table 9-1 provides a comparative assessment of the two site layout options i.e. Alternative Site 1 (layout including land owned by SASA) and Alternative Site 2 (layout excluding land owned by SASA). A description of these alternatives is provided in Section 4.

For many of the specialist fields, the potential impacts for the different project phases (construction and operations) for the two site layout options are relatively the same and have been combined to prevent repetition. A comparative assessment is provided below.

The comparative assessment below takes into account the impact assessment provided in Section 9.1 to Section 9.15.

Table 9-1: Comparative assessment of the two site layout options after mitigation

	SITE ALTERNATIVE 1 (INCLUDING SASA OWNED LAND)	SITE ALTERNATIVE 2 (EXCLUDING SASA OWNED LAND)
Geology - Construction	-6	-6
	Developing either site will result in disturbance to surface geology for development foundations and the potential of gully erosion and dongas exists for both alternatives. The geological impacts before mitigation for both sites are of a **medium** significance and the post mitigation significance is **low**.	
Topography - Construction	-7	-7
	Developing either site will result in disturbance to topography which is similar for both alternatives. The potential impacts before mitigation for both sites are of a **medium** significance and the post mitigation significance is also **medium**.	
Hydrogeology - Construction	-6	-6
	Shallow groundwater contamination through the spillage of fuels, lubricants, lack of provision of ablutions and other aspects such as construction equipment, vehicles and workshop and wash bay areas – for both site options exist and the mitigation measures listed in the EMPr, needs to complied with to reduce this impact from a **medium** to a **low** rating.	
Hydrogeology - Operations	-5	-5
	Leaks of untreated water from pipelines may occur and impact on the shallow groundwater quality. Fixing of the leaks should be executed immediately and affected areas need to be rehabilitated. The significance of this impact before mitigation is **medium** and after mitigation is **low**.	
Hydrology – Construction	-6	-6
	The spillage of fuels, lubricants and other chemical, cement batching activities maybe lead to contaminated run-off entering surface water bodies. For both options the mitigation measures listed in the EMPr, needs to be complied with to reduce this impact from a **medium** significance to **low** significance.	

	SITE ALTERNATIVE 1 (INCLUDING SASA OWNED LAND)	SITE ALTERNATIVE 2 (EXCLUDING SASA OWNED LAND)
	-10	-10
	In addition, water abstraction from surface water resources may be necessary for both options and the necessary licences/permits if required must be obtained for this. The impact before and after mitigation is **high** for this impact.	
Hydrology - Operations	-6	-6
	Run-off from urban infrastructure is likely to constitute **low** significance impact pre-mitigation. It is imperative that there is adequate stormwater management around the site.	
	-5	-5
	Leaks of untreated water from pipelines may occur and impact on the surface water resources. Fixing of the leaks should be executed immediately and affected areas need to be rehabilitated. The significance of this impacts **medium** before and **low** after mitigation.	
Soils - Construction	-9	-8
	Vehicle operation on site could potentially result in the spillage of lubricants and petroleum products into the soil. Machinery and vehicles must be kept in good working order. Depending on the nature of spills, contaminated soil must be treated or disposed of at a licensed hazardous landfill site. Soil disturbance, erosion and degradation are further potential impacts which must be mitigated against as outlined in the EMPr. The average significance of the impacts post-mitigation is **medium**. The significance slightly less for the option excluding SASA owned land at the surface area is less for this alternative and therefore, less soil will be exposed during construction.	
Agricultural Potential – Construction	-14	-13
	The agricultural land capability of the Cornubia Project area can be classed as good land for agriculture. Due to the overall Cornubia Development which addresses housing shortages in the eTM, there is a need to align surrounding land uses with this. The approved Cornubia Development Framework identifies the site as a region for 'General Business' which the project aligns with. Despite this, the impact significance for loss of agricultural land is **very high**. The significance of the preferred option is greater than the alternative as more land will be sterilised in this option resulting in less agricultural land. As the size of this additional land is not extensive and due to the potential likelihood that the land will be developed in the future to align with the adjacent land uses, this is a marginal difference in rating.	
Agricultural Potential – Cumulative	-9	-8
	The overall Cornubia Development will result in a significant loss of agricultural land which has a potential cumulative impact on food security and agriculture. THD have submitted a plan to address loss of agricultural land to the Department of Agriculture and other areas have been identified with excellent agricultural potential. These areas must be prioritised for agriculture. The post-mitigation impact significance is **medium**.	

