Draft Basic Assessment Report and EMP: proposed Komati Lifestyle Development on portion 49 of the farm Komatipoort Townlands no 182 J.U.

An EOH Company

Technical Report: **ER-2016-03-17**
Prepared for: **Ganeloman (Proprietary) Limited**
Prepared by: **Exigo Sustainability (Pty) Ltd**

Email info@exigo3.com
Tel +27 012 751 2160
Fax +27 086 607 2406

The Village Office Park (Block E),
309 Glenwood Road, Faerie Glen,
Pretoria, 0043

Postnet Suite 74,
Private Bag X07,
Arcadia, 0007

Vat nr: 4910184854
Registration nr: 2006/011434/07

An EOH Company

Innovation in Sustainability

www.exigo3.com

Draft Basic Assessment Report and EMP: Proposed Komati Lifestyle Development on portion 49 of the farm Komatipoort Townlands no 182 J.U.

March 2016

Conducted on behalf of:
Ganeloman (Proprietary) Limited

Project team:
R Kruger (M. Environmental Management)
HA Kunene (B. Tech. Environmental Sciences)
M Grobler (BSc. Hons. Conservation Ecology, Masters in Organizational Leadership, Pr.Sci.Nat.)

REPORT DISTRIBUTION LIST

Name	Institution
	Ganeloman (Proprietary) Limited
Rob Peel	Saswamoz International Trading (Pty)Ltd
Registered I&APs	See I&AP database

DOCUMENT HISTORY

Report no	Date	Version	Status
ER-2016-03-17	17 March 2016	1.0	Draft for I&AP review

LIST OF ABBREVIATIONS

Abbreviation	Description
AQA	Air Quality Act
BAR	Basic Assessment Report
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs, Mpumalanga
DWS	Department of Water and Sanitation
ECA	Environmental Conservation Act
EI	Environmental Impact
EIA	Environmental Impact Assessment
EIR	Environmental Impact report
EMPr	Environmental Management Programme
IUCMA	Inkomati- Usuthu catchment management agency
I & AP's	Interested and Affected Parties
IDP	Integrated Development Programme;
MAMSL	Meter Above Mean Sea Level
NEMA	National Environmental Management Act
NWA	National Water Act
WM	With Mitigation
WOM	Without Mitigation

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

1.1. PROJECT BACKGROUND

Exigo Sustainability (Pty) Ltd (Exigo) was appointed by Ganeloman (Proprietary) Limited to facilitate the Environmental Authorization process for the proposed shopping centre and fuel station development on Portion 49 of the farm Komatipoort Townlands no 182 J.U. Exigo is an independent company, the Company Profile and CVs of the project team is detailed in Appendix C.1Company Profile.

The study area is situated southwest of the town of Komatipoort, which is in the Mpumalanga Province. The site locality evaluated during the Environmental Impact Assessment process is Portion 49 of the farm Komatipoort Townlands no 182 J.U (Figure 1). The study area falls within the jurisdiction of the Nkomazi Local Municipality within the Mpumalanga Province and is accessible via the N4 and R571 roads. Central coordinates for the proposed site are:

Latitude: -25°26'49.31"S

Longitude: 31°56'55.40"E

The 21 digit code for the site: TOJU00000000018200049

The proposed development comprises of:

- Retail and value centre including:
  - Anchor shop
  - Line shops
  - Furniture and large nationals
  - Warehousing
  - Hardware/buildings value
  - Restaurants and drive thru's
- Service station and underground fuel tanks
- Associated services

The different components are discussed in more detail in Section 3.3.

The Basic Assessment (BA) Process is a requirement of the National Environmental Management Act, (Act 107 of 1998). The proposed activity is a listed activity in terms of Government Notice No R.983 of December 2014 (See Section 2)

1.2. PROJECT OBJECTIVES

The general approach to this study has been guided by the principles of Integrated Environmental Management (IEM). In accordance with the Integrated Environmental Management Guidelines (DEAT, 2004), an open, transparent approach, which encourages accountable decision-making, has been adopted. The study has also been guided by the requirements of the EIA Regulations (2014) set out in terms of the NEMA (Act No 107 of 1998). The EIA Regulations, which are more specific in their focus, define the specific approach to the EIA process.

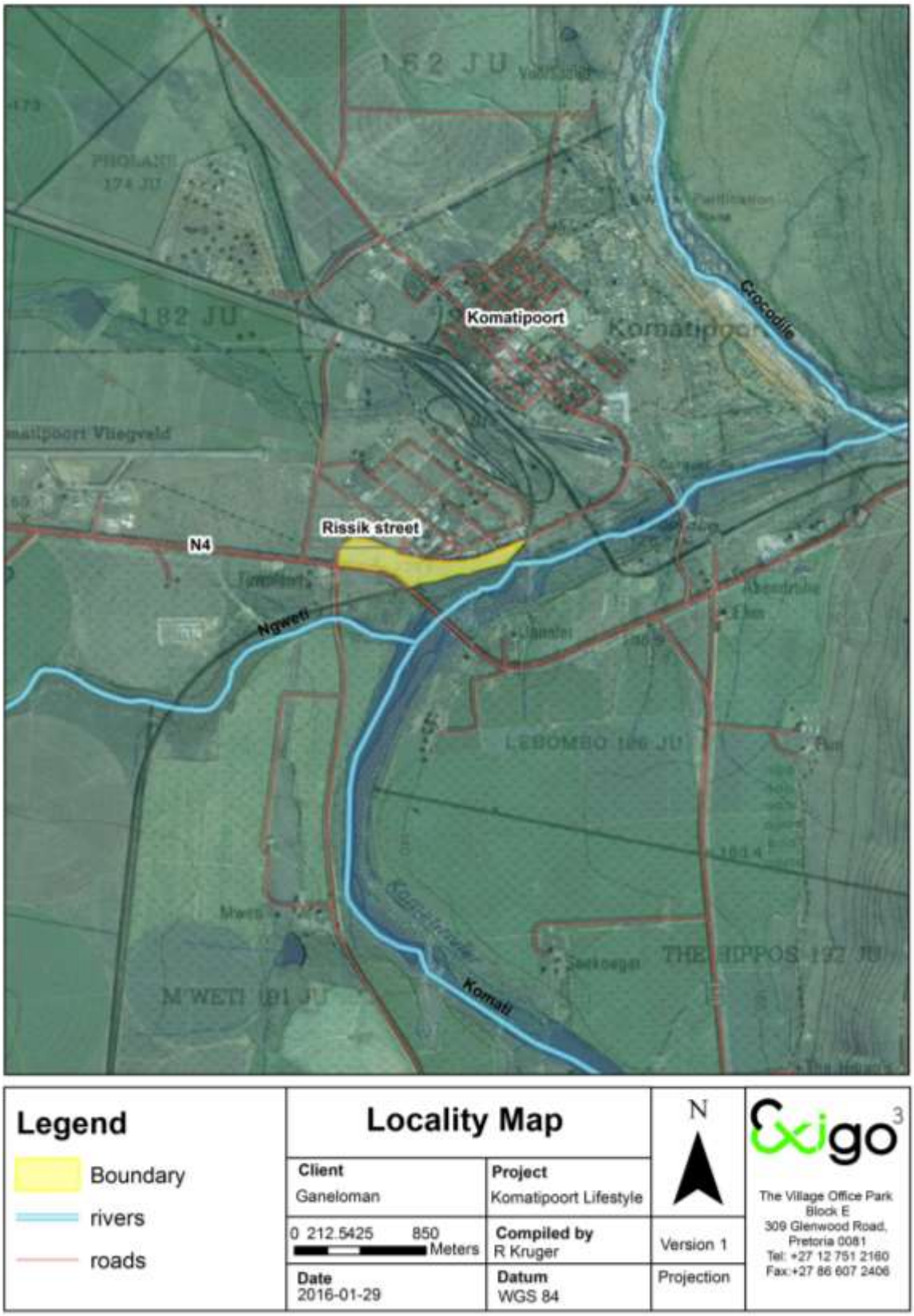


Figure 1 Project Locality map

1.3. DETAILS OF THE APPLICANT

The details of the applicant are indicated below:

Details of the Applicant	
Full names of the applicants:	Ganeloman (Proprietary) Limited
Contact person:	Jose de Sousa
Physical Address	Stand 182 - 49, Rissik Street, Komatipoort, Mpumalanga, 1340
Postal Address	P O Box 296, Komatipoort

1.4. DETAILS OF THE EAP

As per the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998), (NEMA) as amended and the Environmental Impact Assessment Regulations of 2014, the following information is pertinent with regards to the Environmental Assessment Practitioners (EAPs) that has conducted the Basic Assessment Report for the proposed development.

EAP	Qualifications	Years' experience
Mr. Michael Grobler	(BSc. Hons. Conservation Ecology, Masters in Organizational Leadership, Pr.Sci.Nat.)	11 years
Mrs Renee Kruger	M. Environmental Management	8 years
Ms. Hloniphile Kunene	B.Tech. Environmental Sciences	3 years

Contact Details of Principal Environmental Assessment Practitioner:

Details of the EAP	
Full name of the principal EAP:	Exigo Sustainability (Pty) Ltd
Contact person: Address	Michael Grobler Postnet 74, P/Bag X07, Arcadia, 0007 Pretoria
Telephone number:	012 751 2160
Fax number:	086 607 2406
Email address	michael@exigo3.com

1.5. PROJECT TEAM

The project team is shown in Table 1 below. The EIA process was managed by Exigo, an independent company.

Table 1 EIA Project Team and Specialists

Activity	Company	Responsible person	Qualifications
Environmental Impact Assessment	Exigo Sustainability Pty Ltd	M. H. Grobler	BSc Hons (Conservation Ecology) (Pri. Sci Nat)
		R. Kruger	M. Environmental Management
		H. Kunene	B.Tech Environmental Sciences
Heritage Impact Assessment	Exigo Sustainability Pty Ltd	Neels Kruger	BA, BA Hons. Archaeology
Geotechnical investigation	Geo 3 CC	H.J. Schurink	Pri. Sci Nat
Retail feasibility Study	Fernridge Consulting	Sybrand Strauss	BA Hons (Urban Geography)
Service station feasibility study	Petrorex	Hannes Pieterse	21 years' experience in the petroleum industry
Ecological Impact assessment	Exigo Sustainability Pty Ltd	Buks Henning	Ph.D Plant Ecology, MSc Soil Science,
Water specialist Study	Exigo Sustainability Pty Ltd	F. Mostert	M.Sc. Hydrogeology, Pr. Sci.Nat.
		GP Van Dyk	BSc Geology
Services reports	EDS	Garnet van der Walt	Pr Eng, B Eng, Hons (Transportation)
Electrical Services	Ingplan	Etjan Genis	Pr. Eng. B. Eng. (Electronic) MSAIEE

1.6. CONTENT OF THE REPORT

The following table references the content of the report based on the NEMA 2014 Regulations Appendix 1- Content of Basic Assessment reports.

Table 2 Content of the BAR

NEMA 2014 (Appendix 1) Requirements	Cross reference in the report
Details of the EAP	Section 1.4
Expertise of the EAP	Section 1.4
Location of the Activity including:	Section
21 digit surveyor code	Section 1.1
where available the physical address and farm name	Section 1.1
where the required information in item 1 and 2 is not available, the co-ordinates of the boundary of the property or properties	Section 1.1
a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale	Section 3.3
or if it is -	
linear activity, description and co-ordinates of the corridor in which the proposed activity or activities is to be undertaken, or	
on land where the property has not been defined, the coordinates within which the activity is to be undertaken	Not applicable
a description of the scope of the proposed activity including	Section 3.3
all listed and specified activities triggered and being applied for; and	Section 2.10
a description of the activities to be undertaken including associated structures and infrastructure	Section 3.3
a description of the policy and legislative context within which the development is proposed including-	Section 2
an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report	Section 2 and Section 3.1
how the proposed activity complies with and responds to the legislation and policy context plans guidelines tools frameworks and instruments	Section 3.2.2
a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Section 3.2.2
a motivation for the preferred site, activity and technology alternative	Section 8
a full description of the process followed to reach the proposed alternative within the site, including	Section 8

details of all the alternatives considered	Section 8
details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs	Section 4.2
a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them	Section 4.2
the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 6
the impacts and risks identified for each alternative including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts;	Section 9
can be reversed	Section 9
may cause irreplaceable loss of resources and	Section 9
can be avoided, managed or mitigated	Section 9
the methodology used in determining and ranking the nature , significance, consequence, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Section 9
positive and negative impacts that the proposed activity and alternatives will have on the environment and community that may be affected focusing on the geographical, physical, biological, social economic, heritage and cultural aspects	Section 9
The possible mitigation measures that could be applied and level of residual risk	Section 9
The outcome of the site selection matrix	N/A
if no alternative, including alternative locations for the activity were investigated, the motivation for not considering such, and	N/A
a concluding statement indicating the preferred alternatives, including preferred location of the activity	Section 8
a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including -	Section 5.1
the description of all environmental issues and risks that were identified during the environmental impact assessment process, and	Section 9
an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures	Section 9
an assessment of each identified potentially significant impact and risk, including-	Section 9
cumulative impacts	Section 9
the nature, significance and consequence of the impact and risk	Section 9

the extent and duration of the impact on risk	Section 9
the probability of the impact and risk occurring	Section 9
the degree to which the impact and risk can be reversed	Section 9
the degree to which the impact and risk may case irreplaceable loss of resources; and	Section 9
the degree to which the impact and risk can be avoided, managed or mitigated	Section 9
where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these findings and recommendations have been included in the final report	Section 9
an environmental impact statement which contains -	Section 11
a summary of the key findings of the environmental impact assessment	Section 11
a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and	Figure 13
a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Section 9
Based on the assessment and where applicable impact management measures form specialist reports the recording of the proposed impact management objectives and the impact managements outcomes from the development for inclusion in the EMPr	Section 10.1
any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of the authorisation	Section12
a description of an assumption uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 5.2
a reasoned opinion as to whether the proposed activity should or should not be authorised, any conditions that should be made in respect of that authorisation	Section 12
where the proposed activity does not include the operational aspects the period for which the authorisations is required, the date on which the activity will be concluded and the post construction monitoring requirements finalised	N/A
an undertaking under oath or affirmation by the EAP in relation to :	
the correctness of the information provided in the reports	
the inclusion of comments and inputs from stakeholders and I&APs	
The inclusion of inputs and recommendation from the specialist report where relevant and	
any information provided by the EAP to interested and affected parties and any responses by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by Interested and	Appendix E

affected parties and	
where applicable details of any financial provisions for the rehabilitation closure and ongoing post decommissioning management of negative environmental impacts	It is proposed to be conducted prior to decommissioning phase or post authorisation prior to construction
and other matters required in terms of Section 24 (4) (a) and (b) of the act	N/A
Environmental Management Programme	Section 10

2. LEGAL REQUIREMENTS FOR AUTHORIZATION

There are a number of regulatory requirements at local, provincial and national level to which the proposed development will have to conform. A brief summary of the Acts which are relevant to this study are outlined below. Note that other legislative requirements may pertain to the proposed development, but identification and interpretation of these is beyond the brief of this study. As such, the list provided below is not intended to be definitive or exhaustive and serves to highlight key environmental legislation and obligations only.

2.1. THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (ACT 108 OF 1996)

Section 24 guarantees the protection of the environment through reasonable legislative (and other measures) and such legislation is continuously in the process of being promulgated. Section 33(1) concerns administrative justice, which includes the constitutional right to administrative action that is lawful, reasonable and procedurally fair.

2.2. THE PROMOTION OF ADMINISTRATIVE JUSTICE ACT, 2000 (ACT NO. 3 OF 2000)

The purpose of the Promotion of Administrative Justice Act (PAJA) is principally to give effect to the constitutional right to administrative action that is lawful, reasonable and procedurally fair; and to the right to written reasons for administrative action as contemplated in section 33 of the Constitution; and to provide for matters incidental thereto.

2.3. THE PROMOTION OF ACCESS TO INFORMATION ACT, 2000 (ACT NO. 2 OF 2000)

Closely linked to the notion of administrative justice is the right of access to information.

2.4. THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999) (NHRA)

The NHRA established the South African Heritage Resources Agency (SAHRA) as well as provincial heritage resources agencies. In terms of the NHRA, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

2.5. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (ACT 10 OF 2004)

The National Environmental Management Biodiversity Act (Act No. 10 of 2004) (NEMBA) aims to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998.

2.6. NATIONAL FORESTS ACT (ACT 84 OF 1998)

The project may involve the cutting, disturbing, damaging or destroying of any protected trees declared in terms of section 12 of the National Forest Act (NFA) (Act 84 of 1998), if it this is proven during the EIA a licence in terms of section 15 of the NFA will be required.

2.7. NATIONAL VELD AND FOREST FIRE ACT (ACT 101 OF 1998)

The applicant should provide firebreaks in accordance with Chapter 4 of the National Veld and Forest Fire Act (Act 101 of 1998)

2.8. NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2003 (ACT NO. 39 OF 2004) (NEMAQA)

In the comparison of simulated ambient pollutant concentrations (due to the proposed activity) with air quality criteria, reference will be made to guidelines proposed by the South African National Standard (SANS) in SANS 1929:2004 and published for comment by the Department of Water and Environmental Affairs (previously the DEAT).

2.9. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (ACT 59 OF 2008) ("NEMWA")

The NEMWA sets out to reform the law regulating waste management and deals with waste management and control. It also introduces new and distinct concepts never before canvassed within the realm of waste management in South Africa, such as the concept of contaminated land and extended producer responsibility.

2.10. THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014

The overarching principle of the National Environmental Management Act 1998 (Act 107 of 1998) is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations.

Section 2 of NEMA (Act no 107 of 1998) states various principles of National Environmental Management. This includes:

- Environmental management must place people and their needs at the forefront of its concern.
- Development must be socially, environmentally and economically sustainable.

- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.
- Environmental justice must be pursued.
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued.
- Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
- The participation of all interested and affected parties in environmental governance must be promoted.
- Decisions must take into account the interests, needs and values of all interested and affected parties.
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

The Basic Assessment process followed is in compliance with the National Environmental Management Act: NEMA, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations of 2014 (Government Notice No R983 of December 2014). The proposed development involves 'listed activities', as defined by the NEMA, 1998. Listed activities are activities, which may potentially have detrimental impacts on the environment and therefore require environmental authorization from the relevant authorizing body.

The proposed development occurs within Mpumalanga and thus the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) is the responsible decision making authority.

The following listed activities are included for the above mentioned application:

Table 3 Listed activities applicable to the project

Relevant Legislation	Description
GNR 983: item 14	The development 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 cubic metres or more but not exceeding 500 cubic metres.
GNR 983: item 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.
GNR 983: item 28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; Excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.

2.11. NATIONAL WATER ACT (ACT NO 36 OF 1998)

In terms of the NWA, the national government, acting through the Minister of Water and Sanitation (previously the Minister of Water Affairs), is the public trustee of South Africa's water resources, and must ensure that water is protected, used, development, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons (section 3(1)).

In terms of the NWA a person may only use water without a license under certain circumstances. All other use, provided that such use qualify as a use listed in section 21 of the Act, require a water use license. A person may only use water without a license if such water use is permissible under Schedule 1 (generally domestic type use) if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA.

Section 21 of the NWA indicates that "water use" includes:

- taking water from a water resource (section 21(a));
- storing water (section 21(b));
- impeding or diverting the flow of water in a water course (section 21(c));

- engaging in a stream flow reduction activity contemplated in section 36 (section 21(d));
- engaging in a controlled activity which has either been declared as such or is identified in section 37(1) (section 21(e));
- discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit (section 21(f));
- disposing of waste in a manner which may detrimentally impact on a water resource (section 21(g);
- disposing in any manner of water which contains waste from, or which has heated in, any industrial or power generation process (section 21 (h));
- altering the bed, banks, course or characteristics of a water course (section 21(i));
- removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people (section 21(j)); and
- using water for recreational purposes (section 21(k)).

2.12. SABS CODES

There are specific policies (SABS codes) and guidelines that address environmental issues associated with the installation, construction, use, and decommissioning of tanks and pumps for filling stations (liquid fuel facilities). These include inter alia:

- SANS 10400 TT 53 (Sections 1 6)
- SANS 10131
- SANS 10108
- SANS 11535
- SANS 10089 Parts 2 & 3 which requires:
    - The installation of a leak detection system including observation and monitoring wells situated around the tank to facilitate early warning that a leak has arisen.
    - The provision of a plastic sheet below the tank that slopes towards an observation well.
    - Installation of leak detectors on the pressure systems

3. PROJECT DESCRIPTION

3.1. PROJECT MOTIVATION

The proposed township establishment on Portion 49 of the farm Komatipoort Townlands 182 J.U includes amongst others a filling station and a business component with retail as well as commercial development on the remaining part of the application property. This property is located in a development area being next to the N4 National Road at the entrance to Komatipoort Town from the N4 to the Mozambique Lebombo border post. The Maputo corridor, being the N4 is a very prominent road with unique characteristics and potential for urban, social and economic development within the Nkomazi Local Municipality. It is also for this reason that the section of the N4 from Komatipoort town to the border post provides opportunities for a filling station and Retail development.

The application site has accessibility and visibility from the R571 Provincial road to the north and west. Access to the site from the adjacent major roads has been clarified with the relevant authorities such as TRAC and NRA. Access to and from these major roads are essential in assessing whether or not a functional and economically viable development can be established on the application site.

The Komatipoort Border Post has been expanded; this has increased trade capacity and tourism through flow in the area further supporting the need for the proposed development (Fernridge, 2015).

3.2. Need And Desirability Of The Proposed Activities

3.2.1. FUEL STATION FEASIBILITY

A fuel station feasibility study was conducted by Petrorex in 2016 (Appendix D). This study describes the study area in order to determine the potential market for the products and services that the proposed service stations is intended to provide. Specifically, the section identifies the catchment area and describes its characteristics. It included the following

- Identification of the potential supporters of the service stations in the catchment area,
- Demographic profile of the catchment area,
- Economic profile of the assessment of the assessment area,
- Types of transport used by people living in the area,
- Travel patterns within the study area and between the area and other places,
- Traffic flows in the assessment area, and
- Future developments in the area.

Eight (8) current competitor sites have been identified in a 2.27km radius and 1 future site. (Petrorex, 2016)

The competitor sites primarily share in the same directional platoon of traffic.

Competitor sites identified were based on the general guideline1 “within 3 kilometres of an existing filling station in a built up area” (Petrorex, 2016).. The adoption of the policy guideline by several Departments was mainly influence by Environmental Impact Assessment (“EIA”) Administrative Guideline – Guideline for the Construction and Upgrade of Filling Stations and Associated Tank Installations, March 2002. This limitation on the distance between service stations was highly influence by international experience, views of interested persons as well as the anticipated limited end-use of filling stations. The reuse of filling stations must therefore be considered especially if there accesses have been granted at Provincial level where such direct accesses cannot be used for any other purposes.

The majority of competition sites are located north east of the proposed development, approximately 1.4 kilometres from the proposed development.

