

**DRAFT**

**SCOPING REPORT FOR THE PROPOSED  
DEVELOPMENT OF DNG ENERGY (PTY) LTD TAU  
GAS -TO-POWER FACILITY AND ASSOCIATED  
INFRASTRUCTURE WITHIN THE JURISDICTION OF  
NKOMAZI LOCAL MUNICIPALITY, MPUMALANGA  
PROVINCE**

**REF: F010- 20-A**

**OCTOBER 2020**

**SCOPING REPORT FOR THE PROPOSED DEVELOPMENT  
OF DNG ENERGY (PTY) LTD TAU GAS -TO -POWER  
FACILITY AND ASSOCIATED INFRASTRUCTURE WITHIN  
THE JURISDICTION OF NKOMAZI LOCAL MUNICIPALITY,  
MPUMALANGA PROVINCE**

**REF: F010- 20-A**

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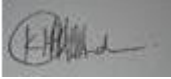

*"From the world we live to the world we seek"*

**DOCUMENT CONTROL**

**PROJECT TITLE:**

Draft Scoping Report for the proposed development of DNG Energy (Pty) Ltd Tau gas-to-power station and associated Infrastructure within the Jurisdiction of Nkomazi Local Municipality, Mpumalanga Province

**QUALITY CONTROL:**

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## EXECUTIVE SUMMARY

DNG Energy (Pty) Ltd is proposing to establish a 620 MW Open Cycle Gas Turbine (OCGT) Power facility and associated infrastructure. The proposed Tau gas-to-power station will be developed in two phases. The first phase involves the development of the 620 MW Open Cycle Gas Turbine (OCGT) Power facility, aboveground gas pipeline from the existing Republic of Mozambique Pipeline Company (ROMPCO) gas pipeline to the power plant, and the above aboveground storage tanks with a capacity of 500m<sup>3</sup> and bulk storage facility. DNG Energy is also proposing the construction of approximately 0.5km x 132 kV overhead powerline from the proposed power plant to the existing Eskom Komati substation. The second phase of the project involves the expansion of the capacity of power to 1000 MW by using Combined-Cycle Gas Turbines (CCGT).

The proposed project will be located within the existing industrial area, on farm Komatipoort Townland 182 FP, Portions 0, 3, 7, 17, 48, 50, 52, 53, 59, 62 and 67 Komatipoort Station Railway Reserve 161 FP, Portion 0, in Komatipoort town within the jurisdiction of the Nkomazi Local Municipality in the Mpumalanga Province of South Africa.

The study area is situated approximately 2 km south of the Kruger National Park, further, it is located outside the protected area. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the proposed site is located within an Ecological Support Area (ESA) local corridor, and a small portion of the Tau gas-to-power station and the majority of the proposed gas pipeline are located within an irreplaceable Critical Biodiversity Area (CBA). However, the southern and a portion in the north east of the focus area has a very high terrestrial sensitivity according to the National Web-based Environmental Screening Tool (2020). This is attributed to the CBA 1 and ESA within the study area.

DNG has appointed Nsovo Environmental Consulting (hereafter referred to as Nsovo), as independent environmental consultant, to undertake an Environmental Impact Assessment (EIA). The EIA process is being undertaken in accordance with the requirements of Appendix 2 of the NEMA EIA Regulations of 2014.

The objective of the Scoping process as indicated in the Regulations process is to, through a consultative process—

- (a) identify the relevant policies and legislation relevant to the activity;
- (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- (d) identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all

the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment

- (e) identify the key issues to be addressed in the assessment phase;
- (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- (g) Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The Scoping phase entailed a detailed description of the baseline environment, which would form the backdrop of the impact assessment phase. Further, it allowed for the identification of critical issues and concerns based on input from the relevant stakeholders, I&APs, and the EAP's professional judgment based on experience and expertise in the field.

In considering the alternatives, various aspects are considered, and this may include, the degree of sensitivity of the site, technical viability, and to a certain extent, the economic viability. The scoping assessment, including specialist input highlighted the following: The proposed development of Tau gas-to-power facility will be undertaken as detailed in the DMRE IPPPP minimum requirements, and the locations deemed preferable and most feasible for projects of this nature. As such, alternatives considered will therefore only include technical.

. The technical alternatives identified, assessed and considered for this project include:

- **Power generation technology:** DNG Energy has considered various technology options including Open Cycle Gas Engine and Reciprocating Engine. From higher efficiency and lower costs to faster, cleaner, higher quality power generation, gas turbines have many advantages over reciprocating engines.
- **Underground and above ground powerline:** Two technical alternatives have been identified for the proposed project i.e., the overhead powerline and underground cabling. Technically, underground cables need to be insulated against the surrounding soil. On low voltage reticulation networks (11kV & 22kV), the heat generated by the cable is low enough for standard insulation to be used; however, on larger power lines (i.e., 132KV as proposed).
- **Structural alternatives:** The use Cross-Rope suspension type; Self-supporting type; and Guyed V towers. None of the above options have been dismissed and remain alternatives depending on the terrain and topography. Taking into consideration aspects such as visual; the selection of the pylons to be used for the proposed powerline will take the potential impacts into consideration.
- **No go alternative**

Consequently, the EIA phase will only assess the following alternatives:

- Technical;
- Structural; and
- No Go Option.

In order to assess the potential impacts on the environment associated with the construction and operation of the proposed Tau gas-to-power facility and associated infrastructure, detailed specialist studies to address the above issues must be undertaken within the EIA phase of the project. The identification and assessment of impacts was based on input from specialist studies that provided baseline information and the necessary detail in preparation of the Report. The details of Specialist are included in the Table below and the Reports are attached as Appendix B:

<b>Specialist Study</b>	<b>Company</b>	<b>Specialist</b>
Biodiversity (flora and fauna);	Scientific Terrestrial Services CC	Nelanie Cloete
Heritage;	Mulaifa Development Consulting	Moses Mabuda

The Draft Scoping Report will be made available to the Interested and Affected Parties (I&APs) and the Organs of State for thirty (30) days to allow them to review and comment. All comments received will be included in the Comments and Response Report, which will form part of the final Scoping report. The Plan of Study for the EIA is also incorporated in this report and it is submitted to the Competent Authority (CA) (the National Department of Environment, Forestry and Fisheries (DEFF)) in terms of section 24C of the National Environmental Management Act (NEMA). The Scoping Report has been prepared as dictated by the Regulations and thus achieved the primary objectives as detailed above.

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<b>LIST OF ACRONYMS AND ABBREVIATIONS</b>	
<b>AEL</b>	Atmospheric Emission License
<b>CARA</b>	Conservation of Agricultural Resources Act (43 of 1983)
<b>CBA</b>	Critical Biodiversity Area
<b>CCGT</b>	Combined Cycle Gas Turbines
<b>DEDEAT</b>	Department of Economic Development, Environmental Affairs and Tourism
<b>DEFF</b>	Department of Environment, Forestry, and Fisheries
<b>DHSWS</b>	Department of Human Settlement, Water, and Sanitation
<b>DMRE</b>	Department of Mineral Resources and Energy
<b>EA</b>	Environmental Authorisation
<b>EAP</b>	Environmental Assessment Practitioner
<b>EIA</b>	Environmental Impact Assessment
<b>EIR</b>	Environmental Impact Report
<b>EMPr</b>	Environmental Management Programme
<b>ERA</b>	Electricity Regulation Act (4 of 2006)
<b>GA</b>	Gas Act (48 of 2001)
<b>GHG</b>	Greenhouse Gas Emissions
<b>GNR</b>	Government Notice Regulations
<b>GSA</b>	Gas Supply Agreement
<b>HSA</b>	Hazardous Substances Act (56 of 1973)
<b>I&amp;APs</b>	Interested and Affected Parties
<b>IDP</b>	Integrated Development Plan
<b>IEA</b>	International Energy Agency
<b>IEP</b>	Integrated Energy Plan
<b>IPPPP</b>	Independent Power Producers Procurement Programme
<b>IRP</b>	Integrated Resource Plan
<b>LNG</b>	Liquefied Natural Gas
<b>MPRDA</b>	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
<b>MW</b>	Megawatt

<b>NCRECA</b>	Noise Control Regulations under the Environmental Conservation Act (73 of 1989)
<b>NDP</b>	National Development Plan
<b>NEMA</b>	National Environmental Management Act, 1998 (Act 107 of 1998)
<b>NEMAQA</b>	National Environmental Management: Air Quality Act (No. 39 of 2004)
<b>NEMBA</b>	National Environmental Management: Biodiversity Act (No. 10 of 2004)
<b>NEMPA</b>	National Environmental Management: Protected Areas Act (57 of 2003)
<b>NEMWA</b>	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
<b>NHRA</b>	National Heritage Resources Act (No. 25 of 1999)
<b>NLM</b>	Nkomazi Local Municipality
<b>NWA</b>	National Water Act, 1998 (Act No. 36 of 1998)
<b>OCGE</b>	Open Cycle Gas Engine
<b>OCGT</b>	Open Cycle Gas-Turbine
<b>OHSA</b>	Occupational Health and Safety Act 85 of 1993
<b>PPP</b>	Public Participation Process
<b>RMIPPPP</b>	Risk Mitigation Independent Power Producer Procurement Programme
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SANBI</b>	South African National Biodiversity Institute
<b>ToR</b>	Terms of Reference
<b>WULA</b>	Water Use Licence Application

## 1 INTRODUCTION AND BACKGROUND

According to the World Energy Outlook 2002, the International Energy Agency has projected that fossil fuels will remain the primary source of energy, meeting more than 90% of the increase in energy demand by the year 2030. However, the demand for natural gas will rise more strongly than for any other fossil fuel – again, this is in concert with the increasing part that natural gas will play in South Africa (Independent EP, 2003). Natural gas is expected to play a central role in supporting Africa’s drive to achieve electricity connection for nearly 600 million people without access to the grid, to reduce widespread reliance on coal for power generation, and to fast-track the continent’s slowed industrial expansion. In support of the vision for the South African Gas to Power Programme, the Department of Mineral Resources and Energy (DMRE) has developed a Liquid Natural Gas (LNG) to Power Independent Power Producer Procurement Programme (IPPPP), which will serve as an anchor for the gas infrastructure required for the establishment of a gas market in the country.

The DMRE ("the Department") has proposed a 20-year Integrated Resource Plan (IRP) outlining a new power generation program to 2030. The program will use various renewable energies and natural gas to produce electricity. With 91.2% or 46,776 MW of its generation coming from coal-fired thermal power stations, South Africa has included in the IRP gas technology to generate 6,000 MW from Closed-Cycle Gas Turbines (CCGT). The promulgation of the IRP 2019 and associated ministerial determinations guide the Independent Power Producers Procurement Programme (IPPPP). The IRP 2019 indicates a short-term electricity supply gap of approximately 2,000 MW between 2019 and 2022.

The Department launched a Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) on the 23<sup>rd</sup> of August 2020. The objective of the RMIPPPP is to fill the current short-term supply gap, alleviate the existing electricity supply constraints, and reduce the extensive utilisation of diesel-based peaking electrical generators. The Determination for the RMIPPPP was gazetted on the 7<sup>th</sup> of July 2020.

Under the Ministerial Determination as gazetted, the Minister of Mineral Resources and Energy, in consultation with the National Energy Regulator of South Africa, has determined that the department is to procure 2,000 MW of new generation capacity from a range of energy source technologies based on the following criteria:

- It will be technology agnostic;
- Based on the plant-performance needs of the electricity system operator;
- It will procure dispatchable flexible generation that should be able to provide energy, capacity, and ancillary services;
- Should be able to operate between 5h00 to 21h30;



- It must have an Automatic Generation Control (AGC) load-following ability, flexible capacity factor and must be “scalable” with changing capacity requirements; and
- Must be able to connect power to the grid by June 2022.

The Department formally invited interested parties to register prospective bids under the Risk Mitigation IPP Procurement Programme on 22 August 2020. DNG Energy (Pty) Ltd. has thus responded to the Request for Proposal (RFP) issued by the DMRE and proposes the development of the Komati gas-to-power facility and associated infrastructure in Komatipoort, within the jurisdiction of Nkomazi Local Municipality in Mpumalanga Province. The project will be undertaken in line with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998) and associated EIA Regulations of 2014 as amended.

The scope of the projects for the earmarked areas will include:

- LNG and or gas distribution hub(s) for the third party off-take;
- Power plant, including the high voltage connection to the electrical grid; and
- Arrangements for independent delivery of LNG, and the sale of a modest percentage of gas and LNG to external users.

## 1.1 PROJECT OVERVIEW

DNG Energy is proposing to establish a 620MW Tau gas-to-power facility and associated infrastructure within the existing industrial area, situated within the Komatipoort town which falls within the jurisdiction of Nkomazi Local Municipality in Mpumalanga Province. The facility will use Open Cycle Gas Turbine (OCGT) and/ or Reciprocating Engine Power. Further, the project shall be referred to as Komati gas-to-power facility.

The proposed development triggers listed activities and an Environmental Impact Assessment (EIA) process must be undertaken in accordance with the EIA Regulations, 2014 (promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended in April 2017. Further, a Water Use Licence Application (WULA) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) will be obtained from the Department of Human Settlement, Water and Sanitation (DHSWS). Subsequently, Nsovo Environmental Consulting (Nsovo) is the independent consultant appointed by DNG Energy responsible for the necessary authorisation and licencing processes to comply with the requirement of the legislation. The project proponent is DNG Energy (Pty) Ltd., whereas the Competent Authority is the Department of Environment, Forestry, and Fisheries (DEFF).

## 2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo has been appointed by DNG Energy as the independent Environmental Assessment Practitioner (EAP) for the proposed project and meets the general requirements as stipulated in regulations 13(3) of the NEMA 2014 EIA Regulations as amended. Nsovo therefore:

- Is independent and objective;
- Has expertise in conducting EIAs;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 1 below provide Details of the EAP and relevant experience. A detailed CV and Qualifications are attached as **Appendix D**.

**Table 1: Details of the Environmental Assessment Practitioner (EAP)**

<b>Name of Company</b>	Nsovo Environmental Consulting
<b>Person Responsible</b>	Khuliso Mudau
<b>Professional Registration</b>	South African Council for Natural Scientific Professions (SACNASP)
<b>Postal Address</b>	Private Bag x29 Postnet Suite 697 Gallo Manor 2052
<b>Telephone Number</b>	011 041 3689
<b>Fax Number</b>	086 602 8821
<b>Email</b>	<a href="mailto:khuliso@nsovo.co.za">khuliso@nsovo.co.za</a>
<b>Qualifications &amp; Experience</b>	B.Sc. Honours Environmental and Water Science <b>09 years of experience</b>
<b>Project Related Expertise</b>	In terms of project related expertise, the Environmental Assessment Practitioner has completed the following projects: <ul style="list-style-type: none"> <li>• EIA for the proposed Maphutha-Witkop powerline in Limpopo Province.</li> <li>• EIA for the proposed Shongweni substation and Hector - Shongweni 400kV powerline in Kwazulu Natal Province.</li> <li>• EIA for the proposed Inyaninga substation and Inyaninga – Mbewu 400kV powerline in Kwazulu Natal Province.</li> <li>• EIA for the proposed Tubatse strengthening phase 1 – Senakangwedi B integration within the</li> </ul>

	<p>jurisdiction of Greater Tubatse Local Municipality in Limpopo Province.</p> <ul style="list-style-type: none"> <li>• EMPr, WULA and EA amendment for the proposed Juno Gromis 400kV power line</li> <li>• Basic Assessment for the proposed Decommissioning and Demolition of Verwoedberg Substation and 275kV power.</li> <li>• Basic Assessment for Bloemendal Substation and loop in and out lines.</li> </ul>
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## 2.1 DETAILS OF THE APPLICANT

DNG Energy (Pty) Ltd has been operating in the renewable energy industry since the year 2013 and has been responsible for bringing Liquefied Natural Gas (LNG) to South Africa, and in doing so is producing cleaner, and cheaper fuel alternative to the market. Table 2 presents details of the responsible persons at DNG Energy (Pty) Ltd.

**Table 2: Details of the Applicant**

<b>Name of Company</b>	DNG Energy (Pty)Ltd
<b>Project Name</b>	Komatipoort
<b>Project Reference</b>	D-1959
<b>Physical Address</b>	27 Fricker Rd Illovo 2196
<b>Postal Address</b>	P O Box 783451 Sandton 2146
<b>Contact Person</b>	Aldworth Mbalati
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### **3 DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY**

This section provides detailed information of the location on the proposed project. The main aim is to provide the environmental aspects found within the area of the proposed development and to provide the baseline description of the surroundings.

#### **3.1 LOCALITY OF THE PROPOSED PROJECT**

The proposed project is situated in the Mpumalanga Province, 10 km north of the Kruger National Park 45 km east of Malelane. The site is within Ehlanzeni District Municipality under the jurisdiction of the Nkomazi Local Municipality in the Mpumalanga Province of South Africa. Figure 1 below is a locality map that depicts the proposed study area at a scale of 1:50 000. Refer to Appendix A for the A3 locality and sensitivity maps.