	SITE ALTERNATIVE 1 (INCLUDING SASA OWNED LAND)	SITE ALTERNATIVE 2 (EXCLUDING SASA OWNED LAND)
Vegetation – Construction	-8	-7
	There will be a loss of significant areas of dense vegetation for both alternatives which have a significance rating of high. However, much of this vegetation is alien invasive in nature and/or degraded. There are occurrences of indigenous vegetation and protected trees for which permits and licenses respectively will be obtained for the relocation and/ or removal. The significance after mitigation is **medium**.	
Vegetation – Operations/Cumulative	+13	+13
	The overall Cornubia Development proposes the establishment of a nursery in which indigenous vegetation will be relocated to. Such a proposal has a **very high** impact significance. The loss of the vegetation units are the same for both alternatives.	
Wetlands – Construction	-8	-8
	Significant permanent loss of wetland units due to infilling of wetlands for the construction of the platforms, stormwater attenuation and sewer crossings. The same wetland units will be lost for both alternatives. All recommended mitigation measures as outlined in the EMPr must be implemented to reduce the significance from **high** to **medium**. There are no wetland units within the SASA owned land and therefore, the significance ratings are the same for both alternatives.	
Wetlands – Operations	-8	-8
	Increased run-off into remaining wetland units within the catchment due to hardened surfaces. The post-mitigation significance is **medium**.	
Wetlands - Cumulative	-8	-8
	Impacts on individual wetland (units) across the overall Cornubia site could result in an important cumulative impact on respective catchments. Wetland offsets and rehabilitation on remaining wetlands must be undertaken as per the recommendations of the specialist report and Open Space and Wetland Rehabilitation Plan to reduce the impact significance from **high** to **medium.**	
	+13	+13
	Wetland units A5, A6 and A8 within the greater Cornubia Development will be rehabilitated to offset for the wetland loss using an offset ration of 1:3. The impact significance is **high**.	
Waste – Construction	-6	-6
	During construction, impacts such as contamination of the surface and site with general and hazardous waste are applicable to both alternatives. The same is for sewerage. The mitigation measures included in the EMPr must be complied with to achieve the post-mitigation significance rating of **medium**.	
Waste - Operations	-7	-7
	The quantities of general waste and sewerage created during operations are the same for both alternatives. The post-mitigation significance rating is **medium**.	
Air Quality – Construction	-8	-7
	Dust and emissions during construction generated by debris handling and debris piles, truck transport, bulldozing and general construction will exist	

	SITE ALTERNATIVE 1 (INCLUDING SASA OWNED LAND)	SITE ALTERNATIVE 2 (EXCLUDING SASA OWNED LAND)
	regardless of the site alternatives. The post-mitigation significance rating is **medium**.	
Odour – Construction	-5	-5
	There is the potential of the release of odours as a result of the chemical toilets on site regardless of the locations of the site. The post-mitigation significance rating is **low**.	
Noise - Construction	-9	-8
	During the construction phase there is likely to be an increase in noise pollution from construction vehicles and construction staff. The post-mitigation significance rating is **medium**.	
Heritage - Construction	-4	-4
	There were no sites or objects of archaeological, historical and cultural significance identified on either of the site layout properties. The significance rating is **low**.	
Visual - Operations	-4	-4
	The development of agricultural land will not have significant visual impacts as the proposed commercial development is in line with the surrounding land use along Flanders Drive and the M41. In addition, the ultimate development of Cornubia will see the entire area developed and the proposal falls within the approved Framework Plan for the area. The area is urban in nature and the development will have no bearing on the visual aesthetics. The significance rating is **low**.	
Traffic – Construction	-5	-5
	During the construction and decommissioning phases there is likely to be an increase in traffic from construction vehicles. Construction vehicles are to avoid main roads during peak traffic hours and mitigation measures outlined in the EMPr are to be implemented. The post mitigation significance is **low**.	
Traffic – Operations	-5	-5
	Traffic along Flanders Drive and the M41 will increase as congestion is presently a concern and people are attracted to the new retail facilities. The proposed M41 interchange will ease the current traffic congestion. All future proposals for road networks as outlined in the TIA must be implanted for existing and new roads to reduce the significance from **high** to **low**.	
Traffic - Cumulative	-5	-5
	Traffic in the region will increase as the residential portion of Cornubia is developed. All future proposals for road networks as outlined in the TIA must be implanted for existing and new roads to reduce the significance from **high** to **low**.	
Socio-economic – Construction	+14	+12
	The development will result in a significant number of construction phase jobs for the local people. As there will be a greater developable area for the preferred site, it is anticipated that there will be more labourers. The significance rating is very **high**.	
	-6	-6
	As could be expected, the construction phase is characterised by a	

	SITE ALTERNATIVE 1 (INCLUDING SASA OWNED LAND)	SITE ALTERNATIVE 2 (EXCLUDING SASA OWNED LAND)
	number of negative social impacts (*viz*. arrival of construction workers; inflow of job seekers, additional demand on services) which is mainly due to the nature of the activities that take place during this phase. Although the expected social impacts associated with the construction phase are mostly negative, these impacts are for the most part only temporary in nature and as such are expected to only last over the construction period. The significance rating is **medium**.	
Socio-economic - Operations	+14	+13
	The development will result in permanent employment opportunities. The significance rating is very **high**.	
TOTAL	**-125**	**-122**

9.31.2 New Mount Edgecombe Refuse Transfer Station

Table 9-2 provides a comparative assessment of the two site layout options i.e. Alternative Site 1 and Alternative Site 2. A description of these alternatives is provided in Section 4.

For many of the specialist fields, the potential impacts for the two site options are relatively the same and have been combined to prevent repetition. A comparative assessment is provided below.

The comparative assessment below takes into account the impact assessment provided in Section 9.16 to Section 9.30.

Table 9-2: Comparative assessment of the two site layout options after mitigation

	SITE ALTERNATIVE 1 (PREFERRED)	SITE ALTERNATIVE 2
Geology - Construction	-6	-6
	Developing either site will result in disturbance to surface geology for development foundations and the potential of gully erosion and dongas exists for both alternatives. The geological impacts before mitigation for both sites are of a **medium** significance and the post mitigation significance is **low**.	
Topography - Construction	-7	-7
	Developing either site will result in disturbance to topography which is similar for both alternatives. The potential impacts before mitigation for both sites are of a **medium** significance and the post mitigation significance is also **medium**.	
Hydrogeology - Construction	-6	-6
	Shallow groundwater contamination through the spillage of fuels, lubricants, lack of provision of ablutions and other aspects such as construction equipment, vehicles and workshop and wash bay areas – for both site options exist and the mitigation measures listed in the EMPr, needs to complied with to reduce this impact from a **medium** to	