The Study reveals the following considerations to be taken into account:

- The location of the site in relation to the competitor sites in sharing in the same trading area with the emphasis on sharing in the same directional platoon of traffic.
- The geographical area divided into several market segments due to natural barriers such as mountains and rivers as well as manmade structures such as arterial roads, railway lines and open land for recreational purposes or government institutions.
- The physical characteristics of the competitor sites in regards to accessibility, visibility and overall its visual manifestation.
- The diversity in quantity and quality of services offered by competitor sites in relation to market demand.
- That there is currently no universal scientific method available in the calculation of the economic influence on competitor sites and that each Applicant has to formulate their own methodology.
- Limited to none statistical market related information, inclusive of volumes throughput of the competitor sites, accessible.

1 The adoption of the policy guideline by several Departments was mainly influence by Environmental Impact Assessment (“EIA”) Administrative Guideline – Guideline for the Construction and Upgrade of Filling Stations and Associated Tank Installations, March 2002.

Table 4: Volume Loss – Moving Market Factor / Calculation

NU.	Competitor Filling Station Name.	Oil Company	Present Estimated Fuel Sale Volume [lpm]	Moving Market Factor [%]	Volume loss kl/site	Volume after loss Year 1	Volume after loss Year 2	Volume after loss Year 3	Volume after loss Year 4	Volume after loss Year 5
1	Sasol Komatipoort	Sasol	575	10.0%	58	518	536	554	574	594
2	Obaro Diesel Komatipoort	Obaro	80	1.0%	1	79	82	85	88	91
3	Komatipoort Motors	Total	175	10.0%	18	158	163	169	175	181
4	Frontier Fuel	Other	75	1.0%	1	74	77	80	82	85
5	Mascor Komatipoort	Caltex	350	15.0%	53	298	308	319	330	341
6	Lebombo Agri Petroleum	Other	250	1.0%	3	248	256	265	274	284
7	Lebombo Truckstop Service Station	Engen	500	1.0%	5	495	512	530	549	568
8	Doeane Garage	BP	550	5.0%	28	523	541	560	579	600

The potential volume loss on all off the identified competition sites would not lead to their closure at all (Petrorex, 2016)

When looking at the future demand potential for the proposed service station, a five year growth scenario was considered. Given the characteristics of the site and the future development potential of the area in which the proposed site of the service station is positioned, it is expected that there will be increased volumes of traffic in the area. An additional assumption was made based on traffic volume growth of 3.5% is in line with realistic economic growth in the area. Since Petrorex conducted a traffic count at the indicated crossing in June 2008 there was a 5.5% year on year traffic growth until the recent traffic count conducted February 2016.

Taking into consideration that the volume projection, as worked out by Petrorex, it is indicated that the projected level of sales can be realized and that the proposed development is highly likely to be viable.

For more details on how all the aspects have been taken into account and the calculations done refer to Appendix D (Petrorex report).

3.2.1. RETAIL FEASIBILITY

Fernridge consulting (Hereafter Fernridge) has conducted the retail feasibility components of the proposed Komati Lifestyle Development in 2009 and updated in 2015. The project has the potential as a business development to serve the residents of Komatipoort, tourists as well as surrounding farm areas and also the traffic between Nelspruit and Maputo, based on its location. The property is included within the urban edge of Komatipoort and thus earmarked for potential development.

The Municipal Spatial Development Framework demarcated the urban edge to include the application site.

.

According to Fernridge if the projected 2017 catchment area demographics were applied (refer to Fernridge report in Appendix D for more details) to the Retail Potential Estimate which indicate a total feasible size of ±6500m² Gross Lettable Area if 18% market share could be intercepted. Fernridge is of the

opinion that this should be an achievable market share depending on the design, locality and tenanting of the proposed development.

- A further combined ±4000m²GLA could be warranted from the passing trade and the tourist inflow support if an average market share of between 10% to 15% could be achieved from the two separate markets. The bulk of this warranted GLA originates from the Cross Border Trade.
- Should these ranging market shares be achieved, then a total first phase developable size of between ±9500m² to 11000²GLA could be feasible at the proposed site. Additional phases can be considered if tenants trade well, low vacancies exist, the market allows for expansion and more space is required by the tenants.

3.2.2. GUIDELINE ON NEED AND DESIRABILITY

In 2014 the DEA published the Guideline on Need and Desirability, Integrated Environmental Management Guideline Series 9. The project has therefore also been evaluated against the criteria presented in the guideline.

Table 5 Need and desirability (DEA, 2010)

How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	Please explain
Please refer to section 6 and 9.5 of this report.	
How were the following ecological integrity considerations taken into account? :	
Threatened Ecosystems	Please explain
Please refer to Appendix D and section 6 of this report.	
Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure	Please explain
Please refer to Appendix D and section 6 of this report.	
Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs")	Please explain
Please refer to Appendix D and section 6 of this report.	
Conservation targets	Please explain
Please refer to Appendix D and section 6 of this report.	
Ecological drivers of the ecosystem	Please explain
Please refer to Appendix D and section 6 of this report.	
Environmental Management Framework	Please explain
Please refer to Appendix D and section 6 of this report.	
Spatial Development Framework	
Please refer to the Fernridge report Appendix D.	
Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.)	Please explain
Please refer to Appendix D (however not of significant relevance)	

How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?			Please explain
Please refer to section 9.7			
How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?			Please explain
Please refer to section 9.7			
What waste will be generated by this development? What measures were explored to firstly avoid waste and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?			Please explain
Refer to Section 8, and 9			
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?			Please explain
Please refer to Section 9.8			
How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?			Please explain
Please refer to Section 8 for the alternatives considered for the proposed development			
How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?			Please explain
Refer to Section 8.1.1			
Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?	**YES**	NO	Please explain
The natural resource dependency in terms of water and power will increase, however the proposed development will promote economic development and the systematic shift to solar energy will reduce power usage. The development is also likely to reduce people having to travel greater distances for certain retail offers in the Komatipoort area.			
Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this proposed development alternative?)	**YES**	NO	Please explain
Reuse of treated water for irrigation significantly reduces the additional water requirements			
Do the proposed location, type and scale of development	**YES**	NO	Please explain

promote a reduced dependency on resources?			
The natural resource dependency in terms of water and power will increase, however the proposed development will promote economic development and the systematic shift to solar energy will reduce power usage. The development is also likely to reduce people having to travel greater distances for certain retail offers in the Komatipoort area.			
How were a risk-averse and cautious approach applied in terms of ecological impacts			Please explain
A risk analyses of the impacts identified was conducted to determine the significance of the impacts on the fauna and flora of the study area.			
What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?			Please explain
Refer to Section 5.2			
What is the level of risk associated with the limits of current knowledge?			Please explain
Refer to Section 5.2			
Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?			Please explain
A risk analyses of the impacts identified was conducted to determine the significance of the impacts on the fauna and flora of the study area.			
How will the ecological impacts resulting from this development impact on people's environmental right in terms following:			
Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?			Please explain
Please refer to section 9.7			
Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?			
Please refer to section 9.7			
Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?			Please explain
Refer to Section 9			
Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?			Please explain
Please refer to section 9 and 8.1.5			
Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option (BPEO)" in terms of ecological considerations?			Please explain
Please refer to section 8			
Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?			Please explain
Please refer to section 5.3.2 and 6 of the Ecological Impact Assessment (Appendix D)			

What is the socio-economic context of the area based on, amongst other considerations, the following considerations?			
The IDP (and its sector plans' vision, objectives, strategies indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,			Please explain
According to the Nkomazi IDP (2014/2015 – 2016/2017) the Development Strategies, Programmes and Projects additional housing and economic development is planned for the near future including the emphasis on the Mozambique South Africa border post developments.			
Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),			Please explain
Please refer to the retail (Fernridge) and Fuel feasibilities (Petrorex)			
Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and			Please explain
The site is currently vacant. The N4 and Rissik street, entrance to the Komatipoort town surrounds the site. Please refer to the SDF map as included in the Fernridge report of proposed new residential developments, dry port and various other. Please refer to the Archaeological Impact Report			
Municipal Economic Development Strategy ("LED Strategy").			Please explain
According to the Mpumalanga LED - The wholesale and retail sector contributed only 8.2% of Provincial value added, but provided almost 14% of Provincial employment. According to data derived from tax receipts at the Lebombo border post, tourists from Mozambique spend approximately R30-million at retail outlets in Nelspruit every month. The wholesale and retail sector, which grew relatively slowly between 1996 and 2002 at 1.8% per annum, added almost 16 000 jobs in the Province between 1996 and 2001. The Nkomazi Local Municipality has an LED Strategy that was approved by council in 2009 – This also emphasises economic growth development of Shopping Malls and wholesale and retail being on the list of developments.			
Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?			Please explain
Section 9.8.7			
Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	**YES**	NO	Please explain
The development could lead to realisation of one of the LED strategies regarding economic growth. It could also assist in the creation of jobs. The anchor tenant could also further the economic development by communities purchasing the produce from the local store which is linked or provided by subsistence farmer's close by.			
How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?			Please explain
This project may contribute with establishing some physical infrastructure that is needed in the community. It will create revenue via tax that may be utilised to address developmental needs and creating social infrastructure. It will assist with creating opportunities to develop skills and create a market for those skills. From a psychological perspective it will create hope for a better future by creating economic opportunities, much needed given the high unemployment and lack of opportunity in the area.			
Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	**YES**	NO	Please explain
Please refer to the feasibility studies conducted for the project. The project is proposed to begin in 2016 with construction and will continue to operate well beyond 30 years, this is a considerably long period which will ensure the social and economic benefits are enjoyed by both current and future generations.			
In terms of location, describe how the placement of the proposed development will:			

result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	Please explain
There are plans to employ local labour as far as is feasibly possibleand thus the place of work will be in close proximity to place of residence.	
reduce the need for transport of people and goods,	Please explain
Considering that local employment will most probably be done by the retail segments there will be a reduced need to transport people.	
result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	Please explain
Yes the centre would also act as a transportation hub for people to travel to and from and create a densification of economic activity in the hub proposed by the municipality for this purpose.	
compliment other uses in the area,	Please explain
Please refer to the feasibility studies conducted.	
be in line with the planning for the area,	Please explain
According to an Nkomazi Local Municipality July 2013 SDF report, the municipality is planning several new developments in and around Komatipoort. Residential developments are mostly orientated towards the lower income households and include 60ha of industrial freehold, warehousing and similar businesses. The main entrance to the town will be developed by SANRAL. Together with the current low cost housing known as Orlando, a social housing project is envisaged by the Municipality. Adjacent to Orlando, another 1000 plots are being established as a township. The department of public works have combined 24 plots with street closures envisages the development of medium cost housing. Overall, the developments can boost the lower income demographics of the area that can contribute to further increase the demand for a retail development. Other developments include the building of a few upper income houses on the north-eastern side of town–facing the Crocodile River.	
for urban related development, make use of underutilised land available with the urban edge,	Please explain
Yes, the area is currently vacant and is located within the urban area of Komatipoort. The town planning approval has also been received for the proposed development.	
optimise the use of existing resources and infrastructure,	Please explain
Refer to the Services reports Appendix D	
opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	Please explain
Refer to the Services reports Appendix D	
discourage "urban sprawl" and contribute to compaction/densification,	Please explain
Yes due to the project being located in the urban area in close proximity to proposed new housing.	
contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	Please explain
Yes, the area is currently vacant and is located within the urban area of Komatipoort.	
encourage environmentally sustainable land development practices and processes,	Please explain

Refer to Section 9	
take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	Please explain
The site is located at the intersection on the N4 and Rissik street, the main access from the N4 to Komatipoort Town. Other favourable location specific factors are described in the feasibility studies.	
the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	
Refer to the feasibility studies	
impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	Please explain.
The proposed site is generally not sensitive in terms of history or sense of place. As such, no major impact on heritage resources or the larger heritage landscape is anticipated	
in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	Please explain
The construction and operation could stimulate economic activities of directly and indirectly affected businesses, which subsequently leads to the creation of new business businesses.	
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	Please explain
Refer to point a), b) and c) below.	
What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Please explain
The assumptions and limitations are provided for in Section 5.2	
What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	Please explain
The level of possible changes depends on the extent of deviation of the actual project's expenditure during both construction and operational phases from the estimated figures used in the modelling exercise.	
Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Please explain
A conservative approach was used in the estimation of impacts.	
How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Please explain
To reduce or avoid negative impacts feasibility studies have been conducted for the proposed development taking into account the surrounding retail and fuel stations.	
Positive impacts. What measures were taken to enhance positive impacts?	Please explain
Please refer to Section 9	
Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	Please explain

The construction and operational phases stimulates economic activities of directly and indirectly affected businesses which translate into the creation of new employment opportunities and creation of businesses. These results in increased household income and subsequently increased household expenditure, through this, an additional round of value adding is created.	
What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	Please explain
Please refer to Fernridge and Petrorex reports –Appendix D	
What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	Please explain
Please refer to Fernridge and Petrorex reports –Appendix D	
What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	Please explain
Refer to Section 9	
What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Please explain
Refer to mitigation section 10 in the BAR	
What measures were taken to:	
ensure the participation of all interested and affected parties,	Please explain
It is not always possible to involve all interested and affected parties individually. Every effort was, however, made to involve as many broad based representatives of the stakeholders in the nominated area as indicated in Section 4.2 and the appropriate Appendices (included in Appendix A). The assumption has, therefore, been made that those representatives with whom there has been consultation, are acting on behalf of the parties which they represent.	
provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	Please explain
Same as previous	
ensure participation by vulnerable and disadvantaged persons,	Please explain
Same as previous	
promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	Please explain
Same as previous	
ensure openness and transparency, and access to information in terms of the process,	Please explain
Same as previous	
ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and	Please explain
Same as previous	
ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?	Please explain

Same as previous			
Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?			Please explain
Please refer to feasibility studies conducted by Fernridge and Petrorex – Appendix D			
What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?			Please explain
This should be taken up with each of the tenants in the contracts as the management of the individual workers will not be with the developer.			
Describe how the development will impact on job creation in terms of, amongst other aspects:			
the number of temporary versus permanent jobs that will be created,			Please explain
This will be tenant dependant. With retail the higher number of jobs would most likely be permanent employees.			
whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),			Please explain
Low to no skills is required for most of the job opportunities in the operational phase.			
the distance from where labourers will have to travel,			Please explain
Most unskilled and semi-skilled workers will come from local communities. Skilled and highly skilled will travel from nearby towns while some might need to be relocated from other parts of SA.			
the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and			Please explain
Positive impacts will be created were the jobs are created			
The opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).			Please explain
Currently the land is vacant and of no economic value, the development will however create jobs and income for the area.			
What measures were taken to ensure:			
that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and			Please explain
Combined site visit and approach was discussed with DWS and DARDLEA. Town planning approval will also be provided to them.			
that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?			Please explain
N/A			
What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?			Please explain
Please refer to mitigation measures			
Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	YES	NO	Please explain
Yes the measures are achievable.			

What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	Please explain
Monitoring will be done and paid for by the applicant. It is proposed that a closure costing be compiled prior to construction to include cost for remedying pollution	
Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Please explain
Refer to Section 8	
Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Please explain
Please refer to the feasibility studies – Appendix D	

3.3. PROJECT OVERVIEW

The proposed Komati Lifestyle development on Portion 49 of the farm Komatipoort Townlands 182 J.U compromises out of the following (the site has been divided into 3 erven, please refer Figure 4 for a diagrammatic view):

- 1st phase
    - Anchor Shop– 2395 m²
    - Line shops – 5649 m²
    - Services 262 m²
    - Outside Seating /Play area – 663m2
    - Furniture 1673 m2
    - Hardware/ Building/ Value – 2961 m^2
    - Drive thru – 500m2
- 2nd Phase
    - Filling station
    - Service station – 680 m² - 5 Pumps
        - 2 X 46 000 liter tanks, and 3 X 23 000 liter tanks
        - Canopies – 451 m²
    - Motor Dealership
    - Motor related/ Warehousing
    - Associated services

3.3.1. CIVIL SERVICES

The proposed development is situated within the jurisdiction of the Nkomazi Local Municipality (NLM). Therefore, NLM will be responsible for the provision of water, electricity, sewerage disposal, and refuse removal services, i.e. civil service provision. A meeting with NLM was held on the 22nd of February 2016 to determine the availability of services. The services have been discussed in more detail below and the reports are appended in Appendix D.

3.3.2. WATER

The existing water treatment plant in Komatipoort currently supplies approximately 3,14 Ml of water per day. This is not sufficient to accommodate the current demand and water restrictions are imposed at night in the town.

The Nkomazi Municipality is currently undertaking a project to upgrade the treatment plant to increase the capacity to 4Ml per day. Future initiatives will increase the capacity to 6 Ml per day.

It was indicated that the development must provide for onsite storage of potable domestic water in order to cater for the current interruptions in municipal water supply. The development must also provide alternative water sources such as boreholes to provide backup water to the development, should the municipal supply be interrupted. The development of this borehole(s) would require applicable authorisation processes.

The water demand for Phase 1 of the development is therefore 63,65 kl/day.

3.3.3. SEWAGE

According to the EDS report (Appendix D). The sewage treatment plant will comprise of a modular biological waste water treatment plant that treats effluent to the required standards for disposal into environment or reuse for irrigation or non-potable uses. The Biological Waste Water Treatment Plant produces no sludge that needs daily handling, and needs no permanent labour, the system further has very low electricity demand.

The Biological waste water treatment plant has the following stages:

- Screening

All effluent to report to inclined manually raked in-ground screen.

Effluent passes through a grit channel for grit removal. The feed pump will be submersible sewage specific pumps that will feed the plant at the designed flow rate. A main and standby feed pump to be installed to eliminate spillages and ensure availability.

- Anaerobic digestion tank

There will be two HDPE Tanks in series that will serve as the anaerobic digestion phases.

- Aerobic digestion or Bioreactors

There will be one aerobic HDPE tank serve as the aerobic digestion phase. Each tank will be fitted with micro bubble diffusers which allows for high dissolved oxygen transfer into the effluent. A double stage blower will be used in the bioreactor.

- Clarifier or Re-activated sludge tank

There will be one HDPE Tank will serve as the clarifier. Submersible pump will be installed to feed the anaerobic phase.

- Disinfection or sterilization

There will be one HDPE tank that will serve as the disinfection tank. The tank will be fitted with two ozone contact chamber to optimize disinfection.

3.3.1. STORMWATER

The land falls to the east of the site towards the rail line from where an existing drainage structure drains the runoff underneath the rail line towards the Komati River to the east.

The proposed stormwater system consists of a combination of surface runoff and a piped system which will

collect the stormwater from the proposed development and discharge it via the existing drainage system underneath the rail line to the Komati River.

The drainage system will be designed to prevent additional stormwater runoff to the N4.

The capacity of the existing drainage structure underneath the rail line will be confirmed during the detail design phase. Measures will be taken to attenuate stormwater on site if required as a result of inadequate capacity of the existing drainage structure.

It is proposed by the engineers to have a retention pond on site on Erf 3 to allow the slow and diffused release of Stormwater (Refer to the Services report in Appendix D).

3.3.2. ROAD INFRASTRUCTURE

The development is located to the north of the existing N4 route between the N4 and R571 (Rissik Street) which is the main access to the town of Komatipoort. The N4 falls under the jurisdiction of the South African National Roads Agency Limited (SANRAL).

Direct access from the N4 to any development will only be granted by SANRAL if the access can be upgraded to a future interchange on the N4. The site is located adjacent to and to the east of the existing main access to the town of Komatipoort. This intersection is planned to be upgraded to an interchange in future. This effectively prohibits any additional access from the N4 to the site as a result of minimum interchange spacing requirements.

No direct access will therefore be possible from the N4 to the development.

N4 Highway / R571 (Rissik Street): An exclusive, short left-turn lane is proposed in the northern approach (R571) to reduce the expected vehicle queues to within acceptable limits (Refer to the Services report in Appendix D).

3.3.3. ELECTRICITY

Nkomazi Municipality to confirm capacity at their substation to supply the proposed development with electricity in writing. Verbal confirmation that 1600kVA is available was received from Mr. Pieter Theron Manager: Electrical Services from the Nkomazi Municipality. The proposed development will require 1520 kVA. It is proposed the use of solar is also investigated further as this would reduce the amount of electricity needed for the development from the municipality although capacity is available at present.