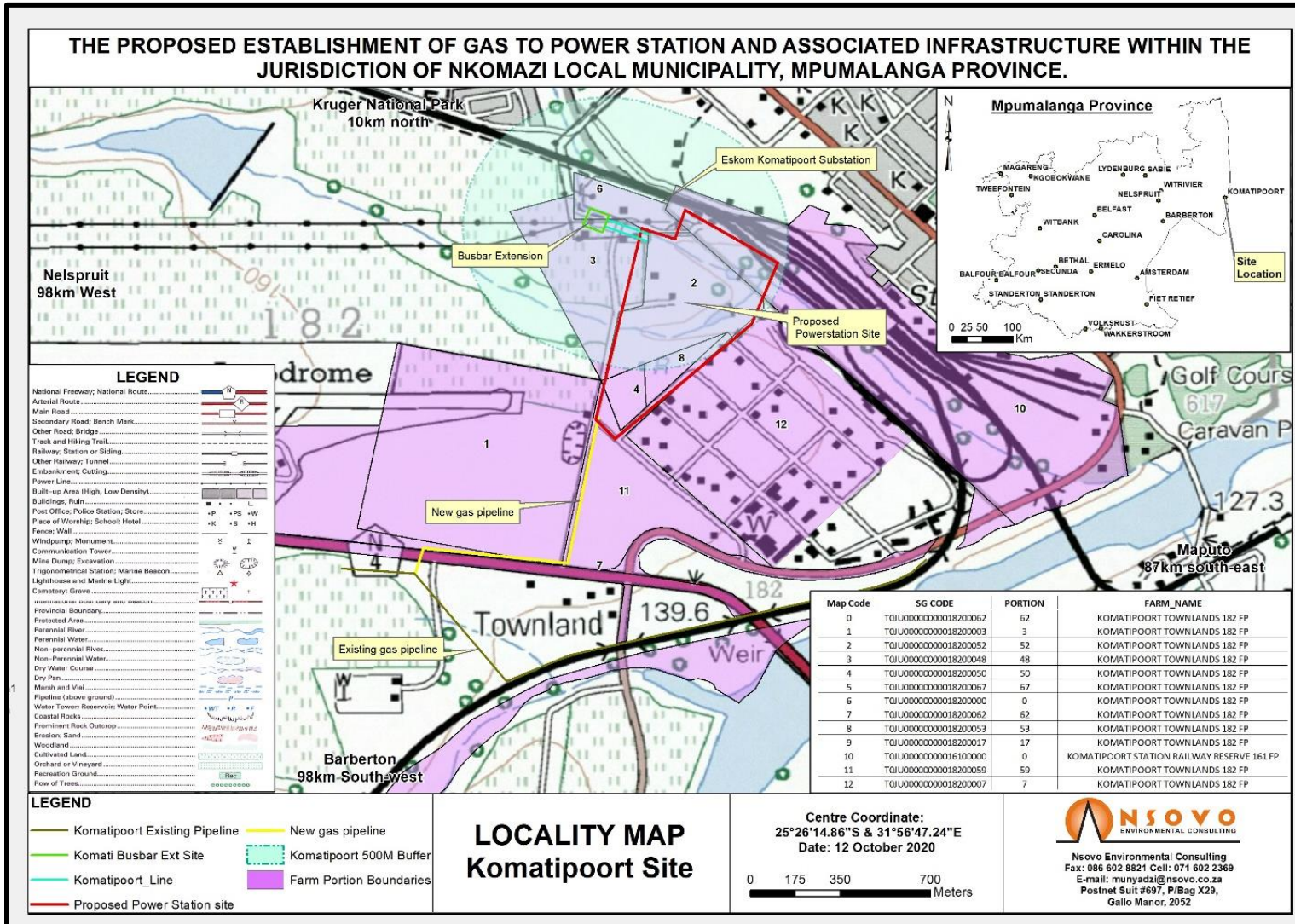


Figure 1: Locality map showing the proposed Study Area

### 3.1.1 PROVINCE AND PROVINCIAL BOUNDARIES

The proposed development is located within the Mpumalanga Province. The Province borders the Swaziland (North of Swaziland) and Mozambique (east of Mozambique).

### 3.1.2 MUNICIPALITY AND WARDS

The proposed development is located within Municipal Ward Number 6 of Nkomazi Local Municipality within the jurisdiction of the Ehlanzeni District Municipality in the Mpumalanga Province.

## 3.2 DESCRIPTION OF THE AFFECTED PROPERTIES

The proposed development of the Tau gas-to-power facility and associated structures will be located on the Farms listed in Table 3.

**Table 3: Details of the proposed site property**

Farm Name	Portion	Surveyor General 21 Digit Code
Komatipoort Townland 182 FP	0	TOJU00000000018200000
Komatipoort Townland 182 FP	3	TOJU00000000018200003
Komatipoort Townland 182 FP	7	TOJU00000000018200007
Komatipoort Townland 182 FP	17	TOJU00000000018200017
Komatipoort Townland 182 FP	48	TOJU00000000018200048
Komatipoort Townland 182 FP	50	TOJU00000000018200050
Komatipoort Townland 182 FP	52	TOJU00000000018200052
Komatipoort Townland 182 FP	53	TOJU00000000018200053
Komatipoort Townland 182 FP	59	TOJU00000000018200059
Komatipoort Townland 182 FP	62	TOJU00000000018200062
Komatipoort Townland 182 FP	67	TOJU00000000018200067
Komatipoort Station Railway Reserve 161 FP	0	TOJU00000000018200000

### 3.3 SURROUNDING LAND USES

This section describes the land uses within and around the proposed study area which includes farming and residential and are discussed as follows:

#### 3.3.1 RESIDENTIAL

The immediate surroundings to the west comprise mainly agricultural lands with a watercourse traversing the focus area, urban development to the north and east and disturbed Lowveld to the south. The residential communities located adjacent to the study area includes informal, semi-suburban (township) as well as suburban households. Table 4 below describes the affected community.

**Table 4: Residential Communities and Farms adjacent the study area**

COMMUNITY	DESCRIPTION
Komatipoort	A low-medium income residential household located adjacent to the site. The town situated at the confluence of the Crocodile and Komati Rivers in Mpumalanga province, South Africa. The town is 8 km from the Crocodile Bridge Gate into the Kruger Park, and just 5 km from the Mozambique border and 65 km from the Eswatini border.
Farms	There is sugar cane farming within the proposed site

#### 3.3.2 COMMERCIAL AND INDUSTRIAL

The main economic sectors within the Nkomazi Local Municipality are a manufacturing sector which contributes about 27%, trade 17% and 14% for agriculture. A major challenge to growing the economy is the lack of skills within the district. The following areas have been identified to become the regional drivers for economic growth and job creation: agriculture, mining, retailing, tourism, manufacturing and business opportunities that might exist due to the development of the N4 Maputo Corridor which is also the Mpumalanga provincial Flagship Project.

##### 3.3.2.1 Agriculture and farming

Sugar cane harvesting is the most notable agricultural activity identified around the proposed project area, and the proposed gas-to-power station will be in close proximity the sugar cane farming.

#### 3.3.3 SURFACE INFRASTRUCTURE

This section provides the description of the surface infrastructures within the study area, which include the description of the road network, existing substations and powerlines.

### 3.3.3.1 Road Network

The site is near the N4 which is a national route in South Africa to Mozambique. The proposed development site is accessed through Rissik Road, which is a secondary road connecting the proposed development site.

### 3.3.3.2 Existing Powerlines and associated Infrastructure

There are an existing 275/132kV Eskom Komatipoort substation and two 11kV and 22kV distribution power lines within the proposed study area. Other infrastructure includes roads, ROMPCON gas pipeline, and railway lines. Further, structures on site include offices and associated structures.

## 4 DESCRIPTION OF THE PROPOSED ACTIVITIES

This section provides the description of the proposed activities which include the scope of the proposed project mainly focusing on the listed activities which triggers the EIA process.

### 4.1 BACKGROUND AND THE PROPOSED SCOPE OF WORK

DNG Energy proposes the following activities and infrastructure:

#### Phase 1:

The initial phase will entail the development of the following primary activities:

- 620MW Open Cycle Gas Turbine (OCGT) and/ or Reciprocating Engine Power with a footprint of 1 hectare.
- Approximately 1km gas pipeline from ROMPCO gas pipeline to the proposed power station.
- $\pm 1$  km 132kV overhead powerline from the proposed power plant to the existing Eskom Komatipoort substation.
- Extension of a Busbar at the Eskom Komatipoort substation;
- Aboveground natural gas storage tanks with a capacity of 500m<sup>3</sup> and bulk storage facility.
- Establishment of an 8m access road to be used as both an access road during construction and service road during the operational phase.

#### Phase 2: Future development

- Phase 2 will entail increase of the capacity of power to 1000 MW by using Combined-Cycle Gas Turbines (CCGT).



## 4.2 ACTIVITIES ASSOCIATED WITH THE PROJECT

The construction phase of the proposed Tau gas-to-power station project would take approximately 18 months, and the activities to be undertaken are indicated on the map below and discussed hereunder. The general surface areas for the project components listed in Table 5 and presented in the map below. In order to meet the urgent additional generation capacity required in terms of the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) timeframe which is to connect power to the **Eskom grid by June 2022**, DNG Energy would aim to fast track the construction timeframe as far as possible.

**Table 5: Infrastructure Footprints (Surface Areas)**

Project component	Area/length/Size	Servitude	Purpose
Power Plant	1hectare	Unknown	The purpose of power plant is to generate electricity using either the Open Cycle Gas turbine or Reciprocating Engines.
Above ground Gas pipeline	1km	36m	To transport gas from the ROMPCO gas pipeline to the power plant.
132kV Overhead transmission line	0,5km	35m	The purpose of this infrastructure is the transmission of electricity to the Eskom Komatipoort substation.
Access/Service road	1km	8m	To access to the site for construction and service roads during the operational phase.
Above ground Storage tanks	500m <sup>3</sup>	Unknown	For gas storage on site.

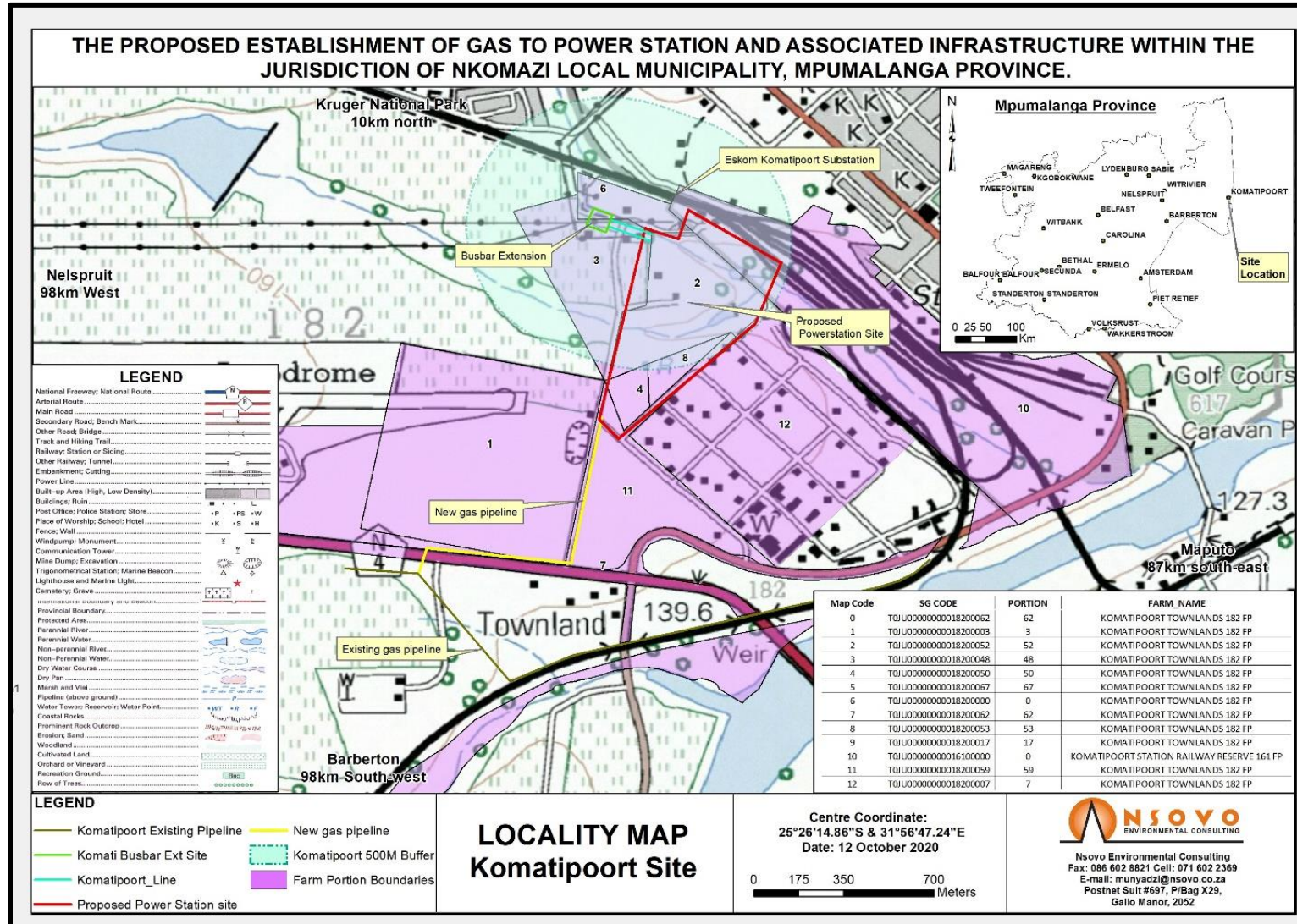


Figure 2: Map showing the proposed activities

The construction phase of the proposed project will entail the following:

**Table 6: Description of Construction Activities**

Activity	Gas Pipeline	Power Plant Facility	Transmission Line	Access road
Site Walk down	Site walk down along the gas pipeline to determine sensitivities and mark areas of sensitivity as no go.	Site walk at the proposed power station site to determine sensitivities and mark areas of sensitivity as no go.	Site walk down along the powerline routes to determine sensitivities and mark areas of sensitivity as no go.	Site walk down along the proposed road to determine sensitivities and mark areas of sensitivity as no go.
Vegetation clearance	Vegetation clearance on the 36m wide corridor	Vegetation clearance on the 1 hectare wide corridor	Vegetation clearance on the 32m wide corridor	Vegetation clearance on the 8m wide corridor
Excavation of foundations	Excavation of trenches via directional drilling or alternative technology for laying the pipelines	Excavation of foundation for the plant.	Excavation of foundations for the towers and minor amendment at the substations.	Preparation of the site earmarked for development of a road.
Civil works	Concrete work and Installation of the pipeline.		Construction of the steel structures.	Construction of the road.
Technical /Mechanical	Mechanical activities to prepare for operation.	Mechanical activities to prepare for operation.	Stringing and energizing the powerline.	
Rehabilitation	Rehabilitation of servitude and		Rehabilitation of servitude and	

Activity	Gas Pipeline	Power Plant Facility	Transmission Line	Access road
	encouraging plant growth.		encouraging plant growth.	

#### 4.2.1.1 Site walk-down

A site walk-down will be undertaken along the gas pipeline to determine the less sensitive areas. The main aim of the walk-down survey is to ensure that the identified sensitive areas are avoided and to create buffer zones for conservation purposes.

#### 4.2.1.2 Access roads

Primary access to the proposed site is through the N4 Maputo corridor and Rissik street be used to access the proposed study areas. Where there is no access, roads may need to be established.

#### 4.2.1.3 Vegetation clearance

Approximately one hectare is required for the proposed Tau gas-to-power station while 36m is required for the gas pipeline. Only the immediate footprint within the study area will be cleared for construction. Further, clearance will be undertaken in accordance with the approved Environmental Management Programme (EMPr), permits, licences, Municipal by-laws as well as DNG Energy's policies and guidelines.

### 4.2.2 CONSTRUCTION OF THE KOMATI GAS-TO-POWER FACILITY AND ASSOCIATED INFRASTRUCTURE

The proposed gas-to-power facility footprint is 60m by 100m with the height of 25m and is set to cover approximately one (1) hectare. Based on the Engineering scope, the technology options for phase 1 and 2 of the proposed development entail the use of a gas turbine.

DNG Energy proposes to commence with a facility with a maximum of 620 MW using an Open Cycle Gas Turbine (OCGT), and later increase to the maximum capacity of 1000 MW using a Combined Cycle Gas Turbine. The difference between OCGT and CCGT is that the latter uses a cycle configuration of combustion turbines, heat recovery steam generators, and steam turbines, to produce electricity.