	SITE ALTERNATIVE 1 (PREFERRED)	SITE ALTERNATIVE 2
	a **low** rating.	
Hydrology – Construction	-6	-8
	The spillage of fuels, lubricants and other chemical, cement batching activities maybe lead to contaminated run-off entering surface water bodies. For both options the mitigation measures listed in the EMPr, needs to be complied with to reduce this impact from a **medium** significance to **low** significance for the preferred and medium significance for the alternative due to the access road traversing a wetland.	
	-10	-10
	In addition, water abstraction from surface water resources may be necessary for both options and the necessary licences/permits if required must be obtained for this. The impact before and after mitigation is **high** for this impact.	
Soils - Construction	-8	-8
	Vehicle operation on site could potentially result in the spillage of lubricants and petroleum products into the soil. Machinery and vehicles must be kept in good working order. Depending on the nature of spills, contaminated soil must be treated or disposed of at a licensed hazardous landfill site. Soil disturbance, erosion and degradation are further potential impacts which must be mitigated against as outlined in the EMPr. The average significance of the impacts post-mitigation is **medium.**	
Agricultural Potential – Construction	-10	-10
	The agricultural land capability of the Cornubia Project area can be classed as good land for agriculture. Due to the overall Cornubia Development which addresses housing shortages in the eTM, there is a need to align surrounding land uses with this. The approved Cornubia Development Framework identifies the site as a region for 'General Business' which the project aligns with. Despite this, the impact significance for loss of agricultural land is **high**. The significance of the preferred option is greater than the alternative as more land will be sterilised in this option resulting in less agricultural land. As the size of this additional land is not extensive and due to the potential likelihood that the land will be developed in the future to align with the adjacent land uses, this is a marginal difference in rating.	
Vegetation – Construction	-8	-7
	There will be a loss of significant areas of dense vegetation for both alternatives which have a significance rating of high. However, much of this vegetation is alien invasive in nature and/or degraded. There are occurrences of indigenous vegetation and protected trees for which permits and licences respectively will be obtained for the relocation and/ or removal. The significance after mitigation is **medium**.	
Wetlands – Construction	-8	-12
	Loss of wetland as a result of the temporary access road. All recommended mitigation measures as outlined in the EMPr must be	

	SITE ALTERNATIVE 1 (PREFERRED)	SITE ALTERNATIVE 2
	implemented to reduce the significance from **high** to **medium** for the preferred site. The alternative site remains a **high** significance due to the significant impact on the wetland for the required access road. 6 730 m^2 of wetland will be lost for the access road for the alternative site 1.	
Wetlands - Cumulative	-8	-8
	Impacts on individual wetland (units) across the overall Cornubia site could result in an important cumulative impact on respective catchments. Wetland offsets and rehabilitation on remaining wetlands must be undertaken as per the recommendations of the specialist report and Open Space and Wetland Rehabilitation Plan to reduce the impact significance from **high** to **medium.**	
	+13	+13
	Wetland units A5, A6 and A8 within the greater Cornubia Development will be rehabilitated to offset for the wetland loss using an offset ration of 1:3. The impact significance is **high**.	
Waste – Construction	-6	-6
	During construction, impacts such as contamination of the surface and site with general and hazardous waste are applicable to both alternatives. The same is for sewerage. The mitigation measures included in the EMPr must be complied with to achieve the post-mitigation significance rating of **medium**.	
Air Quality – Construction	-7	-7
	Dust and emissions during construction generated by debris handling and debris piles, truck transport, bulldozing and general construction will exist regardless of the site alternatives. The post-mitigation significance rating is **medium**.	
Odour – Construction	-5	-5
	There is the potential of the release of odours as a result of the chemical toilets on site regardless of the locations of the site. The post-mitigation significance rating is **low**.	
Noise - Construction	-8	-8
	During the construction phase there is likely to be an increase in noise pollution from construction vehicles and construction staff. The post-mitigation significance rating is **medium**.	
Heritage - Construction	-4	-4
	There were no sites or objects of archaeological, historical and cultural significance identified on either of the site layout properties. The significance rating is **low**.	
Traffic – Construction	-5	-5
	During the construction and decommissioning phases there is likely to be an increase in traffic from construction vehicles. Construction vehicles are to avoid main roads during peak traffic hours and mitigation measures outlined in the EMPr are to be implemented. The post mitigation significance is **low**.	

	SITE ALTERNATIVE 1 (PREFERRED)	SITE ALTERNATIVE 2
Socio-economic – Construction	+12	+12
	The development will result in a significant number of construction phase jobs for the local people. As there will be a greater developable area for the preferred site, it is anticipated that there will be more labourers. The significance rating is very **high**.	
	-6	-6
	As could be expected, the construction phase is characterised by a number of negative social impacts (*viz*. arrival of construction workers; inflow of job seekers, additional demand on services) which is mainly due to the nature of the activities that take place during this phase. Although the expected social impacts associated with the construction phase are mostly negative, these impacts are for the most part only temporary in nature and as such are expected to only last over the construction period. The significance rating is **medium**.	
Land Use Planning and Compatibility	+10	-10
	The development is aligned with future planned land uses for the preferred site but is located in the heart of a future residential area for the alternate site which will have long-term negative impacts.	
TOTAL	**-83**	**-108**

10 ENVIRONMENTAL IMPACT STATEMENT

10.1 Summary of Key Findings

During the EIA, the impact of the Cornubia Retail Park Development and associated construction of a new Mount Edgecombe Refuse Transfer Station and access road on the biophysical and social environments was assessed. From the assessment, it was determined which parts of the two environments will be more significantly affected as compared to others. Below is a summary of the main findings of the EIA.