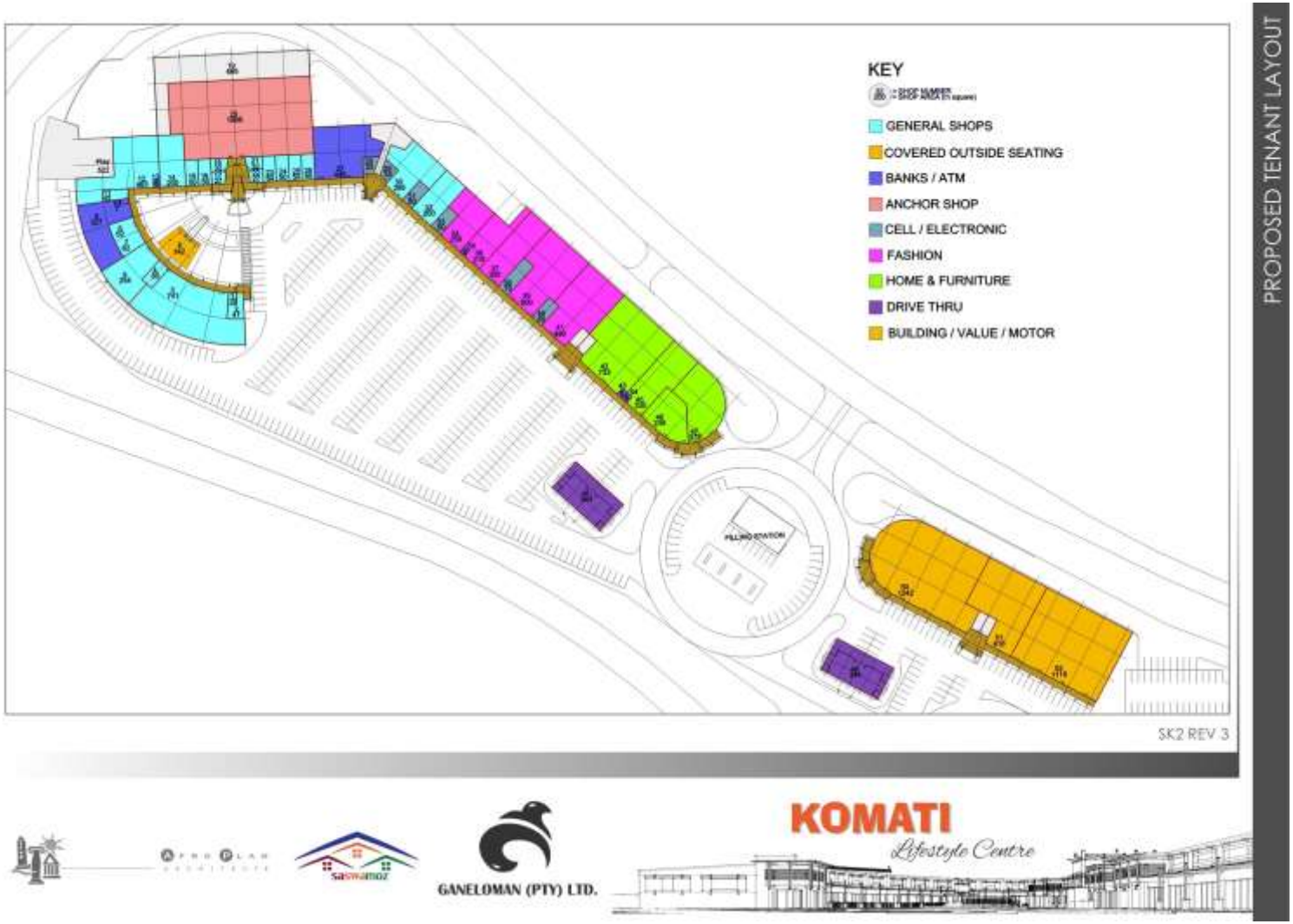


Figure 2 Layout of preferred alternative

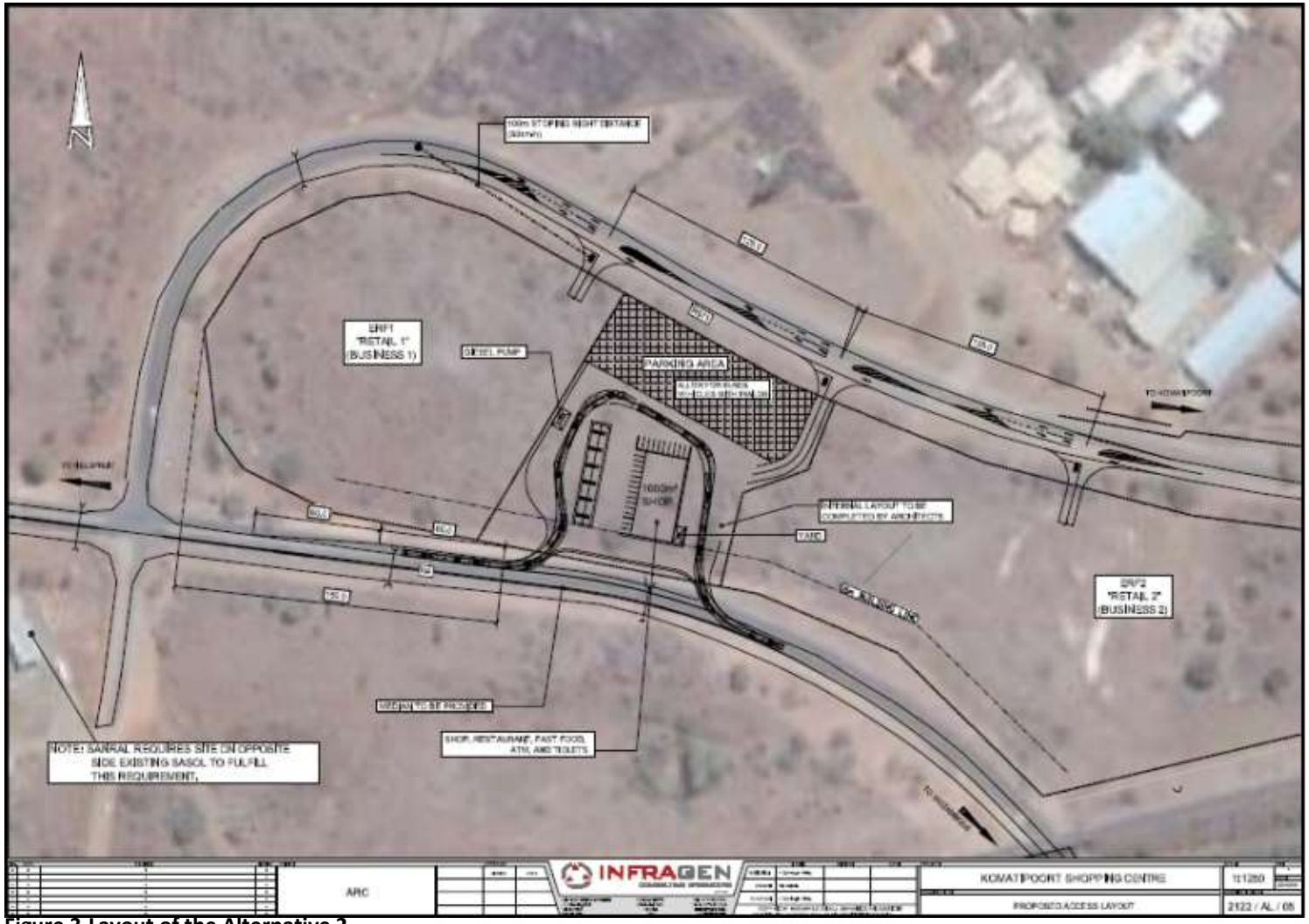


Figure 3 Layout of the Alternative 2

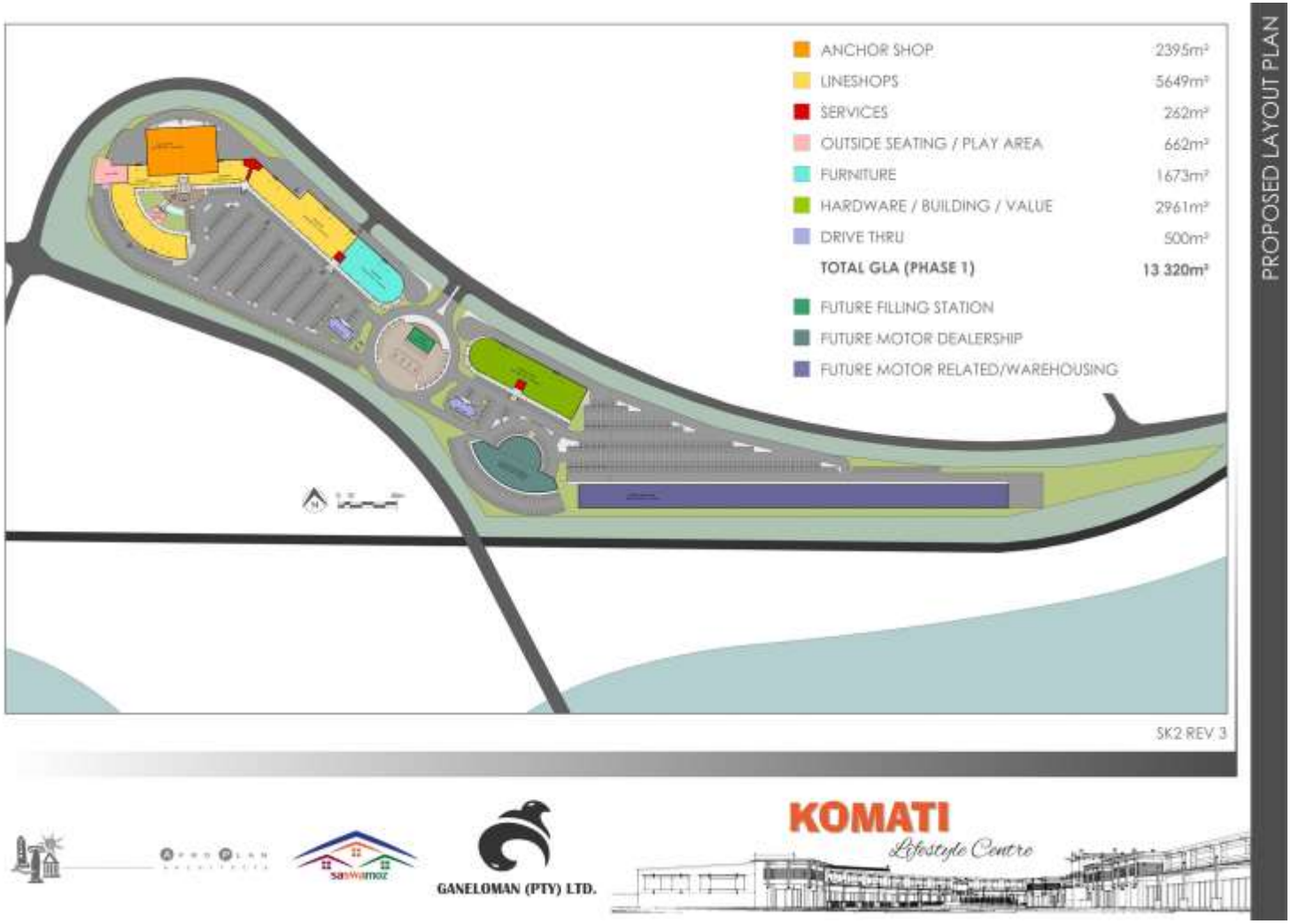


Figure 4 Layout of the Alternative 2

4. APPROACH TO THE PROJECT

4.1. BASIC ASSESSMENT STUDY

A Basic Assessment Study was undertaken by the environmental consultancy Exigo. A pre-application meeting with DARDLEA and Inkomati- Usuthu catchment management agency (IUCMA) was held on the 10th of February 2016 to discuss and agree on the approach to the project.

4.2. PUBLIC PARTICIPATION PROCESS

The principles of NEMA govern consultation with interested and affected parties (I&APs). These principles include the provision of sufficient and transparent information to I&APs on an on-going basis, to allow them to comment.

4.2.1. IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

The following process will was undertaken to facilitate the public participation process for the proposed project:

4.2.2. NEWSPAPER ADVERTISEMENT

Advertisements, notifying the public of the Environmental Impact Assessment application and process, and requesting I&APs to register their comments with Exigo, was placed in the Lowvelder on Tuesday, 16 February 2016. This advertisement was placed in accordance with regulation 41(2) (c) of the EIA Regulations of 2014.

4.2.3. SITE NOTICE

In order to inform surrounding communities and adjacent landowners of the proposed development, site notice boards in accordance with regulation 41(2)(a) and 41(3) of the EIA Regulations was erected on Friday, 12 February 2016 at the following locations:

- 2 notices on site
- 1 notice at Spar Centre in Komatipoort.

4.2.4. DIRECT NOTIFICATION OF IDENTIFIED I&APS

Key stakeholders, who included the following sectors, were informed by means of hand deliveries, emails, faxes or registered post of the proposed development:

- The owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site;
- The owners and occupiers of land within 100 meters from the boundary of the site or alternative site who are or may be directly affected by the activity;
- Ehlanzeni District Municipality;

- Nkomati Local Municipality;
- Ward 6 municipal Councillor;
- Mpumalanga Department of Economic Development, Environment and Tourism;
- Mpumalanga Department of Co-operative Governance and Traditional Affairs;
- Mpumalanga Department of Safety, Security and Liaison;
- Department of Water and Sanitation;
- Department of Public works, Roads and Transport;
- Department of Road and Transport- Ehlanzeni Region
- Mpumalanga Tourism and Parks;
- Kruger National Park;
- Eskom;
- SANRAL;
- Sasol and
- Transnet
- Fuel Retailers Association (FRA)

A Comment and Response Report, detailing all comments from the I&APs is included in **Error! Reference source not found.**

4.2.5. PUBLIC AND FOCUS GROUP MEETING

A focus group meeting was held with SASOL on the 29th of February 2016. The purpose of this meeting was to discuss the SASOL on site gas line and implications.

4.2.6. RAISING OF ISSUES FOR INVESTIGATION BY I&AP

I&APs were granted an opportunity to raise issues either in writing, by telephone or email. All the issues raised by I&APs will be captured in a Comment and Response Report which has been appended on this draft BAR and the I&APs will received responses acknowledging their contributions.

Through the synthesis of issues raised by interested and affected parties and the project team during the notification period, the following issues were identified through specialist studies:

- Municipal Infrastructure Impact
- Transnet right of way
- Risk regarding Sasol Gas Pipeline

- Socio-Economic Impacts; including:
    - Feasibility of the filling station;
    - Impact on existing filling stations and retail;
    - Impact on Jobs (Positive);

4.3. DRAFT BAR

The EIA Regulations specify that I&APs must have an opportunity to verify that their issues have been captured. A period of 30 days was made available to allow for public comment on the Draft BAR. The availability of the Draft BAR was announced via personal notification letters, emails, and/or SMSs to all the registered I&APs on the distribution list. The following methods were available for I&APs to access the reports:

- Published on the Dropbox website
- Hard Copies and Electronic copies were distributed upon request.

4.4. FINAL BAR

A Comments and Response report will be prepared following comments on the Draft BAR. The Draft BAR will be updated to accommodate all received comments. This Final BAR will then be submitted to the Competent Authority.

5. ENVIRONMENTAL IMPACT ASSESSMENT

This BA report expands on the key issues and concerns identified by the specialists, I&APs and EAP through their professional and experience. Specialist studies were conducted and results included in this report. The specialist studies assisted with the assessment of anticipated impacts and highlighted the key areas of concern as well as necessary mitigation measures. The environmental practitioner evaluated the impacts using professional judgement and scientific evaluations..

5.1. METHODOLOGY USED FOR THE IMPACT ASSESSMENTS

Assessments of impacts were based on DEAT's (1998) Guideline Document: EIA Regulations. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts. For more information also see Section 9.2.

5.2. ASSUMPTIONS, UNCERTAINTIES AND LIMITATIONS

The following limitations and or assumptions apply to the study:

- **Retail feasibility:** Fernridge Consulting (Pty) Ltd has taken every care in the preparation of the respective specialist report. The sources of information used are believed to be accurate and reliable, but no guarantee of accuracy or completeness can be given.
- **Heritage Impact Assessment:** The following assumptions and limitations were relevant pertaining to this specialist assessment:
    - Visibility: Visibility proved to be somewhat of a constrain in areas with denser surface cover, as well as portions where vegetation is more pristine
    - Thus, even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the Komatipoort Filling Station and Retail Centre Development, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area.
    - The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological

specialist.

- **General:** The assumptions and limitations on which this study has been based include:
  - All information provided by Proponent and I&APs to the EIA consultants and their specialists was correct and valid at the time it was provided.
  - The EIA consultants and their specialists do not accept any responsibility in the event that additional information comes to light at a later stage of the process.
  - Data from unpublished research is valid and accurate.
  - It is not always possible to involve all interested and affected parties individually. Every effort was, however, made to involve as many broad based representatives of the stakeholders in the nominated area as indicated in Section 4.2 and the appropriate Appendices (included in Appendix A). The assumption has, therefore, been made that those representatives with whom there has been consultation, are acting on behalf of the parties which they represent.
- **Fuel station feasibility**:
  - The identified Competitor Sites in the local trading area, fuel volume sales in literage information is considered as confidential by the relevant Dealers. At the time of the survey the Dealers were not approach to obtain such information. The respective Oil Companies and the Department of Energy are the only institutions that attain this classified information. The volume of sales or throughput can only be accurately included in an amended report once obtained through a public participation process, if applicable.
  - Information obtained in regards to undeveloped service station sites (sites / property carrying the relevant zoning classification) are obtained from the relevant Local Authorities. Although Petrorex uses it best endeavours to obtain the relevant information Petrorex has to depend on the administrators' cooperation in providing such reports and insight of the local trading area.
  - A traffic count was conducted by means of a manual counts at the proposed service station site for a 12 hour period from 06h00 until 18h00 (30 minutes interval) on a typical weekday of Tuesday, Wednesday and a Thursday. The manual count gathered data for determination of vehicle classification (Light vehicles, Taxi's and Heavy vehicles) taking into consideration turning movements and direction of travel. A key limitation of a manual counts is the lack of information about long-term temporal variation. Average daily traffic (ADT)

counts represent a 24-hour count at any specified location. To determine the 12 hour count to an ADT an expansion factor was used. This calculated expansion factor is determined from electronic counts comparison in the vicinity obtained from local authorities and traffic count engineers.

- That there is currently no universal scientific method available in the calculation of the economic influence on competitor sites and that each Applicant has to formulate their own methodology.

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section outlines the existing environment in the project area. Please refer to Figure 1 indicating the major towns, infrastructure, rivers and streams and existing operations in the study area.

6.1. BIOPHYSICAL ENVIRONMENT

6.1.1. TOPOGRAPHY

The proposed site is very flat and has an approximate 1:37 gradient towards the south east; therefore surface water drains by means of sheet wash in the same direction.

6.1.2. CLIMATE

The area is situated in the Mpumalanga Province that has a generally warm to hot climate and a fairly high humidity in summer with average maximum temperatures of 33º C and average minimum temperatures of 8º C. Winds in Mpumalanga blow mainly from the east but their actual destination varies from place to place according to local topographic effects. The precipitation usually occurs as torrential down pours in the afternoon.

6.1.3. RAINFALL

Rainfall data was obtained from station 0557806 (Komatipoort) that is situated approximately 1.8 kilometres to the north of the site in the town Komatipoort. The data cover a time period of 103 years from 1904 to 2007 and the MAP calculated for this period is 489 mm/a, the calculated 96th percentile is 200 mm/a. The study area is situated in a predominantly summer rainfall area with 49% of the MAP occurring in the summer months (December to February), and 5% during the winter months (June to August).

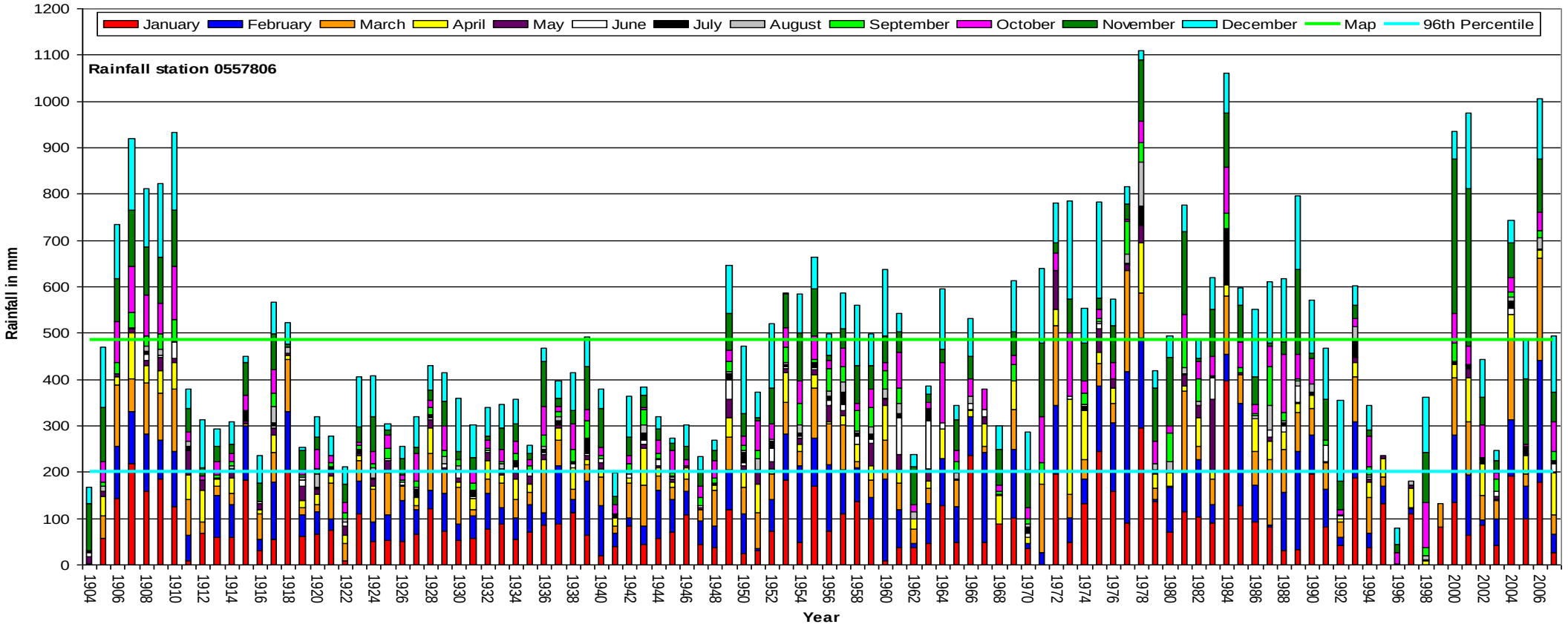


Figure 5 Rainfall for station 0557806 (Komatipoort)

6.1.4. TEMPERATURE

January is the hottest month with an average maximum of 31.7°C (average taken from 2000-2008; Komatipoort - Tenbosch SASRI 2003-2008) and July is the coldest month with an average minimum of 9,1°C. (Table 6). The annual average minimum and maximum temperatures are 7.9°C and 34.6°C.

6.1.5. WIND

October has the highest monthly average with a wind speed. Generally winds are light except for gusts during thunderstorms. Winds blow mainly from the east but their actual destination varies from place to place according to local topographic effects. The passage of weather systems, such as thunderstorms and cold fronts, over the area results in changes in wind direction for short periods. It should however be noted that due to the topographical influences, there would be considerable differences in the wind field and corresponding dispersion characteristics on site.

Table 6 Summary of climate data – Monthly Average for the last 5 years (Komatipoort- Tenbosch [25°22'S, 31°55'E])

Year	ET	Tmin	Tmax	Rain	Wind	Rad
5yrs	4.0	16.5	29.7	48.7	101.6	18.7

Table 7 Summary of climate data – Annual Monthly Average for 2007-2008 (Komatipoort- Tenbosch [25°22'S, 31°55'E])

Month	Year	ET	Tmin	Tmax	Rain	Wind	Rad
Feb	2007	5.70	21.40	33.70	82.70	124.60	24.40
Mar	2007	5.00	20.20	33.10	28.80	120.00	21.20
Apr	2007	3.30	17.50	29.00	100.50	84.70	17.00
May	2007	2.70	10.70	28.00	1.10	66.60	16.00
Jun	2007	2.10	10.20	25.90	17.00	71.80	13.40
Jul	2007	2.50	8.40	26.00	8.60	83.90	14.70
Aug	2007	3.80	10.40	28.40	0.00	133.20	16.30
Sep	2007	4.50	15.80	30.90	0.90	143.80	17.40
Oct	2007	4.30	17.50	28.40	7.40	150.60	16.50
Nov	2007	5.30	19.20	31.10	108.00	166.50	20.40
Dec	2007	5.00	19.70	29.70	97.70	123.90	21.90
Jan	2008	4.90	21.00	31.00	78.90	101.80	21.20
Feb	2008	6.10	20.70	33.60	0.00	114.00	26.60
Average		4.25	16.36	29.91	40.89	114.26	19.00

6.1.6. HYDROLOGY

The greater study area is situated in the primary catchment of the Olifants River (catchment B) and in quaternary catchments B71H and B60J (Figure 11).

6.1.6.1. Field work

Fifteen (15) boreholes and three (3) surface water sites were detected within a 1 km radius from the site.

During the July 2009 hydrocensus seven (7) borehole and three (3) surface water samples were send to a SANAS accredited laboratory for analysis. The borehole samples were analysed for macro and micro chemical parameters as well as physical parameters. Two of the boreholes (BH12 and BH15) were also analysed for micro biological parameters. The surface water samples were analysed for micro biological activity, macro and micro chemical parameters and physical parameters.

The field survey conducted in 2016 was focused on visiting and sampling groundwater and surface water sites detected in 2009 specifically the groundwater and surface water sites which were sampled and analysed. Refer to Figure 6.

An observation from the previous observations from groundwater level results obtained in 2009 indicates that general groundwater flow is towards the south and south-east underneath the project area. The interpolated hydraulic head as measured according to elevation (mamsl) indicates a decrease from west to east across the project area. Refer to Figure 7

Figure 6 Hydrocensus Map

Figure 7 Field survey results and local groundwater regime from water levels taken in 2009

6.1.6.1. SURFACE WATER

The site is situated on the banks of the Komati River in the X13L quaternary catchment of the Inkomati water management area. The Komati River and Crocodile River joins each other approximately 2.3 km to the north-east of the site, before it crosses the border into Mozambique (**Error! Reference source not found.**).