The proposed development will ultimately include the construction of the following associated infrastructure:

- Gas turbines;
- Heat recovery steam generators;

- Dry cooling radiator systems; Development of 620MW facility with Open Cycle Gas Turbine (OCGT) and/or Reciprocating Engine;
- Approximately 1km gas pipeline from the existing ROMPCO gas pipeline to connect to the proposed power station;
- Extension of a Busbar at the existing Eskom Komatipoort substation;
- Development of a 0.5km x 132kV powerline to connect to the existing Eskom Komatipoort substation; and
- Approximately 1km x 8m access road;
- Building infrastructure which will include, but not limited to plant operations and maintenance building, ablution facilities, and offices; and
- Fencing to maximize the security of the plant.

#### 4.2.3 REHABILITATION

On completion of construction work, the site will be rehabilitated as per the specifications of the EMP and approved Method Statements. The rehabilitation activities will include:

- Removal of excess building material and waste;
- Repairing any damage caused by construction activities;
- Rehabilitating the area affected by temporary access roads;
- Reinstating existing roads; and
- Replacing topsoil and planting indigenous vegetation where necessary.

The proposed activities are activities that may not commence without Environmental Authorisation from the Competent Authorities as they trigger listed activities under NEMA, EIA Regulations of 2014 as amended. The listed activities are detailed.

### 4.3 LISTED ACTIVITIES APPLICABLE TO THE PROJECT

The proposed development triggers listed activities in terms of 2014 EIA Regulations as amended, and National Water Act, 1998 (Act 36 of 1998). The listed activities applicable are listed and briefly described in the Table 7 below:

**Table 7: Listed activities applicable to the project**

Listed Activity	Describe the portion of the proposed project to which the applicable listed activity relates
<b>Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 1</b>	

<b>Listed Activity</b>	<b>Describe the portion of the proposed project to which the applicable listed activity relates</b>
<p><b><u>GNR 983</u></b> Activity 12</p> <p><i>“The development of— (i) infrastructure or structures with a physical footprint of 100 square metres or more (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.”</i></p>	<p>The proposed Tau gas to power station and the gas pipeline are within a watercourse</p>
<p><b><u>GNR 983</u></b> Activity 24</p> <p><i>“The development of a road: (ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.”</i></p>	<p>The proposed project will require the development of an access road to the development site.</p>
<p><b><u>GNR 983</u></b> Activity 27</p> <p><i>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.</i></p>	<p>The proposed power station will require a footprint clearance of more than 1ha but less than 20ha.</p>
<p><b>Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 2</b></p>	
<p><b>GNR 984,</b> Activity 2</p> <p><i>“The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more”.</i></p>	<p>The proposed project entails the development of a gas-to-power facility with a 620MW with output.</p>
<p><b>GNR 984,</b> Activity 4</p> <p><i>“The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a</i></p>	<p>The proposed project entails the development of above ground gas storage tanks with a capacity of more than 500 cubic metres.</p>

Listed Activity	Describe the portion of the proposed project to which the applicable listed activity relates
<p><b>GNR 984, Activity 6</b></p> <p><i>“The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent”.</i></p>	<p>The proposed development of the gas-to- power plant will require an Atmospheric Emission License (AEL) in terms of as National Environmental Management: National Environmental Air Quality Act, (Act 39 of 2004) (NEMAQA) for the burning of natural gas.</p>
<p><b>GNR 984, Activity 7</b></p> <p><i>“The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods-</i></p> <p style="padding-left: 40px;">(i) <i>in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day”.</i></p>	<p>The proposed project entails the development of underground gas pipeline from the existing ROMPCO gas pipeline to the gas-to- power facility.</p>
<b>Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 3</b>	
<p><b>GNR 985</b></p> <p>Activity 12 f (ii)</p> <p><i>“The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of Indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><b><u>f-Mpumalanga province</u></b></p> <ul style="list-style-type: none"> <li>•</li> <li>iii. <i>Within critical biodiversity areas identified in bioregional plans</i></li> </ul>	<p>The proposed project entails the development of the power plant, powerline and above ground gas pipeline which will require clearance of 300 square metres or more of indigenous vegetation within the critical biodiversity area</p>

## 5 APPLICABLE LEGISLATION AND GUIDELINES

The EIA Regulations of 2014 as amended, under Appendix 2 Section 1(e) requires a description of applicable legislations in the Scoping Report. This section lists and describes the acts and legislations applicable to the proposed development and associated infrastructure. A list of the current South African environmental legislation, which is considered to be pertinent to the proposed development is described in Table 8 below.

Municipal policies, plans, and by-laws, as well as DNG Energy policies and world best practices, were considered during the undertaking of the EIA process. Table 6 below provides a description of legislations that apply to the project, it is not an exhaustive analysis; however, it provides a guideline to the relevant aspects of each legislation.

**Table 8: Legislation pertaining to the proposed project**

Aspect	Relevant Legislation	Brief Description
Environment	<ul style="list-style-type: none"> <li>• National Environmental Management: Act 1998, (Act No. 107 of 1998) as amended.</li> <li>• Environmental Impact Assessment Regulations, December 2014 as amended</li> </ul>	<p>The overarching principles of sound environmental responsibility as reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) apply to all listed projects. Construction and operation of activities must be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.</p> <p>The EIA process followed is in compliance with the NEMA and the EIA Regulations of December 2014 as amended. The proposed development involves “listed activities”, as defined by NEMA. Listed activities are an activity which may potentially have detrimental impacts on the environment and therefore require an EA from the relevant Competent Authority, in this case DEFF.</p>
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa’s biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.



Aspect	Relevant Legislation	Brief Description
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits for this specific project would be administered by the Mpumalanga Heritage Agency or South African Heritage Resources Agency (SAHRA).
Air quality management and control	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	<p>The objective of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of air quality and to prevent air pollution. The Act makes provision for measures to control dust, noise and offensive odours.</p> <p>Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. The Minister or MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance or other measures aimed at the control of dust. The National Dust Control Regulations (2013) provides for the management and monitoring of dust.</p>
Noise Management and Control	Noise Control Regulations in terms of the Environmental	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr. Applicable laws regarding noise

Aspect	Relevant Legislation	Brief Description
	Conservation, 1989 (Act 73 of 1989)	management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation, 1989 (Act 73 of 1989).
Water Resources Management	National Water Act, 1998 (Act 36 of 1998)	<p>This Act provides for fundamental reform of law relating to water resources and use. The preamble to the Act recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users.</p> <p>The proposed activities will encroach on watercourses such as the wetlands located within and nearby the study area, therefore, the necessary licence will be obtained in due course.</p>
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources in order to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act.
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996)	<p>The Constitution provides for an environmental right (section 24). The State is obliged "to respect, protect, promote and fulfil the social, economic and environmental rights of everyone..."</p> <p>The environmental right states that: "Everyone has the right - a) To an environment that is not harmful to their health or well-being; and</p>

Aspect	Relevant Legislation	Brief Description
		<p>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -</p> <ul style="list-style-type: none"> <li>• Prevent pollution and ecological degradation;</li> <li>• Promote conservation; and</li> <li>• Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul>
Waste	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)	<p>This Act provides fundamental reform of the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This Act also ensures the provision of national norms and standards for regulating the management of waste by all spheres of government. Further, it provides for specific waste management measures; licensing and control of waste management activities; remediation of contaminated land; compliance and enforcement; and for matters connected therewith.</p>
Hazardous Substance Act	Hazardous Substance Act, 1973 (56 of 1973)	<p>The Hazardous Substances Act controls the production, import, use, handling and disposal of hazardous substances. Under the Act, hazardous substances are defined as substances that are toxic, corrosive, irritant, strongly sensitising, flammable and pressure-generating under certain circumstances and may injure, cause ill-health or even death in humans.</p>
Gas Act	Gas Act, 2001 (48 of 2001)	<p>The Gas Act 48 of 2001 intends:</p> <ul style="list-style-type: none"> <li>• to promote the orderly development of the piped gas industry;</li> <li>• to establish a national regulatory framework;</li> </ul>

Aspect	Relevant Legislation	Brief Description
		<ul style="list-style-type: none"> <li>• to establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework; and</li> <li>• to provide for matters connected therewith.</li> </ul> <p>The objects of this Act are to-</p> <p>(a) promote the efficient, effective, sustainable and orderly development and operation of gas transmission, storage, distribution, liquefaction and regasification facilities and the provision of efficient, effective and sustainable gas transmission, storage, distribution, liquefaction, re-gasification and trading services;</p> <p>(b) facilitate investment in the gas industry;</p> <p>(c) ensure the safe, efficient, economic and environmentally responsible transmission, distribution, storage, liquefaction and re-gasification of gas;</p> <p>(d) promote companies in the gas industry that are owned or controlled by historically disadvantaged South Africans by means of licence conditions so as to enable them to become competitive;</p> <p>(e) ensure that gas transmission, storage, distribution, trading, liquefaction and re-gasification services are provided on an equitable basis and that the interests and needs of all parties concerned are taken into consideration;</p> <p>(f) promote skills among employees in the gas industry;</p> <p>(g) promote employment equity in the gas industry;</p> <p>(h) promote the development of competitive markets for gas and gas services;</p> <p>(i) facilitate gas trade between the Republic and other countries; and</p>

Aspect	Relevant Legislation	Brief Description
		(j) promote access to gas in an affordable and safe manner.
Electricity Regulation Act	Electricity Regulation Act, 2006 (Act 4 of 2006)	<p>This act provides the national regulatory framework for the electricity supply industry; to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licences and registration as the manner in which generation, transmission, distribution, reticulation, trading and the import and export of electricity are regulated; to regulate the reticulation of electricity by municipalities; and to provide for matters connected therewith.</p> <p>The objectives of this Act are to:</p> <ul style="list-style-type: none"> <li>• Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa;</li> <li>• Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency, effectiveness and long term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic;</li> <li>• Facilitate investment in the electricity supply industry;</li> <li>• Facilitate universal access to electricity;</li> <li>• Promote the use of diverse energy sources and energy efficiency;</li> <li>• Promote competitiveness and customer and end user choice; and</li> </ul> <p>Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public.</p>

Aspect	Relevant Legislation	Brief Description
Health and Safety	Occupational Health and Safety Act (OHS Act)	The Major Hazard Installation (MHI) regulations (July 2001) published under Section 43 of the Occupational Health and Safety Act (OHS Act) require employers, self-employed persons and users who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk (our emphasis) that could affect the health and safety of workers and the public to conduct a risk assessment in accordance with the legislation. In accordance with legislation, the risk assessment must be done by an approved inspection authority (AIA), which is registered with the Department of Labour and accredited by the South African Accreditation Systems (SANAS), prior to construction of the facility.
Conservation	Mpumalanga Nature Conservation Act	This Act makes provision with respect to nature conservation the Mpumalanga province. It provides for, among other things, protection of wildlife, hunting, fisheries, protection of endangered fauna and flora as listed in the Convention on international Trade in Endangered Species of Wild Fauna and Flora, the control of harmful animals, freshwater pollution and enforcement.

## 5.1 POLICIES AND GUIDELINES

The following Guideline documents have been considered in the preparation of this report:

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7;
- Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010;
- Implementation Guidelines (published for comment) in Government Notice 603 of 2010;
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005);
- (DEA&DP Guideline on Alternatives, August 2010);
- DEA&DP, Guideline on Public Participation (August 2010);
- DEA&DP Guideline on Need and Desirability (August 2010); and

- Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR and Tony Barbour, 2005 – 2007).

## 6 DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

This section provides justification for the need and desirability of the proposed development with focus on its associated benefits and importance to the both the locals and the region at large.

### 6.1 MOTIVATION FOR THE DEVELOPMENT

In 2012, the Minister of the Department of Mineral Resources and Energy indicated the need for new energy generation capacity that should be procured from hydro, coal, and gas sources to support the South Africa's base load energy mix and generation from gas and cogeneration as part of the medium-term risk mitigation project programme. The determinations require that 3126MW of baseload and/or mid-merit energy generation capacity is needed from gas-fired power generation to contribute towards energy security. The gas required for such power generation will be from both imported and domestic gas resources.

In the absence of available natural gas within South Africa and to ensure new capacity is delivered in timescales corresponding with the objectives of the medium-term risk mitigation project, it is recognised that it will be necessary to import gas, in the form of either Liquefied Natural Gas or compressed natural gas. Consequently the Gas to Power Programme is designed as a potential means to catalyse the importation of such gas. It is anticipated that Eskom Holdings (SOC) Limited, in its capacity as the single buyer of electrical energy, will be the sole buyer of electrical capacity and energy generated under the Gas to Power Programme.

The initial period of the development of South Africa's gas industry could be anchored on demand provided by the Gas-to-Power Programme. In support of the vision for the South African gas programme, the DMRE is developing an LNG to Power Independent Power Producer Procurement Programme (IPPPP). Therefore, Third Party Access will be a fundamental aspect of the LNG to Power IPP Programme. This will enable the development of gas demand by third parties and the associated economic development.

DNG Energy is championing the use of LNG for road and maritime transport, specifically for mini-bus taxis, trucks, buses, and shipping, as a first step in contributing to sustainable development. DNG Energy is creating a pan African

LNG supply network. Over the next five years, the company will be investing around USD5 billion to bring this affordable energy alternative to market. The environmental, social, and economic benefits that come with the use of LNG include helping the country meet its targets in reducing greenhouse gas emissions, driving economic growth, and improving the lives of all citizens.

With development and expansion infrastructure programmes planned for South Africa, Mozambique, and Nigeria in the first instance, DNG Energy is looking at the LNG value chain from source to consumption holistically. The transport of the LNG from the exporting countries to South Africa will happen predominantly via sea. DNG Energy has commissioned South African Shipyards to build an 8,000 tons LNG barge, the largest vessel by weight ever built on the African continent, and it will come into service in the near future.

At a national level, South Africa is facing significant electricity shortages as well as water scarcity. The proposed project aims to supply additional electricity to the national grid, without intensive use of water, while also being approximately 40% less CO<sub>2</sub> intensive than conventional coal-fired electricity generation. Significantly, with the proposed maximum project generation at 1000 MW, the project will reduce the risk of rolling electricity blackouts. The benefit of the proposed facility and its location and contribution will furthermore allow for the increased focus on developing desired industrial capabilities, “host regions” for development, and comprehensive planning and design to accommodate the diverse regional development needs and contexts.

Gas-to-power generation has increased significantly in the past few years, with gas overtaking coal as the main energy source in some countries. Electricity generation from natural gas offers greater efficiency and lower CO<sub>2</sub> emissions than coal, and other operational advantages such as compact generators and lower water use.

Furthermore, the natural gas discoveries in southern Africa have increased the potential for gas-to-power generation in this country. It is likely that the development of the gas-powered sector will accelerate in the near future.

## **6.2 BENEFITS OF THE PROJECT**

Further, natural gas is expected to play a central role in supporting Africa’s drive to achieve electricity connection for nearly 600 million people without access to the grid, to reduce widespread reliance on coal for power generation, and to fast-track the continent’s slowed industrial expansion

Consequently, this project aims to respond to the government initiative, which is driven by the need to diversify the country energy sources and created a balanced and more sustainable energy mix. The proposed project will ensure the following:



- Create opportunities within the gas space;
- Reduce greenhouse gas emission;
- Ensure a balanced and cleaner energy supply; and
- Improvement of South Africa's socio-economic status.

The socioeconomic benefits expected from the development

Short term, there will be minimal job opportunities during the construction of the proposed infrastructure. These include skilled, semi-skilled, and under-skilled labors, which could consist of locals in and around the industrial including regional and national communities.

- Natural gas is capable of providing more than just electrical power, it will also provide direct heat and chemical feedstock for industrial processes, commercial and residential cooking and heating applications as well as an alternative source for transport. South Africa has already seen a partial reduction in electricity demand because of trends such as the increasing use of LPG for cooking and space heating.
- A gas- powered plant is far less complex than a coal -fired power plant and hence has shorter construction times, which is crucial in addressing South Africa's current short-term electricity demands.
- In terms of environmental impacts, a gas powered plant has approximately 40% less CO<sub>2</sub> emissions per unit of power than coal, due partly to greater efficiency, but mainly due to the hydrogen content. Rapid start-up, ramp-up, and ramp-down times enable gas power systems to follow variable and rapidly changing generation patterns of renewable energy sources.
- New gas field discoveries on the east and west coasts of Southern Africa, as well as the development of stranded reserves, have opened the possibility of increased imports of gas, either via pipeline or in the form of liquefied natural gas (LNG).
- Gas -fired power plants are the first choice to balance the variability of renewables, and co-location of gas-to-power and Renewable Energy (RE) would seem to be a logical step. It may provide leverage for the development of shale gas power. The co-location of Gas power plants with RE seems to be a logical conclusion.

### 6.3 SUPPORTING STRATEGIES

At the regional level, the project would contribute to improving in the socioeconomic status of the adjacent communities and the region at large. At the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (Department of Minerals and Energy, 1998), which highlights that amongst others, coal plays a central role in the socio-economic development of our country, while simultaneously providing the necessary infrastructural economic base for the country to become an attractive host for foreign

investments in the energy sector. The priorities to which this project would contribute are laying the groundwork for enhancing cleaner energy supply. Several national policy documents, including the White Paper on the Energy Policy of South Africa approved in 1998; the National Development Plan (“NDP”); the draft Integrated Energy Plan; and the Integrated Resources Plan 2010–2030 present the case for natural gas as a significant contributor to South Africa's energy mix.