Table 10-1: Summary of key findings of the EIA

	FINDINGS	RECOMMENDATIONS
Geology, Soil & Topography	The development proposes platforms created by cutting the hill tops and spurs and creating fill embankments on the lower slopes for development. The geotechnical assessment indicates that the proposal is feasible; however there are a few challenges/ constraints which need to be taken into consideration. These include slope stability, subsoil seepage, excavatability and founding conditions. Although permanent disturbance to the geology on site, in terms of the pre-development environment descriptions, the proposed development would be the preferred option. All disturbances on site will be limited to the construction areas.	Appropriate mitigation measures are required to minimise erosion due to medium to high erosion risk of certain soils within the site. Although permanent disturbance to the topography, appropriate mitigation measures will be implemented to minimise the impact. The EMPr must be strictly adhered to.
Hydrogeology & Hydrology	The main impact during construction phase is likely to be the run-off from the construction area into groundwater or surface water resources. Potential impacts during operations include discharge of run-off from dirty areas such as workshop areas, roads and chemical storage areas. Additional impacts include the use of groundwater and surface water resources by contractors and/or labourers.	No unauthorised extraction of water from boreholes or the creation of new boreholes will be allowed on site. The establishment of a stormwater management system will ensure that all surface water run-off from the site is managed appropriately and directed to the natural wetland on site. In terms of water consumption limit consumption by installing water saving taps and duel flushing toilet systems. Water consumption can be reduced by collecting and utilising rain water for gardening purposes.
Agricultural Potential	The Cornubia site and its soils do offer good agricultural potential but the context and location of the development within the broader region necessitates the transformation of the land use for the greater societal good. Tongaat Hulett, who currently farm this land, have been proactive in regard to the 'replacement' of agricultural land that has been lost (which loss will be gradual over a number of years) in more, long term appropriate locations such as within the Ilembe District Municipality. From purely a sugar production perspective, as noted above, there will be	

	FINDINGS	RECOMMENDATIONS
	no nett loss suffered by the Maidstone Sugar Mill or Tongaat Hulett and in fact, with initiatives such as the Operation Vuselela which is a partnership between Tongaat Hulett and the Department of Economic Development that will lead to the planting of over 3 300 hectares of fallow land into sugarcane. Already between 2009-2012, Tongaat Hulett rehabilitated nearly 30 000 hectares of land for sugarcane production and is targeting substantial additional area over the next few years. After considering all the cropping and land use options, the development of this area into medium density residential and light industrial areas could: • Significantly improve the socio-economic situation of the local communities nearby, and in time that of the other communities; • Create sustainable employment to a larger group of people; and • Indirectly improve trade in nearby shopping areas.	
Vegetation	Existing indigenous vegetation communities and areas of sensitivity were identified and the potential and merits for their incorporation into an Open Space System were considered. Given the position of proposed Cornubia Retail Park and Mount Edgecombe Refuse Transfer Station sites in relation to the remainder of the Cornubia site, and the lack of potential Open Space Linkages that were available for utilisation, it was proposed that this portion of the site would not add significantly to the conservation goals of the Municipality and Province and would not add significant value to the overall Open Space System proposed for the Cornubia Development. No ecological integrity and very limited delivery of ecosystem goods and services are currently afforded by this site. Indigenous trees which are persisting are being damaged by fire, bark stripping and vehicular damage. The ongoing management, control and the costs in man power and in terms of re-establishing the vegetation community cannot be justified when considering the development potential and the opportunity cost should the development not occur. Therefore this site is identified as an area which had potential to receive development. There will be a significant loss of existing vegetation due to the need to construct platforms on site.	The necessary permits and licences must be obtained prior to development commencing. The remaining Open Space Areas on Phase 1 of the Cornubia Development have already been subjected to a rehabilitation plan, which will be a template for further developments within the remainder of Cornubia and a condition of the Environmental Authorisation. Seeds must be harvested for replanting at the nursery.

	FINDINGS	RECOMMENDATIONS
Wetlands	The proposed development will result in the loss of 3.75 ha of wetland area and the destruction of existing marginal frog populations and bird habitat. This includes 6 730 m^2 of wetland to be lost for the construction of the temporary access road for the Mount Edgecombe Refuse Transfer Station. The wetland units to be directly impacted by the proposed development either in the form of infilling or sewer line and access road crossings, were all assessed to be in a moderately-poor state and of moderately-low importance from an ecosystem services perspective. Nevertheless, when infilling is proposed, it is also important to determine the importance of the wetland units under a rehabilitated scenario as the infilling of a wetland represents a loss of the opportunity to regain ecosystem functionality and the associated ecosystem functions that may be valuable to society. In this case, the wetland units to be lost under the hypothetical rehabilitation scenario were still only assessed as being of moderate importance, the most important system being that of Wetland Unit A7. Furthermore, a number of potentially significant stormwater, sewer and access road crossing impacts were also identified, described and assessed. The overall impacts of the Retail Park activities on the downstream, wetland systems was assessed as being moderately-low and acceptable provided that the mitigation measures recommended for each impact are strictly adhered to. In addition, it is important to note that such impacts, particularly the water quality impacts, will also contribute to the gradual reduction in the water quality of the Ohlanga River and Estuary if the mitigation measures provided are not implemented effectively.	As the location and layout alternatives for the proposed Retail Park are limited, wetland offsets are the only way of offsetting and mitigating the impacts of the proposed wetland infilling. All wetland units within the Retail Park developmental footprint will be lost and thus there is no opportunity to offset the loss of wetlands within Retail Park Site. As a result the wetland loss associated with the Retail Park must be offset within the greater Cornubia Development Area and Phase 2 specifically. Even though development has been phased, from an environmental perspective the Cornubia Site needs to be viewed as a single entity. This holistic view will allow improved management of wetland resources and will also encourage consistency in terms of rehabilitation and management techniques. The area for area approach involves rehabilitating or reinstating an area of wetland equal to the wetland area being lost at the required offset ratio. Using this approach the offsetting of the 3.75 ha of wetland lost to the retail development, 11.26 ha would need to be rehabilitated at an offset ratio of 1:3. It is the intention that all remaining wetland units within the Cornubia Phase 2 area will be rehabilitated. The latest layouts indicate that the area of wetland available for rehabilitation is approximately 153.88 ha,