Three surface water samples were taken, of the Komati River upstream of the site (SW2), the Komati River downstream of the site (SW1) and one sample was taken upstream of the site in the Ngweti River before it flows into the Komati River (SW3).

6.1.6.2. WATER QUALITY

The current and future water application was used to determine the appropriate water quality guidelines to use for classification. Groundwater in this area is mainly used for irrigation and domestic purposes. The South African National Standards (SANS) 241: 2011 specify a concentration range for which each particular constituent should comply with to be considered suitable for consumption. Any sampled water that exceeds this limit is deemed unsafe and not suitable for consumption. The SANS 241: 2011 standard also states the risk involved if the standard limits are exceeded and indicates whether the constituent poses a chronic, acute or aesthetic health risk. To develop the baseline, several micro constituent (predominantly trace metals) as well as macro and physical constituents were analysed.

The water quality of both the groundwater and surface water samples is generally of good quality.

All parameters that were analysed for does not exceed the standards set by SANS however consumption should be limited to groundwater as no analysis were conducted for micro biology and coliform units.

Guidelines for the macro elements calcium, bicarbonate, magnesium and potassium do exist (South African Water Quality Guidelines 1996) however these parameters are not deemed to have negative implications on human health at concentrations occurring in drinking water. The mentioned parameters together with other macro constituents such as sodium, chloride and sulphate are the largest contributors to the Total Dissolved Solids (TDS) and Electric Conductivity (EC) values of the groundwater and surface water solutions. Of the four surface- and groundwater-samples measured, the average TDS value is 499 mg/ℓ, well below the SANS 241:2011 limit of 1 200 mg/ℓ.

The macro chemistry of the samples is depicted in stacked chemistry plots and the piper plot (Figure 8) and (Figure 9). The error difference stacked chemistry plot indicates the difference between the 2009 and 2016 results. SW3 shows increased differences in concentration between 2009 and 2016. TDS comparison contributes the most which might indicate the seasonal exchange of dissolved solids in the tributaries. The decrease in water level due to the drought condition might also imply increase solids mixed in decreased water volume. Evaporation might also contribute to dilution in the groundwater resource. The other predominant differences can be observed from HCO3, SO4, CO3, EC and Cl.

Increased Cl and SO4 in 2016 are possibly due to oxidation in natural soil processes and organic waste treatment (USGS 1989). Fuel combustion can be a human induced contaminant source released into the eco-system which can potentially cause increased SO4 concentration.

The CO3 and HCO3 chemical parameters are directly associated with the alkalinity of the water type. Alkalinity is refers to as the capacity for solutes contained in solution to react and neutralize acid (USGS 1989). Increased alkalinity in 2016 may be caused by several factors although the most likely cause is the drought conditions. With the observed groundwater level drop, more subsurface area becomes unsaturated especially the soil zone. This exposure will cause enriched CO2 concentration originating from respiration from plants and oxidation from organic matter (USGS 1989).

The stacked chemistry chart indicates the concentrations given in milligrams per litre of the major cations and anions. The overall observed change in concertation from 2009 to 2016 is limited. An increase in cation and anion concentration is evident for 2016 and main contributors and causes are mentioned above.

The Piper diagram indicates a slight difference in water samples chemistry and distinguishes between the water types. All the surface water resembles recently recharged water (calcium magnesium- bicarbonate type water). The remaining borehole has sulphate dominant type water which will most likely be due to the factors mentioned in earlier sections. The 2009 sampling results indicate BH15 as being calcium-magnesium-bicarbonate type water which is similar to the surface water constituent ratios.

A hydrocarbon analysis was done on all four sites to determine baseline conditions. No hydrocarbons, oil, grease, coal or polymers are reported in any of the surface water samples. BH15 indicated a concentration of 1.31 mg/ℓ petroleum hydrocarbons plus unknown compounds up to C26H54 (hexacosane). The 2016 analysis results indicated no petroleum or any hydrocarbons at BH15 which might indicate a possible fossil fuel spill pulse at BH15 in 2009 which has since then passed BH or cleared up. The BTEX analysis has a below detection baseline data set.

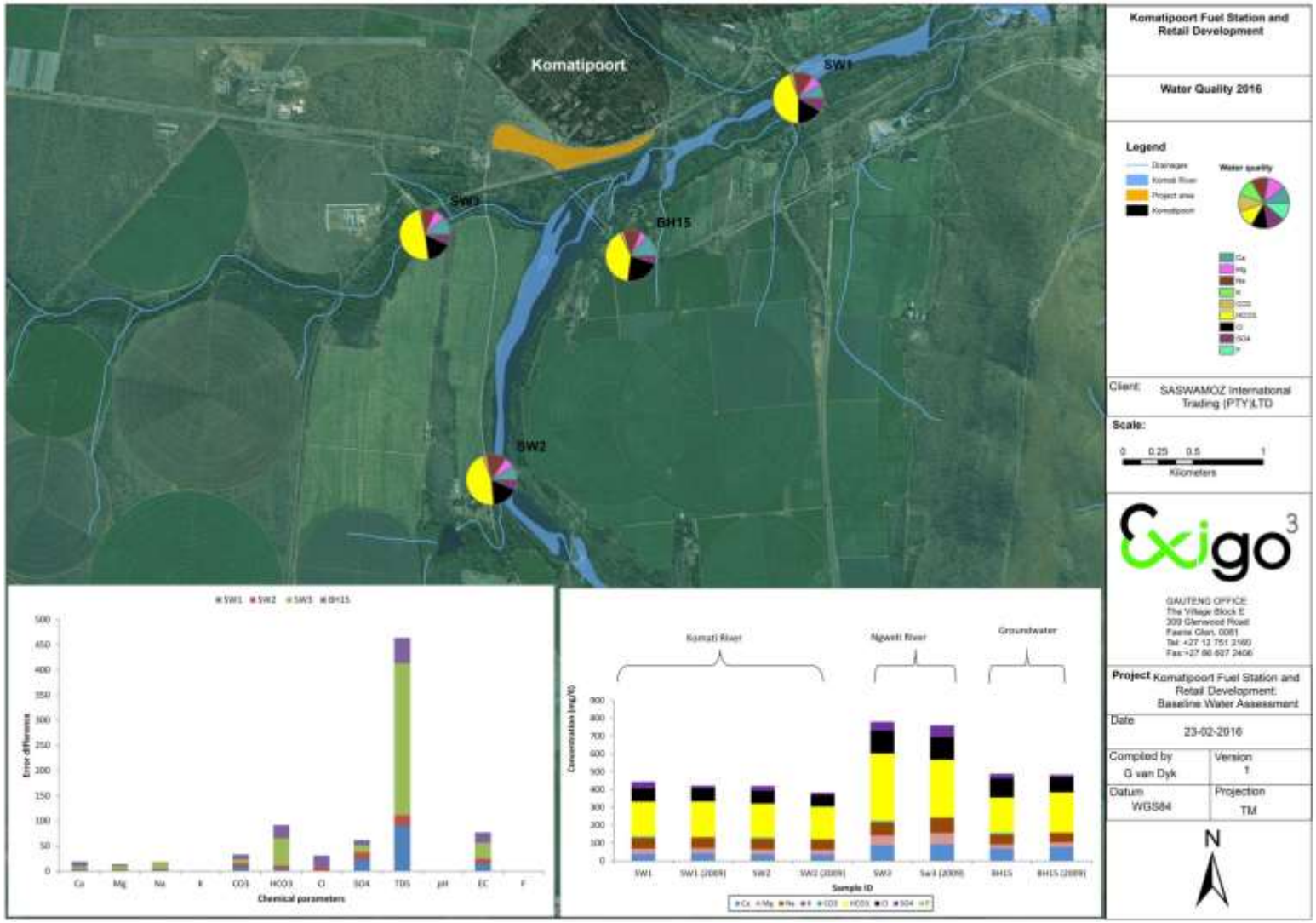


Figure 8 Water quality distribution of groundwater and surface water positions

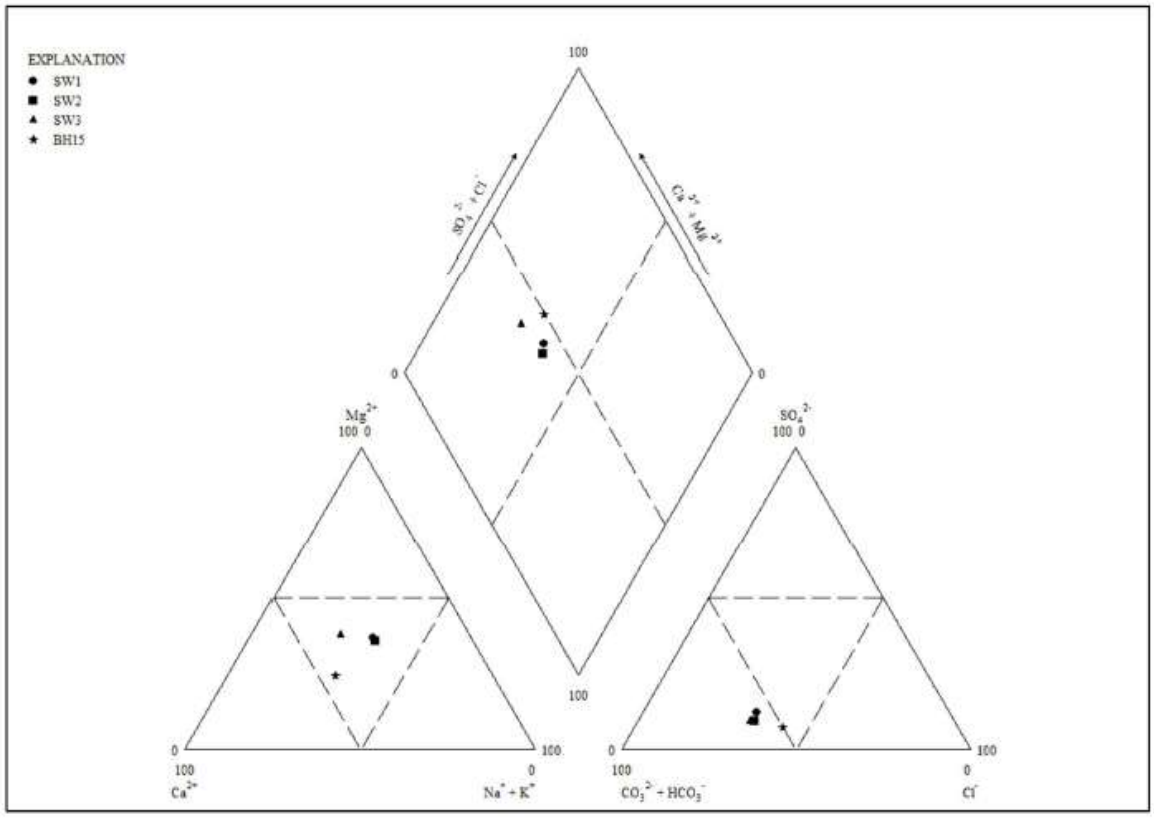


Figure 9 Piper Diagram

The aquifer type can be classified in the same manner as in 2009. Water use is still primarily for domestic, irrigation and livestock with moderately yielding boreholes and variable water quality. This aquifer can be classified as a minor aquifer (Parsons 1995).

6.1.7. GEOLOGY & PEDOLOGY

The site is underlain by intrusive rocks that belong to the Letaba Formation of the Lebombo Group which is part of the Karoo Igneous Province (lavas and intrusive rocks). The Karoo Igneous Province is grouped within the Karoo Supergroup sequence of rocks.

The project area is underlain by granophyric, olivine, feldspathic gabbro (Jk). To the eastern side of the project area cutting north south through the property boundaries is a granophyre (Jkg) intrusion (Figure 10).

Several geological contacts exist that intersect the project area with a north-south trending linear feature which also extends through the project area. This would imply possible groundwater supply to the development as these geological features can be associated with increased groundwater flow zones (Figure 10).

No outcrops were noted and in all instances the bedrock is overlain by thick transported and residual soils.

The moisture-density tests undertaken on the lava and surficial hillwash were classified as follows:

The surficial hillwash is classified as <G107 while underlying gravely residual lava classifies as G77. This makes the hillwash unsuitable for construction purposes while the underlying residual lava is potentially suitable for use (Figure 10).

Excavations for underground fuel storage tanks extend to depths of 3.5 to 4.0m. The residuum from 2.5 m has consistencies of dense or better, the excavations for the underground tanks below this depth should prove stable for short term stability.

Figure 10 Geological Map

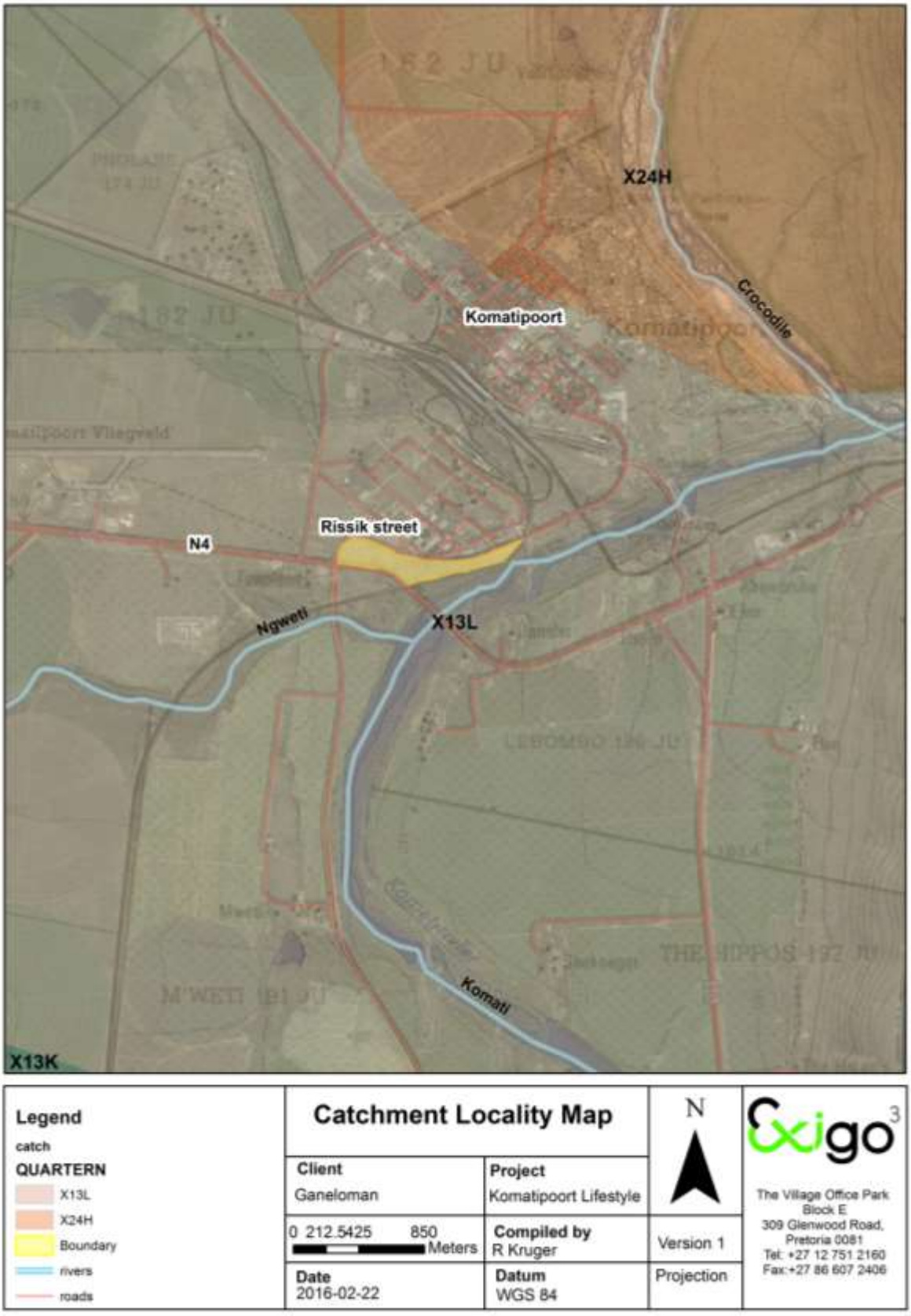


Figure 11 **Catchment map**

6.1.8. FLORA & FAUNA

An Ecological Impact Assessment study was conducted during January 2016 by Dr B Henning (Appendix D). The study area is occurs on slightly Undulating to flat Coastal and comprises low, undulating hills with narrowly incised valleys.

According to Mucina & Rutherford (2006), the study area is situated in Tshowkwane - Hlane Basalt Lowveld within the Lowveld Bioregion in the Savanna Biome. This vegetation type is restricted to strip running parallel to the Lebombo Mountains from central Swaziland in the south to the Olifants River in the north. Tshowkwane - Hlane Basalt Lowveld originally covered about 281 800 ha in Mpumalanga, of which 11.1% has been transformed, mostly through sugarcane and settlements. This vegetation type is considered well protected and has a conservation status of Least Threatened. This is largely due to much of this community occurring within the Kruger National Park.

None of the study area has been transformed, although most of it is disturbed through adjacent industry, littering and neglect (Appendix D).

6.1.9. FLORA

Two degraded vegetation community were confirmed during the specialist fieldwork.

- **Degraded Sclerocarya birrea – Dichrostachys cinerea Mixed woodland**

This vegetation unit represent on slightly undulating terrain in the western section of the site. This woodland type varies between a more open woody structure to denser areas in the central section of the site encroached by Dichrostachys cinerea. The woody layer is dominated by Sclerocarya birrea, Ziziphus mucronata, Acacia tortilis, Dichrostachys cinerea and Philenoptera violaceae on red apedal soils of the Hutton soil form. (Appendix D: Ecological Impact Assessment)

The Botanical and characteristics of this vegetation unit indicates that mixed woodland have a high need for rehabilitation and its conservation priority and sensitivity.is medium to low.

- **Degraded Acacia xanthophloea – Schotia brachypetala – Lantana camara riparian woodland**

The central-eastern section of the project area is characterised by riparian woodland underlied by fertile alluvial soils (Photograph 2). Most of this area has been degraded and lost riparian functionality after the railway line was built through the riparian woodland, separating the Komati River from the riparian woodland to the north of the railway line with a berm (Photograph 3). The vegetation are characterised by diagnostic sweetveld species such as Acacia xanthophloea, Schotia brachypetala, Diospyros mespiliformes and Combretum imberbe, while the shrub layer has become seriously encroached by sickle bush and lantana in certain areas.

For this vegetation unit, the need for rehabilitation is also high and the sensitivity and conservation priority are medium.

A list of red data plant species previously recorded in the study area in which the proposed development is planned was obtained from the Plants of Southern Africa (POSA) database of SANBI. There are various categories for Red Data Book species, such as 'Endangered', 'Vulnerable', 'Rare' and 'Near threatened' as listed in the Red Data List of Southern African Plants (Hilton-Taylor 1996).

Table 8 Red data species potentially occurring in the project area according to the POSA database

Family	Species	Threat status	Growth forms
APOCYNACEAE	*Adenium swazicum*	Critically endangered	Dwarf shrub, succulent
ACANTHACEAE	*Blepharis laevifolia*	Data Deficient	Herb
AMARYLLIDACEAE	*Crinum stuhlmannii Baker*	Declining	Geophyte

Crinum stuhlmannii was documented during the surveys in the mixed woodland. The plants should be rescued and relocated. No other red data species listed above was found during the surveys.

6.1.10. MAMMALS

Large mammals such as elephant, lion, buffalo and rhinoceros species that occurred historically at the site are mainly restricted to game reserves and national parks in the area. This loss of large species on the private land that forms part of the project area means that the mammal diversity on these sites is far from its original natural state not only in terms of species richness but also with regards to functional roles in the ecosystem.

During the site visits mammals, birds, reptiles, and amphibians were identified by visual sightings through random transect walks. In addition, mammals were also recognized as present by means of spoor, droppings, burrows or roosting sites. The 500 meters of adjoining properties were scanned for important fauna habitats. (Appendix D: Ecological Impact Assessment)

6.1.11. BIRDS

Two major bird habitat systems were identified within the borders of the study site, including the riparian woodland and mixed woodland.

There is a long list of red data bird species that have a geographical distribution that includes the site. The presence of the habitat of these species is mostly confined to the riparian woodland observed on site and in the larger area, although the probability of finding these species on site are low, and most habitat is in a fragmented and degraded state. The avifauna will mostly utilize more natural habitat along the Komati and Crocodile Rivers in the larger area.

6.1.12. REPTILES AND FROGS

No reptiles were confirmed to occur during fieldwork. However, Reptile species such as the southern rock python, the black mamba, puff adder, boomslang, vine snake, spotted bush snake and several members of the green snakes (Philothamnus spp.) is expected to occur in the larger area, although the probability of documenting the snakes on site are low due to the fragmented and degraded state of the site. (Appendix D)

There are no amphibian species of conservation concern that have a distribution that includes the project area and which could occur on site. Breeding habitat of frogs and toads can be found mostly in the perennial rivers and dams in the larger project area. These areas won't be affected by the development, although peripheral impacts should be avoided. (Appendix D).

Type	Photograph
Encroached areas of the degraded riparian woodland on site	
Acacia xanthophloea – Schotia brachypetala – Lantana camara	

Figure 12 The two degraded vegetation communities on site

Figure 13 **Sensitivity Map of the proposed development site**

6.1.13. AIR QUALITY

Factors which contribute to the areas baseline ambient air quality are the local industrial developments, existing filling stations, traffic on the surrounding road networks, and the rail traffic.

Fumes from the operation could lead to a possible impact on air quality. This is however considered to be of low probability.

7. SOCIO ECONOMIC ENVIRONMENT

7.1. SOCIAL ENVIRONMENT

7.1.1. DEMOGRAPHY SETTLEMENT AND INFRASTRUCTURE

Ward 6 of the Nkomazi Local Municipality is located south-east to South-West of Komatipoort. The site is bounded to the north by the provincial road (R571) into Komatipoort and to the south-west by the N4 national road linking South Africa to Mozambique. The total population of the Ehlanzeni District Municipality (EDM) was recorded at 168865 and that of the Nkomazi Local Municipality (NLM) was at 393030 being the third largely populated local municipality following the Mbombela Local Municipality and Bushbuckridge Local Municipality at 588794 and 541248 respectively2.