## **7 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED, SITE AND LOCATION WITHIN THE SITE**

The identification of alternatives is a crucial component of the EIA process. The identified alternatives are assessed in terms of environmental acceptability, technical and economic feasibility during the EIA process, wherein the preferred alternative is highlighted and presented to the Authorities.

South Africa has proposed a 20-years Integrated Resource Plan (IRP) outlining a new power generation program to 2030. The program will use various renewable energies and natural gas to produce electricity. The site selection process focused on reviewing the IRP and associated documents that address current and future development in and around the area. The selection of project site alternatives was based primarily on the DMRE's pre-feasibility study that technically determined the broad location based on the need of the project. Further, a detailed public consultation is being undertaken to assess the viability of the selected sites to meet the need and desirability of the project. Within the larger area, other technical alternatives will be assessed to ensure that the most feasible options are considered in consideration of their functionality and the environment. The public participation will also enhance the selection of alternatives in that it will allow the various stakeholders to comment on the proposed options and make recommendations meaningfully.

Consideration of specialist and technical input will culminate in selecting the preferred alternative. After approval by the Department, the EAP recommends that the exact footprint within the approved corridor alternative site be determined. Such will be achieved by undertaking a walk down with the specialist team, particularly the wetland, heritage, and avifauna. The profiling of the powerline will seek to avoid sensitive environments as far as practically possible.

Further, a detailed public consultation is underway to assess the viability of the selected options, resulting in the identification of more options for consideration to determine the economic need and desirability of the project.

## **7.1 DETAILS OF ALTERNATIVES CONSIDERED**

This section describes the alternatives/ options considered and includes the location and route alignments options as well as no-go alternatives which are discussed below.

### **7.1.1 TECHNICAL ALTERNATIVES**

#### **7.1.1.1 Underground vs above ground**

Two technical alternatives have been identified for the proposed project, i.e., the overhead powerline and underground cabling. Instead of constructing the proposed powerline above ground, underground construction is considered to be an alternative. The advantages of the underground alternative would include a reduced impact on bird interaction and a distinct visual impact benefit.

On low voltage reticulation networks (11kV & 22kV), the heat generated by the cable is low enough for standard insulation to be used; however, on larger power lines (i.e., 400kV as proposed), the method of electrical and heat insulation becomes more burdensome.

Control of electrical losses and heat is critical for underground cables. As a result, cables are as much as four times the diameter and ten times the weight of equivalent overhead lines. Heat control is also a factor in the laying of the cables. The three phases of low and medium voltage cables (up to 132kV) can be placed in the same trench, while the phases for high voltage cables must be spaced apart, typically in a flat formation.

Bush fires, lightning strikes, and bird-related faults make up 80% of faults on overhead transmission power lines in South Africa; however, such risks are not associated with underground cables. Further, faulting on underground cables is rare. When faults occur on overhead lines, they are usually re-energised by automatically reclosing the circuit-breaker within a few seconds of the fault. More serious faults, such as a damaged line may be easily found and repaired within a few days at most. Underground cables have faults that are almost exclusively permanent, requiring inspection and correction on site. This usually requires excavating a section of the powerline. As a result, finding the location of faults

is not easy unless there is clear evidence of excavation damage. Therefore, the search and repair of underground cables can take several weeks. This may severely compromise the network of the operation.

Economically, costs vary and are dependent on terrain, land use and size of the powerline. However, underground cabling is in orders of magnitude greater than overhead power lines. There is not much expertise for higher voltage underground cabling in the country; thus, such expertise would have to be sourced from the international market. In terms of maintenance, underground cables are reported to be much more reliable, but outages are more challenging to fix as it is harder to find the faults, and therefore the outages last much longer. The lifespan for underground cables is reported to be much shorter, about half that of overhead power lines.

#### **7.1.1.2 Power generation technology**

DNG has considered various technology options including Open Cycle Gas Engine and Reciprocating Engine. From higher efficiency and lower costs to faster, cleaner, higher quality power generation, gas turbines have many advantages over reciprocating engines.

Reciprocating internal combustion engines, which are typically used for backup, standby, or emergency power, are now becoming increasingly popular for larger utility-scale power generation applications, especially in areas with high levels of electricity generation from intermittent sources such as wind and solar. The recent increase in natural gas or dual-fuel capable reciprocating internal combustion engine units has been driven in part by advancements in engine technology that increase operational flexibility and by changes in natural gas markets that have generally provided ample supply and relatively stable fuel prices.

#### **7.1.1.3 Open Cycle Gas Engine (OCGE)**

- Cheaper, cleaner, faster power –turbines provide cheaper power, a better-quality grid and cleaner power with lower emissions, when compared to reciprocating engines. They can be installed quickly (in as little as a few weeks) to help alleviate frequent outages, making them especially well-suited for utility and industrial applications.
- Higher efficiency with lower costs - A highly efficient turbine in combined cycle can consume only about 2 mL/MWh of lube oil per year—200 times less than a reciprocating engine. That can translate to a savings of more than \$1 million per year for a 100 MW power plant.
- Higher efficiency with lower costs - Gas turbines need maintenance only once a year, or when they have been in operation for 4,000 hours. These engines can save more than 13,000 man hours over a 3-year maintenance cycle.

- Plant availability and fuel flexibility - Gas turbines have the highest availability of any thermal power technology. It can be replaced in a power plant, such as a utility or power plant, within a few days for a major inspection, which translates to higher availability—98.2%
- Plant availability and fuel flexibility - With the ability to operate on a wide spectrum of fuels (e.g., natural gas, LPG, isopentane, ethanol, diesel, and Coke Oven gas), gas turbines can allow power customers to switch between fuels to save money, all without stopping, and without a reduction in power. Using diverse fuel sources doesn't just increase reliability, it also results in significant fuel savings—from \$12 million up to \$43 million per year.
- Getting power to the grid, wherever it's needed - Because they are small and modular, turbine engines can be transported, installed and commissioned in as little as 3 months. They can be installed outdoors with minimal foundation requirements, making them an advantageous energy solution for any region across Africa that needs fast, clean, reliable power.
- Getting power to the grid, wherever it's needed - gas turbines feature a power turbine and high-pressure shaft that work together to respond quickly to grid frequency fluctuations, helping create a more stable and reliable grid.
- Smaller and more stable - Because they have about 22 times more power output per unit than comparable high-speed diesel reciprocating engines, gas power plants take up less space.

#### 7.1.1.4 Open Cycle Gas Engine (OCGE)

- High-speed reciprocating engines—can require up to 50 times more maintenance events per year.
- Power generated by reciprocating engines, average to about 93% availability.
- Fuel costs of a high-speed reciprocating engine are high.
- Fuel savings range based on a natural gas price of \$1–4/MMBTU and a diesel gas price of \$6–12/MMBTU. (One million British Thermal Units)
- In comparison, it can take up to 12-18 months for reciprocating engines.
- Than that of reciprocating engines.
- Require bigger space for a similar energy output.

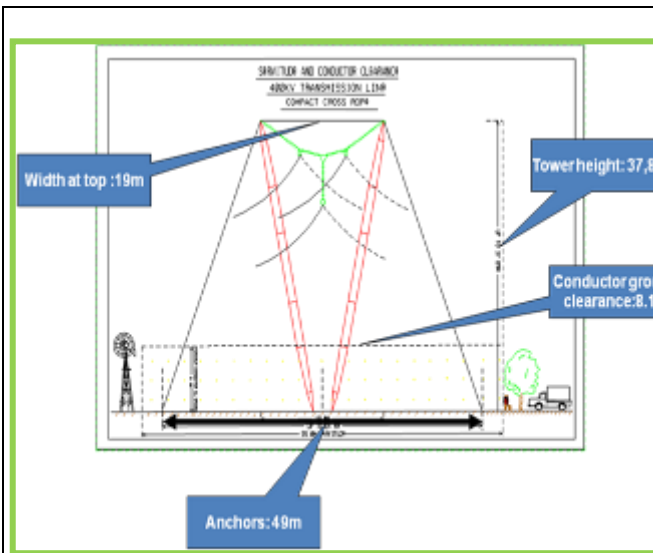
#### 7.1.2 STRUCTURAL ALTERNATIVES

Several design alternatives have been proposed for the proposed 0.5km x 132kV transmission powerline to connect to the Komati substation and they include one or more of the following single circuit pylons:

- Cross-Rope suspension type;
- Self-supporting type; and

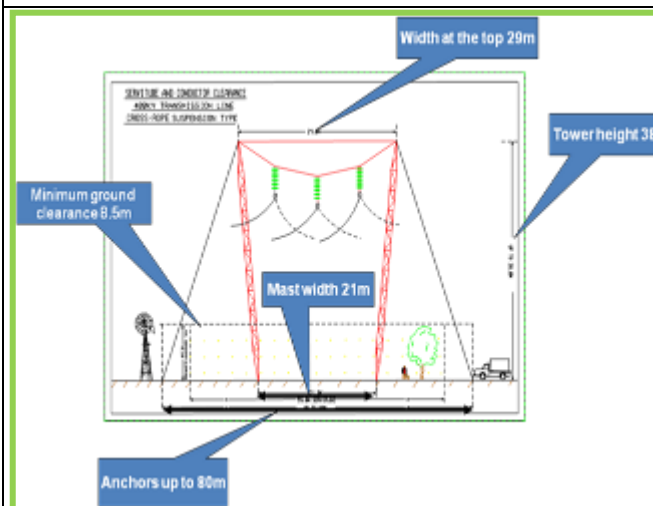
- Guyed V towers.

These are illustrated in **Figures 3 – 8** below. It is important to note that the topography will largely dictate the types of towers to be used. From this perspective, it should be noted that where the line crosses steep, undulating terrains and when it changes direction at an angle, there will be a need to use self-supporting towers.



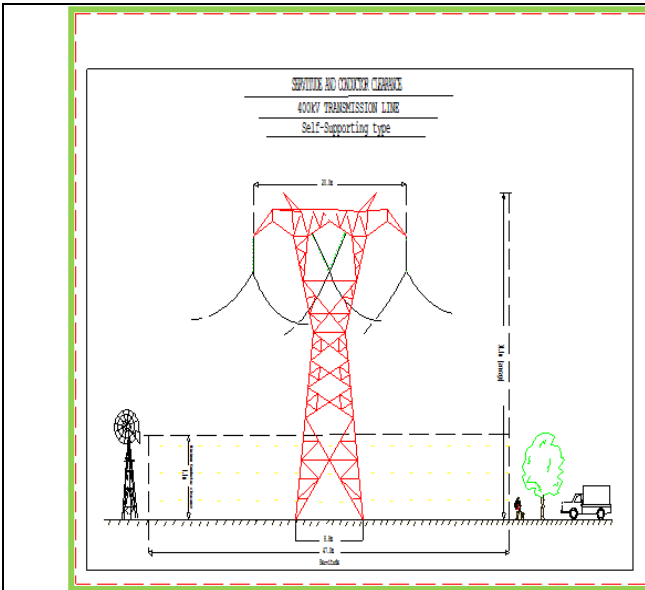
**Figure 3: Guide V tower**

**Figure 4: Photographic Guide V tower**



**Figure 5: Cross rope suspension tower.**

**Figure 6: Photographic illustration of a Cross rope suspension tower.**



**Figure 7: Self-supporting suspension tower.**



**Figure 8: Photographic Self-supporting suspension tower.**

None of the above options have been dismissed and remain alternatives depending on the terrain and topography. Taking into consideration aspects such as visual; the selection of the pylons to be used for the proposed powerline will take the potential impacts into consideration.

### 7.1.3 NO-GO ALTERNATIVE

Under GN R.982, consideration must be given to the option not to act, in which an alternative is usually considered when the proposed development is envisaged to have significant adverse environmental impacts that mitigation measures cannot ameliorate effectively. The no-go alternative would be the option of not undertaking the development of the proposed project. It would imply that the current electricity supply network is not strengthened, industrial development in the area will be hindered and the integration of potential renewable energy in the area will not be possible. Should the no-go alternative be adopted, the country will be deprived of a much needed essential service, particularly given the already existing energy supply challenge countrywide. Furthermore, the identified benefits will not materialize.

The no-go alternative will be used as a baseline throughout the assessment process against which potential impacts will be compared and assessed in the EIR

## 8 PUBLIC PARTICIPATION PROCESS

The NEMA EIA Regulations require that during the EIA process, the Organs of State together with Interested and Affected Parties (I&APs) be informed of the application and allowed to comment on the application.

Public Participation Process (PPP) is any process that involves the public in problem-solving and decision-making; it forms an integral part of the Scoping and EIA process. The PPP provides I&APs with an opportunity to provide comments and raise issues of concern or to make suggestions that may result in enhanced benefits for the project.

The primary purpose of the PPP report is as follows:

- To outline the PPP that was undertaken;
- To synthesise the comments and issues raised by the key stakeholders, I&APs; and
- To ensure that the EIA process fully address the issues and concerns raised.

Chapter 6, Regulation 39 through 44, of the EIA Regulations stipulates the minimum requirements for a compliant Public Participation Process (PPP) process. Therefore, Nsovo will take into account relevant guidelines applicable to public participation as contemplated in section 24J of the Act and give notice to all potential interested and affected parties throughout the EIA process.

### 8.1 PUBLIC PARTICIPATION PRINCIPLES

The principle of Public Participation holds that those who are affected by a decision have the right to be involved in the decision-making process (i.e., the public's contribution will influence the decision). One of the primary objectives of conducting the PPP is to provide Interested and Affected Parties with an opportunity to express their concerns and views on issues relating to the proposed project. The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meet the process needs of all participants.
- Seek to facilitate the involvement of those potentially affected.
- Involves participants in defining how they participate.
- Is as inclusive and transparent as possible, it must be conducted in line with the requirements of Regulation 39 through 44 of the EIA Regulations as amended.



## 8.2 APPROACH AND METHODOLOGY

The Public Participation approach adopted in this process is in line with the process contemplated in Regulation 39 through 44 of the EIA Regulations as amended, in terms of NEMA, which provides that I&APs must be notified about the

### 8.2.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) identified include pre-identified stakeholders (government department), landowners and the general public. Notification and request for comments were submitted to the following key stakeholders:

- Mpumalanga Department of Agriculture and Rural Development and Land Administration
- Mpumalanga Department of Human Settlements, Water and Sanitation;
- Mpumalanga Department of Transport and Public Works;
- N4 TRAC
- Mpumalanga Heritage Resources Agency;
- South African Heritage Resource Agency;
- Wildlife and Environmental Society of South Africa;
- Ehlanzeni District municipality;
- Nkomati Local Municipality; and
- Eskom SOC Limited – Transmission.

### 8.2.2 PUBLIC PARTICIPATION DATABASE

In accordance with the requirements of the EIA Regulations under Section 24 (5) of NEMA, Regulation 42 of GN R. 982, a register of I&APs must be kept by the public participation practitioner. In fulfilment of this requirement, such a register is compiled and details of I&APs including their comments will be updated throughout the project cycle. The database is attached as **Appendix D1**.

### 8.2.3 SITE NOTICES

A2 size notices will be fixed at different conspicuous locations within and around the proposed project study area, and photographic evidence included in the Final Scoping Report.

## 8.2.4 PLACEMENT OF AN ADVERTISEMENT IN THE LOCAL NEWSPAPER

An advertisement will be placed on Lowvelder newspaper on the 15<sup>th</sup> October 2020 to inform I&APs of the proposed project, availability of the Scoping Report, and public meetings. The Draft Scoping Reports will be placed for review and comment at the Public library and Nsovo website from the 19<sup>th</sup> of October to the 30<sup>th</sup> of November 2020.

## 8.2.5 PUBLIC MEETINGS

In line with the requirements of the COVID-19 Regulations, and in the interest of the health and safety of our communities, all engagements, including public meetings, be virtual, the login details are indicated in the Table 9 below:

**Table 9: Public meeting login details**

Host	Meeting ID	Password
Rejoice Aphane	966 6672 1374	6jUF85

## 8.3 A SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

The issues, comments, and concerns raised during the public participation process, together with the responses provided by the Environmental Assessment Practitioner (EAP), will be incorporated into the issues and response report.

## 9 DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS

This section outlines parts of the socio-economic and biophysical environment that could be affected by the proposed development. Using the project description, and knowledge of the existing environment, potential interactions between the project and the environment are identified below. The potential effects of the project on the human environment, socio-economic conditions, physical and cultural resources are included.

### 9.1.1 SOCIO-ECONOMIC DESCRIPTION

This section presents the socio-economic aspects focusing on the Province and Municipalities within which the proposed study area is located.