	FINDINGS	RECOMMENDATIONS
		32.92 ha more than the minimum 120.96 ha, as per the 1:3 offset ratio. Thus the overall wetland losses can be can be considered to be adequately offset and the significance of the impact reduced to acceptable levels. The wetland units nominated for rehabilitation to offset the loss associated with the Retail Park Development fall within Cornubia Phase 2 and total 11.4 ha. The above calculations include the wetland impacts of a number of potentially significant storm water, sewer crossing and access road impacts which were also identified, described and assessed. All mitigation measures outlined in the EMPr and specialist report must be strictly adhered to.
Waste	The potential waste streams for the project were identified as domestic, hazardous, building and sewerage waste. The impact of the waste streams would be minimised by the rigorous mitigation measures that have been developed.	Waste collection will be undertaken by eTM and sent through to a licensed waste disposal facility. All sewerage waste will be sent through to a licensed treatment facility (Phoenix WWTP).
Air Quality	During construction and decommissioning, the pollutants likely to be emitted are particulate matter generated by vehicle movement and exposed soil to wind erosion. This is most likely to be a nuisance.	Dust suppression activities (e.g. wet suppression with water) must be implemented during construction and decommissioning activities.
Odour	Odours from chemical toilets on site for construction staff is a possibility.	The potential for odour will be minimised by ensuring that the toilets are cleaned and maintained on a weekly basis.
Noise	The construction and decommissioning phases will see an increase in noise in the study area.	Impacts relating to noise can be effectively managed with the implementation of the

	FINDINGS	RECOMMENDATIONS
		EMPr.
Heritage	No areas of heritage significance have been identified on the properties to be developed or on adjacent properties.	It is recommended that this project may proceed with the proposed heritage resource mitigation. If permission is granted for the development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and notify Amafa aKwaZulu-Natali should any heritage resources, as defined in the Act, be discovered during the course of development activities.
Visual	The development of agricultural land will not have significant visual impacts as the proposed commercial development is in line with the surrounding land use along Flanders Drive and the M41. In addition, the ultimate development of Cornubia will see the entire area developed and the proposal falls within the approved Framework Plan for the area. The area is urban in nature and the development will have no bearing on the visual aesthetics.	No further recommendations.
Traffic	Due to construction activities there is the possibility of disruptions to traffic flow in the area. Furthermore, the proposed development will see an increase in traffic in an already congested area. The proposed road upgrades as part of the development proposal will alleviate this problem.	It is recommended that the proposed Cornubia Retail Park Development be approved in terms of the expected traffic impact of the development which is in line with the overall Cornubia Development Framework Plan and Transportation Study. The technical details for a number of specific upgrades to existing intersections have been confirmed.
Socio-economic	As could be expected, the construction phase is characterised by a number of negative social impacts (viz. arrival of construction workers; inflow of job seekers, additional demand on services) which is mainly due to the nature of the activities that take place during this phase. Although the expected social	The principles of gender equality, maximising local employment should be implemented in the provision and establishment of jobs. Jobs for the maintenance of infrastructure and

	FINDINGS	RECOMMENDATIONS
	impacts associated with the construction phase are mostly negative, these impacts are for the most part only temporary in nature and as such are expected to only last over the construction period. Even though all of the identified social impacts can be mitigated or enhanced successfully, it can only be done if THD, or its appointed contractor(s), commit to the responsibility of ensuring that the level of disturbance brought about to the social environment by the more negative aspects of the project, is minimised as far as possible. From an economic viewpoint, commercial developments often contribute indirectly to the regional and national economy by improving infrastructure, adding to the country's productive capacity, contributing to the country's capital goods and enabling economic growth. In the case of this project, job creation will be a significant impact.	services will be created following the completion of the development. These jobs might be made available to existing labour there creating long term employment.
Land Use	This is specific to the infrastructure relating to the Mount Edgecombe Refuse Transfer Station. The Alternative Site 1 (preferred site) should be considered as it is closer to the supply of waste from the proposed development compared to the alternate site. This site will reduce the transport related impact in terms of travel distance to the waste site. Furthermore, once the ultimate development of Cornubia is complete and the planned residential developments are functional, the new station at the Alternative Site 2 location will be in close proximity to residential developments which is not desirable. The preferred site has no pure residential uses within 150 m from its location apart from mixed use residential apartments. Whilst the approved Framework Plan for Cornubia does not indicate a possible location for the refuse transfer station, other than identifying the area where the existing facility is located as a General Business use zone, the alternative site 2 would not be considered a suitable location based on the approved framework as it is located in the heart of a future medium density residential zone whilst the preferred site is situated closer to mixed use sites and therefore would be a preferred location for a land use alignment perspective.	Whilst the Alternative Site 1 is within a strategic zone for potential future business/retail uses, its location is deemed as adequate by the urban planners and the Station can be accommodated with this area. Alternative Site 1 is favourable and should be authorised.