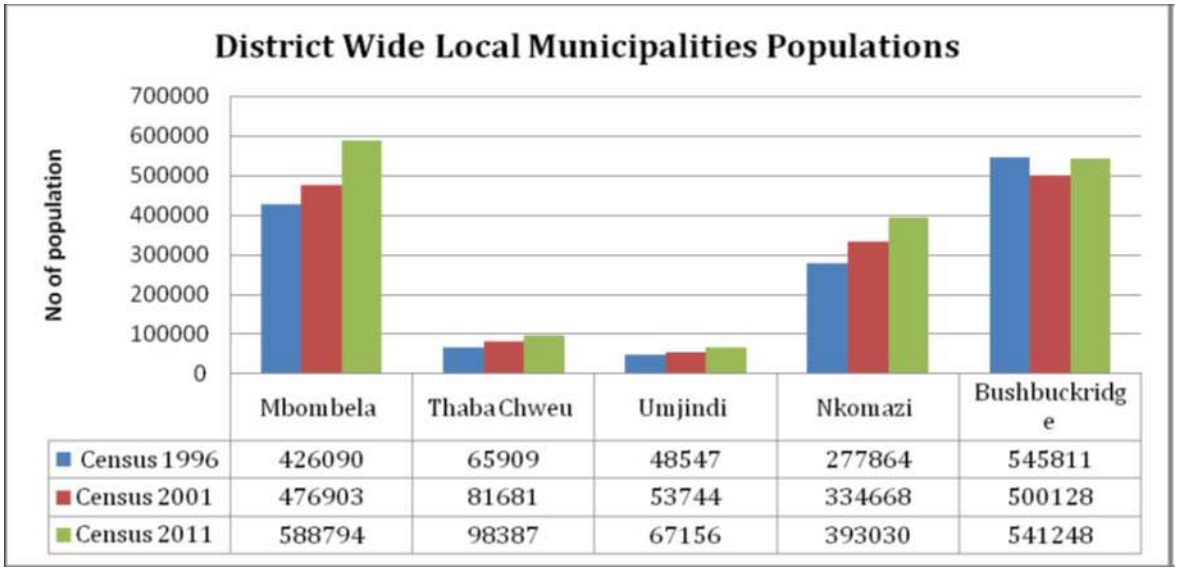


Figure 14 Local Municipalities Population size from 1996, 2001 & 2011 (*Source: Statistics SA Census 1996, 2001 & 2011)*

In 2011 the population group distribution in the Nkomati LM was calculated at 97,7% of African extraction (indicated as Black African), 0,23% Coloured people, 0,3% of Indian or Asian extraction, and 1,6% people of European extraction (indicated as White).

The age distribution in the Nkomazi area has proportionately more children and people in the youth and young adult group than on district level and proportionately less people in the mature adult group. This place greater strain on the mature adults in the area as there are potential more people that are dependent on their income. It is also likely that many adults have migrated to other areas in an attempt to find employment to be able to take care of their dependents as is commonly found in tribal areas.

2 Stats SA Census 2011

At the Nkomati area, about 26% of the population aged 20 years or older have completed Grade 12 and only 7% have obtained a higher level of education. This local municipality has however shown a decline in the number of no schooling which was a highest amongst the other local municipalities in the district. The low levels of education in Nkomazi limit the employment potential as well as the earning potential of the average resident.

During census 2001, more than two thirds of the people in the Nkomazi area aged between 15 – 65 years receive no monthly individual income. Although a significant decrease was recorded in the number and percentage of households that reported not having any income at all, it is still high at 16.8%. The absence of personal income can be linked to the historical educational deprivation. Many people receive money and goods from relatives working elsewhere and it is possible that some engage in small scale subsistence farming or receive grants that they do not view as income, but the fact remains that poverty is very pronounced in the area.

The surrounding area includes a Sasol Filling station and light industrial uses. According to Infragen, SANRAL requires a fuel station on the opposite side of the existing SASOL, the proposed filling station is to fulfil this requirement.

7.1.2. ECONOMIC ENVIRONMENT

Feasibility Studies were conducted by Fernridge and Petrorex to assess the Economic Environment and the impact the proposed development will have on the surrounding Filling stations and Shopping centres. (Appendix D).

This has also been discussed under Section 3.2.

7.1.3. SETTLEMENTS

The site is immediately adjacent to the town of Komatipoort. The settlements of Hectorspruit, Sibayni and Kamaqhekeza are included in the secondary retail catchment.

Filling station sites in close proximity include a Sasol Service Station and are currently the first service stations on the left-hand side, south – western corner of R571 and N4, when entering the Komatipoort trading area from the east to west via the N4. This site is directly opposite the proposed site.

The second site is a BP Service Station and is located approximately 4.2 km east from the proposed site, on the northern boundary of the N4 / Maputo corridor route. It forms part of the Komati Oasis centre consisting of a supermarket, buro exchange and liquor store.

7.1.4. ROAD INFRASTRUCTURE

The proposed development is estimated to generate a total of about 942 vehicles per hour (vph) and 1047vph (total “In” and “Out”) during the Friday afternoon (PM) and Saturday morning (AM) peak periods, respectively.

The development is proposed with three access points (approved in principle), all taken off the R571 (Rissik Street). One of the accesses (referred to middle access in this study) is proposed to be taken opposite the existing access to Business and Shops in Komatipoort, situated to the north of the R571. The other two accesses; are proposed either side (East & West) of the middle access.

This development is expected to contribute towards the provision of public transport facility/facilities, at a suitable location within the parking area of the development, which should accommodate at least eight (8) minibus taxis and be constructed to the relevant design standards in consultation with the Nkomazi Local Municipality.

From the Sidra Intersection Capacity Analyses and our site observations during the critical peak periods, it is concluded that both the analysed key intersections will require minor upgrading to accommodate the additional development traffic generations. The upgrades at both intersections include the addition of an exclusive short turning lane on one of the legs/approaches.

The traffic would therefore have a minimal impact should the mitigation measures be adhered to.

7.1.5. HERITAGE RESOURCES

The terrain has already been severely disturbed by the construction of the existing roads and the railway line and contains little or no original topsoil.

The proposed Komatipoort Filling Station and Retail Centre Development area is situated in environments that have largely been altered where footpaths, roads and other infrastructure have been established but some sections remain pristine (AIA, 2016). For the same proposed project, an archaeological survey was conducted during 2008 and no heritage resources were identified. However during a survey conducted during January 2016, (Appendix D) one heritage occurrence, Stone Age, was noted during the site survey for the current footprint.

During the site survey, Three Middle Stone Age (MSA) flaked tools were identified along the eastern extremity the project area.

Figure 15 MSA flaked tools found on site

7.1.6. VISUAL ENVIRONMENT

The site is bordered by vacant land, residential developments, and retail areas. The site can be clearly seen from the R571, as well as from the adjacent properties to the North. The site is not clearly visible from the south and most of the N4 due to the railway line along the southern border.

The railway line act as both a visual and noise buffer for the residential developments north of the site.

During the site visit, there was evidence of littering and vast dumping on site, which reduced its visual character.

7.1.7. NOISE DESCRIPTION

The site is adjacent to numerous industrial activities as well as the N4 which all increase the ambient noise levels of the area due to the traffic they carry. The retail centre and service station are therefore not expected to worsen the baseline noise of the area.

8. ALTERNATIVES

8.1. IDENTIFICATION OF ALTERNATIVES

The IEM procedure requires that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, DEAT requires that a number of possible proposals or alternatives for accomplishing the same objectives should be considered.

In the case of the proposed development, possible alternatives were identified through discussions with authorities, discussions with I & AP's, reviewing of existing environmental data, specialist inputs/studies and the client.

Some of the alternatives inter alia that will be assessed include:

- Input alternatives
- Site Alternatives
- Layout Alternatives
- Service Alternatives
- Status quo / no-go alternatives;

8.1.1. INPUT ALTERNATIVES

Various types of material can be used for the construction of a filling station and its associated structures. The use of building material that requires excessive amounts of energy to manufacture should be minimised.

Building material that can be recycled / reused should be used rather than building material that cannot.

The use of building material originating from sensitive or scarce environmental resources should be minimised. E.g. no tropical hardwood may be used.

Building material should be legally obtained by the supplier, e.g. wood must have been legally harvested, and sand should be obtained only from legal borrow pits and from commercial sources.

Use highly durable building material for parts of the building that is unlikely to be changed during the life of the building (unlikely to change due to e.g. renovation, fashion, changes in family life cycle) is highly recommended.

8.1.2. SITE ALTERNATIVES

Only one site is currently proposed, no other location alternatives are currently evaluated due to various coexisting factors, including ownership and preferential locality. The proposed site was evaluated through the Retail and Service Station feasibilities and found suitable.

8.1.3. LAYOUT ALTERNATIVES

Alternative 1

Three alternative layouts were evaluated. Alternative 1 (Figure 16) of the development proposes: Corner erf at entrance will be used for Business, Hotel and Restaurant the Middle erf for Filling station and business/retail and the Erf at bridge for Business, Commercial (including a Value Mart).Total lettable Floor Area will be approximately 40 000 m^2.

Alternative 1	
Size of the property	8.8417ha

Detail	• Erf 1
	  • Motor showroom – 1634 m²
	  • Restaurants – 712 m²
	  • Retail Anchor – 2790 m²
	  • Line shops – 4362 m²
	  • Motor showroom offices – 705 m²
	  • Line Shops mezzanine – 3694 m²
	• Erf 2
	  • Service station – 680 m² - 5 Pumps
	  ▪ 2 X 46 000 litre tanks, and 3 X 23 000 litre tanks
	  • Canopies – 451 m²
	  • Supermarket – 1152 m²
	  • Bank – 100 m²
	  • Shops and Curious – 201 m²
	  • Take away foods – 550 m²
	• Erf 3
	  • Retail – 2992 m²
	  • Hotel ground floor – 1581 m²
	  • Value Mart – 11347 m²
	  • Hotel 1st - 4th floor – 3556 m²
	  • Mezzanine offices – 3599 m²

Access	3 Access points from R571
Total Lettable area	+/- 40 000 m²

Alternative 2

Alternative 2 (Figure 17) consist out of the same components as Alternative 1, the only difference being that a lower amount of Lettable Floor Area is proposed approximately 20 000 m².

Alternative 2	
Size of the property	8.8417ha

Number of stands	• Erf 1
	  • Business 1 site area – 28 826 m²
	• Erf 2
	  • Business 2 site area – 47 147 m²
	  • Service station – 680 m² - 5 Pumps
	  ▪ 2 X 46 000 liter tanks, and 3 X 23 000 liter tanks
	  • Canopies – 451 m²
	  • Bank – 100 m²
	  • Shops and Curious – 201 m²
	  • Take away foods – 550 m²
	  • Restaurant - 149 m²

Access	1 Access from the N4 2 Accesses from R571
Total lettable area	+/- 20 000 m²

Preferred Alternative (3)

The preferred alternative (3) (Figure 18) consist out of the same components as Alternative 1 and Alternative 2, the difference being that a lower amount of Lettable Floor Area is proposed approximately 20 000 m² and the Hotel is removed due to the location not being suitable for such in the development..

Preferred Alternative	
Size of the property	8.8417ha

Detail	• 1st phase
	  • Anchor Shop– 2395 m²
	  • Line shops – 5649 m²
	  • Services 262 m²
	  • Outside Seating /Play area – 663m²
	  • Furniture 1673 m²
	  • Hardware/ Building/ Value – 2961 m²
	  • Drive thru – 500m²
	• 2nd Phase
	  • Filling station
	  • Service station – 680 m² - 5 Pumps
	  ▪ 2 X 46 000 liter tanks, and 3 X 23 000 liter tanks
	  ▪ Canopies – 451 m²
	  • Motor Dealership
	  • Motor related/ Warehousing

Access	3 Access points from R571

Total Lettable area (First phase)	13 320 m^3

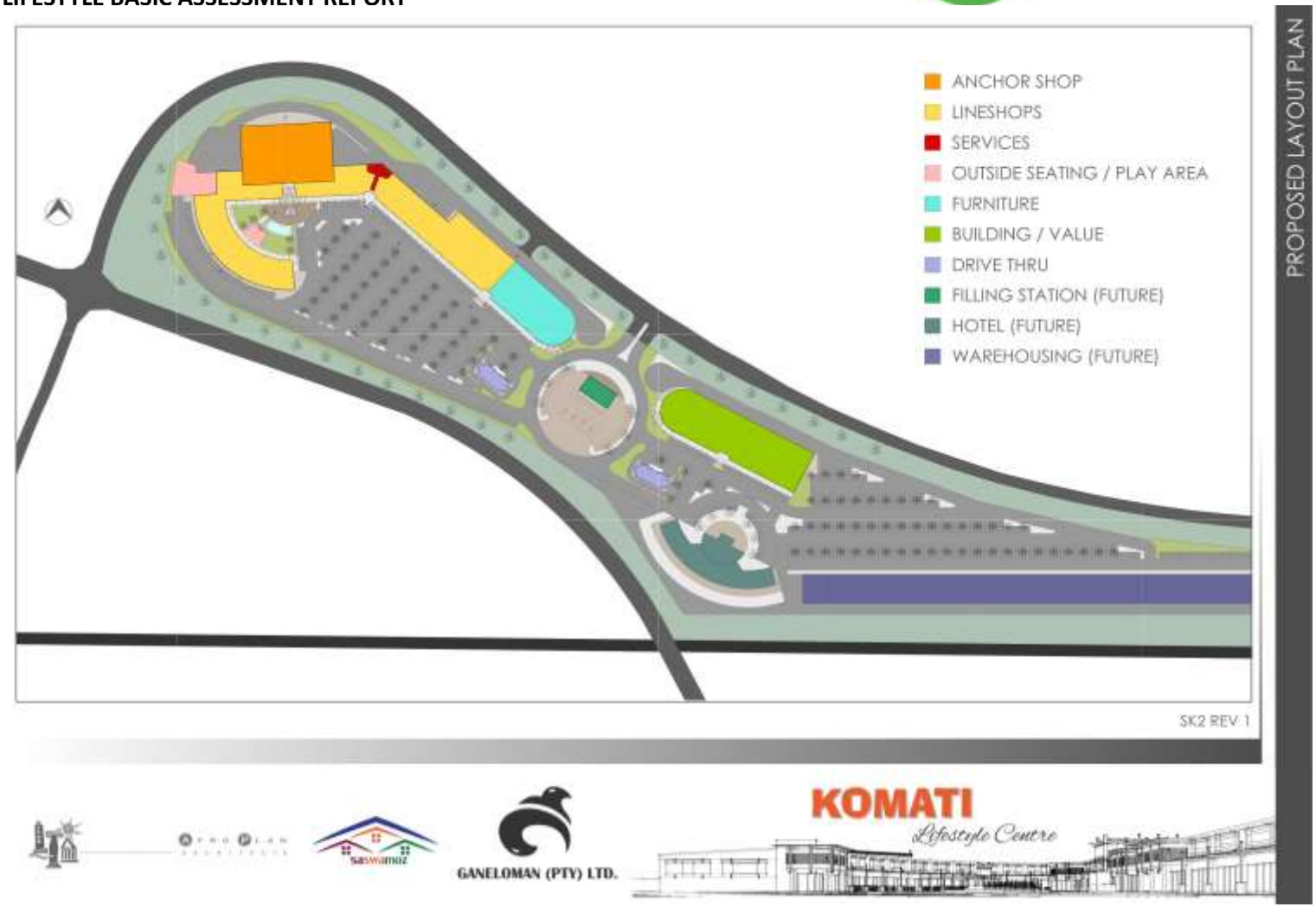


Figure 16 Layout of Alternative 1

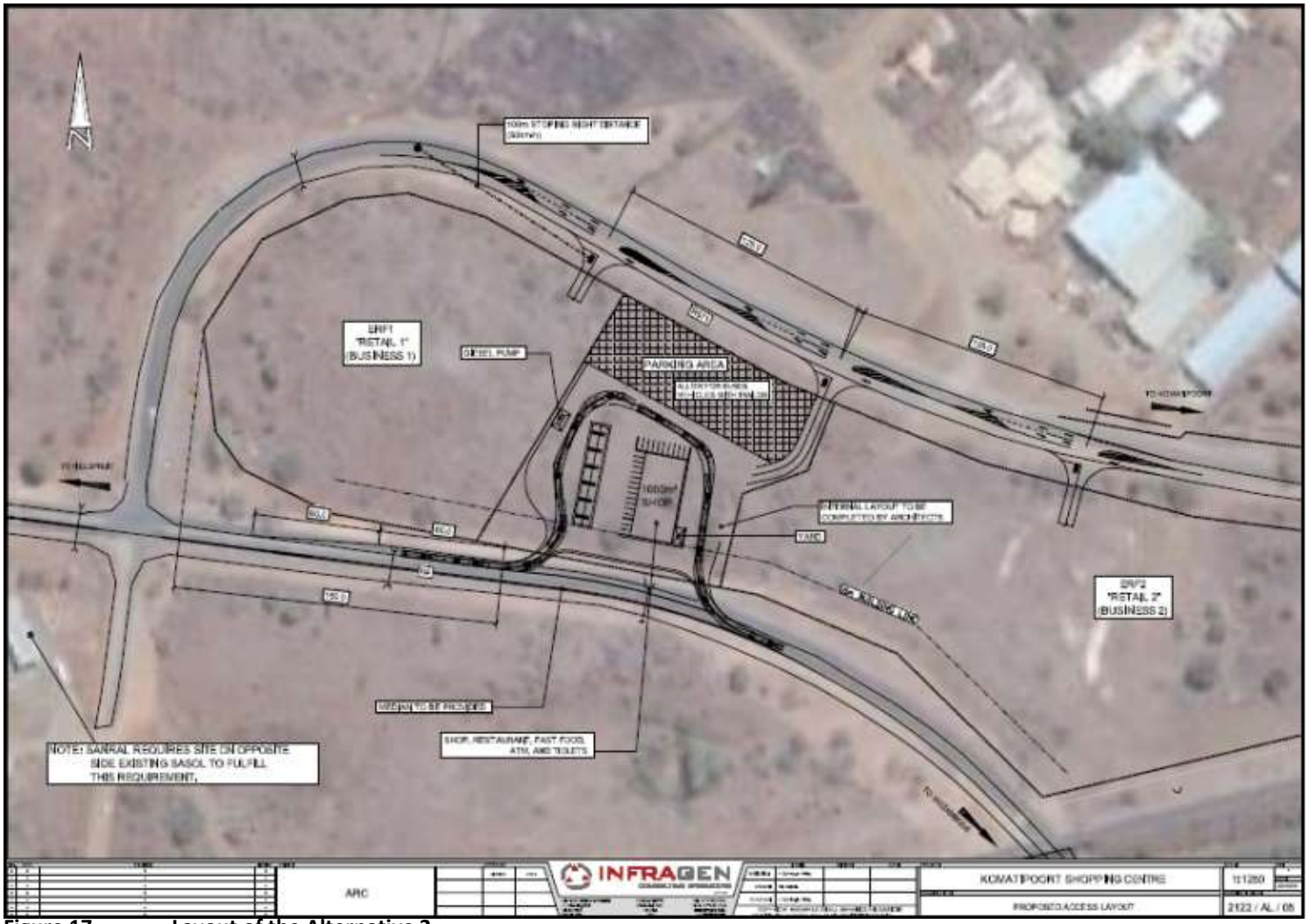


Figure 17 Layout of the Alternative 2

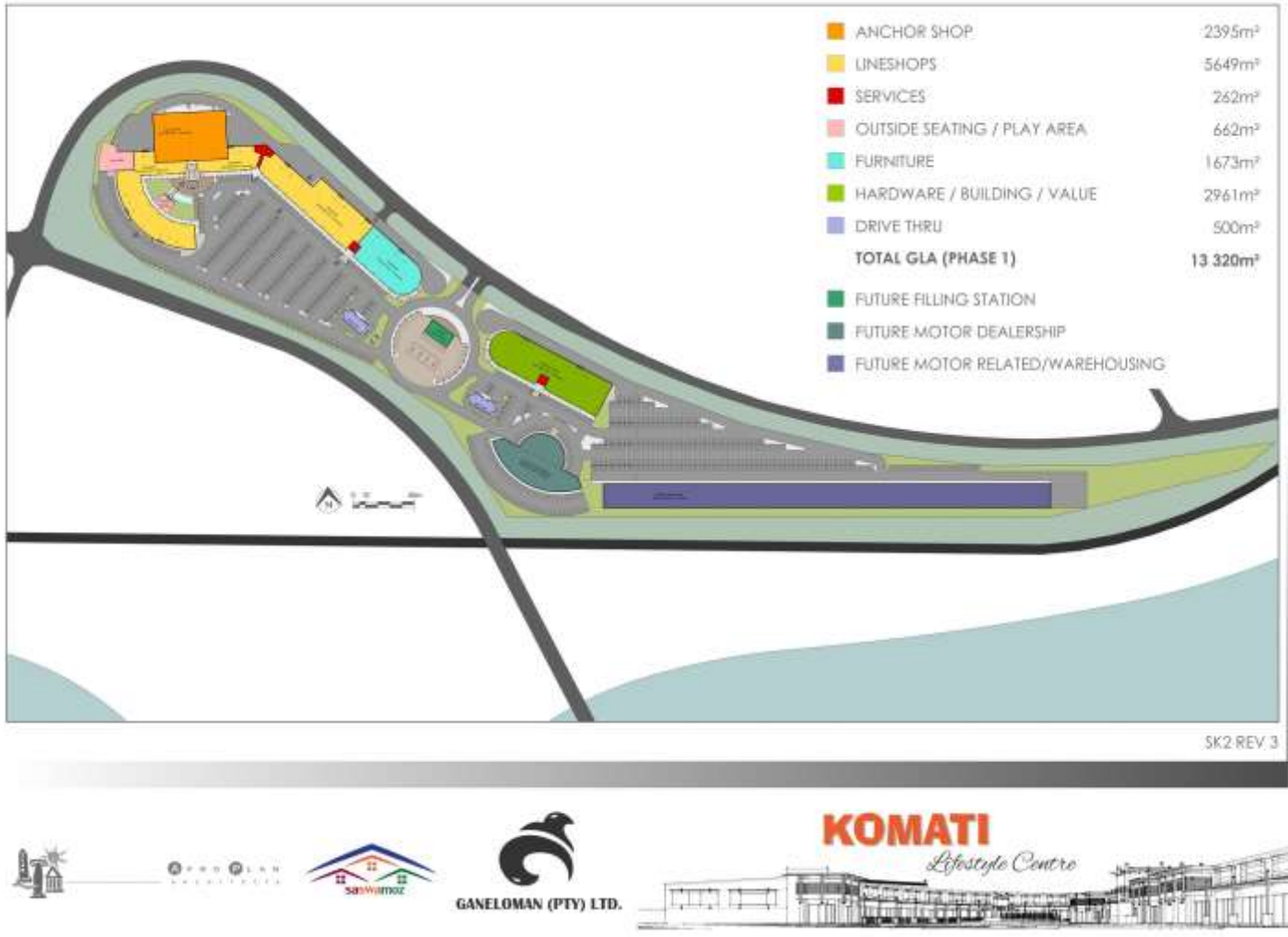


Figure 18 **Layout of the Preferred alternative (3)**

8.1.4. SERVICE ALTERNATIVES

Alternatives with regards to Service Provision were evaluated:

8.1.4.1. SEWAGE TREATMENT

Options that have been evaluated include:

- Provision by the municipal sewage treatment works
- Temporary store on site and them pump to the municipal sewage works
- On site treatment and irrigation/discharge

The Municipality stated that no additional capacity was available at the Komatipoort treatment works during peak flow periods. It was firstly suggested by the municipality that sewage should be stored on site and pumped to the treatment works outside peak times. This would require storage and pumping facilities to the facility 3.2kms away. The preferred alternative suggested by the project team as a that a treatment package plant be situated on site. The reason for the preferred alternative is that if the treatment works on site is treated correctly it would reduce the risk of impact on the water sources. This will lead to a lower impact than that of the municipality treating the sewage. The reason being that the municipality does not have sufficient capacity at present and will therefore be receiving sewage above the capacity limit which will lead to the treatment works overflowing of untreated sewage. The pipeline of 3.2kms has a chance to have leaks and lead to contamination that might not be detected in time.