### **9.1.1.1 Provincial Description of the Proposed Project**

Mpumalanga Province is located in the north-eastern part of South Africa. The province borders two of South Africa's neighbouring countries viz. Mozambique and Swaziland; and other South African provinces namely; Gauteng, Limpopo, KwaZulu-Natal and Free State Provinces. Mpumalanga is characterised by the high plateau grasslands of the Middleveld, which rolls eastwards for hundreds of kilometres. In the north-east, it rises towards mountain peaks and terminates in an immense escarpment ([www.municipalities.co.za](http://www.municipalities.co.za)).

Mpumalanga province covers an area of 76 495km<sup>2</sup> and has a population of approximately 4 335 965 (IDP, 2017). The capital city of Mpumalanga is Mbombela (previously Nelspruit) and other major cities and towns include Emalahleni (previously Witbank), Standerton, eMkhondo (previously Piet Retief), Malelane, Ermelo, Barberton and Sabie. The province is divided into three district municipalities namely, Gert Sibande, Ehlanzeni and Nkangala Districts. These three districts are further subdivided into 17 Local Municipalities of which the proposed development falls within the Nkomazi Local Municipality of the Ehlanzeni District Municipality.

### **9.1.1.2 District Municipality within which the study area is located**

The proposed development will be undertaken within the Ehlanzeni District Municipality, which is a Category C municipality in the Mpumalanga Province with a total area comprises of five local municipalities i.e. Bushbuckridge, Mbombela, Thaba Chweu, Umjindi and Nkomazi ([www.municipalities.co.za](http://www.municipalities.co.za)), the District's headquarters are in Mbombela. The economic growth within the district is through the Maputo Corridor and tourism development. The proximity to Gauteng opens opportunities to a larger market, which is of benefit to the district's agricultural and manufacturing sectors. The main economic sectors within the District include mining, manufacturing, energy and agriculture.

The district municipality is also rich in terms of its biodiversity and mineral resources. Gold mines are operating at Barberton and Pilgrims Rest and chrome mines at Lydenburg. The future development of the Eastern Limb of the Bushveld Complex directly west of Lydenburg will also have an influence on the future land use patterns within the Thaba Chweu Local Municipality.

The Biodiversity within Ehlanzeni also plays a significant role in terms of boosting the tourism industry with the Kruger National Park as one of the major destinations for international and domestic tourism. Tourism, like agriculture, is among other land use patterns, which uses land extensively because of the availability of natural resources

### **9.1.1.3 Local Municipality within which the proposed study area is located**

The proposed development is located within the Nkomazi Local Municipality which is a Category B municipality with a total area of 4 787km<sup>2</sup> within the Ehlanzeni District Municipality. The municipality is strategically placed between Swaziland (north of Swaziland) and Mozambique (east of Mozambique). It is also bounded by Kruger National Park to the north and City of Mbombela Local Municipality to the west. It is the smallest of four municipalities in the district,

making up 17% of its geographical area. It is linked with Swaziland by two provincial roads, and with Mozambique by a railway line and the main national road (N4), which forms the Maputo Corridor.

### **9.1.2 CLIMATIC CONDITION OF THE PROPOSED AREA**

The study area falls within the summer rainfall region with the rainy season normally lasting from October to March. The average mean annual precipitation for the municipal area varies between approximately 750 and 860mm with averages varying from approximately 450 to 550mm in the eastern areas to 1500mm on the higher lying western areas.

### **9.1.3 GEOLOGY WITHIN THE STUDY AREA**

The Large proportion of Nkomazi is underlain with quartz monzonite (30.7%) to the south and central region. Basalt is the second most dominant (16.5%) geology type, located to the east. The northwestern part is predominantly underlain with arenite and lava. The least occurring geology types are ultramafic rocks, granophyre, gabbro and dolorite. The proposed study area is within the Basalt of the Letaba formation.

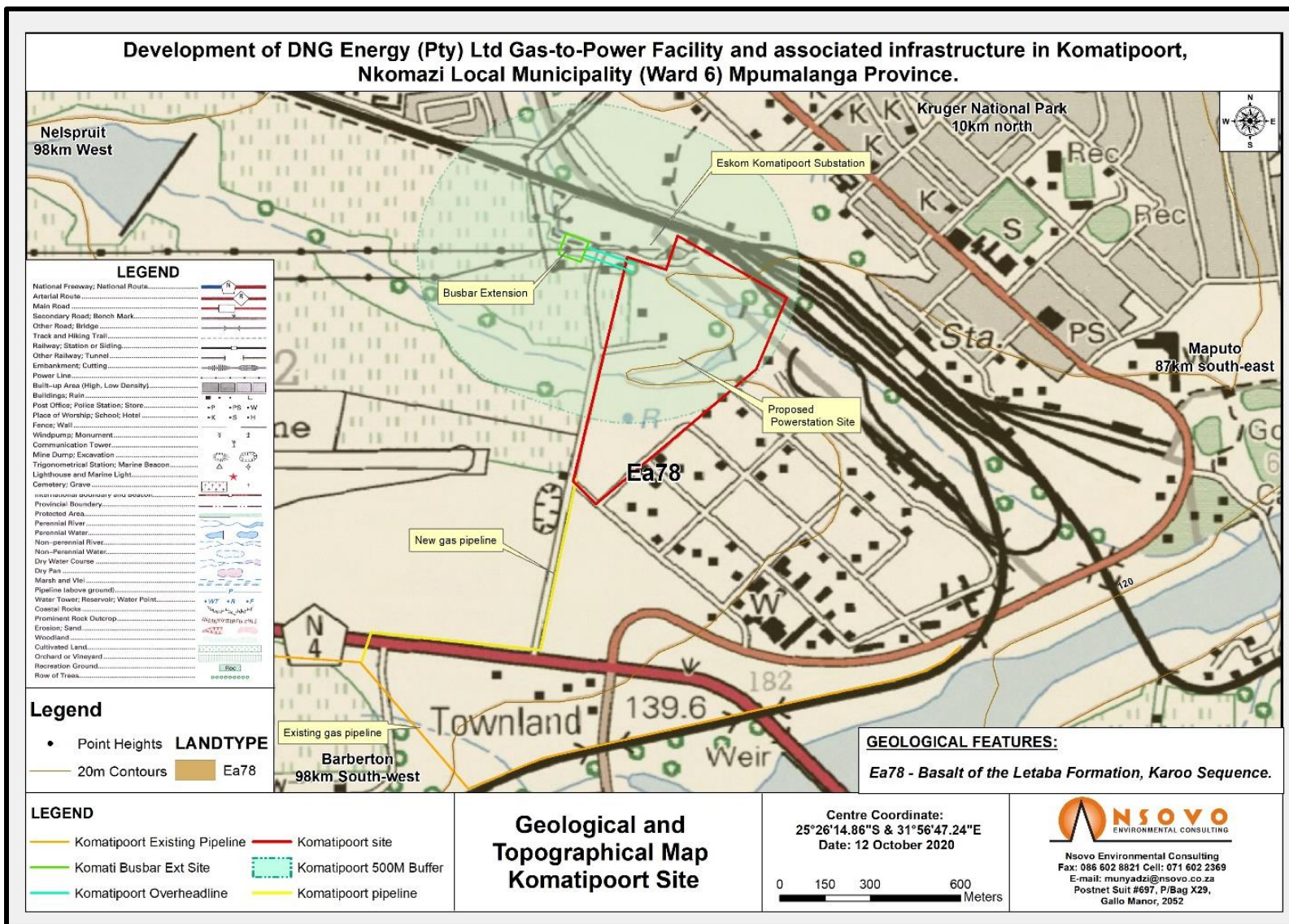


Figure 9: Geological map of the study area



#### **9.1.4 HYDROLOGY**

The study area is situated in Quaternary catchments X13L and X24H in the Nkomati/Usutu quaternary catchments of the Inkomati WMA, refer to Figure 4 below. The Inkomati-Usuthu WMA is located in north-eastern South Africa and borders Mozambique to the east and Swaziland to the south-east. Administratively, the majority of the WMA falls within Mpumalanga Province, with a portion within Limpopo Province.

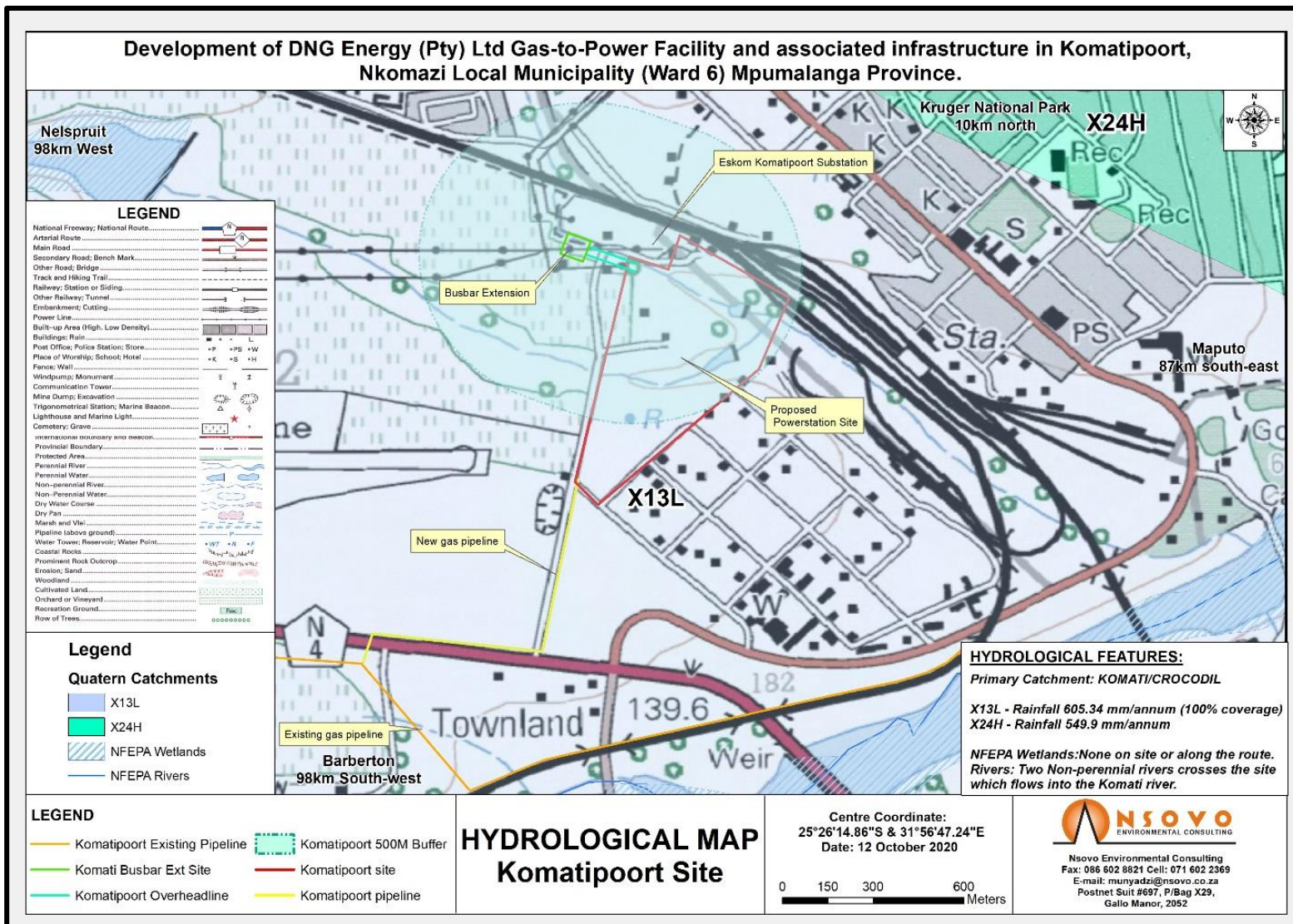


Figure 10: Hydrological map of the proposed location



Two non-perennial rivers flow cross the proposed site into the Komati River. The Komati River runs northwestern from Swaziland before reaching the Lebombo Mountains and join the Krokodile River and the Komatipoort through the Lebombo, below the frontier township of Komatipoort, the river enters extreme southwestern Mozambique, where it is called the Incomati.

#### **9.1.5 SITES OF ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE**

In general, historic sites are associated with colonial era white settlers, colonial wars, industrialization, recent and contemporary African population settlements, and contemporary ritual sites dating to the last hundred years. However, recent historic period sites and features associated with the, African communities, settler and commercial farming communities are on record in the project area environment. Although the affected general landscape is associated with historical events such as white settler migration, colonial wars and the recent African people of the region, no listed specific historical sites are on the proposed development sites. The more common functions of places of cultural historical significance may include historical building or structures older than 60 years.

The Phase I Archaeological and Cultural-Heritage Impact Assessment study (Report attached as Appendix B1) for the proposed site has revealed no archaeological or site of historical significance within the footprint of the proposed development. Refer to Figure 11 below for the Heritage map.

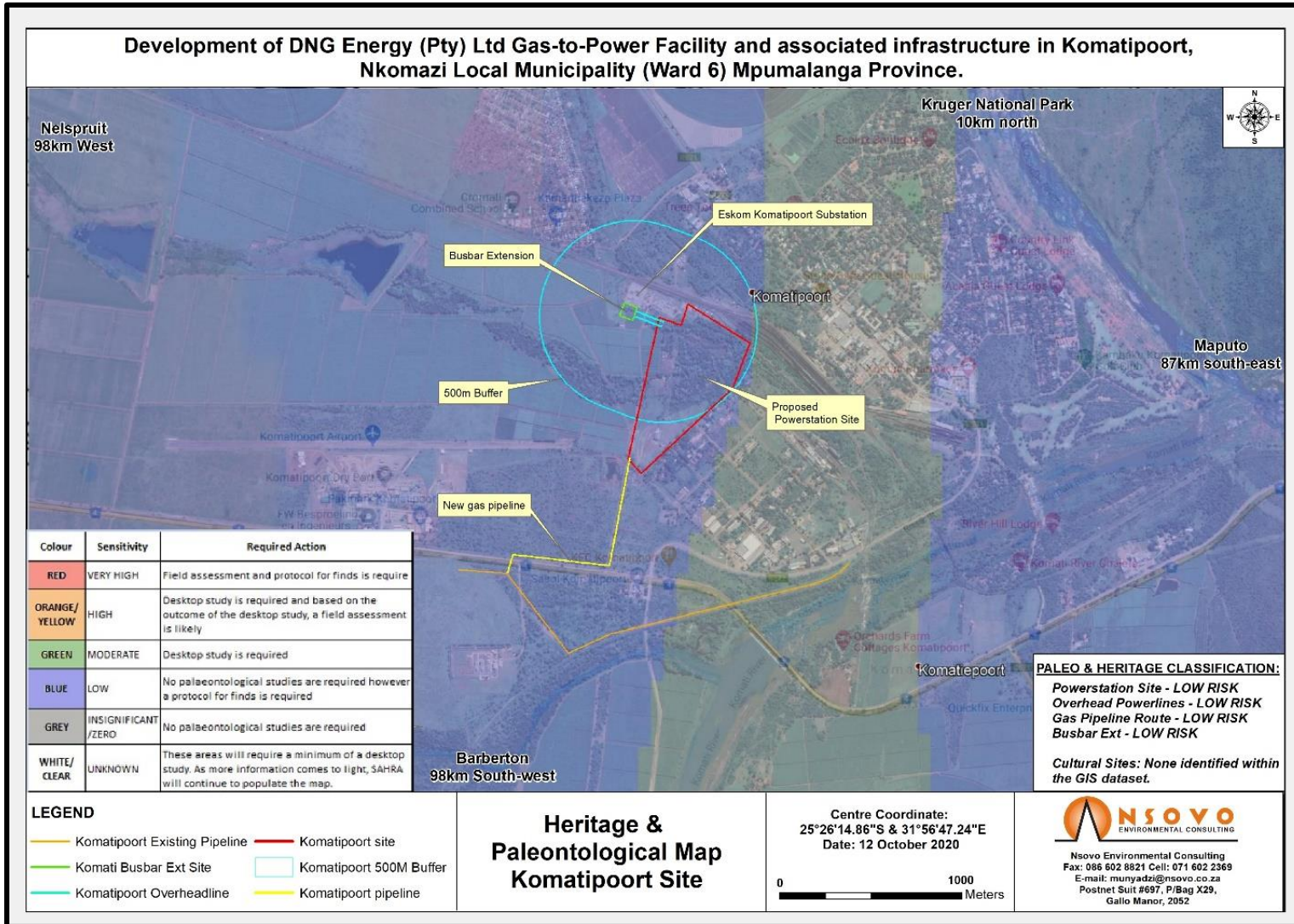


Figure 11: Heritage and Paleontology map of the proposed location

### 9.1.6 AIR QUALITY AND POLLUTION

Air quality is defined to include noise and odour as well as addressing all sources of air pollution (i.e. point, area and mobile sources). The Mpumalanga Air Quality Management Plan has been developed to comply with the National Environmental Management: Air Quality Act, 39 of 2004 and more specifically, to provide guidance on Air Quality Management in the Ehlanzeni District Municipality. The Plan identifies air pollution sources in the proposed locations as follows:

- Railway line (Train);
- Agricultural activities;
- Biomass burning (veld fires);
- Domestic fuel burning (wood and paraffin);
- Vehicle emissions;
- Waste treatment and disposal;
- Dust from infrastructural development;
- Dust from unpaved roads; and
- Other fugitive dust sources such as wind erosion of exposed areas.