10.2 Implications of the Proposed Activity

Based on the Impact Assessment and comparative assessment of the two options/ alternatives for both the Cornubia Retail Park as well as the two alternatives for the infrastructure for the Mount Edgecombe Refuse Transfer Station, a number of potentially negative and a few positive impacts have been identified and assessed across the life-cycle of the project.

Table 10-2: Comparative assessment of the positive and negative impacts of the project

POSITIVE FINDINGS	NEGATIVE FINDINGS
Biophysical Environment	
The assessment of the pre-development environment indicated that the agricultural land capability of the site be classified as good to excellent. However due to the need for provision of affordable housing and services in the northern parts of the eThekwini Municipality, this project is ideally located to address this. The need for the development, in this specific location and context is fundamental with the potential for bringing new land into agriculture in more appropriate locations already being implemented.	Destruction of agricultural land.
The design and layout of the proposed development has taken into consideration and integrated the ecological, topography, and hydrological constraints that have been identified.	There will be permanent alteration of the biophysical environment should the specified mitigation measures not be implemented.
Although sensitive environments have been identified within the project area (i.e. wetlands, riparian areas and vegetation pockets), mitigation measures and management plans have been recommended to improve the overall health and functionality of the area at large. The development will enable a substantial quantum of wetland to be rehabilitated and managed which will result in a nett ecological gain.	In-filling of degraded wetlands and vegetation for the Retail Park and temporary access road to the existing District road.
Socio-economic Environment	
The creation of substantial employment opportunities during the construction of the project and the creation of substantial economic and employment opportunities on completion of the project. It is expected that the majority of labour and contractors will be sourced locally.	This could lead to the influx of people into the area seeking employment which could place a strain on the existing infrastructure, available housing and the potential development of uncontrolled settlements. In general, there are social ills such as crime, the spread of HIV/AIDS etc. that could take place.
The location of the study area is in prime position to promote and foster economic opportunity, social and physical integration, being in close proximity to the King Shaka International Airport and Dube Trade Port.	

POSITIVE FINDINGS	NEGATIVE FINDINGS
The proposed road upgrades will alleviate traffic congestion in Mount Edgecombe.	

11 CONCLUSION AND RECOMMENDATIONS

The Environmental Impact Assessment (EIA) process for the Cornubia Retail Park and associated infrastructural requirements for the relocation of Mount Edgecombe Refuse Transfer Station has been undertaken in accordance with the EIA Regulations published in Government Notice No. R. 543, R.544 and R. 545 of 2010 in terms of Section 24 (5) of the National Environmental Management Act (Act No 107 of 1998) (as amended).

In order to protect the environment and ensure that the Cornubia Retail Park and Mount Edgecombe Refuse Transfer Station are constructed and operate in an environmentally responsible manner, there are a number of significant pieces of environmental legislation that have been taken into account during this study. These include:

APPLICABLE NATIONAL LEGISLATION
The Constitution of South Africa (No. 108 of 1996)
National Environmental Management Act (Act No. 107 of 1998)(as amended)
National Environmental Management: Waste Act (No. 59 of 2008)
National Water Act (Act No. 36 of 1998)
Conservation of Agricultural Resources Act (Act No.43 of 1983)
National Environmental Management Biodiversity Act (Act No. 10 of 2004)
KZN Nature Conservation Ordinance (15 of 1974)
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
National Heritage Resources Act (No. 25 of 1999)
National Environmental Management: Air Quality Act (No. 39 of 2004)
National Veld and Forest Act (Act 101 of 1998)
Hazardous Substance Act (No. 15 of 1973) and Regulations
National Building Regulations and Building Standards Act (Act No. 103 of 1997)
Occupational Health and Safety Act (No. 85 of 1993)

This relevant legislation has informed the identification and development of appropriate management and mitigation measures that should be implemented in order to minimise potentially significant impacts associated with the project.

The conclusions of this final EIAR including comments and concerns from Interested and Affected Parties (I&APs), are as a result of a comprehensive EIA study. These studies are based on issues identified in the Environmental Scoping Study and the parallel process of public participation through to the EIA phase. The public consultation process has been inclusive, and every effort has been made to include representatives of all stakeholders within the process.

11.1 Assumptions, Uncertainties or Gaps in Knowledge

- All information provided by THD and their specialist consultants to the EAP was correct and valid at the time it was provided.
- The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process.
- All data from unpublished research is valid and accurate.
- The scope of this investigation is limited to assessing the potential environmental impacts associated with the Cornubia Retail Park and the proposed relocation of the Mount Edgecombe Refuse Transfer Station.

In addition to the assumptions above, the following assumptions and limitations were noted by the wetland specialist:

- With regards to the assessment of the importance of the wetland units, it is important to note that the WET-EcoServices tool utilised in this assessment is a rapid assessment that gives a general indication of the level of ecosystem services provided by wetlands. This assessment is considered satisfactory for the level of assessment required for inclusion in the EIA Process. Similarly, the WET-Health assessment tool utilised to determine the present state of the wetland units is also a rapid assessment tool. This assessment is also considered satisfactory for the purposes of this assessment particularly as the wetlands units are generally in a poor state. It is also important to note that the two assessments were used to assess the state and importance of the wetland units proposed to be in-filled only.

- The impacts identified, described and assessed are based on the engineering layout provided in Appendix A of the Report, the sewer alignment provided as shown in Figure 6, and the assumption that typical practices regarding storm water management and sewer pipe construction will take place. In addition, the post-mitigation significance scores are based on the mitigation measures provided in this report being strictly adhered to. If any one or more of these mitigation measures cannot be adhered to, the post-mitigation significance of the impacts will need to be re-assessed.