The proposed on site sewage works has the following advantages due to the technology being used:

- Treats effluent to the required standards for disposal into environment or reuse for irrigation or non-potable uses.
- The Biological Waste Water Treatment Plant produces no sludge that needs daily handling,
- needs no permanent labour, and
- the system further has very low electricity demand.

8.1.5. NO-GO ALTERNATIVE

One of the options to be considered as part of the study is that of the no development option. This would entail leaving the site in its present state and not developing the proposed mixed use development or any of the proposed layout Alternatives.

If the development does not take place the following advantages and disadvantages will be foreseen:

Advantages of no-go:

- The site will stay as is from a biophysical environment point of view

- No economic impact on surrounding service stations and shopping centres

Disadvantages of no-go:

- The socio economic benefits associated with the development will not be realized
- Traffic upgrades proposed will not be done

It is considered that the no-go option would not be a feasible alternative. The proposed site is situated within an existing industrial area. Should the mitigation measures proposed in the EMP be implemented the impact on the environment can be considered to be of negligible to low significance. The proposed activities fit in well with the surrounding land uses and are not situated within an environmental no-go area.

9. ENVIRONMENTAL IMPACT ASSESSMENT

9.1. INTRODUCTION

The following section of the EIR provides a discussion on the findings of the specialist studies with regards to identified issues and impacts. Additional issues identified through the EIA process are also discussed in this section.

9.2. ASSESSMENT METHODOLOGY

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need.

The significances of the impacts were determined through a synthesis of the criteria below:

Probability: This describes the likelihood of the impact actually occurring.

Improbable: The possibility of the impact occurring is very low, due to the circumstances, design or experience.

Probable: There is a probability that the impact will occur to the extent that provision must be made therefore.

Highly Probable: It is most likely that the impact will occur at some stage of the development.

Definite: The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.

Duration: The lifetime of the impact

Short term: The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.

Medium term: The impact will last up to the end of the phases, where after it will be negated.

Long term: The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.

Permanent: Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: The physical and spatial size of the impact

Local: The impacted area extends only as far as the activity, e.g. footprint

Site: The impact could affect the whole, or a measurable portion of the above mentioned properties.

Regional: The impact could affect the area including the neighbouring residential areas.

Magnitude/ Severity: Does the impact destroy the environment, or alter its function.

Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This is 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.

Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The following weights were assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3

	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	**Sum (Duration, Scale, Magnitude) x Probability**	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

The significance of each activity is rated without mitigation measures and with mitigation measures for both construction and operational phases of the development.

9.3. IDENTIFICATION OF KEY ISSUES

The key issues listed in the following section have been determined through the following avenues:

- Views of interested and affected parties;
- Legislation; and
- Professional understanding of the project team, environmental assessment practitioners and specialist consultants.

9.4. IMPACT ANALYSIS AND PROPOSED MITIGATION MEASURES

The findings of the impact assessment have been consolidated in the sections below. The impacts have been classified as impacts on the biophysical environment and impacts on the socio-economic environment. The impacts are further classified in terms of the phase of the development in which they are likely to occur namely construction phase and operational phase and decommissioning phase (where applicable).

During their analysis, specialists were required to consider the impact significance before and after mitigation measures are implemented. The mitigation measures are also highlighted in this chapter and discussed in depth further in the specialist reports (see relevant Appendices at the end of the report). In addition, suggested mitigation measures for identified impacts are provided in the Environmental

Management Plan (Section 10).

Even though some impacts are perceived to be of high severity, it must be highlighted that the probability that these impacts will occur might be low and therefore the significance of the impact is reduced.

The significance of residual impacts is marked according to the following colour code for ease of reference:

Colour	Significance
	Impact of high negative significance
	Impact of moderate negative significance
	Impact of low negative significance
	Impact Unknown or Negligible
	Positive range of impacts

Key Impacts identified by the EAP and specialists include:

9.5. BIOPHYSICAL ENVIRONMENT

1. The effect on ground water and surface water impact
2. Biodiversity impact

9.6. SOCIO-ECONOMIC ENVIRONMENT

3. Loss of Heritage Resources;
4. Visual intrusion of the proposed development;
5. Noise impact;
6. Traffic impact;
7. Socio-economic impact (including feasibility)
8. Safety and security;

9.7. BIOPHYSICAL ENVIRONMENT

9.7.1. WATER QUALITY IMPACTS

Impact Description:

The following section was completed with the assistance of the Hydrogeological study undertaken by Exigo – Hydrological Unit (Appendix D). The following section focuses on the groundwater impacts associated with the development.

The South African National Standards (SANS) 241: 2011 specify a concentration range for which each particular constituent should comply with to be considered suitable for consumption. Any sampled water that exceeds this limit is deemed unsafe and not suitable for consumption. The SANS 241: 2011 standard also states the risk involved if the standard limits are exceeded and indicates whether the constituent poses a chronic, acute or aesthetic health risk. The water quality of both the groundwater and surface water samples is generally of good quality and therefore below the acceptable limits. Any potential contamination by fuel, lubricants and or sewage will therefore influence the usability of the water for other users.

The potential exists for spills of contaminants such as fuels and lubricants from construction vehicles. There is also a risk of soil and groundwater contamination due to spillage from chemical and fuel containment facilities.

Water contamination occurs when leakage and spillage of potentially hazardous substances contaminate surface and ground water resources. For this development the main potential source of contamination (i.e. largest impact) would be leakage from the underground tanks, while discharge of contaminated runoff from the stormwater system into the surrounding natural environment is the other main contamination source.

Significance Rating

The below mentioned activities will extend further than the activity in most cases, but localized occurrences associated with fuel and minor spillages are possible. The magnitude of the impact is during the Construction phase is rated as low and can be mitigated to negligible.

During the operational phase the Oil, petrol and diesel spillages will be of moderate significance without mitigation measures. The effective implementation of mitigation measures however will lower the significance to low.

The Petrol and diesel spillages from underground fuel tanks at refuelling bay are the highest risk to the surrounding water resources without mitigation measures. Should the mitigation be implemented the probability of the impact occurring will be dropped to probable and would render the significance to moderate.

9.7.2. BIODIVERSITY IMPACT

Impact Description:

The following section was completed with the assistance of Appendix D Ecological Impact Assessment by Dr. Henning from Exigo.

There are three major categories of impacts on biodiversity namely:

- Impacts on habitat resulting in loss, degradation and / or fragmentation.
- Direct impacts on fauna and flora and species, for example plants and animals that are endemic / threatened / special to a particular habitat will not be able to survive if that habitat is destroyed or altered by the development.
- Impact on natural environmental processes and ecosystem functioning. This can lead to an accumulated effect on both habitat and species.

The construction phase of the development will result in loss of and damage to natural habitats if the vegetation is cleared for the development of infrastructure, access roads and related infrastructure (water supply pipelines etc.). Rehabilitation of some areas would be possible but there is likely to be long-term damage in large areas. Most habitat destruction will be caused during the construction phase. Vegetation communities are likely to be impacted on a very small spatial scale in comparison to the extent of the vegetation communities' total area in the region.

The impact of the habitat destruction will be on the flora and fauna of the study area in the following ways:

- The construction will lead to the loss of individual plants such as grasses, forbs, trees and shrubs that will be cleared on the footprint area. This will mostly occur during the construction phase;
- Loss of riparian habitats where the development will impede onto the fragmented riparian zone;
- Loss of threatened, near-threatened and endemic taxa: The anticipated loss of some of the natural habitats that support endemic species will result in the local displacement of endemic listed flora;
- Due to habitat loss and construction activities animals will migrate from the construction area and animal numbers will decrease;
- Loss of threatened, "near-threatened" and conservation important taxa: The anticipated loss of the natural woodland will result in the local displacement of some fauna species. In some cases isolated populations of threatened fauna might be removed from the area, although no such populations or knowledge thereof was

found in the study area. This impact could also take place because of hunting and snaring of animals in natural areas not used for the development.

- Changes in the community structure: It is expected that the faunal species composition will shift, due to an anticipated loss in habitat surface area. In addition, it is predicted that more generalist species (and a loss of functional guilds) will dominate the study area. Attempts to rehabilitate will attract taxa with unspecialised and generalist life-histories. It is predicted that such taxa will persist for many years before conditions become suitable for succession to progress.

The construction of buildings, fences and roads will inevitably result in natural movement patterns being disrupted and, to a varying degree depending on how different species react to these barriers will result in the fragmentation of natural populations. The development will have a medium impact in fragmenting the degraded habitats on the property.

The construction activities associated with the developments may result in widespread soil disturbance and is usually associated with accelerated soil erosion. Soil erosion promotes a variety of terrestrial ecological changes associated with disturbed areas, including the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous flora.

Construction work of the magnitude contemplated for the proposed development carries substantial risk of soil and water pollution, with the most prominent potential source of pollution being large construction vehicles contributing to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface or groundwater, leading to potential medium/long-term impacts on the flora of the site.

The environmental impacts of wind-borne dust, gases and particulates from the construction activities associated with the proposed development will have an impact on the vegetation of the area when dust settles on plant material reducing the amount of light reaching the chlorophyll in the leaves, thereby reducing photosynthesis, which in turn reduces plant productivity, growth and recruitment. The following activities will typically cause air pollution at the proposed development:

- Land clearing operations, building and scraping;
- Materials handling operations (truck loading & unloading, tipping, stockpiling);
- Vehicle entrainment on paved and unpaved roads;

One of the primary impacts associated with development activities on the biophysical environment is linked to emission of dusts and fumes from the transportation system. Dust pollution will impact the most severe during the construction phase on the flora of the surrounding areas. Construction vehicles

and equipment are the major contributors to the impact on air quality. Dust is generated during site clearance for the construction of infrastructure. Diesel exhaust gasses and other hydrocarbon emissions all add to the deterioration in air quality during this phase. Vehicles travelling at high speeds on dirt roads significantly aggravate the problem.

Dust deposited on the ground may cause changes in soil chemistry (chemical effects), and may over the long-term result in changes in plant chemistry, species composition and community structure. Sensitivities to dust deposition of the various plant species present in the area are not known. It is therefore difficult to predict which species may be susceptible. Dust in the area will be greatly increased in the dry season due to the nature of the soil in the area, with very small particulates

Poor air quality results in deterioration of visibility and aesthetic landscape quality of the region, particularly in winter due to atmospheric inversions.

Continued movement of personnel and vehicles on and off the site during the construction phase will result in a risk of importation of alien species. Vehicles often transport many seeds and some may be of invader species, which may become established along the road, especially where the area is disturbed. The construction carries by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites.

An increase in human activity on the site and surrounding areas is anticipated, especially during the construction phase of the development. The risk of wood harvesting and fires is increased which could have a definite impact on the flora of the larger area. If staff compounds are erected for construction workers, the risk of pollution because of litter and inadequate sanitation and the introduction of invasive flora are increased. The presence of a large number of construction workers or regular workers during the construction phase on site over a protracted period will result in a greatly increased risk of uncontrolled fires arising from cooking fires, improperly disposed cigarettes etc.

Large numbers of fauna are killed daily on roads. They are either being crushed under the tyres of vehicles in the case of crawling species, or by colliding with the vehicle itself in the case of avifauna or flying invertebrates. The impact is intensified at night, especially for flying insects, as result of their attraction to the lights of vehicles.

Significance Rating

The construction phase has a definite probability on a site and regional extent, leading to a High impact and Moderate impacts before mitigation.

Mitigation measures would lower the significance of the activity but not to such an extent that it can be classified as “Low significance”.

9.7.3. ATMOSPHERIC POLLUTION

Impact Description:

During construction dust will be the biggest attributor to atmospheric pollution. During the operational phase however the escape of noxious gases and other chemicals related to fuels could pose a threat to human health. It has however been shown that attendants exposure better correlates with the volume of petrol pumped than with the volume of petrol managed by the station (Wang & Bartha, 1990). The petrol station will be a source of low level emissions. These would disperse into the atmosphere and get diffused and the pollution concentrations would reduce as the distance from the sources increases.

Significance Rating

This impact has a regional extent as well as medium severity. The probability of occurrence is highly probable in the absence of appropriate mitigation measures, rendering this impact moderate.

The mitigation measures proposed will however reduce the impacts to negligible.

9.8. SOCIO-ECONOMIC ENVIRONMENT

9.8.1. LOSS OF HERITAGE SITES

Impact Description and significance rating:

An isolated occurrence of single MSA lithics (EXIGO-KRD-SA01) occurring within the proposed development footprint is of low heritage significance due to the small numbers of formal and diagnostic tools, and general loss of context of the lithics. The potential impact on the resource is considered to be low but this impact rating. Unknown archaeological findings are limited to a negligible impact by the implementation of mitigation measures (site monitoring) for the sites, if / when required.

As Palaeontological remains occur where bedrock has been exposed, all geological features should be regarded as sensitive.

Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past. As Stone Age material the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits.

9.8.2. VISUAL IMPACT

Impact Description:

The landscape character of the greater surrounding environment can be classified as mixed land use due to the presence of other filling stations, industrial warehousing and future housing, dry port and associated infrastructure.

The establishment of a lifestyle centre development will have a visual impact on the landscape character of the surrounding environment, due to site currently being vacant. Light pollution arising from the development will be higher due to the 24hour operation of the filling station and security lighting of the rest of the development. More light will be generated at night than currently.

Removal of trees and vegetation during the construction phase as well as placement of construction camps will lead to a short term visual impact. The site is however screened off from the Komati River side by the elevated railway line passing the site.

Significance Rating

The visual impact during the construction phase and operational phases will be moderate without mitigation. The visual impacts could however be reduced to low and even negligible should the mitigation measures as described in this report be adequately implemented. The visual impact and impact on sense of place of the project will contribute to the accumulative negative effect on the aesthetics of the study area.

9.8.3. TRAFFIC IMPACT

Impact Description:

The presence of construction vehicles on site will have an impact on the traffic situation of the neighbouring areas although minimal as movement outside the site will be limited.

The results of the capacity analyses indicate that the intersections to be used do not operate at acceptable levels of service and upgrades are proposed

There will be an escalation in traffic flow to and from the development during the operational phase. This could result in a significant impact should the specific mitigation measures and recommend road and intersection upgrades not be adhered to.

As the upgrades are already required due to the current traffic loads the mitigation will render the impact after mitigation as positive.

Significance Rating:

Construction activities will result in increased traffic by heavy vehicles in the area that can result in disruptions to traffic flow, even though only for a short period. This can lead to a moderate negative impact during the construction phase without mitigation. Should mitigation be implemented if can be reduced to low significance.

The impact on traffic during the operational phases are long term and on a regional level, with a moderate impact without mitigation measures. A positive moderate impact on the infrastructure upgrading and associated improvement of road and pedestrian safety is however predicted should the mitigation proposed in the traffic study and EMP be implemented.

9.8.4. NOISE IMPACT

Impact Description:

The presence of construction vehicles and activities on site will have an impact on the noise levels in the area. It should be noted that during the construction phase, residents living up to 500 metres from the site will be affected by the noise of the construction heavy vehicles. During the construction phase of the proposed development, there will be a noise pollution impact especially of the surrounding residents. Again this will be a temporary concern that will end once the project is completed. This is however suspected to be minimal as the N4 would already lead to elevated levels of noise during the day and night time. The elevated Transnet railway line would also act as a noise barrier towards the south of the site where agricultural holdings and tourism activities are dominant.

Significance Rating:

Construction activities will result in increase in noise in the area, even though only for a short period. This can lead to a low negative impact during the construction phase without mitigation. Should mitigation be implemented if can be reduced to negligible significance.

9.8.5. SOCIO-ECONOMIC IMPACT

Impact Description:

The assessment of the proposed development from an Operational and Developers point of view indicates that it will be viable and sustainable based on the demand for fuel in the market area (Petrorex, 2016). The relevant factors indicate that the development of the application site will be desirable. Taking into consideration that the volume projection clearly indicates that the projected level of sales can be realized, the proposed development is highly likely to be viable. The probability of the impact on the surrounding fillings station and retail centres will be definite without mitigation. However the impact will not result in the failure of these other sites due to the expected growth in demand in the Komatipoort area (Fernridge, 2015 and Petrorex, 2016).

The property, once developed, is envisaged to have the feasible potential to generate up to 25 permanent employment opportunities, consisting of Cashiers, Forecourt attendants, Chars and Management. It is estimated that the proposed service station development will create an estimated 50 job opportunities during the construction phase alone. This will have a great impact on lives of people currently employed as it will alleviate the level of their poverty. The implication of an additional permanent jobs being created in the local economy is that multiplier effects could result in additional income being generated in terms of additional household income for the local population. Most of this additional income would be spent in the local economy (excluding leakages into the regional economy) which would result in increased turnover for local businesses.

Significance Rating:

This positive socio-economic impact must be balanced with the other potential significant impacts to ensure that the development is sustainable and done in a responsible way. There will be some negative localised social impacts which can be mitigated to different degrees of success.

9.8.6. SAFETY & SECURITY

Impact Description:

There exists the risk of explosion and fire during operation of the filling station with nearby Sasol Gas line. The Sasol Gas Line is a Major Hazardous Installation. On-going discussions are taking place and need to continue to take place between Sasol and the developer to ensure the risk is reduced as far as possible with implementation of safety measures.

In some cases, the service stations pose the problem of safety and security for the surrounding residents. As people know that there is a safe for cash at the petrol station, this becomes a major target for criminals. While targeting the service station, criminals might end up victimizing other residents. It is important to indicate that the development does not impact negatively on the desired lifestyle of the surrounding areas. The development should not encourage crime or alcohol abuse since the presence of security in place will discourage any criminal activity in the area.

During construction there will be contractors moving around as well as people coming to look for work in the area which could lead to the increase in crime. This is however of short duration and can possibly be further mitigated by not allowing false expectations for work and working together with a community forum to address these issues. The significance is however negligible.

9.8.7. RATING OF POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE DEVELOPMENT

The following table contains the rating summary of the Biophysical and Socio-economic Impacts associated with the Development.

Table 9 Impact ratings

Activity/ Issue	Impact	Phase	*With or Without Mitigation*	Probability		Duration		Scale		Magnitude/ Severity		Significance	
Erosion of site and siltation of surface water features	Impact on surrounding water resources	Construction Phase	***WOM***	4	Highly Probable	1	Short Term	3	Regional	6	Medium	40	Low
			WM	2	Probable	1	Short Term	3	Regional	6	Medium	20	Negligible
Oil, grease and diesel spillages from construction vehicles		Construction Phase	***WOM***	4	Highly Probable	1	Short Term	2	Site	6	Medium	36	Low
			WM	2	Probable	1	Short Term	2	Site	6	Medium	18	Negligible
Flooding of construction camps		Construction Phase	***WOM***	4	Highly Probable	1	Short Term	1	Local	8	High	40	Low
			WM	1	Improbable	1	Short Term	1	Local	6	Medium	8	Negligible
Pollution of groundwater		Construction Phase	***WOM***	4	Highly Probable	1	Short Term	2	Site	6	Medium	36	Low

due to sanitation facilities			***WM***	1	Improbable	1	Short Term	2	Site	6	Medium	9	Negligible
Pollution of surface water due to sanitation facilities		Construction Phase	***WOM***	4	Highly Probable	1	Short Term	3	Regional	6	Medium	40	Low
			WM	1	Improbable	1	Short Term	3	Regional	6	Medium	10	Negligible
Ground- and surface water pollution due to storage of chemicals and building materials		Construction Phase	***WOM***	4	Highly Probable	1	Short Term	2	Site	6	Medium	36	Low
			WM	2	Probable	1	Short Term	2	Site	6	Medium	18	Negligible
Spillages from fuel storage facilities		Construction Phase	***WOM***	2	Probable	1	Short Term	2	Site	8	High	22	Low
			WM	1	Improbable	1	Short Term	2	Site	8	High	11	Negligible
Oil, petrol and diesel spillages from the refilling bay		Operational Phase	***WOM***	4	Highly Probable	1	Short Term	2	Site	2	Low	20	Negligible
			WM	2	Probable	1	Short Term	2	Site	2	Low	10	Negligible
Oil, petrol and diesel spillages		Operational Phase	***WOM***	4	Highly Probable	4	Long Term	1	Local	8	High	52	Moderate

from cars and trucks			***WM***	2	Probable	4	Long Term	1	Local	8	High	26	Low
Oil grease and detergents seeping into groundwater and drained into surface water from refuelling bay		Operational Phase	***WOM***	4	Highly Probable	4	Long Term	1	Local	6	Medium	44	Moderate
			WM	2	Probable	4	Long Term	1	Local	6	Medium	22	Low
Petrol and diesel spillages from underground fuel tanks at refuelling bay		Operational Phase	***WOM***	5	Definite	4	Long Term	1	Local	8	High	65	High
			WM	2	Probable	4	Long Term	1	Local	8	High	26	Low
Pollution from underground tanks		Post Operational Phase	***WOM***	4	Highly Probable	4	Long Term	2	Site	6	Medium	48	Moderate
			WM	1	Improbable	4	Long Term	2	Site	6	Medium	12	Negligible
Pollution from rusting and corroding surface infrastructure		Post Operational Phase	***WOM***	4	Highly Probable	4	Long Term	2	Site	2	Low	32	Low
			WM	1	Improbable	4	Long Term	2	Site	2	Low	8	Negligible
Clearing of vegetation for construction of infrastructure	Habitat destruction	Pre-Construction and Construction Phase	***WOM***	5	Definite	5	Permanent	2	Site	6	Medium	65	High
			WM	5	Definite	5	Permanent	1	Local	2	Low	40	Low
Clearing of vegetation for construction of	Habitat fragmentation	Pre-Construction and	***WOM***	5	Definite	5	Permanent	2	Site	6	Medium	65	High

infrastructure		Construction Phase	***WM***	5	Definite	5	Permanent	1	Local	2	Low	40	Low
Exposure of soils to rainfall and wind during construction	Soil erosion	Pre-Construction and Construction Phase	***WOM***	4	Highly Probable	4	Long Term	3	Regional	8	High	60	Moderate
			WM	4	Highly Probable	3	Medium Term	2	Site	2	Low	28	Low
Spillages from construction vehicles	Spillages of harmful substances	Pre-Construction and Construction Phase	***WOM***	4	Highly Probable	4	Long Term	3	Regional	6	Medium	52	Moderate
			WM	2	Probable	4	Long Term	2	Site	2	Low	16	Negligible
Exposure of soils to rainfall and wind during construction and rehabilitation	Dust contamination	Pre-Construction and Construction Phase	***WOM***	4	Highly Probable	4	Long Term	3	Regional	6	Medium	52	Moderate
			WM	2	Probable	4	Long Term	2	Site	2	Low	16	Negligible
Continued movement of personnel and vehicles on and off	Spread of alien invasive species	Pre-Construction and Constructio	***WOM***	4	Highly Probable	4	Long Term	3	Regional	6	Medium	52	Moderate

the site during the construction phase, as well as occasional delivery of materials required for maintenance		n Phase	***WM***	4	Highly Probable	3	Medium Term	2	Site	2	Low	28	Low
Continued movement of personnel and vehicles on and off the site during the construction phase, as well as occasional delivery of materials required for maintenance	Negative effect of human activities	Pre-Construction and Construction Phase	***WOM***	4	Highly Probable	4	Long Term	3	Regional	6	Medium	52	Moderate
			WM	4	Highly Probable	3	Medium Term	2	Site	2	Low	28	Low
Continued movement of vehicles on and off the site during the construction phase, as well as occasional delivery of materials required for maintenance	Fauna mortality on roads	Pre-Construction and Construction Phase	***WOM***	4	Highly Probable	3	Medium Term	2	Site	6	Medium	44	Moderate
			WM	4	Highly Probable	3	Medium Term	2	Site	2	Low	28	Low