There are few sources of air pollutants within the immediate and around the proposed area. The motor vehicle along the N4 may result in elevated ambient concentrations of particulates and Nitrogen Oxides (NO<sub>2</sub>) at times.

### 9.1.7 VEGETATION STRUCTURE AND COMPOSITION

The study area is not located within a protected area, however, it is situated approximately 2 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the proposed site is located within an Ecological Support Area (ESA) local corridor, and a small portion of the gas-to-power station and the majority of the proposed gas pipeline are located within an irreplaceable Critical Biodiversity Area (CBA). The remaining portions of the study area is located within areas classified as either “heavily modified” or “other natural areas”.

The southern and a portion in the north east of the focus area has a very high terrestrial sensitivity according to the National Web-based Environmental Screening Tool (2020). This is attributed to the CBA 1 and ESA within the site, as well as being a focus area for land-based protected areas expansion. The study area is considered to have a medium sensitivity for plant species due to the potential presence of the sensitive species such as *Pavetta zeyheri* subsp. microlancea. For the Animal Species theme, the majority of the study area is considered to have a medium sensitivity

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due to the potential presence of sensitive species such as Sensitive species 2 and Aves – *Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the study area is considered to be of high animal sensitivity due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork).

According to the Plant of Southern Africa online database and the Mpumalanga State of Environment Report, there several floral and faunal Species of Conservation Concern (SCC onsite, site visit will be undertaken for verification. These species are provincially important, should they be present within the focus area, they will require rescuing and relocation to a similar habitat within the vicinity of the focus area before any construction activities commences. Refer to Appendix 12 below.

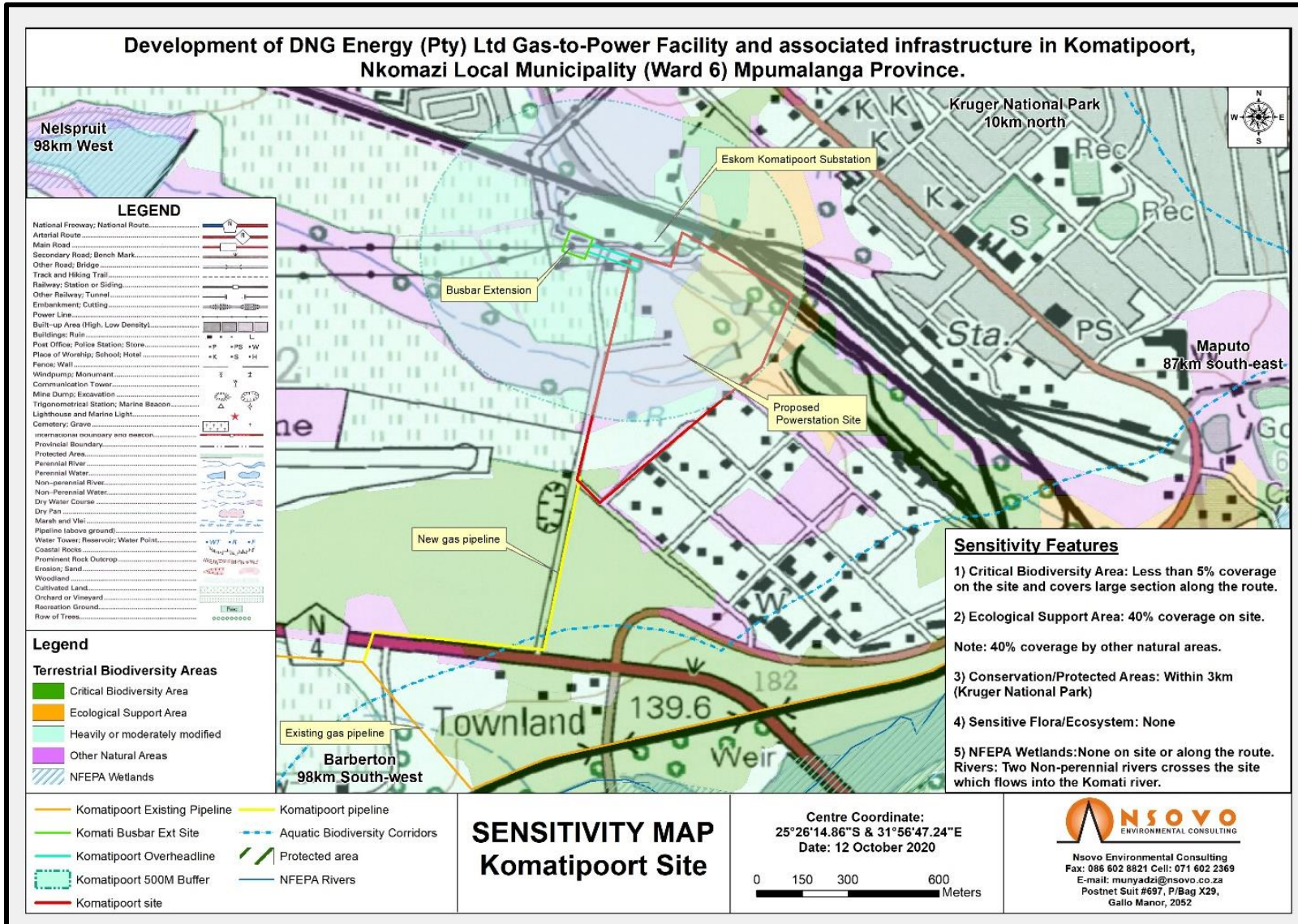


Figure 12: Sensitivity Map of the proposed study site

### **9.1.8 SOIL AND LAND CAPABILITY**

The agricultural sector plays an essential role in the fight against poverty and securing food security for the people of Mpumalanga. The role of agriculture in supplying employment to unskilled workers, ensuring food security to rural people as well as stimulating other sectors in the value chain such as manufacturing and trade makes it an important sector towards attainment of growth and development. The current land utilization by agriculture is determined by the natural resources such as soils, water and climate, and land ownership. Land utilized for commercial farming is about 90% of the total farm land whilst for small scale/emerging farming is less than 10%. In terms of agricultural production, summer cereals and legumes (sunflower seed, sorghum, dry beans, soy beans, potatoes, cotton and maize) dominate the Highveld region, while sub-tropical and citrus fruit and sugar cane are grown extensively in the Lowveld Komatipoort area.

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## 9.1.9 SENSORY ASPECTS

### 9.1.9.1 Noise

In terms of the Noise Regulations a noise disturbance is created when the prevailing ambient noise level is exceeded by 7.0dBA or more. Noise is part of our daily exposure to different sources which is part of daily living and some of these physical attributes which may at times be part of the ambient levels that people get used to without noticing the higher levels. Two aspects are important when considering potential impacts of a project:

- The increase in the noise levels, and;
- The overall noise levels which will be created by the proposed activities.

There will be an upwards shift in the immediate environmental noise levels during the construction phase on a temporary basis. The noise increase at the abutting residential properties will however not exceed the prevailing ambient noise levels during the construction, operational and decommissioning phases as it will be below the threshold value of 7.0dBA.

### 9.1.9.2 Visual Aspects

Visual appreciation or dislike is subjective and thus what is aesthetically pleasing to some can be displeasing to others. The visual analysis of a landscape the impact of new developments and structures tends to be complicated and it is evident from previous experience that when dealing with reaction to landscape changes, a large diversity of opinion exists. In this regard, it is imperative that the applicant be sensitive from a visual impact perspective, to the requirements of the local people, notably rural communities, and farmers. Many topographical features influence this environment and these features will need to be utilized when selecting an alignment so as to minimize visual impacts and intrusions.

The study area is located south of the railway line within the town of Komatipoort and the proposed gas pipeline runs from the proposed power station to the N4 National Highway located south of the proposed power station and the site is approximately 3.6 km to the west of the Lebombo border post going into Mozambique.

Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. They will be affected because of alterations to their views due to the proposed project. The visual receptors included in this study are:

- Residents;
- Tourists; and
- Motorists.

### 9.1.10 CLIMATE CHANGE IMPACT

Scientific opinion suggests that the continued emission due to human activities of greenhouse gases, principally carbon dioxide and methane, may bring about significant and long-term changes to the functioning of the earth's atmosphere. Of great uncertainty still are the possible impacts and damage attributable to such climate change, although indications are that their scale could be significant. According to the White Paper on Energy, South Africa is responsible for 1,6% of global greenhouse gas emissions and the country's energy sector is the single largest source of greenhouse gas emissions in Africa, being dependent on coal for more than 75% of the country's primary energy needs during 1997. This level of emissions is also mainly as a result of the high level of coal use by the electricity generation and synthetic fuels industries, and the high level of industrialisation producing high energy content products. In order to fulfil the national energy policy of making clean, affordable and appropriate energy available to all sectors of the population, a balanced least-cost mix of energy supply is promoted. Although the country is faced with obligations to reduce its greenhouse gas emissions in the near future, international governance of this problem is an evolving area.

Burning liquid natural gas releases methane, a potent greenhouse gas. Methane is the naturally occurring product of the decay of organic matter. Methane accounts for 10.55% of greenhouse-gas emissions created through human activity. According to the Intergovernmental Panel on Climate Change, methane has a global warming potential 21 times greater than that of carbon dioxide over a 100-year timeline.

## 10 METHODOLOGY FOR ASSESSING THE SIGNIFICANCE OF POTENTIAL IMPACTS

The assessment of impacts is largely based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The assessment will consider impacts arising from the proposed activities of the project both before and after the implementation of appropriate mitigation measures.

The impacts are assessed according to the criteria outlined in this section. Each issue is ranked according to extent, duration, magnitude (intensity) and probability. From these criteria, a significance rating is obtained, the method and formula is described below. Where possible, mitigation recommendations have been made and are presented in tabular form.

The criteria given in the Table below will be used to conduct the evaluation. The nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance and probability of occurrence attached to it. This will be assessed in detail during the EIA phase.



**Table 10: Methodology used in determining the significance of potential environmental impacts**

**Status of Impact**

The impacts are assessed as either having a:  
negative effect (i.e. at a `cost' to the environment),  
positive effect (i.e. a `benefit' to the environment), or  
Neutral effect on the environment.

**Extent of the Impact**

- (1) Site (site only),
- (2) Local (site boundary and immediate surrounds),
- (3) Regional (within the City of Johannesburg),
- (4) National, or
- (5) International.

**Duration of the Impact**

- The length that the impact will last for is described as either:
- (1) immediate (<1 year)
  - (2) short term (1-5 years),
  - (3) medium term (5-15 years),
  - (4) long term (ceases after the operational life span of the project),
  - (5) Permanent.

**Magnitude of the Impact**

- The intensity or severity of the impacts is indicated as either:
- (0) none,
  - (2) Minor,
  - (4) Low,
  - (6) Moderate (environmental functions altered but continue),
  - (8) High (environmental functions temporarily cease), or
  - (10) Very high / Unsure (environmental functions permanently cease).

**Probability of Occurrence**

- The likelihood of the impact actually occurring is indicated as either:
- (0) None (the impact will not occur),
  - (1) improbable (probability very low due to design or experience)
  - (2) low probability (unlikely to occur),
  - (3) medium probability (distinct probability that the impact will occur),
  - (4) high probability (most likely to occur), or
  - (5) Definite.

**Significance of the Impact**

Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.  
 $S=(E+D+M)P$

**The significance ratings are given below**

(<30) low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

(30-60) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

(>60) high (i.e. where the impact must have an influence on the decision process to develop in the area).

## 11 DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED

This section describes the potential impacts that the proposed project may pose on the receiving environment. Impacts associated with the relevant environmental components within the study area as identified, have been assessed based on the EAP's opinion as well as consultation with specialist studies. Refer to the Table 9 below, for the potential impacts identified.

## 11.1 SUMMARY POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Potential environmental impacts identified during the Scoping phase are described in Table 11 below. This is not an exhaustive list but insight into the potential impacts associated with the proposed project. It must be borne in mind that the EIA phase may identify more potential impacts and will assess them in more detail.

**Table 11: Potential Environmental Impact Identified**

Aspect	Impact	Description	Mitigation Measures
<b>PRE-CONSTRUCTION PHASE</b>			
Site preparation prior to the commencement of the proposed development	Positive	The proposed facility may impact on the skills of the local personnel through teaching and learning. Providing businesses an opportunity to supply goods and services during construction and operation.	<ul style="list-style-type: none"> <li>• There could be initiatives developed to contribute towards educating and developing necessary skills for the locals to take advantage of opportunities associated with the proposed development.</li> <li>• Local businesses could be incubated and developed to be able to take opportunities in the construction and operation of the proposed project which is highly technical.</li> </ul>
Employment expectations and an influx of migrant labour.	Positive	Providing employment opportunities during the construction and operational phases.	<ul style="list-style-type: none"> <li>• There could be initiatives developed to contribute towards educating and developing necessary skills for the locals to take advantage of opportunities associated with the proposed construction of the proposed project.</li> <li>• Local businesses could be incubated and developed to be able to take opportunities in the construction and operation of the proposed project which is highly technical.</li> <li>• When appointing subcontractors, DNG Energy should give preference to appropriate subcontractors/SMMEs located in the surrounding communities.</li> </ul>

Employment	Positive	<p>Providing employment opportunities during the construction and operational phases.</p> <p>The proposed facility may impact on the skills of the local personnel through teaching and learning.</p>	<ul style="list-style-type: none"> <li>• Employment of skilled, semi-skilled and unskilled labours in the construction of proposed project within the receiving environment and Inkomazi Local Municipality.</li> <li>• Skills development initiative to prepare locals to have necessary skills to take up employment opportunities with the proposed project in line with their Labour Plan and the associated Employment Equity and Skills Development Plans.</li> <li>• DNG Energy must promote the creation of employment opportunities for women and youth. The positions reserved for the youth and women may only be filled with persons outside of these categories if it can be demonstrated that no suitable persons can be employed from these categories.</li> </ul>
<b>CONSTRUCTION PHASE</b>			
Noise and vibration	Negative	<p>Noise may be generated by construction activities (e.g. earthmoving vehicles, service vehicles, generators drilling etc.). It is expected that this noise may have an impact of fauna residing in the proposed area or that habitat within the Komati river. In addition, the facility is in close proximity to the CBD as well as residential area, which may have an impact if not well managed.</p>	<ul style="list-style-type: none"> <li>• Ensure that all construction equipment is well serviced as per the manufacture's manual throughout the construction phase.</li> <li>• The requirements of the Noise Control Regulations (2013) must be adhered to.</li> </ul>

<p>Impact of waste generation and disposal</p>	<p>Negative</p>	<p>Construction waste is expected which will impact on the environment through soil and water contamination.</p> <p>Waste can also have an impact on biodiversity.</p> <p>Waste has a negative impact on the visual aesthetics of an area.</p> <p>This impact is rated as 'medium' without mitigation and is reduced to 'low' with proper mitigation.</p>	<ul style="list-style-type: none"> <li>• Suitable handling and disposal protocols must be clearly explained and sign boarded.</li> <li>• All domestic and general waste generated must be disposed of responsibly.</li> <li>• All reasonable measures must be implemented to ensure there is no littering and that construction waste is adequately managed.</li> <li>• Staff must be regularly reminded about the detrimental impacts of pollution on marine species and suitable handling and disposal protocols must be clearly explained and sign boarded.</li> <li>• The 'reduce, reuse, recycle' policy must be implemented where possible.</li> </ul>
<p>The effect of spillages of hazardous substances on surface water resources</p>	<p>Negative</p>	<p>Hydrocarbon-based fuels or lubricants spilled from construction vehicles, construction materials that are not properly stockpiled, and litter deposited by construction workers may be washed into the surface water bodies. Should appropriate ablution facilities not be provided for construction workers at the camps, the potential exists for surface water resources and surroundings to be contaminated by raw</p>	<ul style="list-style-type: none"> <li>• Construction vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants;</li> <li>• A concrete bund with adequate storage capacity should be used to accommodate substances such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas;</li> <li>• Storage of potentially hazardous materials must be far removed from preferential flow paths and or stormwater infrastructure. These materials include fuel, oil, cement, bitumen etc.;</li> <li>• Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils;</li> <li>• Concrete is to be mixed on mixing trays only, not on exposed soil; Concrete and tar shall be mixed only in areas which have been specially demarcated for this purpose;</li> </ul>