11.2 Concluding Remarks and EAP Opinion

This final EIAR provides an assessment of both the benefits and potential negative impacts anticipated as a result of the project. It further provides a description of the affected environment and alternatives proposed for the Cornubia Retail Park as well as the Mount Edgecombe Refuse Transfer Station.

It is important to understand the fact that this Retail Park development is part and parcel of the Cornubia Integrated Human Settlement but, as a result of the level of interest and commitments wanting to be made for investment into the Retail Park, the EIA for the site has been separated.

Based on the comparative assessment of the two site options and the impact identification and assessment, it is evident that there is a minor difference in the impacts for the Alternative Site 1 and Alternative Site 2 - revised preferred alternative site (-125 for the

Alternative Site 1 – including SASA owned land, compared to -122 for the Alternative Site 2 – excluding SASA owned land).

It is further noted that there will be a loss to wetland habitat as a result of the proposed development. It is proposed that 3.75 ha of degraded wetland area be infilled in order to enable the creation of a sufficiently large platform area that will accommodate the extensive development proposed in line with the Development Framework Plan.

It is noted that the Cornubia Development Framework that was produced considered the overall open space system and took account of the development's socio-economic imperatives in terms of land requirements but also considered the existing wetlands and vegetation. The proposed open space system that has been planned will, for the development as a whole, provide a significant new ecological benefit. It is further noted that the Framework Plan is currently being confirmed in detail with the EIA process underway for the balance of the development. It is the intention that all remaining wetland units within the Cornubia Phase 2 area will be rehabilitated. The latest layouts indicate that the area of wetland available for rehabilitation is approximately 153.88 ha, 32.92 ha more than the minimum 120.96 ha, as per the 1:3 offset ratio. Thus the overall wetland losses can be can be considered to be adequately offset and the significance of the impact reduced to acceptable levels. The wetland units nominated for rehabilitation to offset the loss associated with the Retail Park Development fall within Cornubia Phase 2 and total 11.4 ha. These wetland units are as follows: A3c; A3d; A4; A5; A6; A6a; A8 and A9.

An integrated Water Use Licence Application for the proposed infilling of wetland areas is currently being undertaken for the remainder of Cornubia (Phase 2 and the Retail Park) and will be submitted to the DWA for decision-making.

When considering the development of the Cornubia Retail Park, it is important to note the overall Development of Cornubia. The proposed Retail Park has been identified in the approved Cornubia Development Framework plan and the area has been ear-marked for the development of general businesses and the specific type of development proposed within the Retail Park.

The proposed Retail Park therefore cannot be viewed in isolation and the cumulative impacts of the overall development have been assessed in this report. Similarly, the proposed wetland offsets and rehabilitation should also be viewed holistically. Whilst the infilling of wetland habitats is proposed as part of this EIA application, rehabilitation of remaining wetlands and the establishment of open spaces are also proposed within subsequent phases of Cornubia. Therefore, the Wetland and Open Space Rehabilitation Plan for the Cornubia Development must be considered as part of this application and cannot be discounted.

From a biodiversity point of view, there may be disturbance to existing marginal frog populations and bird habitat. It is therefore recommended that the construction team is instructed to undertake search and rescue operations for these species and to relocate to adjacent wetland areas.

In terms of the proposed Retail Park, the proposed M41 Interchange upgrade, the sewer line and the relocation of the Mount Edgecombe Refuse Transfer Station, there is currently

no significant vegetation or ecological impediments that should prevent the proposed developments from being given Environmental Authorisation. Notwithstanding these conclusions, a licence from DAFF will be required for the removal of the *Sideroxylon inerme* and a permit will be required from Ezemvelo KZN Wildlife for the relocation of the *Scadoxus puniceus* individuals occurring within the two sites, and the collection of the *S. inerme* seed, propagation and replanting of these individuals within the drainage line and associated buffer to the east of Retail Park is necessary. This will enable relocation of indigenous species to the nursery which is to be established for the Cornubia Development.

Should the proposed mitigation measures be implemented correctly, the Cornubia Retail Park will be a viable development. The location of the development is in line with the planning intent as the study area is in a prime location for the nature of uses proposed. The development could serve as a catalyst to induce future private sector investment within this area and will generate much needed employment opportunities for people of Cornubia and surrounds. Since the Medium Density residential development is already under construction with approximately 2500 units envisaged in the short term, the development of the study area may contribute in creating much needed employment opportunities in the area. Initial feasibility studies indicated that the precinct would be able to provide a number of short and permanent jobs as well as contribute significantly to the rates base of the City.

The findings conclude that there are no environmental fatal flaws that could prevent the proposed Cornubia Retail Park Development and the associated relocation of the Mount Edgecombe Refuse Transfer Station provided that the recommended mitigation and management measures contained in the preceding chapter and Environmental Management Programme are implemented. From the outcomes of this assessment it is the view of the EAP that this project will have a positive social and economic contribution. It has been acknowledged that there will be impacts on the potential biophysical environment; however with the implementation of the mitigation measures outlined in this report and the EMPr as well as through adequate environmental monitoring and enforcement those impacts can be successfully mitigated. This will in turn enable the development proposal to take place in an appropriate manner.