Dust pollution from vegetation clearance, earthworks and increased traffic	Construction activities on site	Construction phase	***WOM***	4	Highly Probable	1	Short Term	3	Regional	6	Medium	40	Low
			WM	2	Probable	1	Short Term	3	Regional	2	Low	12	Negligible
Handling and storage of fuel on site	Vapour releases on human health	Operational Phase	***WOM***	4	Highly Probable	4	Long Term	2	Site	6	Medium	48	Moderate
			WM	1	Improbable	4	Long Term	2	Site	2	Low	8	Negligible
Vehicular fumes	Vapour releases on human health	Operational Phase	***WOM***	4	Highly Probable	4	Long Term	2	Site	6	Medium	48	Moderate
			WM	1	Improbable	4	Long Term	2	Site	2	Low	8	Negligible
Excavation of site	Destruction of MSA lithics EXIGO-KRD-SA01	Construction phase	***WOM***	5	Definite	5	Permanent	1	Local	2	Low	40	Low
			WM	5	Definite	5	Permanent	1	Local	2	Low	40	Low

Construction activities	Destruction of unknown sites of Archaeological importance	Construction phase	***WOM***	2	Probable	5	Permanent	1	Local	2	Low	16	Negligible
			WM	1	Improbable	5	Permanent	1	Local	2	Low	8	Negligible
Construction activities	Impact on landscape characteristics, key views and the visual quality of the area.	Construction phase	***WOM***	5	Definite	1	Short Term	2	Site	6	Medium	45	Moderate
			WM	4	Highly Probable	1	Short Term	2	Site	2	Low	20	Negligible
Addition lights at night	Addition to the cumulative negative effect on the visual quality of the landscape.	Operational phase	***WOM***	5	Definite	3	Medium Term	3	Regional	6	Medium	60	Moderate
			WM	4	Highly Probable	3	Medium Term	3	Regional	2	Low	32	Low
Construction vehicle movement on and off site	Additional pressure on road network	Construction phase	***WOM***	5	Definite	1	Short Term	3	Regional	6	Medium	50	Moderate
			WM	4	Highly Probable	1	Short Term	3	Regional	6	Medium	40	Low

Operational traffic due to lifestyle centre	Additional pressure on road network (upgrading of roads)	Operational phase	***WOM***	5	Definite	3	Medium Term	3	Regional	6	Medium	60	Moderate
			WM	5	Definite	3	Medium Term	3	Regional	6	Medium	60	Moderate (Pos +)
Noisy activities during construction (e.g. drilling, hammering etc.)	Noise impact on surrounding landowners	Construction phase	***WOM***	4	Highly Probable	1	Short Term	3	Regional	6	Medium	40	Low
			WM	2	Probable	1	Short Term	3	Regional	2	Low	12	Negligible
Creation of job opportunities	Economic upliftment in the area	Construction phase	***WOM***	2	Probable	1	Short Term	2	Site	2	Low	10	Negligible
			WM	4	Highly Probable	1	Short Term	2	Site	6	Medium	36	Low (Pos +)
Creation of job opportunities	Economic upliftment in the area	Operational phase	***WOM***	4	Highly Probable	3	Medium Term	2	Site	2	Low	28	Low (Pos +)
			WM	4	Highly Probable	3	Medium Term	2	Site	6	Medium	44	Moderate (Pos +)
Development of new retail centre and filling station	Impact on livelihood of surrounding filling station and retail centres	Operational phase	***WOM***	5	Definite	4	Long Term	3	Regional	8	High	75	High
			WM	4	Highly Probable	4	Long Term	3	Regional	6	Medium	52	Moderate
Explosion and fire during operation of	Safety risks to	Operational phase	***WOM***	2	Probable	1	Short Term	3	Regional	8	High	24	Low

the filling station with nearby Sasol Gas line	neighbours		***WM***	2	Probable	1	Short Term	3	Regional	6	Medium	20	Negligible
Construction workers on site	Increase in crime - Safety risks to neighbours	Construction phase	***WOM***	2	Probable	1	Short Term	3	Regional	6	Medium	20	Negligible
			WM	2	Probable	1	Short Term	3	Regional	6	Medium	20	Negligible

9.9. CUMULATIVE IMPACTS

Cumulative impacts result from actions, which may not be significant on their own, but which are significant when added to the impact of other similar actions i.e. combined impacts from existing filling stations. Cumulative impacts relating to the proposed development include:

- Potential reduced **ground water quality** due to underground storage tanks containing hazardous substances. These tanks will be stringently monitored and within a secondary containment system;
- Increased **air pollution** due to vehicle-entrained dust emissions, motor vehicle emissions, and VOC emissions. Other factors contributing to the reduced air quality is the vapours released on site during operation of the pumps etc.
- There will be a general **visual and light** intrusion caused by the proposed filling station due to the construction activities as well as the lighting utilised during both phases;
- **Surface water pollution and increased run-off** will occur as a result of the increased paved surfaces. However, it will be contained as the area will be provided with comprehensive storm water infrastructure systems.
- Other **filling stations** will be impacted on due to the increased capacity of the new filling station.
- Various alternatives were investigated, which took into account all these cumulative impacts as listed above. The final proposed Site Layout Plan is therefore one which is considered to result in the least cumulative impacts.

All these cumulative impacts have been taken into consideration in the impact assessment above.

10. ENVIRONMENTAL MANAGEMENT PROGRAMME

10.1. ENVIRONMENTAL MANAGEMENT PROGRAMME

10.1.1. ROLES AND RESPONSIBILITIES

A number of role-players will be responsible to ensure responsible environmental practices as described in this report are implemented on the proposed development site throughout each of the project cycles and throughout the project lifespan.

Key individuals are briefly discussed in this section, and are identified in the table below where specific responsibility is assigned to each.

10.1.1.1. ENVIRONMENTAL CONTROL OFFICER (ECO)

The ECO is appointed by the developer and is responsible for undertaking regular monitoring of site activities.

10.1.1.2. ADJUDICATING AUTHORITY'S INSPECTORATE

The Inspectorate of the adjudicating authority may carry out 'spot checks' on the site.

10.1.1.3. ENVIRONMENTAL MANAGER (EM)

The Environmental Manager (a contractor/developer employee) is responsible for the overseeing of the environmental management of all aspects of the construction and operational phase of the development. Will receive feedback from the ECO, and will approve any changes to the EMP, changes to the design etc. will be responsible for overseeing any environmental incidents and the proper mitigation thereof.

10.1.1.4. PROJECT MANAGER (PM)

The Project Manager is responsible for the overseeing of the construction and activities associated with the development. Will receive feedback from the ECO, and will approve any changes to the EMPr, changes to the design etc.

10.1.1.5. THE DEVELOPER/ PROJECT PROPONENT

The developer assumes overall responsibility of the development and its repercussions on the environment. Duty of care in respect of environmental management as, inter alia, explained in the National Environmental Management Act, Section 28 and other relevant provisions as contained in this plus other applicable laws.

10.1.1.6. THE CONTRACTOR OR SUB-CONTRACTORS

All contractors have the responsibility to implement and adhere to the EMPr and ensure that the

factors which may compromise the achievements of the objectives of sustainable development and environmentally responsible operations are brought to the attention of the project proponent. The contractor must comply with all orders pertaining to environmental management issues (whether verbal or written) given by the ECO or directly by the project proponent. Contractors also have the responsibility to ensure that their employees are fully cognizant of, and abide by the EMPr. It is the service provider's responsibility to ensure that the works will comply with the specifications as set out in the management plan. Operators should be properly trained and informed of operational and maintenance responsibilities and environmental liabilities.

10.1.2. ENVIRONMENTAL MANAGEMENT ACTIVITIES CHECKLIST

The following table forms the core of this EMPr for the planning, construction and operational phases of this project. This table ought to be used as a checklist on site. During the construction phase, compliance with this EMPr must be audited monthly.

10.1.3. ENVIRONMENTAL INCIDENTS

An environmental incident is defined as any unplanned event that results in actual or potential damage to the environment, whether of a serious or non-serious nature. An incident may involve non-conformance with any of the following:

- Legal requirements
- Requirements of the EMP
- Any verbal or written order given by the ECO on site

In the event of any incident, the Environmental Incident Log, given in Appendix A should be completed. Corrective action to mitigate the impact (appropriate to the nature and scale of the incident) should be conducted immediately and affected parties notified.

In the case of serious incidents or emergencies, the incident report should be sent to the relevant authority as soon as possible after the incident has been recorded.

Table 10 Environmental management programme

Activity/ Issue	Impact	Phase	With or Without Mitigation	Significance	Management and Mitigation	Compliance (Yes/No)
Erosion of site and siltation of surface water features	Impact on surrounding water resources	Construction Phase	WOM	Low	1. Construction should preferably take place during the dry season. 2. Excavations should be open for as short period as practically possible. 3. Unpaved areas should be vegetated as soon as practically possible	
			WM	Negligible		
Oil, grease and diesel spillages from construction vehicles		Construction Phase	WOM	Low	4. Construction vehicles and machines must be maintained properly to ensure that oil spillages are kept at a minimum. 5. Spill trays must be provided if refuelling of construction vehicles are done on site.	
			WM	Negligible		
Flooding of construction camps		Construction Phase	WOM	Low	6. Construction should take place during the dry season. 7. The construction camp should be constructed on high ground and outside the 1:100 year flood line	
			WM	Negligible		
Pollution of groundwater due to sanitation facilities		Construction Phase	WOM	Low	8. Chemical sanitary facilities must be provided for construction workers. Construction workers should only be allowed to use temporary chemical toilets on the site. 9. Chemical toilets shall not be within close proximity of the drainage system. Frequent maintenance should include the removal without spillages	
			WM	Negligible		
Pollution of surface water due to sanitation facilities		Construction Phase	WOM	Low		
			WM	Negligible		
Ground- and surface water pollution due to		Construction Phase	WOM	Low	10. Adequate fuel containment facilities to be used during construction phase.	

storage of chemicals and building materials			WM	Negligible	11. The use of all materials, fuels and chemicals which could potentially leach into underground water must be controlled. 12. All materials, fuels and chemicals must be stored in a specific and secured area to prevent pollution from spillages and leakages 13. No uncontrolled discharges from the construction camp shall be permitted. 14. Chemical storage areas should be sufficiently contained, and the use of chemicals should be controlled.	
Spillages from fuel storage facilities		Construction Phase	WOM	Low		
			WM	Negligible		
Oil, petrol and diesel spillages from the refilling bay		Operational Phase	WOM	Negligible	15. The use of all detergents, oil, fuels and chemicals which could potentially leach into underground water must be controlled. 16. Refuelling bay should be properly designed so that fuel and oil spillages that occur during refuelling/ on refuelling bay can be contained and included in a dirty water system. 17. The dirty water system should be discharged into a licensed municipal system and not into any streams, rivers, or open fields. This will depend on the current infrastructure and town drainage design. 18. Any discharge will join the current town drainage system with waste fossil fuel products being contained and disposed of accordingly. 19. Chemical storage areas should be sufficiently contained, and the use of chemical should be controlled. 20. Storm water from outside the perimeter should be redirected around the site 21. Rainwater falling on the site should be contained and included in a storm water system.	
			WM	Negligible		
Oil, petrol and diesel spillages from cars and trucks		Operational Phase	WOM	Moderate		
			WM	Low		
Oil grease and detergents seeping into groundwater and drained into surface water from refuelling bay		Operational Phase	WOM	Moderate		
			WM	Low		
Petrol and diesel spillages from underground fuel tanks at refuelling bay		Operational Phase	WOM	High	22. Underground fuel tanks should be properly installed and maintained to prevent possible leakage into ground. 23. Fuel pumped into underground fuel tanks should be accounted for and metered, for the early detection of leakages	
			WM	Low		

Pollution from underground tanks		Post Operational Phase	**WOM**	Moderate	24.Underground tanks should be removed with decommissioning of the filling station	
			WM	Negligible		
Pollution from rusting and corroding surface infrastructure		Post Operational Phase	**WOM**	Low	25. Surface infrastructure should be maintained, or removed if possible	
			WM	Negligible		
Clearing of vegetation for construction of infrastructure	Habitat destruction	Pre-Construction and Construction Phase	**WOM**	High	26. The removal of the indigenous trees and shrubs should only occur on the footprint area of the development and not over the larger area; 27. Conduct flora species search and rescue efforts before ground clearing begins in order to reduce negative impacts on species of concern; 28. Remove and relocate any plants of botanical or ecological significance as indicated by the ecologist or Environmental Control Officer (ECO); 29. Obtain permits for the eradication of protected trees and flora where rescue and relocation will not be possible; 30. Vegetation to be removed as it becomes necessary; 31. Clearly demarcate the entire development footprint prior to initial site clearance and prevent construction personnel from leaving the demarcated area; 32. Monitoring should be implemented during the construction phase of the development to ensure that minimal impact is caused to the flora of the area; 33. The ECO should advise the construction team in all	

			WM	Low	relevant matters to ensure minimum destruction and damage to the environment. The ECO should enforce any measures that he/she deem necessary. Regular environmental training should be provided to construction workers to ensure the protection of the habitat, fauna and flora and their sensitivity to conservation; 34. Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications; 35. Where trenches pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This could be prevented by the constant excavating and backfilling of trenches during pipeline construction; 36. Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist;	
Clearing of vegetation for construction of infrastructure	Habitat fragmentation	Pre-Construction and Construction Phase	WOM	High	37.All possible efforts must be made to ensure as little disturbance as possible to the sensitive habitats associated with the Komati River that occurs to the south of the site; 38. Unnecessary driving around in the veld or bulldozing natural habitat must not take place; 39. Construction activities must remain within defined construction areas and the road servitudes. No construction / disturbance will occur outside these areas.	
			WM	Low		
Exposure of soils to rainfall and wind during construction	Soil erosion	Pre-Construction and Construction	WOM	Moderate	40. Cover disturbed soils as completely as possible, using vegetation or other materials; 41. Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices.	

		Phase	WM	Low	42. Sediment trapping, erosion and Stormwater control should be addressed by a hydrological engineer in a detailed Stormwater management plan; 43. Protect sloping areas and drainage channel banks that are susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas; 44. Repair all erosion damage as soon as possible to allow for sufficient rehabilitation growth; 45. Gravel roads must be well drained in order to limit soil erosion;	
Spillages from construction vehicles	Spillages of harmful substances	Pre-Construction and Construction Phase	WOM	Moderate	46.Any excess or waste material or chemicals should be removed from the site and discarded in an environmental friendly way. The ECO should enforce this rule rigorously; 47. Hazardous chemicals to be stored on an impervious surface protected from rainfall and storm water run-off; 48.Spill kits should be on-hand to deal with spills immediately; 49. All vehicles should be inspected for oil and fuel leaks on a regular basis. Vehicle maintenance yards on site should make provision for drip trays that will be used to capture any spills. Drip trays should be emptied into a holding tank and returned to the supplier.	
			WM	Negligible		
Exposure of soils to rainfall and wind during construction and rehabilitation	Dust contamination	Pre-Construction and Construction Phase	WOM	Moderate	50. A speed limit should be enforced on dirt roads (preferably 40km/h)	
			WM	Negligible		

Continued movement of personnel and vehicles on and off the site during the construction phase, as well as occasional delivery of materials required for maintenance	Spread of alien invasive species	Pre-Construction and Construction Phase	**WOM**	Moderate	51. Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the CARA or in terms of Working for Water guidelines. The control of these species should even begin prior to the construction phase considering that small populations of these species was observed during the field surveys; 52. Institute strict control over materials brought onto site, which should be inspected for seeds of noxious plants and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual herbicides prior to transport to or in a quarantine area on site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase. Alien invasive tree species listed by the CARA regulations should be eradicated; 53. Rehabilitate disturbed areas as quickly as possible to reduce the area where invasive species would be at a strong advantage and most easily able to establish; 54. Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds. Once detected, an eradication/control programme should be implemented to ensure that the species' do not spread to surrounding natural ecosystems.	
			WM	Low		
Continued movement of personnel and vehicles on and off the site during the construction phase, as	Negative effect of human activities	Pre-Construction and Construction Phase	**WOM**	Moderate	55. Adequate rubbish bins and sanitation facilities should be provided; 56. The ECO should regularly inspect the site, including storage facilities and compounds. A monitoring programme should also be implemented around these areas to detect	

well as occasional delivery of materials required for maintenance			WM	Low	alien invasive species early, before they become established and, in the case of weeds, before the release of seeds; 57. Maintain proper firebreaks around entire development footprint. 58. Educate construction workers regarding fire risks	
Continued movement of vehicles on and off the site during the construction phase, as well as occasional delivery of materials required for maintenance	Fauna mortality on roads	Pre-Construction and Construction Phase	WOM	Moderate	59. More fauna are normally killed the faster vehicles travel. A speed limit should be enforced (speed on site max 40 km/hour; Outside of the site 80 km/h. In Rain max 40 km/h). It can be considered to install speed bumps in sections where the speed limit tends to be disobeyed. (Speed limits will also lessen the probability of road accidents and their negative consequences). 60. Travelling at night should be avoided or limited as much as possible during construction. No travelling at night should be allowed without approval by site manager during construction; 61. Lights should be positioned 5m from the roads or paved areas	
			WM	Low		
Dust pollution from vegetation clearance, earthworks and increased traffic	Construction activities on site	Construction phase	WOM	Low	62. Damping down of access roads, stockpiles and cleared areas must take place to minimize dust pollution. 63. Hard surface the site roads at the earliest stage in the construction phase. 64. Proper rehabilitation of disturbed areas is required in order to minimize bare patches	
			WM	Negligible		
Handling and storage of fuel on site	Vapour releases on human health	Operational Phase	WOM	Moderate	65. Fuel emissions can be reduced by the installation of the following equipment: 66. Vapour recovery systems at the tanks 67. Vapour recovery systems at the fuel point 68. Carbon filters on the vents 69. Regular monitoring of all filters, extraction fans and air	
			WM	Negligible		

Vehicular fumes	Vapour releases on human health	Operational Phase	**WOM**	Moderate	conditioning units to ensure acceptable working conditions 70. Regular monitoring of pump devices to ensure acceptable working conditions	
			WM	Negligible		
Excavation of site	Destruction of MSA lithics EXIGO-KRD-SA01	Construction phase	**WOM**	Low	71. A Palaeontological Impact Assessment is recommended where bedrock is to be impacted and, should fossil remains such as fossil fish, reptiles or petrified wood be exposed during construction, these objects should carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist. 72. An isolated occurrence of single MSA lithics (EXIGO-KRD-SA01) occurring within the proposed Komatipoort Filling Station and Retail Centre Development footprint is of low heritage significance due to the small numbers of formal and diagnostic tools, and general loss of context of the lithics. No farther action is required in terms of mitigation of the site and occurrences. 73. Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be	
			WM	Low		
Construction activities	Destruction of unknown sites of Archaeological importance	Construction phase	**WOM**	Negligible		

			WM	Negligible	notified immediately 74. It is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development	
Construction activities	Impact on landscape characteristics, key views and the visual quality of the area.	Construction phase	WOM	Moderate	75. The construction site , material stores , stockpiles and lay down area should be kept tidy. 76. Measures to control wastes and litter should be included in the contract specification documents	
			WM	Negligible		
Addition lights at night	Addition to the cumulative negative effect on the visual quality of the landscape.	Operational phase	WOM	Moderate	77. Paint buildings & structures - environmental complementing colours (natural browns and dark greens of the surrounding landscape) Avoid pure lights & darks. 78. To reduce glare external surfaces - structures surfaces to be articulated & textured. 79. Planted Trees to emulate natural/cultural adjacent patterns.	

			WM	Low	80. Paving materials with 'earthy' tones to complement the natural red/brown colours of the soils in the area. 81. Parking areas to be laid out to retain clusters of vegetation to break monotony of paved surfaces. 82. Light fixtures - precisely directed illumination - reduce light "spillage". 83. High pole top security lighting avoided - use motion activated lights. 84. Public movement areas (pathways and roads) - low level 'bollard' type lights - avoid post top lighting.	
Construction vehicle movement on and off site	Additional pressure on road network	Construction phase	WOM	Moderate	85. N4 Highway / R571 (Rissik Street): An exclusive, short left-turn lane is proposed on the northern approach (R571) and R571 (Rissik Street) / Entrance to Spar: exclusive short right-turn lane is proposed on the eastern approach (R571)	
			WM	Low		
Operational traffic due to lifestyle centre	Additional pressure on road network	Operational phase	WOM	Moderate		
			WM	Moderate (Pos +)		
Noisy activities during construction (e.g. drilling, hammering etc.)	Noise impact on surrounding landowners	Construction phase	WOM	Low	86. Construction activities to take place during daytime period only unless where necessary and agreed with the communities that may be impacted. 87. All equipment should be kept at a high level of maintenance. This is especially true for all diesel powered equipment	
			WM	Negligible		
Creation of job opportunities	Economic upliftment in the area	Construction phase	WOM	Negligible	89. Contractors should be required to make use of a certain proportion of local labour – it is acknowledged that all skills will not be available locally. Jobs should be advertised in a way that is accessible to all members of society and labour desks should be established in accessible areas	
			WM	Low (Pos +)		
Creation of job opportunities	Economic upliftment in the area	Operational phase	WOM	Low (Pos +)	90. Preference should be given to local labour that is within easy travelling distance from the proposed development. Jobs should be advertised in a way that is accessible to all members of society.	
			WM	Moderate (Pos +)		

Development of new retail centre and filling station	Impact on livelihood of surrounding filling station and retail centres	Operational phase	**WOM**	High	91. Ensure retail outlets in the new development supplement rather than compete with the existing mall, especially in the case of small businesses by, for example, not allowing small businesses similar to existing small businesses. 92. No real mitigation is possible as the new filling station will necessarily lead to an initial decrease in sales of competitor sites. However, this decrease will not result in the failure of these other sites due to the expected growth in demand in the Komatipoort area.	
			WM	Moderate		
Explosion and fire during operation of the filling station with nearby Sasol Gas line	Safety risks to neighbours	Operational phase	**WOM**	Low	93. Discussion should be on-going with Sasol. X. The proponent should develop a safety plan in conjunction with the police and fire brigade should an emergency occur. 94. All personnel should be trained in what is expected from them in such a situation	
			WM	Negligible		
Construction workers on site	Increase in crime - Safety risks to neighbours	Construction phase	**WOM**	Negligible	95. Contractors should wear some form of identification that will make them easily recognizable as representatives from the construction company utilised. A community forum should be established and together an action plan against potential crime should be drafted, for example establishing a community policing forum.	
			WM	Negligible		

10.1.4. ENVIRONMENTAL AWARENESS TRAINING

Environmental awareness training is critical for two primary reasons:

- the workforce must understand how they can play a role in achieving the objectives specified in the EMP, and
- the workforce must understand their obligations in terms of the implementation of the EMP and adherence to environmental-legislative requirements.

This section of the report contains the environmental awareness plan which is aimed at ensuring that employees, contractors, subcontractors and other relevant parties are aware of and able to meet their environmental commitments. This plan is to be updated on a yearly basis during the construction and operational phases of the project in light of operational changes, learning experiences and identified training needs.