		<p>sewage. The utilisation of watercourses for disposal of water used for washing could decrease the abundance and diversity of aquatic macro-invertebrates inhabiting the section of the Malelane river and riparian areas further downstream. Contaminated runoff from concrete mixing and sediment release including hydrocarbon spillages may infiltrate into the groundwater.</p>	<ul style="list-style-type: none"> <li>• After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at an approved waste dump.</li> <li>• Any proclaimed weed or alien species that germinate during the operational period shall be cleared by hand before flowering;</li> <li>• The re-release of clean water from clean and dirty water separation infrastructure must be diffused and not reach stream habitat as concentrated flows where it will have serious negative impacts.</li> <li>• The storm water plan must include adequate attenuation facilities to ensure that peak flows do not cause negative impacts on streams.</li> <li>• Caution must be taken to ensure building materials are not dumped or stored within the proximity of the streams;</li> <li>• Emergency plans must be in place in the case of spillages.</li> <li>• All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised and be surrounded by bunds; for a minimum amount of time necessary;</li> <li>• A phased planned approach must be taken when construction is initiated. Areas must only be stripped directly prior to construction and only expose soils to erosion for the minimum period necessary. Where possible, re-vegetation of areas must be implemented as soon as possible.</li> </ul>
<p>Potential groundwater contamination caused by construction activities</p>	<p>Negative</p>	<p>Contaminated runoff from concrete mixing and sediment release including hydrocarbon spillages may infiltrate into the groundwater.</p>	<ul style="list-style-type: none"> <li>• Place drip trays under stationary machinery, only re-fuel machines at the temporary fueling station, install temporary structures to trap fuel spills at the temporary fueling station.</li> <li>• Immediately clean oil and fuel spills and dispose of contaminated material (soil, etc.) at licensed sites only.</li> </ul>

			<ul style="list-style-type: none"> <li>• Equip the site with sufficient ablution facilities. Secure chemical toilets to ensure that they do not blow over in windy conditions.</li> <li>• Do not release any pollutants, including sediment, sewage, cement, fuel, oil, chemicals, hazardous substances, waste water, etc., into the environment.</li> <li>• Compile a procedure for the storage, handling and transport of different hazardous materials and ensure that it is strictly adhered to.</li> <li>• Ensure vehicles and equipment are in good working order and drivers and operators are trained with respect to actions to be taken in the case of a fuel spill or leak.</li> <li>• Ensure that good housekeeping rules are applied.</li> </ul>
Traffic	Negative	<p>During the construction phase, increased heavy vehicle traffic will be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further unmanaged construction vehicles may decrease road safety for other road users and uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction. The</p>	<ul style="list-style-type: none"> <li>• The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads where possible;</li> <li>• Existing access roads must be used;</li> <li>• Delivery vehicles must comply with all traffic laws and bylaws;</li> <li>• Inform communities of planned construction activities that would affect vehicle/pedestrian traffic.</li> </ul>

		propose site is adjacent to the N4, which is a major road leading to the Mozambican boarder. Without mitigation, this impact may be high, however, implementation of mitigation measures may result in medium/low significance.	
Change in local land use in the affected area for the proposed project.	Negative	The proposed site is currently under agricultural, as such, the proposed activity will reduce the area marked for agricultural purposes.	<ul style="list-style-type: none"> <li>• Minimise the construction footprint of the power plant.</li> </ul>
Water availability	Negative	Increase in pressure for water demand and allocation to support the construction of the proposed project	<ul style="list-style-type: none"> <li>• Construction related vehicles should be restricted to daylight hours and the workweek if at all possible. Thus, it is recommended that trucks should not be operated after sunset or over weekends.</li> <li>• Roads must be adequately maintained to prevent deterioration of roads surfaces due to heavy vehicle traffic. Road maintenance should not be the sole responsibility of the Nkomati Local Municipality or the Department of Public Works.</li> <li>• Safe travelling speeds must be determined, and measures implemented to ensure that these restrictions are enforced.</li> </ul>
Impact on biodiversity	Negative	The impact on terrestrial biodiversity is considerable during the construction phase.	<ul style="list-style-type: none"> <li>• Avoid or minimise loss of sensitive habitats:</li> <li>• Avoid any disturbance to the No-Go habitats (Protected Areas)</li> </ul>



		<p>Most of the identified impacts are of medium significance with mitigation measures. Such impacts include:</p> <ul style="list-style-type: none"> <li>• Loss of indigenous vegetation</li> <li>• Loss of exotic vegetation</li> <li>• Loss of or displacement of fauna</li> <li>• Increase in alien invasive vegetation</li> <li>• Loss of ecological function</li> </ul> <p>pipeline are located within an irreplaceable Critical Biodiversity Area (CBA).</p> <p>The remaining portions of the study area is located within areas classified as either “heavily modified” or “other natural areas”.</p>	<ul style="list-style-type: none"> <li>• Minimise the physical destruction of the identified ESA, in general, minimise clearing and operations in habitats with a High sensitivity rating and clearly delineate and maintain a no-go buffer of at least 100 m around such habitats.</li> <li>• Use existing gravel roads and already disturbed areas to access the facility as far as possible to avoid the creation of new roads or access routes across natural areas.</li> <li>• Avoid blocking and/or destruction of any streams/rivers and wetlands.</li> <li>• After the final layouts of the operation components has been approved and prior to any new groundwork’s, conduct a thorough footprint investigation (during summer) to assess all Protected or Threatened plant species (population location and its size).</li> <li>• Parking and operational areas should be regularly inspected for hazardous substances spills and covered with an impermeable or absorbent layer (with the necessary storm water control).</li> <li>• If filling material is to be used, this should be sourced from areas free of invasive species, and alien plant control measures are to be applied to all areas used for sourcing fill materials.</li> <li>• Efforts must be taken to minimise the footprint of short-duration activities and/or linear infrastructure. Efforts to minimise such footprints will include grouping all infrastructure to the same servitude and/or as close as possible to existing and planned long-term physical disturbances; this will reduce habitat fragmentation.</li> </ul>
Impact on soils and agriculture	Negative	<p>The loss of topsoil in South Africa is a national concern and thus erosion control should be taken seriously. Soil erosion</p>	<ul style="list-style-type: none"> <li>• Any disturbance of high potential agricultural soils must be actively avoided, should this be not feasible, the footprint of the proposed power facility should be clearly demarcated to restrict the planned activities within infrastructure footprint</li> </ul>

		<p>may occur during the construction phase due to:</p> <ul style="list-style-type: none"> <li>• Excavations particularly on steep slopes</li> <li>• Ineffective storm water management</li> <li>• Excessive use of gravel roads</li> <li>• Use of heavy machinery or vehicles</li> </ul> <p>Construction activities may lead to the compaction of disturbed soils further to this the exposure of the soil to environmental factors increases the likelihood of erosion. The removal of surface vegetation will cause exposed soil conditions where rainfall and high winds can cause mechanical erosion. Rainfall and inadequate drainage systems would lead to sediments washing down into wetlands and rivers, causing sedimentation. In addition, hardened surfaces and bare</p>	<p>as far as possible, thus minimising edge effects and reducing the extent and overall significance of impact;</p> <ul style="list-style-type: none"> <li>○ An adequate storm water management plan must be carefully designed and implemented in order to avoid erosion of topsoil</li> <li>○ Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed;</li> <li>○ Runoff from paved surfaces should be slowed down by the strategic placement of berms; and</li> <li>○ All stockpiles and waste stockpiles must have berms and/catchment paddocks at their toe to contain runoff of the facilities;</li> </ul> <ul style="list-style-type: none"> <li>• Construction activities should be scheduled to coincide with low rainfall period as far as possible. These periods have may reduce erosive runoffs and wind impacts;</li> <li>• As the footprints of the proposed development are not vegetated, it is best to be regularly dampened with water to suppress dust during the construction phase, especially when strong wind conditions are predicted according to the local weather forecast;</li> <li>• Bare soils adjacent to the infrastructural areas can be vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust;</li> <li>• Erosion control is regarded critical as the majority of the soils are susceptible to erosion.</li> <li>• Compaction of soil can be mitigated by ripping the footprint and introducing both organic and inorganic fertilizers.</li> </ul>
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		<p>areas are likely to increase surface run off velocities and peak flows received by riparian habitat and wetlands.</p> <p>If adequate soil erosion measures are implemented during the construction phase of the proposed activity, this impact can be deemed to be of low significance. Where soils are highly erodible, adequate measures must be implemented to prevent undue soil erosion.</p>	<ul style="list-style-type: none"> <li>• Unnecessary disturbances of the potentially arable soils outside the demarcated areas can be avoided where possible to minimise loss of arable soils;</li> <li>• The footprint should be ripped at 25 cm to alleviate compaction as part of rehabilitation;</li> <li>• The footprint should be re-vegetated with a grass seed mixture as soon as possible, preferably in spring and early summer to stabilise the soil and prevent soil loss during the rainy season.</li> </ul>
Impact on heritage	Negative	<p>The affected general landscape is associated with historical events such as white settler migration, colonial wars and the recent African people of the region, no listed specific historical sites are on the proposed development sites. The more common functions of places of cultural historical significance may include:</p>	<ul style="list-style-type: none"> <li>• Sites of low significance require minimum or no mitigation. Minimum mitigation recommended could be a collection of all surface materials and/ or detailed site mapping and documentation. No excavations would be considered necessary.</li> <li>• If any chance archaeological or previously unknown grave(s), be exhumed or discovered during the course of construction work, activities on the proposed development area should be stopped within a radius of at least 10m of such indicator, and a heritage specialist monitoring the project be notified immediately. The area should then be demarcated by a danger tape. In the meantime, it is the responsibility of the Environmental officer and the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. It is mandatory to report any incident of human remains encountered to the South African Police</li> </ul>

		<ul style="list-style-type: none"> <li>•Historical building or structures older than 60 years.</li> </ul>	<p>Services, SAHRA staff member and professional archaeologist. Any measure to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law under Section 35(4) and 36(3) of the National Heritage Resources Act, Act 25 of 1999. The developer should induct field worker about archaeology, and steps that should be taken in the case of exposing archaeological materials.</p>
Visual Impact	Negative	<p>The visibility analyses consider worst-case scenarios, using line-of-sight, based on topography. Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource, and value it differently. Viewers will be affected because of the alterations of the views as a result of the proposed development (gas to power facility). The visual receptors included are tourists that visit the Kruger National Park, the local residents of Komatipoort, as well as migrants that travel between South Africa and Mozambique via the N4.</p>	<ul style="list-style-type: none"> <li>• It is recommended that a permeable steel structure be used for the pylons to create the lowest degree of visual obstruction;</li> <li>• Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance;</li> <li>• Screen the construction camp and lay-down areas; Rehabilitate disturbed areas around pylons as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil.</li> <li>• Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation;</li> <li>• Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors;</li> </ul>

Air pollution	Negative	<p>The potential air pollutant during construction may be dust emanating from site preparation and excavations during construction as well as exhaust fumes from construction vehicles. Given the nature and magnitude of the proposed development it is anticipated that if not mitigated the impact will be local in extent, short term, and of medium significance and this can be reduced to low with proper mitigation.</p>	<ul style="list-style-type: none"> <li>• Unnecessary clearing of vegetation must be avoided to limit dust generation.</li> <li>• Dust suppression techniques must be implemented. These techniques will include dampening the ground with a water truck, adhering to site speed limits etc. All construction staff must wear their dust masks whenever necessary.</li> <li>• Dust suppression techniques must be implemented, particularly during the winter period.</li> <li>• Vehicles travelling on site must keep the 30km/hr. speed limit.</li> <li>• Burning of any form in of waste material must not be allowed.</li> </ul>
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**OPERATIONAL PHASE**

<p>Increased noise levels during the operational phase. The operational phase of the Project will be undertaken over two phases (Phase 1 – OCGT with 620MW capacity and Phase</p>	Negative	<p>The following noise sources have been identified:</p> <ul style="list-style-type: none"> <li>• the air intake fans;</li> <li>• fans located on the air and steam condensers;</li> <li>• gas turbine, steam turbine and generator (normally within building);</li> <li>• ventilation fans located on the turbine generator building; and</li> </ul>	<ul style="list-style-type: none"> <li>• Other noise modelling studies performed on similar technology (CCGT at Saldanha Bay) have indicated that noise impacts at night time during the operational phase are somewhat negligible compared to the daytime. Given that daytime levels are anticipated to be lower and noise generated during the day by the power plant may be masked by other noises from a variety of sources surrounding potentially noise-sensitive developments.</li> <li>• Given that the impact is anticipated to be low, monitoring is proposed if there are noise complaints or if people in the future settle closer than 2,000 m from the power plant.</li> </ul>
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<p>2 – CCGT with 1000MW capacity.</p>		<p>exhaust.</p>	<ul style="list-style-type: none"> <li>• In addition, it is proposed that a detailed noise impact assessment be conducted during the EIA phase.</li> </ul>
<p>Air quality and climate change [Combustion facilities using gas primarily for steam raising for electricity generation are classified as Listed Activity in terms of Section 21 the NEM: AQA (Category 1, sub-category 1.4 (gas). LNG will be the primary fuel used for electricity generation with emissions of pollutants from the power plant which include oxides of nitrogen (NOX = NO + NO2) and carbon dioxide (CO), as well</p>	<p>Negative</p>	<p>Decreased ambient air quality. The scale of the impact is related to whether the predicted ambient concentrations of the pollutants exceed the limit values of the NAAQS in sensitive areas, i.e. residential or non-industrial areas. A detailed air quality impact will be undertaken during the EIA phase to determine actual human and environmental impacts of the emissions.</p>	<ul style="list-style-type: none"> <li>• Development and implementation of servicing programmes for all operational components of the facility.</li> <li>• Stocking of critical components to ensure the availability of spares in the event of mechanical faults.</li> </ul>

<p>as greenhouse gases such as CO<sub>2</sub> and CH<sub>4</sub>.]</p>			
<p>Climate</p>	<p>Negative</p>	<p>Climate change has become an environmental concern and this is due to emission and greenhouse gases on projects of a similar nature.</p>	<ul style="list-style-type: none"> <li>• Mitigation including minimising the area required to be cleared, avoidance and demarcation of particularly sensitive vegetation is possible and may reduce the significance of the impact, however given the loss of CBA the significance of the impact may not be able to be reduced.</li> <li>• Adhere to the national/ and provincial noise regulations.</li> <li>• Adherence to national/ and provincial air quality regulations and standards.</li> <li>• Development and implementation of servicing programmes for all operational components of the facility.</li> <li>• Stocking of critical components to ensure the availability of spares in the event of mechanical faults.</li> </ul>

## 11.2 CUMULATIVE IMPACTS

Cumulative impacts in relation to an activity, means the past, present and reasonably foreseeable future impacts of an activity, considered together with the impacts of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations). This section provides cumulative impacts ratings associated with the proposed project, which include the waste generation, traffic, socio-economic and visual impacts. Additional cumulative impacts will be assessed during the EIA phase. It also outlines the mitigation measures of each rated cumulative impacts as follows:

### 11.2.1 WASTE GENERATION

During the construction phase of the proposed project, there will be a variety of waste material produced within the study area.

### 11.2.2 VISUAL IMPACT

The proposed activity will change the visual character of the area particularly considering that the proposed site is located next to national roads (N4). Cumulative impact will be higher than anticipated due to existing activities i.e. Eskom Komatipoort substation.

### 11.2.3 TRAFFIC IMPACT

During the construction phase, increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further unmanaged construction vehicles may decrease road safety for other road users and uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction.

### 11.2.4 SOIL AND LAND CAPABILITY

Sixty six percent (66%) of Mpumalanga Province's irrigated land is located in the Ehlanzeni, most of these lands are located in the Nkomazi municipality. The plantation lands are located mostly at the centre of the Province forming a belt stretching north to south mainly along the escarpment. The surrounding areas within which the proposed activities are to occur, are dominated by sugar cane farming activities. The conversion of land use will decrease the economy of the province, as these soils are considered to contribute significantly to provincial and/or national agricultural productivity by state entities such as the Department of Agricultural Forestry and Fisheries (DAFF).



## 12 PLAN OF STUDY FOR EIA

The Scoping phase is fundamental as it allows for the identification of potential impacts on the environment, as well as facilitation of the process of compiling the EIA and Environmental Management Programme (EMPr). This report incorporates information from the client, specialist studies, site visits, literature reviews as well as previous environmental studies conducted in the area; it, therefore, provides a comprehensive baseline of the environment of the study area.

This Scoping Process has followed the appropriate standards and procedure for the EIA application, as set out in the NEMA and the EIA Regulations of April 2017 as amended. The study includes a description of the various alternatives and indicates those alternatives, which should be pursued as part of the detailed assessment of the EIA process. Impact significance of the proposed activity on the environment will be assessed in the EIA phase with the assistance of the various specialist studies.

The purpose of this section is to outline how the EIA for the proposed development will proceed during the EIA phase. The detailed assessment phase of the EIA process entails the integration of the specialist studies for those potential impacts evaluated to be of significance. Relevant mitigation measures will be included in the EMPr. This section provides specific terms of reference and impacts assessment methodology for utilisation by the specialist team and EAP. The Plan of Study for EIA is intended to provide a summary of the key findings of the Scoping Phase and to describe the activities to be undertaken during impact assessment. The Plan of Study provides the following:

- A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
- A description of the aspects to be assessed as part of the environmental impact assessment process;
- Aspects to be assessed by specialists;
- A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
- A description of the proposed method of assessing duration and significance;
- An indication of the stages at which the competent authority will be consulted;
- Particulars of the public participation process that will be conducted during the EIA process;
- A description of the tasks that will be undertaken as part of the environmental impact assessment process; and
- Identification of suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

## 13 A DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED WITHIN THE PREFERRED SITE, INCLUDING THE OPTION OF NOT PROCEEDING WITH THE ACTIVITY

The scoping phase assessed technical alternatives and these alternatives will be assessed further during the EIA. The preferred technical alternative will be the one with the least environmental impacts as well as providing most benefits from a socioeconomic perspective.

## **14 A DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT**

The following are aspects that have been identified and briefly describes as part of the Scoping Report. Further detailed assessment will be undertaken during the EIA phase:

- Biodiversity (flora and fauna);
- Heritage;
- Wetland;
- Traffic;
- Air quality;
- Socio-economic;
- Visual impacts; and
- Climate Change.

### **14.1 ASPECTS TO BE ASSESSED BY THE SPECIALISTS**

During the draft scoping phase, two (2) specialist studies were undertaken, the specialist reports are attached herein as **Appendix B**. Additional studies that may become necessary during the EIA phase include the following:

- Traffic;
- Air quality;
- Socio-economic;
- Visual impacts; and
- Climate Change.

### **14.2 A DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL IMPACTS**

The description of the proposed method of assessing the duration and significance is included in **Table 9** above.

### 14.3 AN INDICATION OF THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

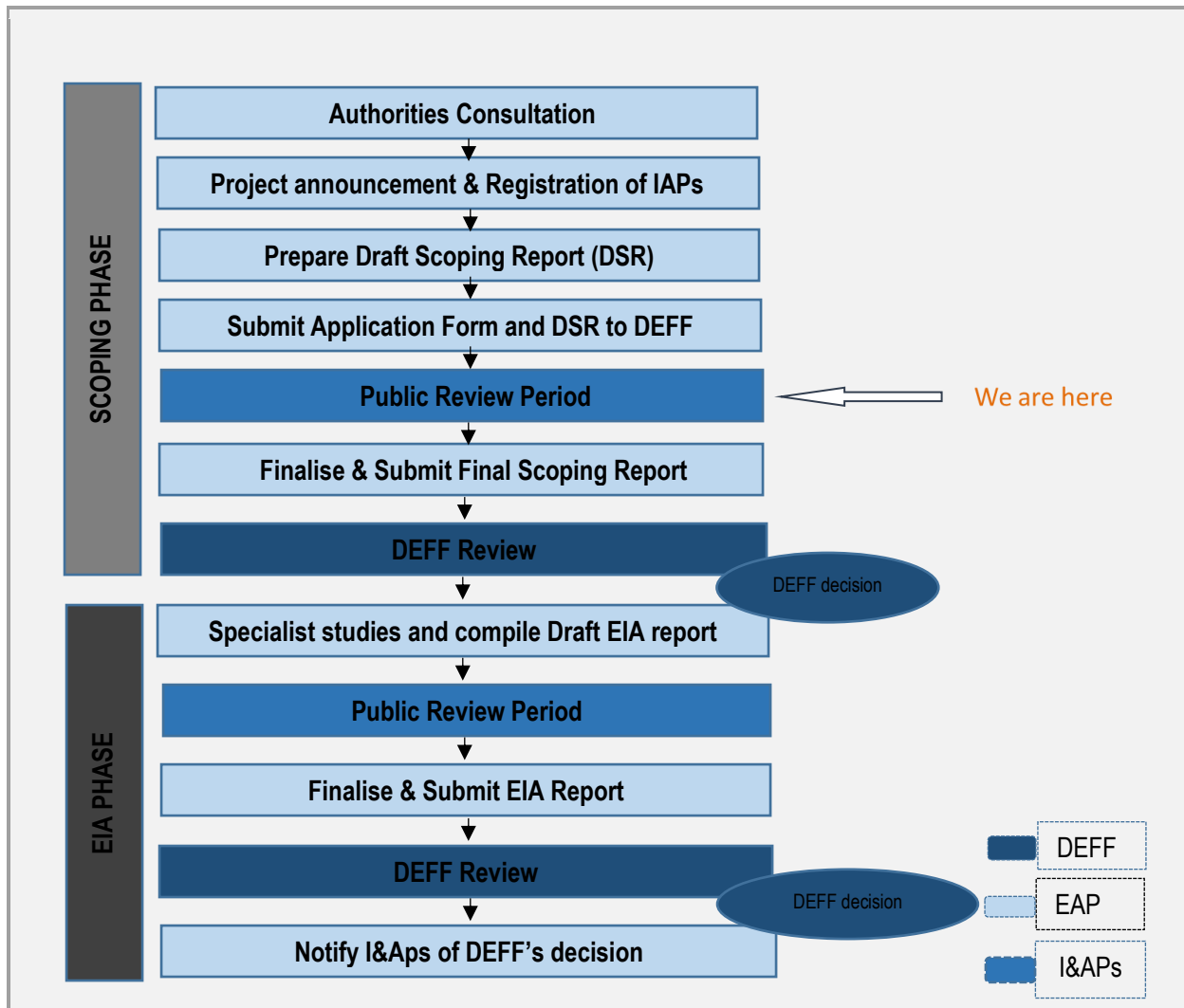


Figure 13: The different stages at which the Competent Authority will be consulted.

## **14.4 SCOPING PHASE**

The draft Scoping Report together will be submitted to the DEFF for review and comment. The EAP will consider the comments and prepare responses. In addition, the report will be sent to all stakeholders to review and comment for a period of 30 days, of which any comments or issues raised will be addressed appropriately. The final Scoping Report will be submitted to the DEFF for consideration.

## **14.5 ENVIRONMENTAL IMPACT ASSESSMENT PHASE**

The draft Environmental Impact Report (EIR) will be prepared and distributed for public review and comments. Further, copies of the draft EIR will be submitted to the DEFF and stakeholders for comment. The final EIR which includes all comments received, specialist reports and recommendations will be submitted to the DEFF for decision making.

The database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the draft EIR for review and will be given 30 days to provide their comments. The comments received will be incorporated into an updated Comments & Response Report (CRR).

Additional public consultation will take place in the form of public meetings and focus group meetings as appropriate. The purpose of the public meetings would be to present the findings of the draft EIR as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. The EAP will use this forum to provide more information about the proposed development including the specialist input, and to provide the stakeholders with the opportunity to further comment on the proposed development. In the event that the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIR, the necessary amendments will be made to the report. The Final EIR will be submitted to the DEFF, subsequent to the second phase of public consultation.

## **14.6 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS THAT WILL BE CONDUCTED DURING THE ENVIRONMENTAL IIMPACT ASSESSMENT PROCESS**

The database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the draft EIR for review and will be given 30 days to provide their comment. The comments received during the review period will be incorporated into an updated Comments & Response Report.

Further public consultation will take place in the form of public meetings and focus group meetings as appropriate. The purpose of the public meetings would be to present the findings of the draft EIA Report as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. Nsovo will use this forum to provide more information about the proposed development including the specialist input, and also to provide the stakeholders with the opportunity to further comment on the proposed development. In the event that the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIA Report, the necessary amendments will be made, and the final EIA Report will be compiled and submitted to the DEFF.

#### **14.6.1 ADVERTISING**

The commencement of the EIA process i.e. the Scoping Phase was advertised in a local newspaper in English. The proposed project was further announced publicly through the following forms of information sharing:

- Newspaper adverts providing a description of the proposed development and location, as well as contact details of where more information can be obtained and announcing the availability of the draft Report for review and comment;
- A2 notices in English will be placed at conspicuous locations along the study area; and
- Letters /Emails will be sent to key stakeholders.

Further advertising will take place during the EIA phase and will relate to the availability of the reports for public review and announcement of public meetings that will be held at strategically located sites, which will allow for maximum attendance.

#### **14.6.2 INTERACTION WITH DEFF AND PROVINCIAL DEPARTMENTS**

Interaction with DEFF and other provincial authorities with jurisdiction on the proposed development undertaken during the Scoping Phase will continue into the EIA Phase of the project. Further interaction will occur in the following manner:

- Submission of the final Scoping Report to DEFF;
- A consultation meeting with various stakeholders and I&APs as appropriate, to discuss the findings of the Draft EIR;
- Submission of the Draft EIRs following a public review period; and
- Notification of registered I&APs of the EA once it is issued.

The draft EIR will be reviewed by I&AP's, authorities and key stakeholders. Furthermore, the report will also be published and the made available on Nsovo (EAP) website for public review. The **Table 11** below shows some of the key stakeholders to be consulted:

**Table 12 : I&AP's, authorities and key stakeholders to review draft EIR.**

<ul style="list-style-type: none"><li>• Mpumalanga Department of Agriculture and Rural Development and Land Administration</li><li>• Mpumalanga Department of Water and Sanitation;</li><li>• Mpumalanga Department of Transport and Public Works;</li><li>• N4 TRAC</li><li>• Mpumalanga Heritage Resources Agency;</li><li>• South African Heritage Resource Agency;</li><li>• Wildlife and Environmental Society of South Africa;</li><li>• Ehlanzeni District municipality;</li><li>• Nkomati Local Municipality; and</li><li>• Eskom SOC Limited – Transmission.</li></ul>
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#### **14.6.3 DEVELOPING A STRATEGY AND RESOLVING KEY ISSUES**

A strategy for addressing and resolving key issues is to be developed and will include:

- Details on all assessments and investigations carried out;
- Use of the public participation meetings to present the findings of the reports and test the acceptability of priority issues and mitigations;
- Openly and honestly relating both positive and negative impacts of the proposed development during the public meetings; and
- Allowing the public to understand the consequences of the proposed development on the area and their livelihoods.

#### **14.7 A DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT**

The section below indicates the tasks that will be undertaken as part of the EIA process.

##### **14.7.1 PREPARATION OF THE DRAFT EIR AND EMPR**

The draft EIR and EMPr will be prepared as per Appendices 3 and 4 of the 2014 EIA Regulations and will include input from the specialist studies as indicated in **Section 9.3.2** above. **Contents of the draft EIR (Appendix 3) will include the following:**

- Details and expertise of the EAP;
- Location of the activity;

- A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity;
- A description of the policy and legislative context within which the proposed development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- 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;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity;
- An assessment of each identified potentially significant impact and risk including (i) and (vii) as per the Regulations;
- A summary of the findings and recommendations of specialist reports;
- Environmental Impact Statement inclusive of (i) to (iii) as per the Regulations;
- Recommendations from the specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;
- The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;
- Aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;
- A description of any assumption, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;
- A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- The period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised;
- The undertaking under oath by the EAP in relation to (i) and (iv) as per the regulations;

An indication of any deviation from the approved Scoping Report, including the Plan of Study including (i) and (ii) as per the Regulations.

**Contents of the EMPr (Appendix 4) will include the following:**

- An EMPr must comply with Section 24N of the Act and include - details of the EAP who prepared the EMPr; and the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
- A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;
- A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;
- A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including (i) to (v) of the 2014 EIA Regulations as amended;
- A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated above will be achieved, and must, where applicable, include actions as indicated on (i) to (iv) of the EIA 2014 Regulations as amended.
- The method of monitoring the implementation of the impact management actions contemplated above;
- The frequency of monitoring the implementation of the impact management actions contemplated above;
- An indication of the persons who will be responsible for the implementation of the impact management actions;
- The time periods within which the impact management actions contemplated above must be implemented;
- The mechanism for monitoring compliance with the impact management actions contemplated above;
- A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;
- An environmental awareness plan describing the manner in which-
- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
- (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and
- Any specific information that may be required by the competent authority.

**14.7.2 PUBLIC PARTICIPATION PROCESS**

The public participation process will be undertaken as indicated on Section 9 above.

**14.7.3 PREPARATION OF THE FINAL EIA REPORT AND EMPR**

The final EIR and EMPr will be prepared as per Appendices 3 and 4 of the 2014 EIA Regulations as amended, further, it will be submitted to DEFF in hard copy and electronic version (CD) and will include the following:



#### **14.7.4 IDENTIFY SUITABLE MEASURES TO AVOID, REVERSE, MITIGATE OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED**

The aspects that will be assessed have been identified and their potential impacts and mitigation measures are indicated on Sections 9.1 and will be elaborated further in the EMP. The proposed method of assessing environmental aspects are included on Table 18 above.

### **15 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP**

In undertaking the draft and final Scoping phases of the project the EAP has taken into consideration the requirements stipulated in the EIA 2014 Regulation as amended, as well as other relevant Acts and Regulations. The EAP hereby confirm that with the information available at the time of preparing the Scoping Report and the reports prepared by the specialists, the following has been considered in preparing this report:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and interested and affected parties; and
- Any information provided by the EAP to the interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

Refer to **Appendix D** for the Declaration of the EAP.

#### **15.1 AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP IN RELATION TO THE LEVEL OF AGREEMENT BETWEEN THE EAP AND INTERESTED AND AFFECTED PARTIES ON THE PLAN OF STUDY FOR UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT**

The draft Plan of Study for EIA is part of the draft Scoping Report which will be made available to I&APs and Organs of State for a 30 days review and comment period. Comments/issues raised will be addressed and included in the Issues and Response Report (**Appendix C2**). No agreement between the EAP and I&APs is in place.

#### **15.2 WHERE APPLICABLE, ANY SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

No specific information required by the authority; should it be required it will be included accordingly.

#### **15.3 ANY OTHER MATTER REQUIRED IN TERMS OF SECTION 24(4) (A) AND (B) OF THE ACT.**

This Report has been prepared in terms of NEMA, its respective 2014 EIA Regulations as well as other various Acts. Information that is required by the NEMA has been included in the Draft Scoping Report and will also be included in the EIA phase.

## **16 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS**

### **16.1 ASSUMPTIONS AND LIMITATIONS**

It is assumed that technical data supplied by the client was correct and valid at the time of compilation of specialist studies and the Draft Scoping Report. Furthermore, it is assumed that the alternatives presented by the client are feasible.

#### **16.1.1 PUBLIC PARTICIPATION PROCESS**

Given the magnitude of the project and the various extent and portions of farms in the area of which some are private and not easily accessible, it is likely that some I&APs were not reached. However, effort was made as part of the process to advertise on local media as well as placing of notices at noticeable places within the communities.

#### **16.1.2 LITERATURE REVIEWS IS VIEWED AS CORRECT**

The compilation of the reports was based on various literature reviews and specialist input which were viewed as correct at the time. However, it is acknowledged that there might be some gaps in knowledge with regards to the literature reviewed although concerted efforts were made to attain as much information as possible.

#### **16.1.3 HERITAGE STUDY**

It is possible that the Phase 1 HIA may have missed heritage resources in the project area, as some heritage structures may lie below the surface and may only be exposed once development commence.

#### **16.1.4 VEGETATION ASSESSMENT**

There is a key difference between the approach of the ecological consultant and that of the ecological researcher. In consultancy, judgements must be made and advice provided that is based on the best available evidence, combined with collective experience and professional opinion. The available evidence may not be especially good, potentially leading to over-simplification of ecological systems and responses, and do contain a considerable deal of uncertainty.

## **17 FATAL FLAWS**

No fatal flaws or highly significant impacts were identified during the scoping phase that would necessitate substantial redesign or termination of the project. Potential negative impacts have been identified and where the impacts were detrimental to the environment, alternatives were proposed together with mitigation measures.

The main impacts are outlined below, and recommended mitigation measures and a summary of site suitability and residual impacts will further be assessed in detail during the EIA phase. Such potential impacts include the following:

- Impacts on flora and fauna;
- Impacts on Wetlands;
- Impacts on heritage and archaeology;
- Visual impact to neighbouring communities, road users and tourist
- Impact on air quality due to the Power station.
- Impact on noise;
- Climate change impact; and
- Traffic impact;

The subsequent EIA phase will provide a detailed assessment of the identified aspect, rate the significance accordingly and propose mitigation measures as applicable. Based on all the findings and assessment of impacts by the EAP, the site is feasible for the proposed development and will therefore be assessed further in the EIA phase. The No-Go option will also be assessed comprehensively taking into consideration specialist studies that have been recommended as part of the PPP.

## 18 CONCLUSION

The Draft Scoping study was undertaken in accordance with the requirements of the NEMA and the EIA Regulations as well as associated Legislations. The technical alternatives have been proposed and the primary objective was to assess the suitability of the site for the intended use as well as to assess the impacts of the proposed Tau gas-to-power facility, gas pipeline, and the transmission powerline. This report has comprehensively addressed the baseline environment which will form the backdrop of the impact assessment. Information provided has been supported by specialist studies that were undertaken and attached hereto.

## 19 REFERENCES

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- Mucina, L. & Rutherford, M.C. (2006): The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia 19*. South African National Biodiversity Institute, Pretoria.
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- Second Edition, E & FN Spon Press Landscape Institute and the Institute of Environmental Assessment and Management. (2002). Guidelines for Landscape and Visual Impact Assessment (GLVIA).
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