Thus, from all the findings of this report, it is recommended that the development be **authorised**. It is further noted that there are minimal differences in the significance ratings between the Alternative Site 1 (including SASA land) and Alternative Site 2 (excluding SASA land) due to the fact that there are few environmental attributes on the portion of land owned by SASA. Consequently, the only difference in significance ratings pertain the larger area of land to be sterilised for development. As at the time of finalising this recommendation, SASA and THD had not concluded an agreement with regard to the development of the SASA owned land for the Retail Development as proposed in Alternative Site 1, and as the significance ratings have a marginal difference only, it is the recommendation of the EAP that the **Alternative Site 2 (excluding SASA owned land)** is authorised.

In terms of the options presented for the new location of the Mount Edgecombe Refuse Transfer Station, it is noted that the approved Cornubia Framework Plan does not indicate a possible location for this Station, other than identifying the area where the existing Station is located as a General Business use zone. It is further noted that the nature of the Retail

Park development does not allow for the Station to continue operations at its current location. The Alternative Site 1 (preferred site alternative) is situated closer to mixed-use sites rather than in the heart of a future residential area (as is the case for the alternative site 2) and therefore would potentially be a preferred location. The preferred site has no pure residential uses within 150 m from its location apart from mixed-use residential apartments and is situated closer to mixed-use commercial and industrial sites, reducing the possible odour and/ or visual nuisances. Whilst the preferred site is within a strategic zone for potential future business /retail uses, its location is deemed as adequate by the urban planners and the Station can be accommodated with this area.

Further to this, the location of the Station in this zone is in close proximity to the existing facility. The preferred site is also well located along a higher order road, Dube East in close proximity to the Cornubia Boulevard intersection.

From an ecological perspective, both sites have a reasonable buffer (30 m) against the inadvertent pollution of contaminated stormwater into the wetlands and stream; however the Alternative Site 2 will require a new temporary access road to be constructed which will traverse a wetland and will therefore have significant impacts until removed and rehabilitated. Both alternatives require the construction of a temporary road to enable access onto the existing district road that provides access to the Blackburn settlement and which will have impacts on the wetland until removed and rehabilitated. The preferred site (Alternative Site 1) will get access off Dube East which is part of the Retail park development.

For these reasons, the **Alternative Site 1 is favourable for the Mount Edgecombe Refuse Transfer Station which includes the construction of a temporary access road onto the existing district road and it is the recommendation of the EAP that this site and the access road is authorised**, provided the mitigation measures presented in the EMPr are complied with. This is supported by the comparative assessment of the two site options and the impact identification and assessment, which illustrates that there is a significant difference in the impacts for the preferred and alternative sites (-83 for the Alternative Site 1 (preferred site), compared to -108 for the Alternative Site 2).

As mentioned previously, it is noted that the above authorisation pertains to the infrastructural requirements of the new Station and it is noted that a Waste Management Licence is necessary for the proposed relocation which is in progress.

The above is the view and recommendation of the Environmental Assessment Practitioner based on the findings of this EIA.

11.3 Conditions and Final Recommendations

In order to achieve appropriate environmental management standards and ensure that the findings of the environmental studies are implemented through practical measures, the recommendations from this EIA study are included within an EMPr (refer to Appendix G). The EMPr must be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for the life cycle phases of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project.

In addition, the following key conditions should be included as part of the authorisation:

a) The proponent is not negated from complying with any other statutory requirements that is applicable to the undertaking of the activity. Relevant key legislation that must be complied with by the proponent includes *inter alia*:

   - Provisions of the National Environmental Management Waste Act (No. 59 of 2008)
   - Provisions of the National Water Act, 1998 (Act No 36 of 1998)
   - Provisions of the National Forests Act (Act No 84 of 1998)
   - KZN Nature Conservation Ordinance (15 of 1974)
   - Provisions of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)
   - SANS 10103

b) The proponent must appoint a suitably experienced (independent) Environmental Control Officer (ECO) for the construction phase of the development that will have the responsibility to ensure that the mitigation/rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr.

c) The Stormwater Management Plan must be complied with.

d) The remaining Open Space Areas on Phase 1 of the Cornubia Development have already been subjected to a rehabilitation plan (Appendix G), which is now a template for Phase 2 and the Retail Park which is in progress and must be a condition of the environmental authorisation. Once prepared the Open Space and Rehabilitation Plan for Phase 2 and the Retail Park must be appended to the EMPr.

e) The rehabilitation of all remaining wetlands as detailed in the Open Space and Rehabilitation Plan for Phase 2 and the Retail Park, including Wetland Units A3c, A3d, A4, A5, A6, A6a, A8 and A9 must be undertaken by the proponent and a suitable timeframe for the monitoring of this must be implemented.

APPENDIX A:
Acceptance of ESR

APPENDIX B:
Site Layout

APPENDIX C:
Specialist Reports

C1. AGRICULTURAL POTENTIAL ASSESSMENT

C2. GEOTECHNICAL ASSESSMENT

C3. CULTURAL HERITAGE ASSESSMENT

C4. VEGETATION ASSESSMENT

C5. WETLAND ASSESSMENT

C6. TRAFFIC IMPACT ASSESSMENT

C7. STORMWATER MANAGEMENT PLAN

C8. PLANNING ASSESSMENT

C9. ENGINEERING SERVICES REPORT

C10. ELECTRICAL SERVICES REPORT

APPENDIX D:
Public Participation Report & Comments and Response Report

APPENDIX E:
Environmental Management Programme

APPENDIX F:
Wetland and Open Space Rehabilitation Plan for Cornubia

APPENDIX G:
Service Level Agreements

APPENDIX H:
DSW Acceptance of the Mount Edgecombe Refuse Transfer Station

APPENDIX I:
Company Profile and CVs of the EAP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