All full time staff and contractors are required to attend an induction session when they start at the construction, which session should include environmental aspects. Any contractor, who works on the site for a period of 24 hours or more, is also required to undergo induction training which should also be inclusive of environmental aspects.

It is therefore recommended that the Environmental Officer on site be involved in induction training (if this entity is separate from the SHE rep). The induction sessions may be modified / adapted based on the audience attending the specific session, but it should be ensured that all employees gain a suitable understanding of:

- Environmental requirements of the project, and how these will be implemented and monitored, including each employee's responsibilities with respect to environmental issues;
- Contents and commitments of the EMPR, including no-go areas, employee conduct, pollution prevention (prohibitions against littering, unauthorized fires, loud music, entry to adjacent properties, road conduct etc.);
- Environmentally sensitive areas on and around the project site, including why these are deemed important and how these are to be managed. Employees will also be made aware of protected species found on the site and how these are to be conserved, as well as alien invasive species potentially found on the site and how these should be managed; and
- Incident identification, remediation and reporting requirements: what constitutes an environmental incident (spillages, fire etc.) and how to react when such an incident occurs.

Environmental training will therefore not be restricted to induction training sessions, but will also be conducted on an on-going basis throughout the Life of project as and when required. Records are to be

kept of the type of training given (matters discussed and by whom), date on which training was given and the attendees to each training session.

Management shall ensure that employees are adequately trained with regard to the implementation of the EMPR and environmental legal requirements and obligations. It is recommended that a training need analysis be conducted by a competent environmental training consultant to identify the appropriate environmental training programmes, and the appropriate target groups. Environmental training programmes shall be targeted at three distinct levels of employment i.e. the executive, middle management and labour. The training programmes shall contain the following information:

- The names, positions and responsibilities of the personnel to be trained
- The framework for appropriate training programmes
- The summarized content of each training course
- A schedule for the presentation of the training courses

10.2. AUDIT PROTOCOL

It is essential that during the construction and operational phase of the plant of the proposed project the monitoring and auditing of certain elements are carried out to ensure compliance with regulatory bodies. An Audit Protocol for both the construction phase and the actual operational phase will be required.

10.2.1. CONSTRUCTION PHASE

The following audits need to be completed:

1. All installations must comply to required standards as set out by regularly authorities and include:
    - Tank Specification to set standards:
        - SABS 089, 1535 and 0131 relating to tank installation;
        - SABS 0108 relating to classification of hazardous locations and selection of apparatus for such installations; and
        - SABS 0400 relating to building regulations.
    - Secondary containment of tank and piping;
    - Certification of tests carried out on completion of tank installation to ensure they don't leak; and
    - Sign off by an independent engineer off above audits.
2. EMP compliance (on at least a monthly): to be checked by an Environmental Auditor.

3. Noise and / or Light Monitoring

- A record of complaints must be kept on the premises which will record all noise and / or light complaints as well as the measure taken to address these complaints.

4. Occupational Health and Safety Act Compliance

- A register must be complied by the contractor that will indicate that the employees have been informed as to their rights under the Act; and
- Accident records must be kept, as per the Act.

10.2.2. OPERATIONAL PHASE

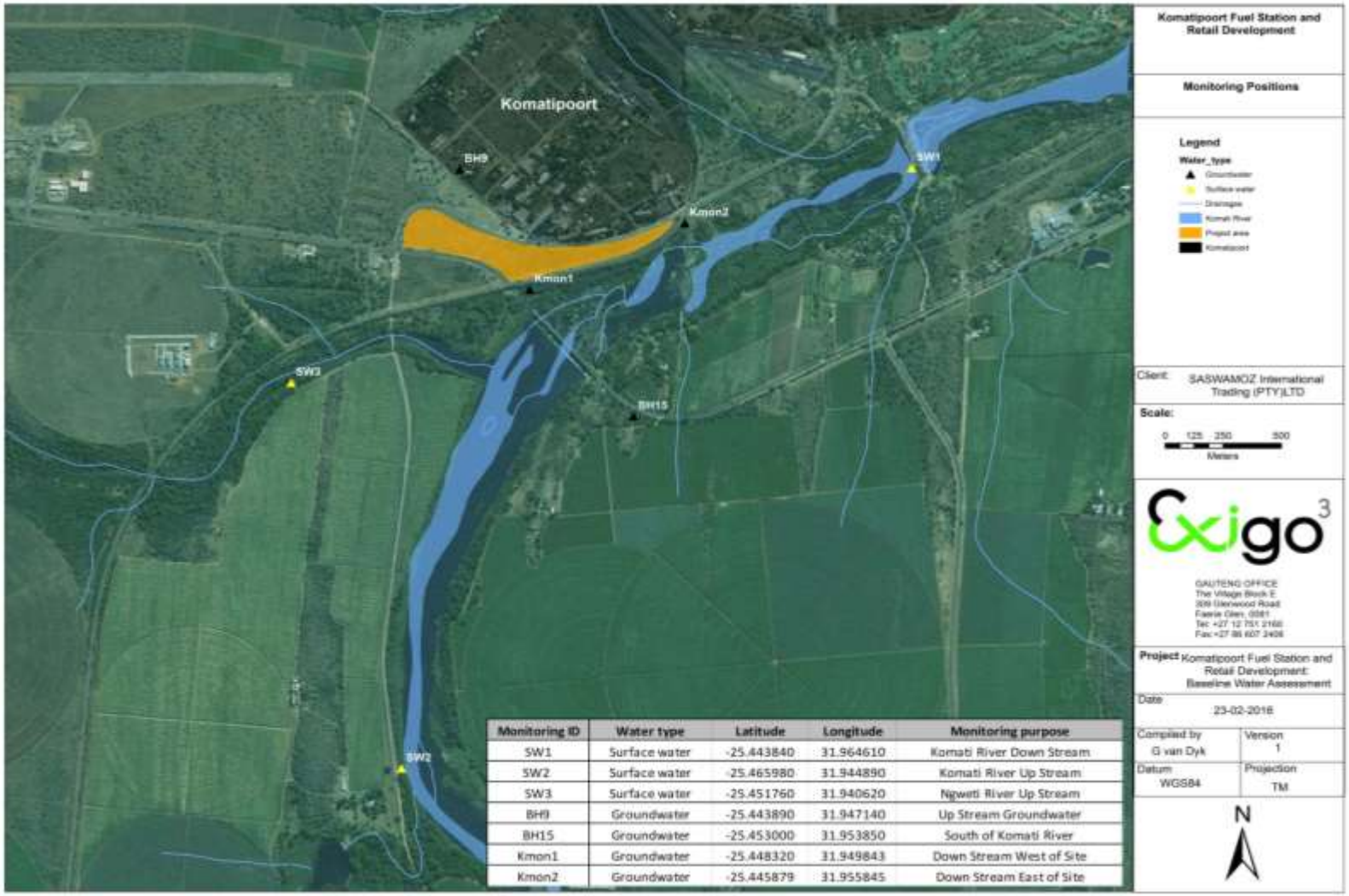
The following audits must be compiled:

1. Fuel Tanks

- An electronic gauging system will be installed in each tank to monitor fuel levels on real time basis taking accurate measures of tank dips, pump sales, deliveries and stock transfer. This will ensure:
    - Preventing spillage due to overfill;
    - Leak detection; and
    - Product and client turnover;

2. Water Monitoring

- Monthly audits must be done by the operations manager as well as the monitoring team. Log sheets must be filled in and actions noted according to the policies.
- Monitoring to include the following:
    - Quarterly water samples should be taken at the monitoring boreholes and surface water points and analysed as indicated in Figure 19. When sampling duplicate samples should be taken, one sample should be tested for field parameters and then marked to be kept as a backup sample, the second sample should be sealed immediately after sampling and send to an accredited laboratory for analysis as soon as possible.
    - Monthly water samples should be taken at all monitoring points and analysed for total diesel hydrocarbons, total petrol hydrocarbons, oil, grease and detergents (Figure 19). Water levels should be taken at the monitoring boreholes before samples are taken.



Monitoring ID	Water type	Latitude	Longitude	Monitoring purpose
SW1	Surface water	-25.443840	31.964610	Komati River Down Stream
SW2	Surface water	-25.465980	31.944890	Komati River Up Stream
SW3	Surface water	-25.451760	31.940620	Ngweti River Up Stream
BH9	Groundwater	-25.443890	31.947140	Up Stream Groundwater
BH15	Groundwater	-25.453000	31.953850	South of Komati River
Kmon1	Groundwater	-25.448320	31.949843	Down Stream West of Site
Kmon2	Groundwater	-25.445879	31.955845	Down Stream East of Site

Figure 19 Water monitoring localities

Table 11 Quarterly Sampling

Site	Frequency	Analysis			
		Water Level	Field Measurements	Chemical Parameters	Hydrocarbons
Kmon 1	Quarterly	Yes	EC; pH; TDS; Temp	Ca, Mg, Na, K, Cl, SO4, NO3-N, F, NH3-N; PO4-P, Al, Fe, Mn, CO3, HCO3, pH, EC, TDS, Oil Grease Soap and Detergents, LSI	Total Diesel Hydrocarbons, Total Petroleum Hydrocarbons
Kmon 2	Quarterly	Yes	EC; pH; TDS; Temp	Ca, Mg, Na, K, Cl, SO4, NO3-N, F, NH3-N; PO4-P, Al, Fe, Mn, CO3, HCO3, pH, EC, TDS, Oil Grease Soap and Detergents, LSI	Total Diesel Hydrocarbons, Total Petroleum Hydrocarbons
BH9	Monthly	Yes	EC; pH; TDS; Temp	Ca, Mg, Na, K, Cl, SO4, NO3-N, F, NH3-N; PO4-P, Al, Fe, Mn, CO3, HCO3, pH, EC, TDS, Oil Grease Soap and Detergents, LSI	Total Diesel Hydrocarbons Total Petroleum Hydrocarbons
BH15	Monthly	Yes	EC; pH; TDS; Temp	Ca, Mg, Na, K, Cl, SO4, NO3-N, F, NH3-N; PO4-P, Al, Fe, Mn, CO3, HCO3, pH, EC, TDS, Oil Grease Soap and Detergents, LSI	Total Diesel Hydrocarbons Total Petroleum Hydrocarbons
SW1	Quarterly	No	EC; pH; TDS; Temp	Ca, Mg, Na, K, Cl, SO4, NO3-N, F, NH3-N; PO4-P, Al, Fe, Mn, CO3, HCO3, pH, EC, TDS, Oil Grease Soap and Detergents, LSI	Total Diesel Hydrocarbons, Total Petroleum Hydrocarbons
SW2	Quarterly	No	EC; pH; TDS; Temp	Ca, Mg, Na, K, Cl, SO4, NO3-N, F, NH3-N; PO4-P, Al, Fe, Mn, CO3, HCO3, pH, EC, TDS, Oil Grease Soap and Detergents, LSI	Total Diesel Hydrocarbons, Total Petroleum Hydrocarbons
SW3	Quarterly	No	EC; pH; TDS; Temp	Ca, Mg, Na, K, Cl, SO4, NO3-N, F, NH3-N; PO4-P, Al, Fe, Mn, CO3, HCO3, pH, EC, TDS, Oil Grease Soap and Detergents, LSI	Total Diesel Hydrocarbons, Total Petroleum Hydrocarbons

Table 12 Monthly Sampling

Site	Frequency	Analysis			
		Water Levels	Field Measurements	Chemical Parameters	Hydrocarbons
Kmon 1	Monthly	Yes	EC; pH; TDS; Temp	Oil Grease Soap and Detergents EC, pH, TDS	Total Diesel Hydrocarbons Total Petroleum Hydrocarbons

Site	Frequency	Analysis			
		Water Levels	Field Measurements	Chemical Parameters	Hydrocarbons
Kmon 2	Monthly	Yes	EC; pH; TDS; Temp	Oil Grease Soap and Detergents EC, pH, TDS	Total Diesel Hydrocarbons Total Petroleum Hydrocarbons
SW1	Monthly	No	EC; pH; TDS; Temp	Oil Grease Soap and Detergents EC, pH, TDS	Total Diesel Hydrocarbons Total Petroleum Hydrocarbons
SW2	Monthly	No	EC; pH; TDS; Temp	Oil Grease Soap and Detergents EC, pH, TDS	Total Diesel Hydrocarbons Total Petroleum Hydrocarbons
SW3	Monthly	No	EC; pH; TDS; Temp	Oil Grease Soap and Detergents EC, pH, TDS	Total Diesel Hydrocarbons Total Petroleum Hydrocarbons

- An electronic gauging system will be installed in each tank to monitor fuel levels on real time basis.
- A Computerised forecourt control system will be linked to all pumps to monitor sales on real time basis.
- The Tank Gauging System and the Forecourt Control System readings will be reconciled on a 24hour basis to ensure that no fuel is lost in terms of theft or a potential leak into the environment.

3. Waste Management

- The developer/operator will engage into contract with a waste control company to remove waste from site the site.
- Waste separation to take place to ease the monitoring of the waste amounts
- Sewage sludge/Sewage should be removed by a contractor to a licenced facility.
- Weekly monitoring of waste sites and waste management to be implemented.

11. ENVIRONMENTAL IMPACT STATEMENT

An assessment of potential impacts identified for the Komati Lifestyle Development was undertaken. The impacts identified for further assessment were assessed within the respective specialist studies. The specialist studies undertaken to this effect are listed in Table 1.

The specialist studies recommended mitigation measures in order to reduce or eliminate any impacts were identified.

The proposed project could be developed in a sustainable manner in light of the site being situated within an existing industrial area and should the mitigation measures proposed in the EMP be implemented the impact on the environment can be considered to be of negligible to low significance. The proposed activities fit in well with the surrounding land uses and are not situated within an environmental no-go area.

All impacts identified were also analysed according the following key considerations, a description of which is included in chapter 7:

Probability: This describes the likelihood of the impact actually occurring.

Duration: The lifetime of the impact

Scale: The physical and spatial size of the impact

Magnitude/ Severity: Does the impact destroy the environment, or alter its function.

Significance: This is 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.

In summary, based on the Impact analysis (Section 9), the Komati Lifestyle Development can be established without fatal flaws should the mitigation proposed be followed.

Before mitigation the following impacts were rated of high significance without mitigation measures:

- Petrol and diesel spillages from underground fuel tanks at refuelling bay;
- Clearing of vegetation for construction of infrastructure;
- Impact on livelihood of surrounding filling station and retail centres

All of the above impacts can however be mitigated to moderate significance.

12. OVERALL CONCLUSIONS AND RECOMMENDATIONS

The findings of the specialist studies undertaken within this Environmental process provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed project. The findings conclude that provided that the recommended mitigation and management measures are implemented there are no environmental fatal flaws that should prevent the proposed project from proceeding.

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 report have been included within an Environmental Management Plan (EMPr) which has been included in Section 10

This EMP will form part of the contract with the contractors appointed to construct and maintain the proposed plant and associated infrastructure. The EMP would be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for key cycle phases (i.e. construction and operation) of the proposed project is considered to be fundamental in achieving the appropriate environmental management standards as detailed for this project.

It is also recommended that the process of communication and consultation with the community representatives is maintained after the closure of this BA process, in particular, during the construction phase associated with the proposed project.

Therefore, based on the results of this Report, Exigo recommends that this report is accepted for consideration by the competent authority.

13. REFERENCES

- Acocks, J.P.H. 1988. Veld types of South Africa, 3rd ed. Memoirs of the Botanical Survey of South Africa. 57: 1–146.
- Africa. Briza, Pretoria.
- Barbour, M.G., J.H. Burk, and W.D. Pitts. 1987. Terrestrial Plant Ecology. Second Edition. Benjamin/Cummings Publishing, Menlo Park, CA.
- Bothma, J. DU. P. 1996. Game Ranch Management. Van Schaick, Pretoria.
- Branch, B. (1998). Field guide to snakes and other reptiles of Southern Africa. Struik Publishers. Cape Town.
- Bredenkamp, G.J. & Brown, L.R. 2001. Vegetation – A reliable ecological basis for environmental planning. Urban Greenfile Nov-Dec 2001: 38-39.
- Briza publications. 2001. Problem plants of South Africa. Pretoria.
- CHECHI, F. & ROBERTS, L. 2005. Interpreting and using mortality data in humanitarian emergencies: A primer for non-epidemiologists. Humanitarian practice Network at ODI.
- CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983. (ACT No. 43 OF 1983)
- Convention on Biological Diversity. Signed 1993 and ratified 2 November 1995.
- Cowling, W. E. 2005. Tourism- A Catalyst For Attitudinal Changes in Aitutaki, Cook Islands University of Waikato, Hamilton, New Zealand
- DEAT, 1998. Guideline Document on the EIA Regulations implementation of sections 21, 22 and 26 of the Environment Act, Government Printer, Pretoria.
- DEAT, 2002. Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism, Pretoria
- Enpat, 2000.Environmental Potential Atlas. Department of Environmental Affairs and Tourism, Pretoria.
- Fabian, A & Germishuizen, G. 1997. Wild flowers of Northern South Africa. Fernwood Press.
- Friedman, Y & Daly, B. 2004. Red Data Book of the Mammals of South Africa: A Conservation Assessment: CBSG Southern Africa, Conservation Breeding Specialist Group (SSC/IUCN), Endangered Wildlife Trust. South Africa.
- Germishuizen, G. and Clarke, B. (2003). Illustrated Guide to the Wildflowers of Northern South Africa. Briza Publications, Pretoria
- Gertenbach, W. P. D. 1983. Landscapes of the Kruger National Park. Koedoe 26: 9-121.
- Golding, J. (Ed.) 2002. Southern African Plant Red Data Lists. Southern African Botanical Diversity Network report no. 14. National Botanical Institute. pp. 237.

- Hilton-Taylor, C. 1996a. Red Data list of southern African plants. Strelitzia 4: 1 - 117.
- Hilton-Taylor, C. 1997. Red Data list of southern African plants. 2. corrections and additions. Bothalia 27:195 - 209.
- IFC. Performance Standard 6 Biodiversity Conservation and Sustainable Natural Resource Management
- Kent, LE. 1980. Stratigraphy of South Africa. Part 1: Lithostratigraphy of the Republic of South Africa, South West Africa/Namibia and the Republics of Bophuthatswana, Transkei and Venda. Pretoria: Department of Mineral and Energy Affairs, Handbook 8.
- Land type Survey Staff, 1987. Land types of the maps. Mem. Agric. Nat. Resour. S. Afr. no. 8.
- LEE, K. E. & WOOD, T. G. 1971. Termites and Soils. Academic Press, London.
- LOW, A. B. & REBELO, A. G. 1996. Vegetation of South Africa, Lesotho and Swaziland. Dept. Environmental Affairs and Tourism, Pretoria.
- MacKay, H. 1998: Towards a Classification System for Water Resources in South Africa. Institute for Water Quality Studies. Internal Report. Department of Water Affairs and Forestry, Pretoria, South Africa.
- Manning, J. (2003). Photographic Guide to the Wildflowers of South Africa. Briza Publications. Pretoria.
- Minter, L.R., Burger, M., Harrison, J.A., Braack, H.H., Bishop, P.J. and Kloepfer, D. (2004). Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland. Smithsonian Institute, Washington, DC.
- Mucina, L & Rutherford, M. C. 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19, SANBI, Pretoria.
- Mucina, L., Bredenkamp, G.J., Hoare, D.B. & McDonald, D.J. 2000. A National vegetation database for South Africa. South Africa Journal of Science 96:497-498.
- Mueller-Dombois, D. & Ellenberg, H. 1974. Aims and methods of vegetation ecology. Wiley, New York.
- NATIONAL FOREST ACT, 1998 (Act No. 84 of 1998). Government Gazette No. 29062, Notice 897, 8 September 2006)
- NATIONAL WATER ACT, 1998. Act No 36 of 1998.
- Onderstall, J. (1996). Wild Flower Guide for Mpumalanga and Northern Province. DynamicAd. Nelspruit.
- Palgrave, M.C. (2002). Trees of Southern Africa. Struik Publishers. Cape Town.
- Pooley, E. 1998. A field guide to wild flowers of Kwazulu Natal and the Eastern Region. Natal Flora Publications Trust.

- SANBI & DEAT. 2009. Threatened Ecosystems in South Africa: Descriptions and Maps. Draft for Comment. South African National Biodiversity Institute, Pretoria, South Africa.
- Sinclair, A. R. E. & A. E. Byrom. 2006. Understanding ecosystem dynamics for conservation of biota. Journal of Animal Ecology, 75: 64–79
- Smithers, R.H.N. (1983). Soogdiere van die Suider-Afrikaanse Substreek. Universiteit van Pretoria. Pretoria
- Tainton, N. M. (ed.), 1981. Veld and Pasture Management in South Africa. Shuter and Shooter, Pietermaritzburg, 481pp.
- The Government Gazette RSA Vol. 467, 26436, Cape Town, June 2004.
- The National Environmental Management Biodiversity Act, 2004. (Act 10 0f 2004).
- The National Environmental Management Biodiversity Act, 2004. (Act 10 0f 2004). Draft. List of Threatened Ecosystems. Government Gazette RSA Vol. 1477, 32689, Cape Town, 6 Nov 2009.
- The Natural Scientific Professions Act (Act 27 of 2003)
- THOMPSON H (2006) Water Law: A Practical Approach to Resource Management and the Provision of Services. Juta, Cape Town.
- Van Der Merwe, C. R. 1952. Soil Groups and subgroups of South Africa. Science Bulletin356.
- Van Oudtshoorn, F. (1991) Gids tot grasse van Suid Afrika. Briza Publikasies. Pretoria.
- Van Wyk, B & Malan, S. 1988. Field Guide to the wild flowers of the Highveld. Struik Publishers.
- Van Wyk, B. & Van Wyk, P. 1997. Field Guide to Trees of Southern Africa. Struik Publishers. Cape Town.
- Van Wyk, B.E., Van Oudtshoorn, B. & Gericke, N. 1997. Medicinal plants of South
- VAN WYK, B-E. & GERICKE, N. 2000. People's Plants: A Guide to useful plants of southern Africa. Briza publications, Pretoria.
- WERGER, M.J.A. 1978. Biogeography and Ecology of Southern Africa. Monographie Biologicae vol. 31. Junk, The Hague.
- Westhoff, V. & Van der Maarel, E. 1978. The Braun-Blanquet approach. In: Whittaker, R.H. (ed.) Classification of plant communities. W. Junk, The Hague.
- WHITE, F. 1983. The vegetation of Africa: a descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa. UNESCO, Paris, France.

14. APPENDIX A: PUBLIC PARTICIPATION

15. APPENDIX B: CORRESPONDENCE FROM DEPARTMENT OF ENVIRONMENTAL AFFAIRS

Information to be included in final Basic Assessment Report.

16. APPENDIX C: COMPANY PROFILE AND CURRICULUM VITAE OF PROJECT TEAM

17. APPENDIX D: SPECIALIST REPORTS

18. APPENDIX E: EAP DECLARATION

The EAP herewith confirms

i) *the correctness of the information provided in the reports* ☒

ii) *the inclusion of comments and inputs from stakeholders and I&APs ;* ☒

iii) *the inclusion of inputs and recommendations from the specialist reports where relevant;* ☒ *and*

iv) *that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.* ☒

Signature of the environmental assessment practitioner:

Name of company:

Date: