

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
SCOPING REPORT

PROPOSED GAS TO POWER PLANT ON A
SITE WITHIN THE RICHARDS BAY
INDUSTRIAL DEVELOPMENT ZONE,
KWAZULU-NATAL PROVINCE

NOVEMBER 2015

Prepared for:

Richards Bay Gas to Power 2 (Pty) Ltd
3 Pencarrow Crescent,
La Lucia Ridge Office Estate,
La Lucia,
4051

Prepared by:

Savannah Environmental Pty Ltd

UNIT 10, BLOCK 2
5 WOODLANDS DRIVE OFFICE PARK,
CORNER WOODLANDS DRIVE & WESTERN
SERVICE ROAD, WOODMEAD, GAUTENG
PO BOX 148, SUNNINGHILL, 2157
TEL: +27 (0)11 656 3237
FAX: +27 (0)86 684 0547
E-MAIL: INFO@SAVANNAHSA.COM
WWW.SAVANNAHSA.COM



PROJECT DETAILS

- Title** : Environmental Impact Assessment Process
Draft Scoping Report: Proposed gas to power plant on a site within the Richards Bay Industrial Development Zone, KwaZulu-Natal Province
- Authors** : Savannah Environmental (Pty) Ltd
Jo-Anne Thomas
Candice Hunter
Thalita Botha
Gabriele Wood
- Client** : Richards Bay Gas Power 2 (Pty) Ltd
- Report Status** : Draft Environmental Impact Assessment Report for public review

When used as a reference this report should be cited as: Savannah Environmental (2015) Draft Scoping Report: Proposed gas to power plant on a site within the Richards Bay Industrial Development Zone, KwaZulu-Natal Province

COPYRIGHT RESERVED

This technical report has been produced for Richards Bay Gas Power 2 (Pty) Ltd. The intellectual property contained in this report remains vested in Savannah Environmental. No part of the report may be reproduced in any manner without written permission from Savannah Environmental (Pty) Ltd or Richards Bay Gas Power 2 (Pty) Ltd

PURPOSE OF THE SCOPING REPORT

Richards Bay Gas Power 2 (Pty) Ltd, an Independent Power Producer (IPP), is proposing the establishment of a gas to power plant and associated infrastructure on a site located within the Richards Bay Industrial Development Zone 1F, located within the Umthlathuze Municipality, Kwazulu-Natal Province. The power station will have a capacity of up to 300MW. This project is to be developed in response to the Department of Energy's request for projects to be developed by Independent Power Producers in order to provide alternative power generation technologies as part of the technology mix for the country.

As the project has the potential to impact on the environment, an Environmental Impact Assessment process is required to be completed in support of an application for Environmental Authorisation prior to the commencement of construction of the project. This Draft Scoping Report describes and evaluates this proposed project and consists of the following chapters:

- » **Chapter 1** provides background to the proposed project and the environmental impact assessment process.
- » **Chapter 2** outlines the strategic legal context for the energy planning and the proposed project.
- » **Chapter 3** provides a description of the proposed project, including feasible alternatives considered.
- » **Chapter 4** outlines the process which was followed during the Scoping process.
- » **Chapter 5** describes the existing biophysical and socio-economic environment affected by the proposed project.
- » **Chapter 6** provides a description and evaluation of the potential issues and impacts associated with the proposed project.
- » **Chapter 7** presents the recommendations for further studies to be undertaken within the EIA.

The Scoping Phase of the EIA process identified potential issues associated with The Scoping Study for the proposed Gas-to-Power Plant is being undertaken in accordance with the Section 24 (5) of the National Environmental Management Act (No 107 of 1998). In terms of the EIA Regulations (2014) of GN R982, GN R983, GN R984 and GN R985, a Scoping and EIA study is required to be undertaken for the proposed project. In accordance with these Regulations, this Scoping process aims at identifying and describing potential issues associated with the proposed project, and defining the extent of studies required within the EIA phase. This was achieved through an evaluation of the proposed project involving review of previous studies undertaken for the site, desk-top specialist inputs, as well as a consultation process with the Interested and Affected Parties

(I&APs), including the decision making authority, directly impacted landowners/occupiers, adjacent landowners/occupiers, relevant organs of state departments, ward councillors and other key stakeholders. This chapter serves to outline the process which was followed during the Scoping Phase of the EIA process.

EXECUTIVE SUMMARY

Overview of the Project Overview

Approximately 90% of South African electricity comes from coal-fired power stations, with Eskom being the dominant electricity producing company generating 95% of all electricity in South Africa (as detailed in the SA Yearbook 2009/2010). The demand for electricity in South Africa has grown, on average, at more than 4% over the past few years, with a simultaneous reduction in the surplus generating capacity due to limited commissioning of new generation facilities. Although the electricity demand shows a slight negative trend over the recent past, the maximum demand, together with the greater need for maintenance of existing power plants, has put the available power supply under pressure. In spite of capacity coming on line in the near future (as a result of the commissioning of Medupi Power Station near Lephalale, and a number of renewable energy projects across the country), the electricity demand within the country is still higher than the available capacity.

The Integrated Resource Plan (IRP) 2010 developed by the Department of Energy projected that an additional capacity of up to 56 539MW of generation capacity will be required to support the country's economic development and ensure adequate reserves over the next twenty years. The required expansion is more than two times the size of the existing capacity of

the system. In order to meet this required generation capacity, the IRP includes a mix of generation technologies, including a nuclear fleet of 9.6 GW; 6.3 GW of coal; 17.8 GW of renewables; and 8.9 GW of other generation sources, including gas. Although liquefied natural gas (LNG)-fuelled combined cycle gas turbines is considered to be one of the alternative baseload power generation options in the least-cost Base Case presented in the IRP, the potential to develop these plants has been constrained by the availability of fuel and the capacity to build. Transnet is currently working with Department of Energy Independent Power Producer (IPP) office to help expedite the 3126 MW Ministerial determination for Gas IPPs. It is in response to this initiative that this project is being proposed.

In response to the need for additional electricity supply to the national grid, and the goal of Government to procure electricity from Independent Power Producers (IPPs), as detailed in the IRP 2010, Richards Bay Gas to Power 2 (Pty) Ltd is proposing the construction of a gas-fired power station. The gas to power plant and associated infrastructure is proposed to be located on erven 17455, 17443 and 17442 within the Richards Bay IDZ Zone 1F (refer to Figure 1).

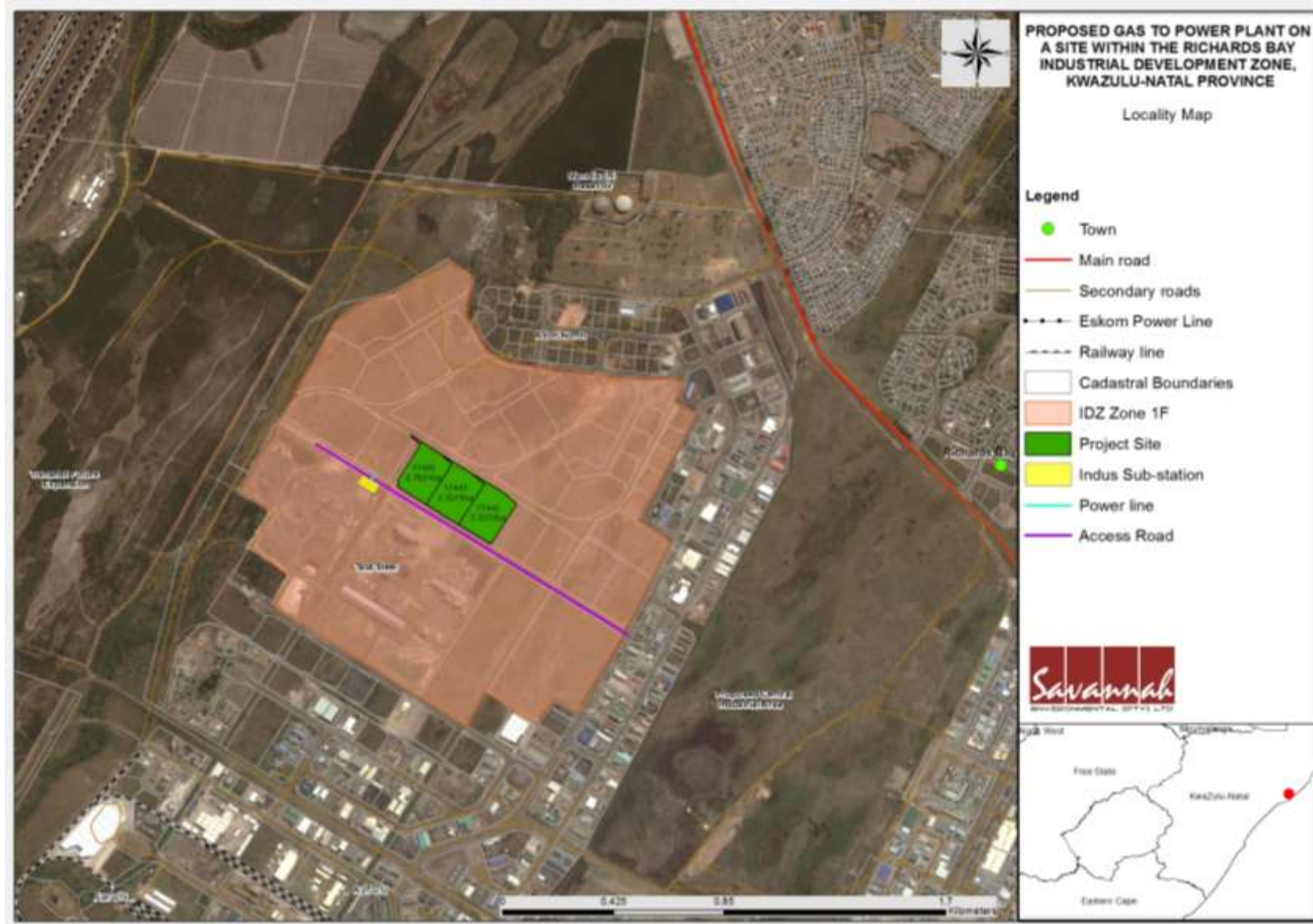


Figure 1.1: Locality map showing the proposed area for the establishment of the gas-fired power station

The facility will have a maximum capacity of 300MW, to be developed in 2 phases to operate with a wide variety of fuels, including diesel, Heavy Fuel Oil (HFO), Light Fuel Oil (LFO), Liquefied Petroleum Gas (LPG) (phase 1 of the development) and ultimately Liquid Natural Gas (LNG) or Natural Gas (phase 2 of the development).

The main infrastructure associated with the facility includes the following:

- » Various Generation technologies are being considered:
 - * Simple Cycle Gas Turbines
 - * Simple Cycle Gas Engines
 - * Combined Cycle Gas Turbines (CCGT) and 1 - 2 steam turbines utilising the heat from all the engines for power production in a steam cycle.
- » The power plant will comprise multiple engine halls, each of ~50MW. Each engine hall will typically comprise up to 6 engines. Stacks associated with engine halls will be up to 30m in height.
- » Access roads within project locality boundaries.
- » Fuel tanks (4 x 10 000m³) which will be used as an interim fuel storage facility until the gas infrastructure is constructed by Transnet. Twelve fuel unloading stations will be associated with these tanks.
- » Water storage facilities for process water and fire-fighting purposes.

- » An HV-Yard and Substation, adjacent to the power plant.
- » A new 132kV power line to connect into the Municipal grid, connecting directly to the Indus Substation bordering the site.
- » Guard house, admin building, workshops and a warehouse.

The proposed gas to power plant will utilise minimal amounts of water for the power generation process and cooling purposes. Water volumes of between 50 000m³ and 265 000m³ per annum are expected to be required for the project. Water is to be sourced from the Umhlathuze Water Works.

Environmental Impact Assessment

As the project has the potential to impact on the environment, an Environmental Impact Assessment process is required to be completed in support of an application for Environmental Authorisation prior to the commencement of construction of the project. On the basis of the listed activities relevant to the project, a Scoping and an EIA process is required to be undertaken for the proposed facilities. This process is to be undertaken in two phases as follows:

- » The Scoping Phase includes the identification and description of potential issues associated with the proposed project through a desktop study and consultation with I&APs through a public participation process. Areas of sensitivity within the study area

are identified and delineated in order to identify any environmental fatal flaws, and sensitive or no go areas. Following the review period of the Scoping report, this phase culminates in the submission of a Final Scoping Report and Plan of Study for EIA to the DEA.

- » The EIA Phase involves a detailed assessment of potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase includes detailed specialist investigations and a public participation process. Following public review period of the EIA report, this phase culminates in the submission of a Final EIA Report and an Environmental Management Programme (EMPr), including recommendations of practical and achievable mitigation and management measures, to DEA for review and decision-making.

Evaluation of the Proposed Project

Potential impacts associated with the proposed gas to power project are expected to occur during both the construction and operational phases. The majority of potential impacts identified to be associated with the construction of the project are anticipated to be localised. Impacts associated with air quality during the operational phase are expected to occur at a local, regional and potentially transboundary level.

From the scoping study undertaken, the following conclusions have been made regarding potential impacts associated with the proposed project:

- » Impacts on ecological resources, including loss of remaining patches of natural vegetation and loss of species of conservation concern, are likely to occur at the extent of the site. As a result of the largely disturbed nature of the site, it is expected that the development would not result in any irreplaceable loss of resources and the consequences of the impacts are expected to be limited. Impacts can be minimised through the implementation of appropriate mitigation measures. Overall impacts are expected to be low in significance. Due to the limited footprint of the proposed development, cumulative impacts are expected to be limited.
- » As a result of the limited agricultural potential of the site due largely to local climatic factors, the construction of the proposed projects are expected to be very unlikely to occur and will not result in the irreplaceable loss of resources. Impacts of the proposed projects on agricultural potential are expected to be of very low significance. No mitigation is required in this regard. No further studies in this regard are required.
- » There is the potential for the loss of soil resources through erosion, particularly during the construction phase. This impact

- can be effectively minimised through the implementation of appropriate mitigation measures including implementation of an appropriate stormwater management plan and regular monitoring of the occurrence, spread and potential cumulative effects of erosion. Impacts post-mitigation are expected to be of low significance.
- » The heritage resources in the area proposed for development are sufficiently recorded. The previous surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. It is therefore unlikely that impacts in this regard will occur. Should impacts occur, these would be local in extent and may result in irreplaceable loss of resources but the consequences are expected to be low. Impacts of the proposed projects on heritage resources are expected to be of very low significance. No further studies in this regard are therefore required.
 - » The facility is located more than 1000m from the closest potential noise-sensitive receptors and therefore the potential of a noise impact would be low. This is in line with point 5.4 (h) of SANS 10328:2003, that states that if industry is to be situated further than 1,000m from noise-sensitive developments the activity is unlikely to have any acoustical implications. No further studies in this regard are therefore required.
 - » There is the potential for impacts on ambient air quality to occur as a result of the proposed development, specifically during the operational phase. Impacts during construction are largely expected to be associated with dust emissions. This impact is likely to occur and is typically limited to the immediate vicinity of the proposed site, the consequences of which are expected to be limited. With appropriate mitigation such as dust suppression through a watering management program, this impact can be marginal or of low significance. Operation of the gas to power plant is expected to result in relatively low emissions to the atmosphere as a result of the fuels to be used (ultimately natural gas). Despite the benefit of relatively low emissions per unit, the combined emissions of the all combustion turbines are expected to be potentially significant. Unless adequately mitigated, these emissions have the potential to negatively impact ambient air quality. The primary concerns are potential health impacts and associated ecological impacts. Pollutant concentrations are expected to be highest in the immediate vicinity of the plant, dispersing rapidly with increasing distance from the proposed site. The nearest residential area is located more the 1.5km to the north-west of the site. There is the potential for impacts on

human health to occur. This should be confirmed through a detailed study within the EIA phase of the process. This study must also consider the cumulative impacts of other industrial developments within the Richards Bay area.

- » Impacts on the social environment are expected during both the construction and operational phases. Both positive and negative impacts are anticipated to occur. The most important potential social benefits associated with the construction and operations of the project refer to the job opportunities and possible socio-economic spin-offs created. New economic activities such as this project having the potential to assist with the developmental challenges that much of province is faced with, providing employment and skills development to local community and contributing to the social, economic and institutional development of the local area. Additional employment and associated indirect economic benefits could improve the quality of life of the local community. The main negative impacts are associated with the influx of in-migrants and intrusion impacts associated with the construction phase from the gas to power plant. The extent of the negative impacts and possible benefits would be further assessed during the EIA phase when these would be investigated in more detail.

No environmental fatal flaws or impacts of very high significance were identified to be associated with the proposed project on the identified site at this stage in the process. This conclusion must however be confirmed through a detailed investigation of the development footprint within the EIA Phase of the process.

Risks Associated with the Proposed Project

A potential risk associated with the development of the gas to power plant will be potential conflict with the land-use of the area. However, as the land is located within the identified Industrial Development Zone, and has been allocated for the purposes of the project, this conflict is considered to be negligible for this project.

The most significant risk associated with the project is the potential for increase in air quality impacts associated with the operational phase of the project. Burning natural gas produces nitrogen oxides and carbon dioxide (CO₂). Natural gas contains very little sulphur and no particulates, therefore the emissions of these pollutants are negligible. Methane (CH₄) is a primary component of natural gas and may also be emitted when natural gas is not combusted completely in the power generation process. Methane can also be emitted from leaks and losses during storage and transportation. NO₂ is a criteria air pollutant with known risks to human

health. Detailed investigation of impacts of the gas to power station on air quality will be required to be undertaken in order to confirm the significance of potential impacts and risks in terms of human health.

7.5 Recommendations

At this stage in the process, there are no environmental fatal flaws identified to be associated with the gas to power station located within the RBIDZ Phase 1F, and there is no reason for the project not to be evaluated further in a detailed EIA study. During the EIA phase more detailed environmental studies will be conducted in line with the Plan of Study contained in Chapter 8 of this report. These studies will consider the detailed layouts produced by the developer and make recommendations for the implementation of avoidance strategies (if required), mitigation and management measures to ensure that the final assessed layout retains an acceptable environmental impact.

TABLE OF CONTENTS

	PAGE
PROJECT DETAILS	I
PURPOSE OF THE SCOPING REPORT.....	II
EXECUTIVE SUMMARY	IV
TABLE OF CONTENTS	XI
CHAPTER 1: INTRODUCTION	1
1.1. PROJECT OVERVIEW.....	1
1.2. DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER AND EXPERTISE TO CONDUCT THE SCOPING AND EIA	5
CHAPTER 2: STRATEGIC CONTEXT FOR ENERGY PLANNING	6
2.1 NATIONAL POLICY AND PLANNING CONTEXT.....	6
2.1.1 <i>The National Energy Act (2008)</i>	6
2.1.2 <i>White Paper on the Energy Policy of South Africa, 1998</i>	7
2.1.3 <i>Electricity Regulation Act, 2006</i>	7
2.1.4 <i>Integrated Energy Plan</i>	8
2.1.5 <i>Integrated Resource Plan, 2010 - 2030</i>	9
2.1.6 <i>National Development Plan</i>	10
2.1.7 <i>Gas Utilisation Master Plan (GUMP)</i>	10
2.2 PROVINCIAL POLICY AND PLANNING CONTEXT	11
2.2.1 <i>KwaZulu-Natal Provincial Growth and Development Strategy (PGDS) (2011)</i>	11
2.2.2 <i>KZN Provincial Growth and Development Strategy (PGDS) 2011-2030 (Version 29.2- September 2013)</i>	12
2.2.3 <i>KZN Department of Economic Development and Tourism Strategic Plan 2013/14- 2017/18</i>	12
2.2.4 <i>KwaZulu Natal Provincial Spatial Development Framework (PSDF)</i> 13	
2.2.5 <i>KwaZulu Natal Climate Change Response and Sustainable Development Plan</i>	14
2.3 LOCAL POLICY AND PLANNING CONTEXT	15
2.3.1 <i>uThungulu District Municipality (UDM) Integrated Development Plan (IDP) (2012/2013-2014/2015)</i>	15
2.3.2 <i>uThungulu District Municipality (UDM) Spatial Development Framework (SDF) (2012)</i>	16
2.3.3 <i>uMhlathuze Local Municipality (ULM) Integrated Development Plan (IDP) (2012-2017)</i>	18
2.3.4 <i>uMhlathuze Spatial Development Framework (2007)</i>	20
2.3.5 <i>Environmental Management Framework (EMF) Report for Richards Bay Port Expansion Area and Industrial Development Zone (IDZ) (2011)</i>	21

2.4. CONCLUSION	23
CHAPTER 3: SCOPE OF THE PROPOSED PROJECT	24
3.1. NEED AND DESIRABILITY FOR THE PROPOSED GAS TO POWER STATION	24
3.2. DESCRIPTION OF THE PROPOSED PROJECT.....	25
3.3. PROJECT ALTERNATIVES	27
3.3.1. <i>Site Alternatives</i>	27
3.3.2. <i>Cooling Technology Alternatives</i>	29
3.3.3. <i>The 'Do-Nothing' Alternative</i>	30
3.4. GAS-TO-POWER GENERATION TECHNOLOGY	30
3.5. LIFE-CYCLE PHASES OF THE PROPOSED POWER PLANT	33
3.5.1. <i>Construction of a Gas-to Power Plant</i>	33
3.5.2. <i>Operation of a Gas-to Power Plant</i>	34
3.5.3. <i>Decommissioning of a Gas-to Power Plant</i>	34
CHAPTER 4: APPROACH TO UNDERTAKING THE SCOPING PHASE	35
4.1. RELEVANT LISTED ACTIVITIES	35
4.2. OBJECTIVES OF THE SCOPING PHASE.....	37
4.3. OVERVIEW OF THE SCOPING PHASE	38
4.3.1. <i>Authority Consultation and Application for Authorisation in terms of GNR982 of 2014</i>	39
4.3.2. <i>Public Participation Process</i>	39
4.4. REVIEW OF THE SCOPING REPORT AND PUBLIC MEETING.....	44
4.4.1. <i>Identification and Evaluation of Issues</i>	44
4.4.2. <i>Finalisation of the Scoping Report</i>	45
4.5. REGULATORY AND LEGAL CONTEXT	45
4.5.1. <i>Regulatory Hierarchy</i>	45
4.5.2. <i>Legislation and Guidelines that have informed the preparation of this Scoping Report</i>	46
4.6. ASSUMPTIONS AND LIMITATIONS OF THE EIA	53
CHAPTER 5: DESCRIPTION OF THE RECEIVING ENVIRONMENT	54
5.1. REGIONAL SETTING: LOCATION OF THE STUDY AREA	54
5.2. CLIMATIC CONDITIONS	56
5.3. BIOPHYSICAL CHARACTERISTICS OF THE STUDY AREA	56
5.3.1. <i>Topography and Hydrology</i>	56
5.3.2. <i>Soil types</i>	57
5.3.3. <i>Agricultural Potential</i>	57
5.3.4. <i>Ecological Profile</i>	58
5.4. AIR QUALITY	60
5.5. HERITAGE FEATURES OF THE REGION	62
5.5.1. <i>Heritage and archaeology</i>	62
5.5.2. <i>Palaeontology (Fossils)</i>	62
5.6. SOCIAL CHARACTERISTICS OF THE SITE AND SURROUNDING AREAS.....	64

CHAPTER 6: SCOPING OF ISSUES ASSOCIATED WITH THE GAS TO POWER PLANT 66

6.1. METHODOLOGY FOR IMPACT AND RISK ASSESSMENT DURING THE SCOPING PHASE .. 67
6.2. DESCRIPTION AND EVALUATION OF IMPACTS 68
 6.2.1. *Potential Impacts on Ecology*..... 68
 6.2.2. *Impacts on soil and agricultural potential*..... 70
 6.2.3. *Impacts on heritage resources*..... 72
 6.2.4. *Impacts on ambient noise levels*..... 72
 6.2.5. *Impacts on ambient air quality* 73
 6.2.6. *Impacts on the social environment*..... 75

CHAPTER 7: CONCLUSIONS..... 86

7.1. EVALUATION OF THE PROPOSED PROJECT 86
7.2. RISKS ASSOCIATED WITH THE PROPOSED PROJECT 88
7.3. RECOMMENDATIONS..... 89

CHAPTER 8: PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT 90

8.1. AIMS OF THE EIA PHASE 90
8.2. AUTHORITY CONSULTATION 91
8.3. ASSESSMENT OF POTENTIAL IMPACTS AND RECOMMENDATIONS REGARDING MITIGATION MEASURES..... 91
8.4. METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS..... 96
8.5. PUBLIC PARTICIPATION PROCESS 99
8.6. KEY MILESTONES OF THE PROGRAMME FOR THE EIA100

CHAPTER 9: REFERENCES 101

APPENDICES

- Appendix A:** CVs of Project Team
- Appendix B:** Public Participation Information
- Appendix C:** Heritage Screening Report
- Appendix D:** Noise Letter
- Appendix E:** Social Scoping Report

INTRODUCTION

CHAPTER 1

Richards Bay Gas Power 2 (Pty) Ltd, an Independent Power Producer (IPP), is proposing the establishment of a gas to power plant and associated infrastructure on a site located within the Richards Bay Industrial Development Zone 1F, located within the Umthlathuze Municipality, Kwazulu-Natal Province. The power station will have a capacity of up to 300MW. This project is to be developed in response to the Department of Energy's request for projects to be developed by Independent Power Producers in order to provide alternative power generation technologies as part of the technology mix for the country.

As the project has the potential to impact on the environment, an Environmental Impact Assessment process is required to be completed in support of an application for Environmental Authorisation prior to the commencement of construction of the project. This Draft Scoping Report describes and evaluates this proposed project and consists of the following chapters:

- » **Chapter 1** provides background to the proposed project and the environmental impact assessment process.
- » **Chapter 2** outlines the strategic legal context for the energy planning and the proposed project.
- » **Chapter 3** provides a description of the proposed project, including feasible alternatives considered.
- » **Chapter 4** outlines the process which was followed during the Scoping process.
- » **Chapter 5** describes the existing biophysical and socio-economic environment affected by the proposed project.
- » **Chapter 6** provides a description and evaluation of the potential issues and impacts associated with the proposed project.
- » **Chapter 7** presents the recommendations for further studies to be undertaken within the EIA.

1.1. Project Overview

Approximately 90% of South African electricity comes from coal-fired power stations, with Eskom being the dominant electricity producing company generating 95% of all electricity in South Africa (as detailed in the SA Yearbook 2009/2010). The demand for electricity in South Africa has grown, on average, at more than 4% over the past few years, with a simultaneous reduction in the surplus generating capacity due to limited commissioning of new generation facilities. Although the electricity demand shows a slight negative trend over the recent past, the maximum demand, together with the greater need for

maintenance of existing power plants, has put the available power supply under pressure. In spite of capacity coming on line in the near future (as a result of the commissioning of Medupi Power Station near Lephalale, and a number of renewable energy projects across the country), the electricity demand within the country is still higher than the available capacity.

The Integrated Resource Plan (IRP) 2010 developed by the Department of Energy projected that an additional capacity of up to 56 539MW of generation capacity will be required to support the country's economic development and ensure adequate reserves over the next twenty years. The required expansion is more than two times the size of the existing capacity of the system. In order to meet this required generation capacity, the IRP includes a mix of generation technologies, including a nuclear fleet of 9.6 GW; 6.3 GW of coal; 17.8 GW of renewables; and 8.9 GW of other generation sources, including gas. Although liquefied natural gas (LNG)-fuelled combined cycle gas turbines is considered to be one of the alternative baseload power generation options in the least-cost Base Case presented in the IRP, the potential to develop these plants has been constrained by the availability of fuel and the capacity to build. Transnet is currently working with Department of Energy Independent Power Producer (IPP) office to help expedite the 3126 MW Ministerial determination for Gas IPPs. It is in response to this initiative that this project is being proposed.

In response to the need for additional electricity supply to the national grid, and the goal of Government to procure electricity from Independent Power Producers (IPPs), as detailed in the IRP 2010, Richards Bay Gas to Power 2 (Pty) Ltd is proposing the construction of a gas-fired power station. The gas to power plant and associated infrastructure is proposed to be located on erven 17455, 17443 and 17442 within the Richards Bay IDZ Zone 1F (refer to Figure 1.1). The facility will have a maximum capacity of 300MW, to be developed in 2 phases to operate with a wide variety of fuels, including diesel, Heavy Fuel Oil (HFO), Light Fuel Oil (LFO), Liquefied Petroleum Gas (LPG) (phase 1 of the development) and ultimately Liquid Natural Gas (LNG) or Natural Gas (phase 2 of the development).

The main infrastructure associated with the facility includes the following:

- » Various Generation technologies are being considered:
 - * Simple Cycle Gas Turbines
 - * Simple Cycle Gas Engines
 - * Combined Cycle Gas Turbines (CCGT) and 1 - 2 steam turbines utilising the heat from all the engines for power production in a steam cycle.
- » The power plant will comprise multiple engine halls, each of ~50MW. Each engine hall will typically comprise up to 6 engines. Stacks associated with engine halls will be up to 30m in height.

- » Access roads within project locality boundaries.
- » Fuel tanks ($4 \times 10\,000\text{m}^3$) which will be used as an interim fuel storage facility until the gas infrastructure is constructed by Transnet. Twelve fuel unloading stations will be associated with these tanks.
- » Water storage facilities for process water and fire-fighting purposes.
- » An HV-Yard and Substation, adjacent to the power plant.
- » A new 132kV power line to connect into the Municipal grid, connecting directly to the Indus Substation bordering the site.
- » Guard house, admin building, workshops and a warehouse.

The proposed gas to power plant will utilise minimal amounts of water for the power generation process and cooling purposes. Water volumes of between $50\,000\text{m}^3$ and $265\,000\text{m}^3$ per annum are expected to be required for the project. Water is to be sourced from the Umhlathuze Water Works.

More details regarding the proposed project are included within Chapter 3 of this Report.

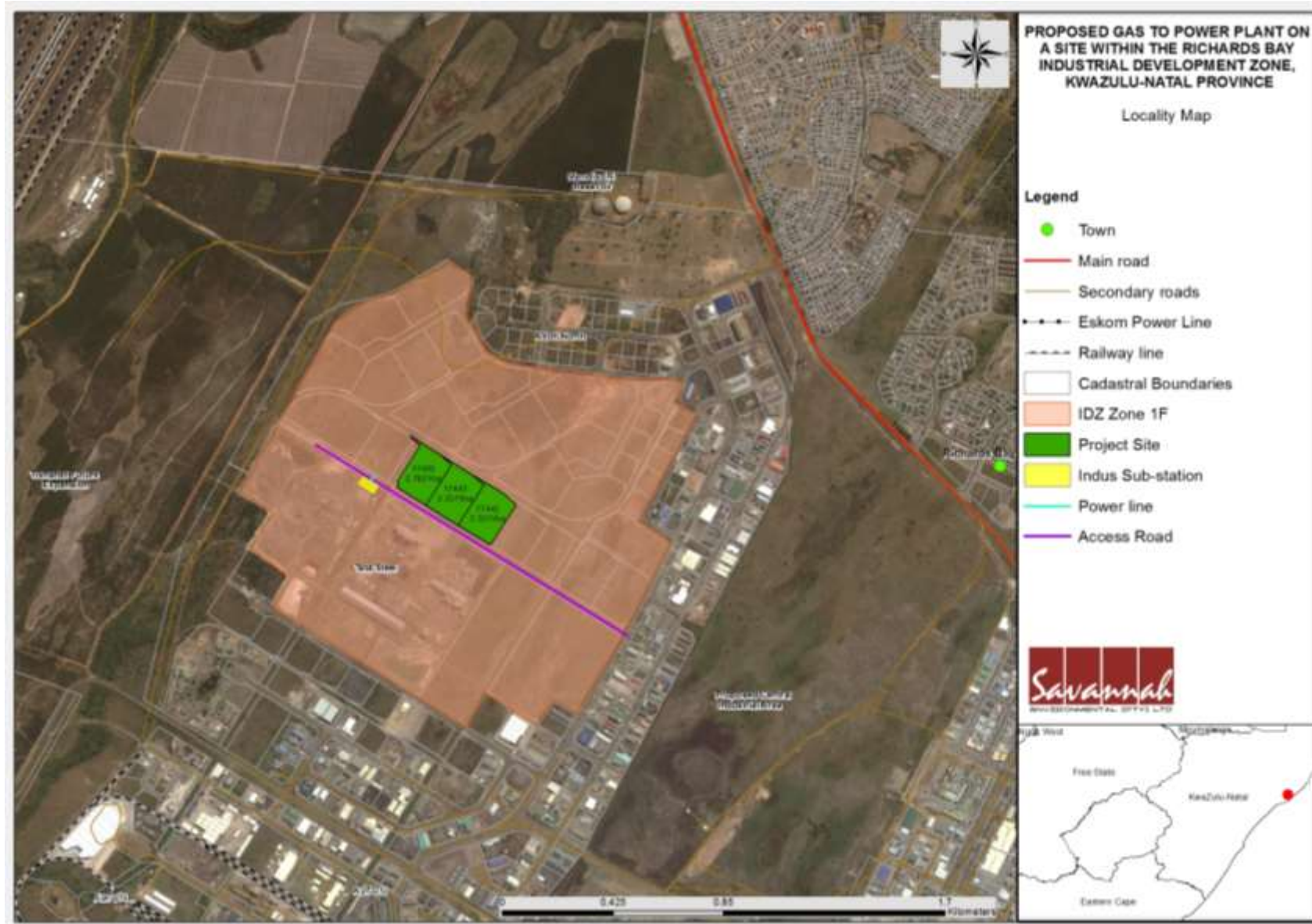


Figure 1.1: Locality map showing the proposed area for the establishment of the gas-fired power station

1.2. Details of Environmental Assessment Practitioner and Expertise to conduct the Scoping and EIA

Savannah Environmental was contracted by Richards Bay Gas to Power 2 (Pty) Ltd as an independent consultant to undertake the required Environmental Impact Assessment (EIA) for the proposed project, as required by the NEMA EIA Regulations of December 2014. Neither Savannah Environmental, nor any of its specialist sub-consultants on this project are subsidiaries of / or affiliated to Richards Bay Gas to Power 2 (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

The Savannah Environmental staff and sub-consultants have acquired considerable experience in environmental assessment and environmental management over the last 10 years, and have been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa. Strong competencies have been developed in project management of environmental EIA processes, as well as strategic environmental assessment and compliance advice, and the identification of environmental management solutions and mitigation/risk minimising measures. Savannah Environmental has successfully completed various EIAs for transmission power lines, as well as EIAs for several substations, distribution power lines and power generation projects for Eskom Holdings Limited and Independent Power Producers.

Jo-Anne Thomas, is a registered Professional Natural Scientist (in the practice of environmental science) with the South African Council for Natural Scientific Professions. She has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation and transmission projects through her involvement in related EIA processes over the past sixteen (16) years. She has successfully managed and undertaken EIA processes for electricity generation projects throughout South Africa. She is supported by Candice Hunter and Gabriele Wood from Savannah Environmental. Curricula vitae for the Savannah Environmental project team consultants are included in Appendix A. In order to adequately identify and assess potential environmental impacts as well as evaluate alternatives, Savannah Environmental has appointed several specialist consultants to conduct specialist studies, as required. Details of these specialist studies are included in Chapter 4.

STRATEGIC CONTEXT FOR ENERGY PLANNING

CHAPTER 2

2.1 National Policy and Planning Context

The need to expand electricity generation capacity in South Africa is based on national policy and informed by on-going strategic planning undertaken by the Department of Energy (DoE). The hierarchy of policy and planning documentation that support the development of renewable energy projects such as solar energy facilities is illustrated in Figure 2.1.

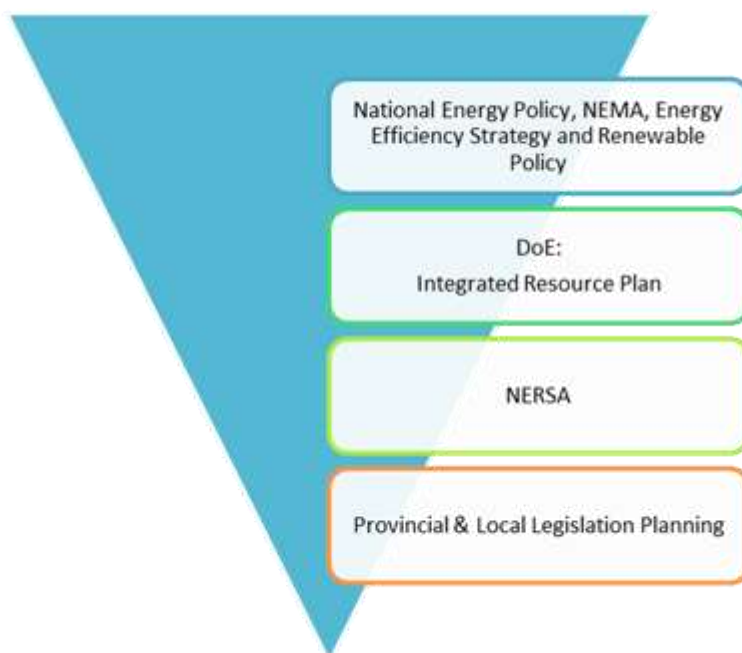


Figure 2.1: Hierarchy of electricity policy and planning documents

These policies are discussed in more detail in the following sections, along with the provincial and local policies or plans that have relevance to the proposed development.

2.1.1 The National Energy Act (2008)

The National Energy Act was promulgated in 2008 (Act No 34 of 2008). One of the objectives of the Act was to promote diversity of supply of energy and its sources. The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The Act provides the legal framework which supports the development of power generation facilities.

2.1.2 White Paper on the Energy Policy of South Africa, 1998

The South African Energy Policy, published in December 1998 by the Department of Minerals and Energy (DME) identifies five key objectives, namely:

- » Increasing access to affordable energy services;
- » Improving energy sector governance;
- » Stimulating economic development;
- » Managing energy-related environmental impacts; and
- » Securing supply through diversity.

In order to meet these objectives and the developmental and socio-economic objectives in South Africa, the country needs to optimally use the available energy resources. The South African Government is required to address what can be done to meet these electricity needs both in the short- and long-term. The White Paper identifies key objectives for energy supply, such as increasing access to affordable energy services, managing energy-related environmental impacts and securing energy supply through diversity.

The White Paper on Energy Policy (1998) promotes fuel diversification in the South Africa energy mix, and recognises natural gas as an attractive option for South Africa. It also provides the basis for the development of the Integrated Energy Plan (IEP).

2.1.3 Electricity Regulation Act, 2006

Under the National Energy Regulator Act, 2004 (Act No 40 of 2004), the Electricity Regulation Act, 2006 (Act No 4 of 2006) and all subsequent relevant Acts of Amendment, NERSA has the mandate to determine the prices at and conditions under which electricity may be supplied by licence to Independent Power Producers (IPPs). NERSA has recently awarded electricity generation licences for new generation capacity projects to renewable projects under the Renewable Energy IPP procurement (REIPPP) programme.

National Climate Change Response White Paper (2011)

South Africa's response to climate change has two objectives: 1) to effectively manage the inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity; and 2) to make fair contribution to the global efforts to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system

within a timeframe that enabled economic, social and environmental development to proceed in a sustainable manner. The paper proposes a number of approaches dealing with climate change impacts with respect to selected sectors. Energy, in this context, is considered to be one of the key sectors that provides for possible mitigations to address climate changes. In this regard the proposed development would need to take into consideration the air pollution impacts that may arise.

2.1.4 Integrated Energy Plan

The development of a national Integrated Energy Plan (IEP) was envisaged in the White Paper on Energy Policy of 1998 and the Minister of Energy, as entrenched in the National Energy Act of 2008, is mandated to develop and publish the IEP on an annual basis. The IEP takes existing policy into consideration and provides a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development.

The IEP takes into consideration the crucial role that energy plays in the entire economy of the country and is informed by the output of analyses founded on a solid fact base. It is a multi-faceted, long-term energy framework which has multiple aims, some of which include:

- » To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector.
- » To guide the selection of appropriate technologies to meet energy demand (i.e. the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels).
- » To guide investment in and the development of energy infrastructure in South Africa.
- » To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro-economic factors.

Eight key objectives for energy planning were identified:

- » Objective 1: Ensure the security of supply
- » Objective 2: Minimise the cost of energy
- » Objective 3: Increase access to energy
- » Objective 4: Diversify supply sources and primary sources of energy
- » Objective 5: Minimise emissions from the energy sector
- » Objective 6: Promote energy efficiency in the economy
- » Objective 7: Promote localisation and technology transfer and the creation of jobs
- » Objective 8: Promote the conservation of water

The IEP recognises the potential of natural gas both for power generation and direct thermal uses. It is noted that power generation remains the main driver behind gas demand growth globally and remains a key potential for South Africa. It is highlighted that South Africa has a limited gas network and that one of the challenges of introducing gas into new markets is that large, capital-intensive investment in infrastructure along the supply chain is required. Transporting gas by pipeline is relatively expensive, more so than oil, because of the additional capital-intensive equipment needed to overcome the lower energy density of gas. The construction of an LNG facility would need to be underpinned by a gas-fired power plant as a key off-taker as the most feasible solution in the short- to medium-term. This option could enable South Africa to move towards a low carbon future as natural gas has lower carbon content than coal.

2.1.5 Integrated Resource Plan, 2010 - 2030

The Integrated Resource Plan (IRP) 2010-30 was promulgated in March 2011. The primary objective of the IRP 2010 is to determine the long term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. However, the IRP 2010 also serves as input to other planning functions, *inter alia* economic development, and funding, environmental and social policy formulation. The accuracy of the IRP 2010 is to be improved by regular reviews and updates, and a draft revised Plan is currently available for public comment. The IRP 2010 projected that an additional capacity of up to 56 539MW of generation capacity will be required to support the country's economic development and ensure adequate reserves over the next twenty years. The required expansion is more than two times the size of the existing capacity of the system.

The current iteration of the Integrated Resource Plan (IRP) for South Africa, initiated by the Department of Energy (DoE) after a first round of public participation in June 2010, led to the Revised Balanced Scenario (RBS) that was published in October 2010. The document outlines the proposed generation new build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on the cost-optimal solution for new build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation. In addition to all existing and committed power plants, the RBS included a nuclear fleet of 9.6 GW; 6.3 GW of coal; 17.8 GW of renewables; and **8.9 GW of other generation sources (including gas)**. This means that 75% of new generation capacity by 2030 will be derived from energy sources other than coal.

2.1.6 National Development Plan

The National Development Plan (NDP, 2012) aims to eliminate poverty and reduce inequality by 2030. Infrastructure is a key priority of the NDP, which identifies the need for South Africa to invest in a strong network of economic infrastructure to support the country's medium- and long-term economic and social objectives. The NDP has been approved and adopted by government and has received strong endorsement from broader society.

The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation: coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources – especially wind, solar and imported hydroelectricity – will play a much larger role. The development of gas is identified in a number of areas of the NDP as a priority, including:

- The development of policies and plans for the exploration of gas as an alternative to coal.
- The investigation and development of various gas supply options as an alternative to coal for power generation in order to help reduce South Africa's greenhouse gas emissions.
- The consideration of the use of gas as an alternative to nuclear power. Gas could provide a reliable base-load and mid-merit power generation through combined-cycle gas turbines.
- The construction of infrastructure to import liquefied natural gas and increasing exploration to find domestic gas feedstock (including investigating shale and coal bed methane reserves) to diversify the energy mix and reduce carbon emissions.

2.1.7 Gas Utilisation Master Plan (GUMP)

In 2012, the Minister of Energy directed in her determinations that new generation capacity 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 3 126MW 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 (<https://www.ipp-gas.co.za/Home/About>).

Power generation utilising natural gas currently comprises only 3% of the total energy mix (Michael-Fichardt, Department of Energy, 2014). South Africa has three options for increasing its natural gas share in its primary energy mix:

1. Increase imports through pipelines from neighbouring countries;
2. Import Liquefied Natural Gas (LNG) via tankers and yet-to-be-built LNG landing terminals; and
3. Own domestic gas, either conventional or unconventional

The Department of Energy is currently developing a Gas Utilisation Master Plan in order to give guidance on how these different options could be developed in the next decades. The GUMP is a 30-year plan for the development of the South African gas industry and has been developed in parallel to the Gas-to-Power Procurement Programme. The GUMP includes an analysis of demand; supply; current infrastructure; market structure and organisation; and social, economic and environmental risks and considerations.

2.2 Provincial Policy and Planning Context

2.2.1. KwaZulu-Natal Provincial Growth and Development Strategy (PGDS) (2011)

The KwaZulu-Natal (KZN) Province has revised the development vision as outlined in the recently introduced Provincial Growth and Development Strategy (PGDS). The PGDS is a primary strategy for KZN that drives growth and development in the province to 2030. It provides the province with a rational strategic framework for accelerated and shared economic growth through catalytic and developmental interventions, within a coherent equitable spatial development architecture, putting people first, particularly the poor and vulnerable, and building sustainable communities, livelihoods and living environments (PGDS, 2011). Associated attention is also given to the provision of infrastructure and services, restoring the natural resources, public sector leadership, delivery and accountability, ensuring that these changes are responded to with resilience, innovation and adaptability. In terms of spatial planning, the PGDS advocates the following: Achieve sustainability; Address climate change; Ensure place-making; Ensure environmental protection and enhancement; Achieve economic development; Address service delivery – infrastructure, transport, energy, utilities and flood management; development of specific Corridor Plans to co-ordinate interventions around provincial corridors; Continuation of the Small Town Regeneration and Rehabilitation Programme, and; Formalisation of Strategic Rural Nodes.

As the proposed development is in line with achieving sustainability and contributing to economic development, it is considered that it will contribute to the overall objectives of the PGDS.

2.2.2 KZN Provincial Growth and Development Strategy (PGDS) 2011-2030 (Version 29.2- September 2013)

The Provincial Growth and Development Plan (PGDP) for KZN addresses the triple challenge of poverty, inequality and unemployment. The KZN provincial government's vision is for the province to maximize its position as a gateway to South and Southern Africa, as well as its human and natural resources to create a safe, healthy and sustainable environment by 2030; eliminating poverty, inequality, unemployment and the current disease burden in the province. Through the seven strategic goals the KZN PGDS aims to achieve its vision by 2030, including:

- 1) Job creation (expanded and sustained economic output is the fundamental driver for job creation)
- 2) Human resource development (the human resource capacity of KZN is relevant and responsive to the growth and development needs of the province)
- 3) Human and community development (reduce poverty and inequality in KZN)
- 4) Strategic infrastructure (strategic infrastructure provides for social and economic growth and development needs of KZN)
- 5) Environmental sustainability (reduce global greenhouse gas emissions and create social-ecological capacity to adapt to climate change)
- 6) Governance and policy (effective and efficient government systems)
- 7) Spatial equity (increased spatial access to goods and services)

The proposed development will result in the creation of job opportunities, human resource development, and strategic infrastructure for social and economic growth which will contribute towards reducing poverty and inequality in KZN. This development will therefore assist the province in achieving the aims of the PGDS to some extent.

2.2.3. KZN Department of Economic Development and Tourism Strategic Plan 2013/14- 2017/18

The strategic focus for the KZN DEDT during the 2013/14 – 2017/18 planning period will be building a resilient KZN provincial economy that can respond to global factors, stimulating provincial economic development, alignment of functions and purpose of all economic development entities as well as building a vibrant organisation. The vision of the strategic plan is 'leading the attainment of inclusive growth for job creation and economic sustenance.' The mission of the

strategic plan is to 1) develop and implement strategies that drive economic growth; 2) be a catalyst for economic transformation and development; 3) provide leadership and facilitate integrated economic planning and development; and 4) create a favourable environment for investment. The main objectives of the strategy that relate to the proposed project are as follows:

- » To facilitate creation of new markets;
- » To drive growth of the KZN provincial economy;
- » To enhance sector and industrial development through Trade, Investment and Exports Logistics, ICT, Manufacturing, Green economy, agri-business, Tourism, Creative Industries, Maritime, Aerotropolis, Aviation;
- » To investigate and develop viable alternative energy generation options.

The proposed development will drive economic growth, infrastructural transformation and development and the area is seen as a favourable area for investment and development.

2.2.4. KwaZulu Natal Provincial Spatial Development Framework (PSDF)

The KZN Provincial Spatial Development Strategy has been developed in order to achieve the goals and objectives of the PGDS in a targeted and spatial co-ordinated manner. Spatially, it is vital to consider general accessibility as a cross-cutting variable which impacts all three pillars of sustainable development and as a result the four main spatial variables informing the provincial spatial development framework include:

- » *Environmental Sensitivity:* According to the environmental constraints map, the study area is located in an area that's been transformed and is not located in any Biodiversity Priority areas
- » *Economic Potential:* Key economic sectors include Agriculture, Industry, Tourism and Service Sector. The current general distribution of high potential agricultural land has the potential to increase its contribution to the provincial economy. The potential for industrial development in the province is anchored by the nodes of eThekweni and uMhlatuze. The primary tourism potential within the province is in the beach tourism cultural tourism and eco-tourism markets. The areas of national tourism importance within the province are the Southern Zululand and Dolphin Coast, the Elephant Coast and surrounds, the greater Pietermaritzburg and Durban region, and the Drakensberg region. The service sector is the largest sector in the provincial economy, contributing 52.8% to GGP. Based on all the key economic sectors, the economic potential in the study area is medium-high.
- » *Social Need:* uMhlatuze was identified as one of the core areas where concentrated high densities of more than 451 persons per square kilometre

were recorded. The ULM was not indicated as one of the Local Municipalities with notable concentrations of significantly high dependency ratios. The Social Needs composite map demonstrates that the study area where the proposed site is located has low social needs.

- » *Urban Accessibility:* The areas where limited urban accessibility occurred were classified as areas with a high need for intervention as regional accessibility is viewed as the first step towards spatial integration of these marginalised areas into the provincial economy. The study area has significant urban accessibility.

The PSDF spatial variables were considered collectively and a ranking order to key elements used to formulate a composite Provincial Spatial Development Framework which identifies Broad Provincial Spatial Planning Categories such as:

- » Conservation Corridors
- » Biodiversity Priority Areas
- » Areas of Economic Value adding
- » Areas of Economic support
- » Areas of Agricultural Development
- » Areas of High Social Need
- » Mandated Service Delivery Areas

The study area is located within the Areas of Economic Value Adding and Areas of Economic Support. Areas of Economic Value Adding is the key economic centres and areas where all of the variety of economic sectors (Agriculture, Tourism, Manufacturing, Services) are prevalent and perceived to have good potential to be further expanded on. These areas are visibly linked to high accessibility areas with existing bulk infrastructure and relatively high population densities which would both contribute to the economic expansion and benefit from interventions in these areas. Due to these factors, further economic processing and value adding at a provincial level, are mainly proposed within these identified areas. Areas of Economic Support resemble a region of good economic potential in more than just one of the key provincial economic sectors. Typical interventions in these areas would include economic prioritisation of development, labour force interventions (e.g. skills development), key economic infrastructure investment and area promotion. The proposed development will contribute towards economic value, economic support and economic growth in the area.

2.2.5. KwaZulu Natal Climate Change Response and Sustainable Development Plan

In September 2012, the KwaZulu-Natal Provincial Government became the first provincial government to establish a Climate Change and Sustainable

Development Council, which boosts multi-stakeholder membership (<http://www.theclimategroup.org/who-we-are/our-members/the-province-of-kwazulu-natal>). The Council has set up three Working Groups, namely Policy and Regulatory Alignment Working Group; Adaptation and Mitigation Working Group and Renewable Energy Working Group.

The province is in the early stages of developing the Climate Change Response and Sustainable Development Plan which is guided by, among others, the national strategy and the KwaZulu-Natal Growth and Development Strategy which has among its goals environmental sustainability as well as:

- » Provision of 100% energy access in KZN Province by 2030, i.e., an additional 600,000 households or some 3 million people.
- » Implementation of a number of significant renewable energy and energy efficiency projects.
- » Establishment of renewable energy manufacturing hubs, a localisation initiative.

2.3 Local Policy and Planning Context

The strategic policies at the district and local level have similar objectives for the respective areas, namely to accelerate economic growth, create jobs, uplift communities and alleviate poverty. The proposed development is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

2.3.1. uThungulu District Municipality (UDM) Integrated Development Plan (IDP) (2012/2013-2014/2015)

The vision for uThungulu was developed within the context of the international, national and provincial environment. The vision of the UDM is as follows: "An economically viable district with effective infrastructure that supports job creation through economic growth, rural development and promoting of our heritage." The mission of uThungulu District Municipality is to create a prosperous district through:

- » Rural development, agrarian reform and food security,
- » Creating economic growth and decent job opportunities,
- » Fighting crime and corruption,
- » Promoting quality education for all,
- » Improving the quality of health,
- » Community participation, nation building and good governance

The UDM core values include integrity, transparency, commitment, co-operation, innovation and accountability. The uThungulu District Municipality goals include:

- » Municipal Transformation and Institutional Development
- » Basic Service Delivery and Infrastructure Development (one of the objectives is to facilitate renewable energy programmes)
- » Local Economic Development (Objectives: promote job creation, capacitate SMMEs and local entrepreneurs)
- » Municipal Financial Viability and Management
- » Cross cutting

The district with the support of its social partners like COGTA is currently implementing innovative renewable and clean energy projects. The most notable projects in UDM are the Biogas and Wonderpot projects. Funding for these projects has been secured from COGTA and efforts to secure more funding will be intensified due to the success of the pilot projects.

Local Economic Development opportunities that will promote job creation are one of the key strategic objectives of the district municipality. In terms of infrastructure development one of the objectives is to facilitate renewable energy programmes. The proposed development will provide green energy opportunities for the area as well stimulate local economic growth through job creations, diversifying the local industry and skills development which is in line with the IDP.

2.3.2. uThungulu District Municipality (UDM) Spatial Development Framework (SDF) (2012)

According to the 2010 Global Insight Statistics, it is noted that the vast majority of economic performance (41.8%) in the district is vested in uMhlathuze Local Municipality with its primary urban centres being Richards Bay and Empangeni. This area is the third most important in the province of KZN in terms of economic production and contributes 9.1% of the total GGP1 and 8.5% of the total employment (formal and informal) in 2010. The uMhlathuze Municipality, although it has the smallest comparative size, accounts for nearly half of the population of the uThungulu District. The most significant population growth is noted in the uMhlathuze and Mthonjaneni Local Municipalities. A large and growing population will necessarily place increased pressure on the provision of infrastructure, i.e. water, sanitation, electricity and housing. Apart from engineering infrastructure, pressures will also increase for the provision of social infrastructure and economic development will have to be fostered to ensure households and individuals become and remain self-sufficient. Such a large population does also present an opportunity of development in the form of a large

potential work force that has the ability to create and support economic opportunities.

Richards Bay, Msunduzi, Newcastle and Port Shepstone has been identified as provincial Secondary Nodes and thus urban centres with good existing economic development and the potential for growth and services to the regional economy. Key strategic interventions specifically targeted at these nodes include:

- » Primary Economic Growth Area
- » Priority Socio-Economic Development Spending
- » Promote as Primary Node in support of Corridor Development
- » Promote Compact Urban Development & Combat Urban Sprawl
- » Promote Focused Investment & Managed Growth
- » Promote Densification (Brown Agenda) and Infill Development
- » Provide Economies of Scale for Effective & Affordable Service Delivery
- » Infill where High Levels of Services are Available (Restructuring Nodes)
- » Increased Residential Density (number of dwellings)
- » Promote provision of sufficient Bulk Infrastructure Services (Demand & Supply)
- » Priority spending on Infrastructural Upgrading Needs (New & Maintain)
- » Promote Effective & Efficient Public Transportation Systems linked to Multi Modal Facilities
- » Single Land Use Management System (Township Formalization)

The SDF states that a major economic sector is manufacturing which is located in Richards Bay. It is important to continue enforcing investor confidence through the provision of infrastructure. Also states the need to encourage alternative energy use in future developments given constraints in the electrification industry is critical. The uThungulu Environmental Concerns include, air pollution, loss of valuable agricultural land for food production and loss of biodiversity.

The SDF states the need to encourage alternative energy use in future developments given constraints in the electrification industry is critical; the proposed development will provide an alternative energy source for the national grid and contribute towards diversifying the local industry. Currently the district has a large and growing population that places increased pressure on the provision of infrastructure and services. It is therefore important that the majority of the labour for the project be sourced from within the local area as bringing in a non-local work force could further strain the existing infrastructure and services. Richards Bay has been identified as provincial Secondary Nodes and thus urban centres with good existing economic development and the potential for growth and services to the regional economy. The proposed

development is located within the secondary node in Richards Bay and would contribute towards economic growth and alternative energy supply.

2.3.3. uMhlathuze Local Municipality (ULM) Integrated Development Plan (IDP) (2012-2017)

The ULM provides a reference point and essential socio- economic amenities and facilities to most of the towns in the northern region. Challenges facing the municipality include economic recovery placing huge strain on the municipality financial sustainability and the attraction of economic investment in the town, as well as rural development, employment, affordable housing, and maintenance of infrastructure and health issues. The Local government has the following objectives:

- » Provide democratic and accountable government;
- » Provision of Services to the community in a sustainable manner;
- » Promote Social and Economic Development;
- » Promote safe and healthy environment; and
- » Encourage the involvement

Priority needs for budget purposes in the local municipality include the upgrade of rural roads, poverty/ job creation, housing, crime, provision of electricity, sanitation and water. The following key issues were identified within the situational analysis:

- » Sustainable financial management: new approaches to risk and growth need to be created to sustain financial stability.
- » Cash Flow Management
- » Low levels of skills development and literacy
- » Limited access to basic household and community services
- » High rates of unemployment and low economic growth
- » High levels of poverty
- » Limited access to basic household and community services
- » Unsustainable development practices: The Municipality faces a challenge of reacting to urban sprawl, which, in turn, results in increased informal settlement, overcrowded schools, ill health, marked spatial disparities, higher cost of providing infrastructure and services, disturbed ecosystems and environmental resources, changes in air quality, change in aesthetics and urban form, as well as loss of land for economic and agricultural services (ULM IDP, 2012-2017).
- » Ensuring adequate energy and water supply: The unsustainable use of resources such as energy and water has major impacts on the environment, and will ultimately compromise the Municipality's energy security, as well as

its ability to deliver water of adequate quality and quantity to its citizens. . In the case of water, whole catchment management (including areas that fall outside of the municipal area) as well as efficient nature conservation programmes will help to ensure that there is an adequate supply of clean water. The most sustainable solution to the energy crisis is to reduce the demand for energy and at the same time investigate alternative renewable energy sources.

- » High levels of crime and risk
- » Increased incidents of HIV/AIDS and communicable diseases
- » Infrastructure degradation: Degradation has become a critical social problem. It is therefore critical that the Municipality works towards managing its assets, work towards mitigating climate change, ensure life cycle management of infrastructure, thus ensuring value for money.
- » Climate Change: Escalating greenhouse gas emissions contribute towards climate change and will ultimately impact on human health, food security, natural resources, sea level rise, land loss and coastal infrastructure. As such climate change runs the risk of undoing all of the development gains of the last one and a half decades, and for a city such as Durban climate change adaptation in all sectors will have to become one of the Municipality's top development priorities.

The vision of the uMhlathuze Local Municipality is 'offering improved quality of life for all its citizens through sustainable development.' The uMhlathuze's development strategies include the following:

- » Development strategy 1: Good governance
- » Development strategy 2: Infrastructure and services provision
- » Development Strategy 3: Social and economic development (Objectives: to create opportunities through economic growth and development to increase economic stability by creating new functional linkages with other economic activities through enhancing a prudent and efficient use of social and economic infrastructure to meet future demands. To promote social cohesion and the creation of a safe and healthy living environment)
- » Development Strategy 4: Institutional Development
- » Development Strategy 5: Sound Financial Management

Key issues of the ULM include climate change, low levels of skills development and literacy, high rates of unemployment, low economic growth and high levels of poverty. The proposed development will contribute towards local economic development and job creation, therefore marginally reducing the unemployment rate/ poverty level during the temporary construction phase as well as during the operation phase of the proposed project. It will contribute towards economic

development in the local municipality which will in turn support economic growth and provide employment opportunities which is in line with strategy 3 of the IDP.

2.3.4. uMhlathuze Spatial Development Framework (2007)

As part of the SDF, four (4) spatial development goals were identified. These include:

- » Promote Sustainable urban Development
- » Environmental management and Conservation
- » Promote Economic Development (Permitting and encouraging diverse land uses at appropriate locations to develop the economy. Boosting those economic sectors/activities that have the potential to grow and create employment and income.)
- » Provision of a minimum Level of Service (LOS) to all (New developments should, as far as possible, be serviced by existing infrastructure networks. Indicate where infrastructure investment is needed to provide minimum levels of services.)

The following elements that have a significant impact on the spatial development include:

- » Proposed expansion of the Richards Bay Port - the proposed expansion of the Richards Bay Port is driven by external forces. The implementation of the Port Expansion proposals has a significant implication on the spatial form and structuring of the municipal area.
- » Air Quality - dangerous emissions in the Richards Bay area (taking into account anticipated emissions from TATA Steel and Pulp Unite) cannot continue to increase. Based on current emissions, the air has virtually reached its limit. Significant portions of Richards Bay fall within a health risk area.
- » Environmental conservation and linkage zones.
- » Geotechnical stability.
- » Availability of Bulk Infrastructure.
- » Access to land.

One of the main outcomes of the uMhlathuze SDF is the identification of potential expansion areas. Also, the SDF considers a number of growth scenarios for the municipal area based on recorded growth over the last few years. The proposed development falls in line with the spatial development goals as the development will contribute towards sustainable urban development as well as it will promote economic development.

2.3.5. Environmental Management Framework (EMF) Report for Richards Bay Port Expansion Area and Industrial Development Zone (IDZ) (2011)

The Environmental Management Framework (EMF) was prepared for an area of about 25 000 hectares within the City of uMhlatuze informed mainly by the Port of Richards Bay (and its proposed expansion) as well as the then IDZ area to guide decision making in the area. The EMF essentially identified a number of Environmental Management Zones. Eight such zones were identified and a ninth zone was created as an overlay to address issues of conflicting and long-term land use proposals. The following environmental management zones were identified during the process:

- » Zone 1 Lakes and Corridors
- » Zone 2: Floodplain
- » Zone 3: Port, Estuary, Marine and Seashore Area
- » Zone 4: Dune Cordon
- » Zone 5: Coastal Plain Residential Area
- » Zone 6: Coastal Plan Subsistence Farming Area
- » Zone 7: Coastal Plain Commercial-Industrial Area
- » Zone 8: External Linkages
- » Zone 9: Strategic Development Management Overlay Zone

The proposed development is located within the RBIDZ Zone 1F. Phase 1F of the IDZ falls within the Coastal Plain Commercial-Industrial Area Zone (Zone 7 of the EMF). Zone 7 represents fairly flat land on the sandy coastal plain. It is used primarily for light and heavy industrial purposes, business and commerce, and forms the economic hub of the municipality. The EMF Zone 7 objective is 'To promote sustainable commercial and industrial development that is able to secure ecosystem productivity over the long-term.'

- » Environmental management priorities in Zone 7:
 1. Use of space
 2. Critical ecological assets and linkages (grasslands and wetlands)
 3. Integrated water resources management (alternative supply options, demand side measures, water quality, storm water management)
 4. Sustainable consumption and production patterns (energy, air quality, waste management)
 5. Industrial and commercial development
 6. Port expansion potential
 7. Integrated industrial development planning
 8. Institutional arrangements for achieving conservation priorities
 9. Landscape risks

10. Climate change

- » Activities encouraged in Zone 7:
 - * Industrial development that is directly related to and/or dependent on the port.
 - * Activities such as techno-park industries (e.g. electronic components and assembly plants).
 - * Energy-saving industries, such as solar water heater manufacturing.
 - * Labour-intensive activities.
 - * Development that promotes local entrepreneurship.
- » Activities discouraged in Zone 7:
 - Large manufacturing facilities which may aggravate the air quality situation.
 - Resource intensive primary industries such as refineries and smelters.
 - Encroachment into open spaces.
 - Groundwater abstraction.

The land in Phase 1F is largely transformed. Tata Steel is located in this zone. Constraints for development include wetland and ecological linkages, water and air quality, and uncertainty about long-term energy and water supply. Opportunities exist to develop the area as long as the EMF guidelines are followed. The EMF must be therefore consulted when decisions are made.

- » Activities encouraged in phase 1F:
 - * Manufacturing activities that create backward linkages, such as assembling for electronic components and automotive parts.
 - * Activities like chemical storage and blending.
 - * IDZ enterprises that will advance the objectives of the EMF.
- » Activities discouraged in phase 1F:
 - * Encroachment of development into conservation amenity areas.
 - * Large industrial activities such as refineries, smelters, pulp and paper mills.
 - * Industries that demand large quantities of water.
 - * Activities with high energy demand.

Conservation priorities of wetlands and ecological linkages in Phase 1F must be protected, maintained and managed as a contribution to the management of water quality by:

- » Discouraging encroachment of development into and/or near wetlands.
- » Delineating appropriate ecological buffers in accordance with the land development types.

- » Discouraging reclamation or infilling of wetlands except if a no net loss policy is followed, if suitable offset receiving sites can be identified and if appropriate arrangement could be made to manage and monitor such arrangements.
- » Preventing the illegal dumping of waste into water features and storm water gutters.
- » Ensuring that activities which pose a risk of water contamination employ appropriate design measures to avoid and minimise this risk.

In terms of consumption and production there is severe air quality constraints associated with phase 1F. There are also uncertainties in respect of sustainable supply of water and energy, and the area's waste infrastructure in general is unable to accommodate potential future waste streams. Any development in Phase 1F must take cognisance of the air quality constraints and the potential impact and consequences development may have on the health of adjacent communities. Development in this zone must also take cognisance of the prevailing water demand and the integrated water resources management approach of the study area, and ensure that appropriate demand side management measures is implemented. The same applies to the energy constraints that currently prevail in the area. To ensure that land use in this area does not result in erosion and pollution appropriate storm water management is critical. Appropriate development must be promoted in this Phase to protect atmospheric integrity and air quality and to ensure sustainable consumption and production patterns.

Development priorities: The land in Phase 1F is zoned as general industrial. The 2005 IDZ Designation Notice promoted the area for "a Ferro-Metals Cluster as well as RHI Refractories". The Tata Steel Ferrochrome Smelter was subsequently established in this phase. There is still space to advance industrial development but the prevailing environmental constraints on these sites may limit the extent to which this potential could be realised. The IDZ objectives must be promoted in this phase but this must take cognisance of the environmental constraints outlined above.

2.4. Conclusion

The findings of the review of the relevant policies and documents pertaining to the energy sector indicate that the gas to power plant is supported at a national, provincial, and local level, and that the proposed gas to power plant will contribute towards the various targets and policy aims.

SCOPE OF THE PROPOSED PROJECT

CHAPTER 3

The power station components and infrastructure presented in this chapter are indicative at this stage and aimed at enabling the reader to obtain an understanding of the proposed project.

3.1. Need and Desirability for the Proposed Gas to Power Station

Approximately 90% (NDP, 2011) of South African electricity comes from coal-fired power stations, with Eskom being the dominant electricity producing company generating 95% of all electricity in South Africa (SA Yearbook 2009/2010). The demand for electricity in South Africa has grown, on average, at more than 4% over the past few years, with a simultaneous reduction in the surplus generating capacity due to limited commissioning of new generation facilities. Although the electricity demand shows a slight negative trend over the recent past, the maximum demand, together with the greater need for maintenance of existing power plants, has put the available power supply under pressure. In spite of capacity coming on line in the near future (as a result of the commissioning of Medupi Power Station near Lephalale, and a number of renewable energy projects across the country), the electricity demand within the country is still higher than the available capacity.

The Integrated Resource Plan (IRP) 2010 developed by the Department of Energy projected that an additional capacity of up to 56 539MW of generation capacity will be required to support the country's economic development and ensure adequate reserves over the next twenty years. The required expansion is more than two times the size of the existing capacity of the system. In order to meet this required generation capacity, the IRP includes a mix of generation technologies, including a nuclear fleet of 9.6 GW; 6.3 GW of coal; 17.8 GW of renewables; and 8.9 GW of other generation sources.

In 2012, the Minister of Energy directed in her determinations that new generation capacity 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 3 126MW of baseload and/or mid-merit energy generation capacity is needed from gas-fired power generation to contribute towards energy security. Transnet is currently working with Department of Energy's Independent Power Producer (IPP) office to help expedite this Ministerial determination for Gas IPPs. It is in response to this initiative that this project is being proposed.

In addition, the proposed project is considered desirable in terms of the planning and policy aims and needs of the province and local municipality, as discussed in the previous chapter of this report.

The proposed site within the Richards Bay IDZ, and adjacent to the Tata Steel industrial complex is considered to be technically feasible by the applicant due to the proximity to the Port of Richards Bay, from where gas will be supplied, the availability of land for development and the availability of water for the operation of the power station.

3.2. Description of the Proposed Project

The project involves the construction of a gas-fired power station which will provide baseload and mid-merit power supply¹ to the electricity grid. The power station would have a capacity of up to 500 MW, to be developed in two phases to operate with a wide variety of fuels, including diesel, Heavy Fuel Oil (HFO), Light Fuel Oil (LFO), Liquefied Petroleum Gas (LPG) (phase 1 of the development) and ultimately Liquefied Natural Gas (LNG)/Natural Gas (NG) (phase 2 of the development). LNG is to be supplied via Transnet operated infrastructure, currently being planned for the Port of Richards Bay².

Table 2.1 below provides details of the proposed project, including the main infrastructure and services.

Table 2.1: Details of the proposed project

Component	Description/ Dimensions
Location of the site	erven 17455, 17443 and 17442 within the Richards Bay IDZ Phase 1F, KwaZulu-Natal
Municipal Jurisdiction	uMhlathuze Municipality
Electricity Generating capacity	300MW
Proposed technology	<ul style="list-style-type: none"> » Various Generation technologies are being considered: <ul style="list-style-type: none"> * Simple Cycle Gas Turbines * Simple Cycle Gas Engines * Combined Cycle Gas Turbines (CCGT) and 1 - 2 steam turbines utilising the heat from all the engines for power production in a steam cycle. » Dry cooled » The facility will be developed as a zero liquid effluent

¹ Baseload electricity generating capacity" refers to power station technology designed specifically to generate electricity continuously for all hours of the day and night

² An EIA process for floating power stations and LNG Import Facilities at the Port of Richards Bay is being undertaken by ERM on behalf of Transnet.

Component	Description/ Dimensions
	discharge (ZLED) plant.
Extent of the proposed development footprint (including all associated infrastructure)	» 7.3 ha
Extent of broader site	» 7.4571ha
Stack height	» Stacks associated with engine halls will be up to 30m in height.
Fuel storage	<ul style="list-style-type: none"> » Fuel tanks (4 x 10 000m³) which will be used as an interim fuel storage facility until the gas infrastructure is constructed by Transnet. » Twelve fuel unloading stations will be associated with these tanks.
Site access	» Via existing roads within the IDZ Phase 1F (already approved through an EIA undertaken for the Phase 1F infrastructure)
Grid connection	<ul style="list-style-type: none"> » On-site substation (HV Yard) associated with the power station » A new 132kV power line to connect into the Municipal grid, connecting directly to the Indus Substation bordering the site.
Associated buildings	» Guard house, admin building, workshops and a warehouse
Services required	<ul style="list-style-type: none"> » Waste disposal - all waste material generated from the development will be collected by a contractor to be disposed of at a licensed waste disposal site off site. This service will be arranged with the municipality when required. » Sanitation – during construction, all sewage waste will be collected by a contractor to be disposed of at a licensed waste disposal site. This service will be arranged with the municipality when required. During operation, the facility will be connected to the municipal sewer system. » Water– Water is to be sourced from the uMhlathuze Municipality water works. Water volumes of between 50 000m³ and 270 000m³ per annum are expected to be required for the project. » Electricity: the electricity requirements for this facility are to be obtained from the municipality. This service will be arranged with the municipality when required.
Raw-Water Storage Reservoir	» Water storage facilities for process water and fire-fighting purposes will be located on site

3.3. Project Alternatives

3.3.1. Site Alternatives

The development site is located within the Richards Bay Industrial Development Zone (RBIDZ) Phase 1F. The site has been zoned for general industrial development as part of the planning for this IDZ area.

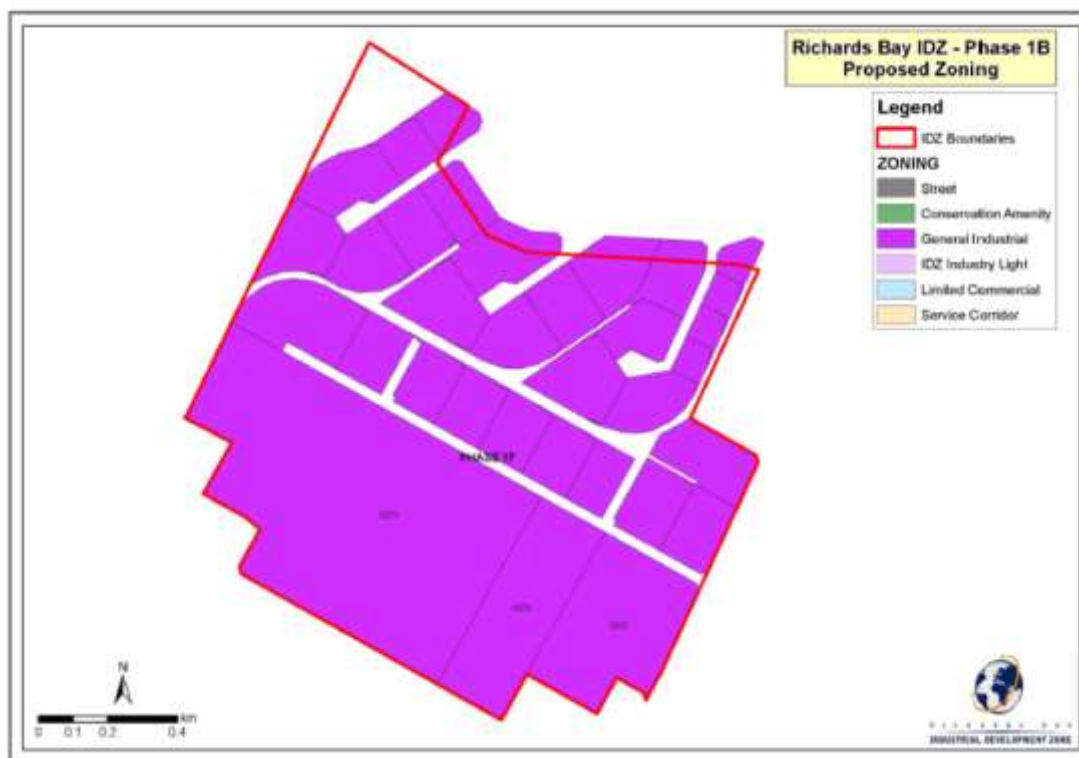


Figure 3.1: Zoning for Phase 1F (uMhlathuze Municipality)

The erven on which the proposed facility is planned have been allocated to the developer for this purpose (refer to Figure 3.2). Therefore, the siting of the facility has been predetermined and no feasible siting alternatives exist.

Richards Bay Gas Power 2 (Pty) Ltd considers this area, and specifically the demarcated site, to be highly preferred for the development of a gas to power project from a technical perspective. This conclusion is based on the following considerations:

Extent of the site: The extent of the allocated site is adequate for the development of the gas to power plant, which requires 7.3ha of the 7.45ha available.



Fi

Power transmission considerations: The existing Indus Substation is located on the boundary of the site and has capacity to accommodate the 300MW to be generated from the power plant.

Site access: The study site is accessible via already authorised and established access roads within the RBIDZ Phase 1F.

Current Land use considerations: The site falls within a declared Industrial Development Zone and has been designated for the proposed development as part of the planning for this IDZ area.

Fuel supply: Richards Bay Port has been identified by Transnet and the Department of Energy for Gas and Gas to Power enablement. Environmental studies are currently underway to facilitate the import of Liquefied Natural Gas (LNG) to allow for the development of medium- to long-term gas power plants at the Port of Richards Bay.

3.3.2. Cooling Technology Alternatives

Gas to power plants are often designed to use water for cooling at the back-end of the thermal cycle. There are different types of cooling technologies available (discussed below for comparative purposes). Dry cooled technology is, however, the cooling technology that will be used for the project under investigation. This is also consistent with the Department of Water and Sanitation requirements. Therefore no alternative technology is considered.

Dry Cooling

Dry cooling by air cooled condensers (ACC) consists of large sections of finned air cooled heat exchangers (with mechanical draft), and the exhaust steam passes through the heat exchangers forming condensate. This arrangement uses no cooling water, and therefore requires no makeup for evaporation losses. ACC cooling can reduce the total make-up water demand considerably, leaving only the process consumption and service water as major users, but is limited by its sensitivity to ambient temperature, negative effect on performance and capital expenditure.

Wet cooling system

A wet cooling tower is a conventional design and is the most common and economic alternative. This form of technology application and system design is based on the one hand by convective heat transfer, and on the other hand, evaporation of the water (increase in the air's humidity). As a result, the cooling water temperature that can be obtained from a wet cooling tower is not solely operative from the ambient temperature but also from the air humidity (air with

100% humidity). This type of technology results in severe water loss of which the primary reasons for loss of water in the cooling tower.

3.3.3. The 'Do-Nothing' Alternative

The 'do-nothing' alternative is the option of not constructing the proposed gas to power plant on the site within the RBIDZ Phase 1F. Should this alternative be selected then the benefits of this project will not be realised.

The electricity demand in South Africa is placing increasing pressure on the country's existing power generation capacity and the resultant restrictions are severely damaging the economy. There is, therefore, a need for additional electricity generation options to be developed throughout the country. The 'do nothing' option in terms of implementing alternative energy projects such as that proposed will result in a scenario where a fossil fuel or nuclear facility must rather be developed to provide the required energy demands. Environmental considerations aside, these have long lead times (considerably longer than the time required to implement alternative energy projects) and therefore the implementation of these options would result in delayed implementation and subsequent impacts on the South African economy and its citizens. Furthermore, the development of alternative energy generation technologies such as gas, as promoted by the South African Government would also not be realised, and the reliance on fossil fuel energy sources would not be reduced, as has been committed to.

At this stage in the process, it is considered that the benefits of the proposed project would outweigh the costs. The EIA project team therefore concludes that there is no reason for the gas to power project not to be evaluated further and that its envisaged associated environmental and social impacts should be able to be satisfactorily mitigated to acceptable levels.

The "do nothing" option will be further assessed within the EIA phase of the process in order to confirm the above conclusion.

3.4. Gas-to-Power Generation Technology

A gas power station turns the chemical energy in natural gas into electrical energy that can be used in homes and businesses. It is proposed to make use of combustion engines for the gas to power plant considered within this report. The

following description of the proposed technology is adapted from information provided by Wartsila³.



Figure 3.3: Aerial view of a typical gas to power plant

Combustion engines are a well-known technology used in automobiles, trucks, construction equipment, marine propulsion, and backup power applications. Combustion engines employ the expansion of hot gases to push a piston within a cylinder, converting the linear movement of the piston into the rotating movement of a crankshaft to generate power. Modern combustion engines used for electric power generation are internal combustion engines in which an air-fuel mixture is compressed by a piston and ignited within a cylinder. Combustion of natural gas produces a mixture of gases called the combustion gas as well as heat.

Two types of reciprocating internal combustion (IC) engines are available, and are characterised by the type of combustion:

- i) Spark-ignited (SG) engines use a spark plug to ignite an air-fuel mixture injected at the top of a cylinder. In this engine type, the fuel mixture does not get hot enough to burn without a spark.
- ii) Compression-ignited engines, also known as diesel. In these engines, air is compressed until the temperature rises to the auto-ignition temperature of the fuel. As the fuel is injected into the cylinder, it immediately combusts

³ <http://www.wartsila.com/energy/learning-center/technical-comparisons/combustion-engine-for-power-generation-introduction>

with the hot compressed air and expanding combustion gases push the piston to the bottom of the cylinder.

The size and power of a combustion engine is a function of the volume of fuel and air combusted. Thus, the size of the cylinder, the number of cylinders and the engine speed determine the amount of power the engine generates. By boosting the engine's intake of air using a blower or compressor – called supercharging – the power output of the engine can be increased. A commonly used supercharger is a turbocharger, which uses a small turbine in the exhaust gas path to extract energy for driving a centrifugal compressor.

Combustion engines can burn a variety of fuels, including natural gas, light fuel oil, heavy fuel oil, biodiesel, biofuels, and crude oil. Diesel engines are generally more efficient than SG engines, but also produce more emissions (in the form of nitrogen oxides (NO_x), sulphur dioxide (SO₂), and particulate matter (PM)). SO₂ and PM formation is a function of the fuel, with natural gas producing low emissions. The formation of NO_x is coupled with combustion temperature. In SG engines, premixing of air with the fuel to produce "lean" conditions (more air than is needed for combustion) has the effect of lowering the combustion temperature and impeding NO_x formation. New engine designs have been developed to take advantage of the diesel process while maintaining the benefits of lean burning. Dual-fuel (DF) engines are designed with the ability to burn both liquid and gaseous fuels, as is proposed for the project under investigation.

In a power plant, many SG or diesel engines are grouped into blocks called generating sets. Every engine is connected to a shaft which is connected to its electric generator. These generating sets provide modular electric generating capacity and come in standardized sizes, ranging from 4 to 20 MW.



Figure 3.4: Engine Hall of typical Gas Engine power plant

3.5. Life-cycle Phases of the proposed Power Plant

3.5.1. Construction of a Gas-to Power Plant

Construction of the proposed gas-to-power power plant is expected take approximately 18 months. The construction activity involves the following:

- » Prior to initiating construction, a number of surveys will be required including, but not limited to, geotechnical survey, site survey and confirmation of the power station footprint, survey of substation site and power line servitude.
- » Access roads will need to be established to the site.
- » Site preparation activities will include clearance of vegetation and excavations for foundations. These activities will require the stripping of topsoil, which will need to be stockpiled, backfilled and/or spread on site.
- » Thereafter civil works will take place which involves concrete works for structures such as foundation, the production unit (which houses the turbines, generator and so forth), stacks, cooling towers (if applicable), substation and associated infrastructure.
- » Mechanical and electrical work will then follow.
- » Ancillary infrastructure such as guard house, admin building, workshops and a warehouse will be established.
- » As construction is completed in an area, and as all construction equipment is removed from the site, the site will be rehabilitated where practical and reasonable.

3.5.2. Operation of a Gas-to Power Plant

Prior to the operation of the power station, testing and trails will need to be undertaken. The proposed facility will create up to 239 permanent employment positions (dependent on final generation technology chosen) that will be retained for 20-25 years (depending on the length of the Power Purchase Agreement (PPA) signed). It is anticipated that there will be full time security, maintenance and control room staff required at the site. In order to operate a gas to power plant, resources are required (input), and processes and outputs occur from the electricity generation process. For combustion fuel (ultimately LNG) and air are required. Water is required in the power generation process – it is converted to steam for energy conversion (from thermal energy to mechanical energy). The output of the process is electricity as well as waste and by-products. The power station will operate for 24 hours a day and 7 days a week.

3.5.3. Decommissioning of a Gas-to Power Plant

The lifespan of the proposed gas to power station is more than 20 years. Equipment associated with this facility would only be decommissioned once it has reached the end of its economic life or if it is no longer required. It is most likely that decommissioning activities of the infrastructure of the facility discussed in this EIA process would comprise the disassembly and disposal of the infrastructure. Decommissioning activities will involve disassembly of the production units and ancillary infrastructure, demolishing of buildings, removal of waste from the site and rehabilitation to the desired end-use.

APPROACH TO UNDERTAKING THE SCOPING PHASE

CHAPTER 4

An Environmental Impact Assessment (EIA) process refers to that process (in line with the EIA Regulations) which involves the identification of and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed project or activity. The EIA process comprises two main phases: i.e. **Scoping Phase** and **EIA Phase**. The EIA process culminates in the submission of an EIA Report (including an Environmental Management Programme (EMPr)) to the competent authority for decision-making.

The Scoping Study for the proposed Gas-to-Power Plant is being undertaken in accordance with the Section 24 (5) of the National Environmental Management Act (No 107 of 1998). In terms of the EIA Regulations (2014) of GN R982, GN R983, GN R984 and GN R985, a Scoping and EIA study is required to be undertaken for the proposed project. In accordance with these Regulations, this Scoping process aims at identifying and describing potential issues associated with the proposed project, and defining the extent of studies required within the EIA phase. This was achieved through an evaluation of the proposed project involving review of previous studies undertaken for the site, desk-top specialist inputs, as well as a consultation process with the Interested and Affected Parties (I&APs), including the decision making authority, directly impacted landowners/occupiers, adjacent landowners/occupiers, relevant organs of state departments, ward councillors and other key stakeholders. This chapter serves to outline the process which was followed during the Scoping Phase of the EIA process.

4.1. Relevant Listed Activities

In terms of the EIA Regulations, 2014 of GN R983, GN R984 and GN R985; the following 'listed activities' are triggered by the proposed facilities as shown in **Table 4.1** below.

Table 4.1: Listed activities triggered by the proposed Gas-to-Power project

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity as per project description
GN 983, 08 December 2014	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation <i>The development area is 7.3ha in extent and</i>

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity as per project description
		<i>will require the clearance of natural vegetation.</i>
GN 983, 08 December 2014	28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares <i>The development footprint for the gas to power plant will exceed 5ha</i>
GN 984, 08 December 2014	1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more; <i>The total electricity output for the facilities will be 300MW.</i>
GN 984, 08 December 2014	4	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 combined capacity of more than 500 cubic metres. <i>Fuel tanks (4 x 10 000m³) will be used for fuel storage facility until the gas infrastructure is constructed by Transnet and as Emergency fuel storage thereafter</i>
GN 984, 08 December 2014	6	The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent. <i>An Air Emissions License is required to be obtained for the project in terms of the NEM: Air Quality Act</i>
GN 984, 08 December 2014	28	Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity as per project description
		<i>An Air Emissions License is required to be obtained for the project in terms of the NEM: Air Quality Act</i>

On the basis of the above listed activities, a Scoping and an EIA process is required to be undertaken for the proposed facilities. This process is to be undertaken in two phases as follows:

- » The Scoping Phase includes the identification and description of potential issues associated with the proposed project through a desktop study and consultation with I&APs through a public participation process. Areas of sensitivity within the study area are identified and delineated in order to identify any environmental fatal flaws, and sensitive or no go areas. Following the review period of the Scoping report, this phase culminates in the submission of a Final Scoping Report and Plan of Study for EIA to the DEA.
- » The EIA Phase involves a detailed assessment of potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase includes detailed specialist investigations and a public participation process. Following public review period of the EIA report, this phase culminates in the submission of a Final EIA Report and an Environmental Management Programme (EMPr), including recommendations of practical and achievable mitigation and management measures, to DEA for review and decision-making.

4.2. Objectives of the Scoping Phase

This Scoping report documents the evaluation of the potential environmental impacts of each proposed solar energy facility and forms part of the EIA process. The Scoping Phase was conducted in accordance with the requirements of the EIA Regulations in terms of Section 24(5) of the National Environmental Management Act (NEMA; Act No 107 of 1998).

This Scoping Phase aims to:

This Scoping Phase aims to:

- » Identify, describe and evaluate potential environmental (biophysical and social) impacts and benefits of all phases of the proposed facility (including design, construction, operation and decommissioning) within the site through a desk-top review of existing baseline data and desk-top specialist studies.

- » Identify potentially sensitive environmental features and areas within the broader site in order to inform the preliminary design process of the facility.
- » Define the scope of studies to be undertaken within the EIA process.
- » Provide the authorities with sufficient information in order to make a decision regarding the scope of issues to be addressed in the EIA process, as well as regarding the scope and extent of specialist studies that will be required to be undertaken as part of the EIA Phase of the process.

Within this context, the objectives of this Scoping Phase are to, through a consultative process:

- » Identify the policies and legislation relevant to the project.
- » Motivate the need and desirability of the proposed project, including the need and desirability of the activity in the context of the preferred location.
- » Identify and confirm the preferred project and technology alternative.
- » Identify and confirm the preferred site.
- » Identify the key issues to be addressed in the EIA phase.
- » 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 project will impose on the preferred site through the life of the project, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site.
- » 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.

4.3. Overview of the Scoping Phase

The Scoping Phase has been undertaken in accordance with the EIA Regulations published in Government Gazette No 38282 in December 2014, in terms of NEMA. Key tasks undertaken within the scoping phase included:

- » Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- » Submission of the completed application form for authorisation to the competent authority (DEA) in terms of Regulations 5 and 16 of Government Notice R982 of 2014.
- » Undertaking a public participation process throughout the Scoping process in accordance with Chapter 6 of Government Notice R982 of 2014 in order to identify issues and concerns associated with the proposed project.

- » Undertaking of independent specialist studies in accordance with Appendix 6 of Government Notice R982 of 2014.
- » Preparation of a Scoping Report and Plan of Study for EIA in accordance with the requirements of Appendix 2 of Government Notice No R982 of 2014.
- » Preparation of a Comments and Response Report detailing key issues raised by I&APs as part of the Scoping phase.

The tasks are discussed in detail below.

4.3.1. Authority Consultation and Application for Authorisation in terms of GNR982 of 2014

In terms of the Energy Response Plan, the DEA is the competent authority for all energy related projects. As the project is located within the KwaZulu-Natal Province, the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) is the commenting authority for the development of the facilities. Consultation with these authorities will be undertaken throughout the Scoping process. This consultation has included the following:

- » Submission of the application for authorisation to DEA;
- » Submission of the Scoping Report for review by I&APs, the Organs of State and the competent authority.

A record of all authority correspondence i.e. National, Provincial and Local authorities undertaken prior to and within the Scoping Phase is included in **Appendix B**.

4.3.2. Public Participation Process

Public participation is an essential and regulatory requirement for an environmental authorisation process and is guided by Regulations under NEMA, specifically the EIA Regulations (GN R982 of December 2014).

The sharing of information forms the basis of the public participation process and offers the opportunity to Interested and Affected Parties (I&APs) to become actively involved in the EIA Process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

During the Scoping Phase

- » identify issues of concern and suggestions for enhanced benefits;
- » verify that their issues have been recorded;
- » assist in identifying reasonable alternatives; and

- » contribute relevant local information and knowledge to the environmental assessment.

During the EIA Phase

- » contribute relevant local information and knowledge to the environmental assessment;
- » verify that their issues have been considered in the environmental investigations; and
- » comment on the findings of the environmental assessments.

During the decision-making phase:

- » to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The public participation process therefore aims to ensure that:

- » Information that contains all the relevant facts in respect of the application is made available to I&APs for review.
- » Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the proposed facilities.
- » Adequate review periods are provided for I&APs to comment on the findings of the Scoping and EIA Reports.

In order to ensure effective participation, the public participation process includes the following:

- » Distribution of project related information in the form of notification letters and a background information document at the outset of the project.
- » Identification of potential I&APs including:
 - the competent authority (National Department of Environmental Affairs),
 - all organs of state which have jurisdiction in respect of the activity to which the application for environmental authorisation relates;
 - owners, person in control of and occupiers of the site where the activity is to be undertaken or to any alternative site where the activity is to be undertaken;
 - owners, person in control of, and occupiers of land adjacent to the site where the activity is to be undertaken or to any alternative site where the activity is to be undertaken;
 - the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - the municipality which has jurisdiction in the area; and
 - any other I&AP as required by the competent authority.
- » Placement of site notices at the project site.

- » Placement of advertisements in a local newspaper.
- » Compilation of an I&AP database which is updated throughout the Scoping and EIA process.
- » On-going consultation with all registered I&APs regarding the progress in the EIA process through stakeholder consultation via notification letters, telephone calls and consultation meetings.
- » Release of the Scoping and EIA reports for 30-day review periods
- » Holding meetings with I&APs to further facilitate the public participation process.

The following sections detail the tasks which were undertaken as part of the public participation process.

i. Stakeholder identification

In terms of the EIA Regulations, 2014, affected and surrounding landowners are identified and registered on the project database. Other stakeholders are required to formally register as stakeholders or interested and affected parties (I&APs) for the EIA process. The first step in the public participation process is to initiate the identification of potential I&APs. I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database, liaison with potentially affected parties in the study area and a registration process involving completion of a registration and comment sheet. An initial list of stakeholders identified and registered is listed in **Table 4.1** below:

Table 4.1: List of Stakeholders identified during the Scoping Phase

Organs of State
National Government Departments
Department of Agriculture, Forestry and Fisheries (DAFF)
Department of Communications
Department of Energy (DoE)
Department of Mineral Resources (DMR)
Department of Public Works (DPW)
Department of Rural Development and Land Reform (DRDLR)
Department of Water and Sanitation (DWS)
Department of Science and Technology (DST)
Government Bodies and State Owned Companies
Eskom SOC Limited
National Energy Regulator of South Africa (NERSA)
Sentech
South African Civil Aviation Authority (CAA)

South African National Roads Agency Limited (SANRAL)

Square Kilometre Array: Southern Africa

Telkom SA Ltd

Provincial Government Departments

KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs

Amafa / Heritage KwaZulu Natali

Ezemvelo KZN Wildlife

Local Government Departments

uThungulu District Municipality

uMhlathuze Local Municipality

Non-Governmental Organisations

BirdLife South Africa

Wildlife and Environment Society of South Africa (WESSA)

Endangered Wildlife Trust (EWT)

Richards Bay Clean Air Association

Landowners

Affected landowners and tenants

Neighbouring landowners and tenants

ii. Register of Interested and Affected Parties

As per Regulation 42 of the EIA Regulations, 2014 all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix B** for a listing of recorded parties). The register of I&APs contains the names, contact details and addresses of:

- » all persons who requested to be registered on the database in writing
- » all organs of state which hold jurisdiction in respect of the activity to which the application relates
- » all persons who submitted written comments or attended meetings during the public participation process

While I&APs have been encouraged to register their interest in the EIA process from the onset, the identification and registration of I&APs will be on-going for the duration of the EIA process. The register of I&APs will be updated throughout the EIA process, and will act as a record of the parties involved in the public participation process.

iii. Adverts and Notifications

In order to notify and inform the public of the proposed EIA process being undertaken for each of the facilities and invite members of the public to register as I&APs for this process, an advertisement was placed in The Mercury (13

November 2015) and Zululand Observer (16 November 2015) newspapers. The advert provides information on the following (in terms of Regulation 41):

- » the details of the project; and
- » the availability of the Scoping Report for review.

Site notices (in English and Afrikaans) have been placed at visible points along the boundary of the property, in accordance with the requirements of the EIA Regulations. Further notices will be placed at the Richards Bay Public Library. In addition to the advertisements and site notices, key stakeholders and registered I&APs were notified in writing of the commencement of the EIA process and the availability of the Scoping Report for review. Copies of all the advertisements, site notices and written notifications are included within **Appendix B**.

iv. Public Involvement and Consultation

In order to provide information regarding the proposed project and the EIA process, a background information document (BID) for the project has been compiled (refer to **Appendix B**). The BID has been distributed to identified stakeholders and I&APs, with additional copies made available at public venues within the surrounding areas of the study area. The BID is also available electronically on the Savannah Environmental website.

Through consultation with key stakeholders and I&APs, issues for inclusion within the issues-based scoping study have been identified and confirmed. In order to accommodate the varying needs of stakeholders and I&APs within the communities surrounding of the study area, as well as capture their views, issues and concerns regarding the facilities, various opportunities have been provided in order for I&APs to note their issues. I&APs are being consulted through the following means:

- » **Focus group meetings** (pre-arranged and stakeholders invited to attend)
- » **One-on-one consultation meetings** (for example with directly affected or surrounding landowners)
- » **Telephonic** consultation sessions
- » Written, faxed or e-mail **correspondence**

v. Identification and Recording of Issues and Concerns

A Comments and Response Report has been compiled to include all comments received through the public participation process to date. Additional comments received during the scoping phase of the process, including those received in the review period of the Scoping Report will be included in Comments and Response Report within the Final Scoping Report.

4.4. Review of the Scoping Report and Public Meeting

The Scoping Report will be made available for review from **13 November 2015 – 14 December 2015** at the following locations:

- » Richards Bay Public Library
- » www.savannahSA.com

4.4.1. Identification and Evaluation of Issues

A number of investigations have been undertaken for the RBIDZ Phase 1F within which the proposed development is planned. Therefore, a large amount of information regarding the affected environment and potential environmental issues was available. This has included the following:

- » Thorn-ex, September 2010. Environmental Risk Evaluation and Guidelines for the Richards Bay Industrial Development Zone.
- » Sivest, August 2010. Environmental Risk Assessment of Richards Bay IDZ 1A, 1B, 1C, 1D & 1F.
- » NEMAI Consulting, September 2014. Richards Bay Industrial Development Zone Phase 1F – Installation of Bulk Infrastructure Services, Richards Bay, KwaZulu Natal: Draft Scoping Report.
- » NEMAI Consulting, September 2015. Richards Bay Industrial Development Zone Phase 1F - Environmental Impact Assessment Report.

This information formed the basis of the identification and evaluation of the potential impacts associated with the proposed project. In addition, inputs from the following specialists were obtained regarding specific issues of potential concern.

Table 3.3: Specialist consultants appointed to evaluate the potential impacts associated with the project

Specialist	Area of Expertise	Refer Appendix
Cedar Tower Services	Heritage	Appendix C
Morne de Jager of EARES	Noise	Appendix D
Candice Hunter of Savannah Environmental	Social	Appendix E

In order to evaluate issues and assign an order of priority, the following methodology was used to identify the characteristics of each potential issue/impact for each of the proposed project components:

- » Identify the **nature** of the potential impact, which includes a description of what causes the effect, what will be affected and how it will be affected
- » Identify the **extent** of the potential impact, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development) or regional
- » Identify **sensitive receptors** that may be impacted on by the proposed facility and the **types of impacts** that are most likely to occur.
- » Evaluate the **significance** of potential impacts in terms of the requirements of the EIA Regulations.
- » Identify the potential impacts that will be **considered further** in the EIA Phase.

4.4.2. Finalisation of the Scoping Report

The final stage in the Scoping Phase will entail the capturing of responses from stakeholders and I&APs on the Scoping Report in order to finalise and submit the Scoping report for consideration. It is the final Scoping Report upon which the decision-making environmental Authorities provide comment, recommendations, and acceptance to undertake the EIA Phase of the process.

4.5. Regulatory and Legal Context

The South African energy industry is evolving rapidly, with regular changes to legislation and industry role-players. The regulatory hierarchy for energy generation projects of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels. As energy development is a multi-sectoral issue (encompassing economic, spatial, biophysical, and cultural dimensions) various statutory bodies are likely to be involved in the approval process for the project and the related statutory environmental assessment process.

4.5.1. Regulatory Hierarchy

At **National Level**, the main regulatory agencies are:

- » *Department of Energy (DoE)*: This Department is responsible for policy relating to all energy forms, and is responsible for forming and approving the IRP (Integrated Resource Plan for Electricity).
- » *National Energy Regulator of South Africa (NERSA)*: This body is responsible for regulating all aspects of the electricity sector, and will ultimately issue licenses for solar energy developments to generate electricity.
- » *Department of Environmental Affairs (DEA)*: This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and

the EIA Regulations. The DEA is the competent authority for the facilities, and charged with granting the relevant environmental authorisation.

- » *National Department of Agriculture, Forestry, and Fisheries (DAFF)*: This Department is responsible for activities pertaining to subdivision and rezoning of agricultural land. The forestry section is responsible for the protection of tree species listed under the National Forests Act (Act No 84 of 1998).
- » *South African National Roads Agency (SANRAL)*: This Agency is responsible for the regulation and maintenance of all national routes.
- » *Department of Water and Sanitation*: This Department is responsible for water resource protection, water use licensing and permits.
- » *Department of Mineral Resources (DMR)*: Approval from the DMR may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No 28 of 2002): In terms of the Act approval from the Minister of Mineral Resources is required to ensure that the proposed activities do not sterilise a mineral resource that might occur on site.

At the **Provincial Level**, the main regulatory agencies are:

- » *Provincial Government of KwaZulu-Natal – KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs*: This Department is the commenting authority for this project.
- » *Amafa / Heritage KwaZulu Natali*: This department identifies, conserves and manage heritage resources throughout the KwaZulu-Natal Province.
- » *Ezemvelo KZN Wildlife*: Ezemvelo KZN Wildlife is the provincial agency mandated to carry out biodiversity conservation and associated activities in the province of KwaZulu-Natal.

At the **Local Level**, the local and municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. In the North West Province, both the local and district municipalities play a role. The local municipality is the uMhlathuze Local Municipality which forms part of the uThungulu District Municipality.

4.5.2. Legislation and Guidelines that have informed the preparation of this Scoping Report

The following legislation and guidelines have informed the scope and content of this Scoping Report:

- » National Environmental Management Act (Act No. 107 of 1998)
- » EIA Regulations, published under Chapter 5 of NEMA (GNR R982 in Government Gazette No 38282 of December 2014)

- » International guidelines – the Equator Principles and the International Finance Corporation and World Bank Guidelines.

Several other Acts, standards or guidelines have also informed the project process and the scope of issues evaluated in the scoping report, and to be addressed in the EIA. A listing of relevant legislation is provided in Table 4.2. A more detailed review of legislative requirements applicable to the proposed project will be included in the EIA phase.

Table 4.2: Initial review of relevant environmental policies, legislation, guidelines and standards applicable to the proposed coal-fired power station project EIA

Legislation	Applicable Sections
National Legislation	
Constitution of the Republic of South Africa (Act No 108 of 1996)	<ul style="list-style-type: none"> » Bill of Rights (S2) » Environmental Rights (S24) – i.e. the right to an environment which is not harmful to health and well-being » Rights to freedom of movement and residence (S22) » Property rights (S25) » Access to information (S32) » Right to just administrative action (S33) » Recognition of international agreements (S231)
National Environmental Management Act (Act No 107 of 1998)	<ul style="list-style-type: none"> » National environmental principles (S2), providing strategic environmental management goals and objectives of the government applicable throughout the Republic to the actions of all organs of state that may significantly affect the environment » NEMA EIA Regulations (GN 982 – 985 of December 2014) » The requirement for potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority (S24 – Environmental Authorisations) » Duty of Care (S28) requiring that reasonable measures are taken to prevent pollution or degradation from occurring, continuing or recurring, or, where this is not possible, to minimise & rectify pollution or degradation of the environment » Procedures to be followed in the event of an emergency incident which may impact on the environment (S30)

Legislation	Applicable Sections
	<ul style="list-style-type: none"> » Appeals against decisions made by authorities (S43)
Environment Conservation Act (Act No 73 of 1989)	<ul style="list-style-type: none"> » National Noise Control Regulations (GN R154 dated 10 January 1992)
National Noise Control Regulations (of 10 January 1992)	<ul style="list-style-type: none"> » In terms of section 25 of the ECA, the national noise-control regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) were promulgated. The NCRs were revised under Government Notice Number R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. » Subsequently, in terms of Schedule 5 of the Constitution of South Africa of 1996, legislative responsibility for administering the noise control regulations was devolved to provincial and local authorities. Provincial Noise Control Regulations exist in the Free State, Western Cape and Gauteng provinces.
National Heritage Resources Act (Act No 25 of 1999)	<ul style="list-style-type: none"> » Stipulates assessment criteria and categories of heritage resources according to their significance (S7) » Provides for the protection of all archaeological and palaeontological sites, and meteorites (S35) » Provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority (S36) » Lists activities which require developers any person who intends to undertake to notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development (S38) » Requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction (S44)
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	<ul style="list-style-type: none"> » Provides for the MEC/Minister to identify any process or activity in such a listed ecosystem as a threatening process (S53) » A list of threatened and protected species has been published in terms of S 56(1) - Government Gazette 29657. » Three government notices have been published, i.e. GN R 150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R

Legislation	Applicable Sections
	<p>151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or Protected Species Regulations).</p> <ul style="list-style-type: none"> » Provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GN 1002), 9 December 2011). » This Act also regulates alien and invader species.
<p>National Environmental Management: Air Quality Act (Act No 39 of 2004)</p>	<ul style="list-style-type: none"> » S18, S19 and S20 of the Act allow certain areas to be declared and managed as “priority areas”. » Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards. » The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act. » Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan. » GNR831 of 01 November 2013 establishes emission standards and reporting requirements for small boilers (i.e. boilers with a capacity between 10MW and 50MW).
<p>Conservation of Agricultural Resources Act (Act No 43 of 1983)</p>	<ul style="list-style-type: none"> » Prohibition of the spreading of weeds (S5) » Classification of categories of weeds & invader plants (Regulation 15 of GN R1048) & restrictions in terms of where these species may occur. » Requirement & methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R1048).
<p>National Water Act (Act No 36 of 1998)</p>	<ul style="list-style-type: none"> » Under S21 of the Act, water uses must be licensed unless such water use falls into one of

Legislation	Applicable Sections
	<p>the categories listed in S22 of the Act or falls under the general authorisation.</p> <ul style="list-style-type: none"> » In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring. » National Government is the public trustee of the Nation's water resources (S3) » Entitlement to use water (S4) – entitles a person to use water in or from a water resource for purposes such as reasonable domestic use, domestic gardening, animal watering, fire fighting and recreational use, as set out in Schedule 1 » Duty of Care to prevent and remedy the effects of pollution to water resources (S19) » Procedures to be followed in the event of an emergency incident which may impact on a water resource (S20) » Definition of water use (S21) » Requirements for registration of water use (S26 and S34) » Definition of offences in terms of the Act (S151)
<p>National Environmental Management: Waste Act (Act No 59 of 2008)</p>	<ul style="list-style-type: none"> » The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. » In terms of the regulations published in terms of this Act (GN 921 of November 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. » Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that <ul style="list-style-type: none"> (a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit for the safe storage of waste; (b) Adequate measures are taken to prevent accidental spillage or leaking; (c) The waste cannot be blown away; (d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and

Legislation	Applicable Sections
	(e) Pollution of the environment and harm to health are prevented.
National Forests Act (Act No 84 of 1998)	<ul style="list-style-type: none"> » According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister'. » GN 1042 provides a list of protected tree species.
The Hazardous Substances Act No. 15 of 1973	<ul style="list-style-type: none"> » This Act was promulgated to provide for the control of » substances which may cause injury or ill-health to, or death of, humans by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature. » The Hazardous Substances Act also provides for matters concerning the division of such substances or products into groups in relation to the degree of danger, the prohibition and control of the importation, manufacture, sale, use, operation, application and disposal of such substances and products.
Guideline Documents / Standards / Plans	
South African National Standard (SANS) 10328, Methods for environmental noise impact assessments in terms of NEMA No. 107 of 1998	<ul style="list-style-type: none"> » Prediction of impact that noise emanating from a proposed development would have on occupants of surrounding land by determining the rating level. » Noise limits are based on the acceptable rating levels of ambient noise contained in SANS 10103
South African Bureau of Standards (SABS)	<ul style="list-style-type: none"> » Four South African Bureau of Standards (SABS) scientific standards are considered relevant to noise from a Power Station. They are: <ul style="list-style-type: none"> * SANS 10103:2008. 'The measurement and rating of environmental noise with respect to annoyance and to speech communication'. * SANS 10210:2004. 'Calculating and predicting road traffic noise'. * SANS 10328:2008. 'Methods for environmental noise impact assessments'. * SANS 10357:2004. 'The calculation of sound propagation by the Concave

Legislation	Applicable Sections
	<p>method’.</p> <ul style="list-style-type: none"> » The relevant standards use the equivalent continuous rating level as a basis for determining what is acceptable. The levels may take single event noise into account, but single event noise by itself does not determine whether noise levels are acceptable for land use purposes. The recommendations that the standards make are likely to inform decisions by authorities, but non-compliance with the standards will not necessarily render an activity unlawful per se.
<p>SANS 69 - South African National Standard - Framework for setting & implementing national ambient air quality standards, SANS 1929 - South African National Standard - Ambient Air Quality - Limits for common pollutants.</p>	<ul style="list-style-type: none"> » The South African Bureau of Standards (SABS), through a technical committee, developed ambient air quality limits, based on international best practice for particulate matter less than 10 µm in aerodynamic diameter (PM10), dust fallout, sulphur dioxide, nitrogen dioxide, ozone, carbon monoxide, lead and benzene. » These ambient limits were derived from international best practice and what was regarded to be achievable in the South African context, taking both the natural environment and socio-economic status into account. The SANS limits informed the newly promulgated SA Standards
<p>IFC Air Emissions and Ambient Air Quality. Environmental, Health and Safety Guidelines. Washington DC, International Finance Corporation</p>	<ul style="list-style-type: none"> » The World Bank group through the IFC has emission guidelines for power plants. These guidelines are applicable to new facilities. Please note that the emission values are normalised to 6% excess oxygen, while the South African standards are normalised to 10% excess oxygen.
<p>The Equator Principles (June 2003)</p>	<ul style="list-style-type: none"> » The Equator Principles (EPs) are a voluntary set of standards for determining, assessing and managing social and environmental risk in project financing. Equator Principles Financial Institutions (EPFIs) commit to not providing loans to projects where the borrower will not or is unable to comply with their respective social and environmental policies and procedures that implement the EPs. » The Equator Principles were developed by private sector banks. The banks chose to model the Equator Principles on the environmental

Legislation	Applicable Sections
	standards of the World Bank and the social policies of the International Finance Corporation (IFC).

4.6. Assumptions and Limitations of the EIA

In conducting this scoping process, the following general assumptions have been made:

- » It is assumed that the development site identified represents a technically suitable site for the establishment of a gas to power plant and associated infrastructure.
- » The power station will be sited within the predefined properties within the Richards Bay Industrial Development Phase 1F (erven 17455, 17443 and 17442) assessed in the EIA. The EIA will comparatively assess site alternatives for the power line / grid connection options.
- » This Scoping Report has been prepared based on information available at the time of doing the study. More detailed information will be available for consideration in the EIA phase of the process.

DESCRIPTION OF THE RECEIVING ENVIRONMENT

CHAPTER 5

This section of the Scoping Report provides a description of the environment that may be affected by the Richards Bay Gas to Power Plant. This information is provided in order to assist the reader in understanding the receiving environment within which the proposed power plant is situated. Features of the biophysical, social and economic environment that could directly or indirectly be affected by, or could affect, the proposed development have been described. This information has been sourced from existing information available for the area (refer to Chapter 9 for list of references), and aims to provide the context within which this EIA is being conducted. As the layout and/or ancillary infrastructure associated with the construction of the Richards Bay Gas to Power Plant will be located within Erf 17455, 17443 and 17442.

5.1. Regional Setting: Location of the Study Area

The KwaZulu-Natal Province is situated in the north of South Africa. The province shares the boundaries with the Mpumalanga, Free State and Eastern Cape Provinces. The proposed development falls under the jurisdiction of the uMhlathuze Local Municipality and within the greater uThungulu District Municipality in the KwaZulu-Natal Province. The uMhlathuze Local Municipality is situated on the coast of the Indian Ocean in KwaZulu-Natal, South Africa. It is one of 6 municipalities that form part of the uThungulu District Municipality. In 2002 Richards Bay and Empangeni, as well as the surrounding rural and tribal areas merged to form the "City of uMhlathuze" covering an area of approximately 800 km² and supporting approximately 300 000 people.

The proposed development site falls within the Richards Bay Industrial Development Zone (IDZ) Phase 1F. Phase 1F is located in the Alton North Area, a few kilometres to the north of the other IDZ sites. The land is currently vacant, borders Tata Steel on the south and zoned as IDZ Industry. The broader area is characterised by intense past land-use modifications from agriculture, mining, tourism, residential, recreational and industrial development activities. The study area within the IDZ Phase 1F is bordered by mixed-use of industrial developments as well as residential areas and open areas. The Nsezi Rail Yard lies immediately to the west of this phase. The Richards Bay Cemetery lies to the north-east. The area to the south-east of the site is used for light industrial development.

The site for the proposed Richards Bay Gas to Power Plant is situated south of the North Central Arterial and to the west of Alton on Erf 17455, 17443 and 17442 (refer to Figure 5.1). To the west are formal Eucalypt plantations, while the eastern edge is industry linked with Alumina Alley. The land for the development of the power plant is owned by the City of uMhlathuze.

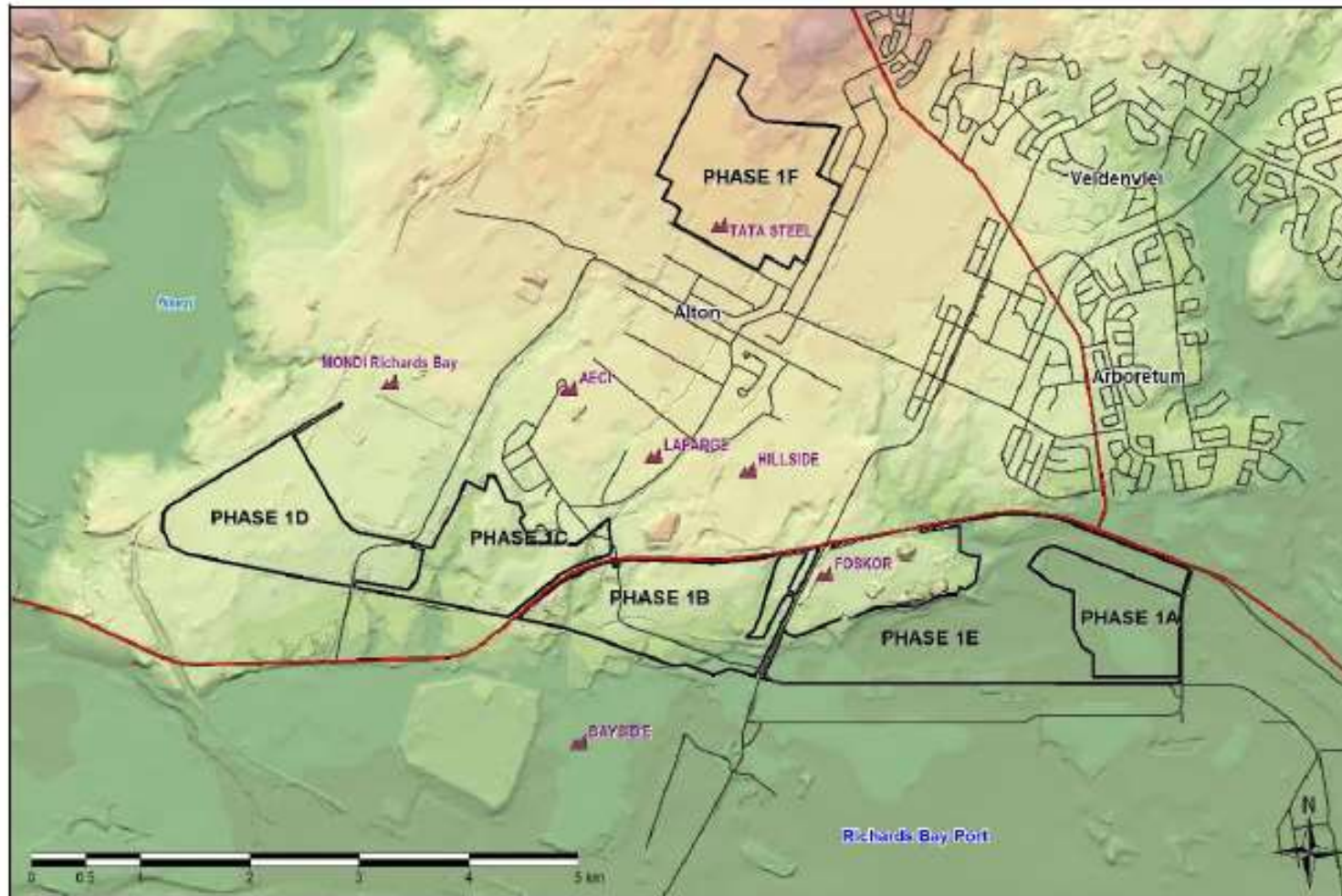


Figure 5.1: Context of the Richards Bay Gas to Power Plant site (Thorn-Ex, 2011)

5.2. Climatic Conditions

Richards Bay's climate is characterised by a warm to hot and humid subtropical climate, with warm moist summers. Average daily maximum temperatures range from 29°C in January to 23°C in July, and extremes can reach more than 40°C in summer. The average annual rainfall is 1 228 mm and 80% of the rainfall occurs in the summer, from October to March, although rainfall also occurs in winter (approximately 20%) (uMhlathuze LM IDP, 2012-2017). In December 2013, predominant winds blew from two sectors: NNE to NE (33.3%), and S to SW (29.9%) (Figure 5.2).

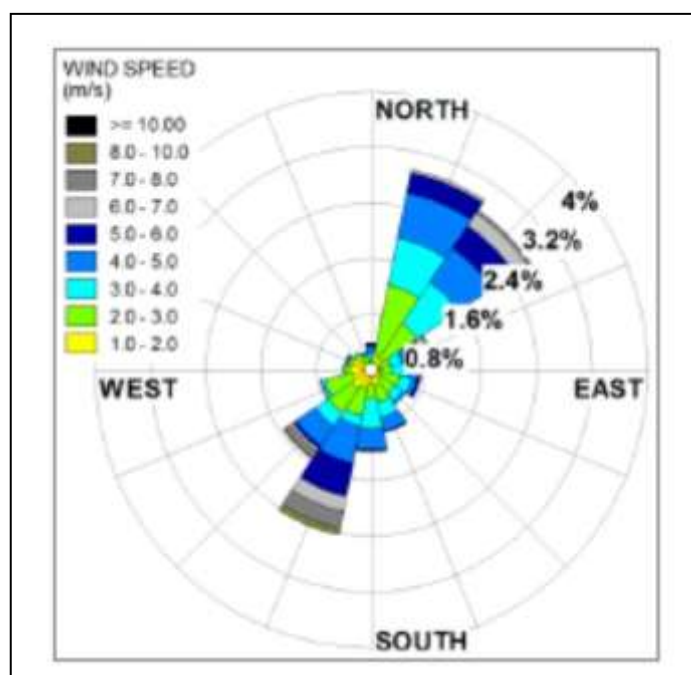


Figure 5.2: Wind Rose (December 2013) for Richards Bay, KwaZulu-Natal Province (NEMAI Consulting, 2014).

5.3. Biophysical Characteristics of the Study Area

5.3.1. Topography and Hydrology

The topographical characteristics of the area give rise to a local landscape that is characterised by an interconnected network of hydrological ecosystems that sustains a combination of locally important habitats and species which contribute to the maintenance of one of South Africa's biodiversity hotspots. The existence of water-logged areas on the plain has necessitated earlier construction of drainage channels to mitigate potential flooding, particularly in the industrial area

of Alton. The eastern parts of the IDZ extend into the historical floodplain of the study area where alluvial and estuarine elements are still present.

The study area is located on the Maputaland Coastal Plain. The Maputaland Coastal Plain is characterised by relatively flat to slightly undulating paeledune fields. The majority of these areas feature approximately north/south orientated drainage systems linked with the dune-slacks and depressions created in these historic windblown landscapes.

5.3.2. Soil types

An Engineering Geological Investigation for the site was undertaken in June 2013 by Engeolab cc. The investigation revealed that the study area is dominated by redistributed Quaternary sandy and clayey soils that blanket the coastal section of Richards Bay which are of marine origin, mainly yellowish and argillaceous redistributed sands. Soils are nutritionally very poor and well leached, except in the interdune depressions where organic-rich soils are sometimes found (NEMAI Consulting, 2014). Soils with increasing organic levels are linked to increasing moisture levels. Mottling was limited due to the generally inert nature of these regic sands and quarts derived soils.

The average soil profile on the site comprises very loose, grey-brown sand grading through light brown to yellowish brown with a loose to medium dense consistency, mainly silty to clean, equigranular sand (that is sand with no binding material) down to an average depth of some 2.5m below surface.

5.3.3. Agricultural Potential

According to the Agricultural Geo-Referenced Information System (AGIS), the site is located on an area that is considered to have a moderate agricultural potential in terms of arable land. Various factors have constraints that prohibit crop production and lead to insignificant agricultural activities except that of grazing. The proposed development site is surrounded by existing farming and forestry activity and other industry to the south east and north (NEMAI Consulting, 2014). The proposed project area has been identified for industrial development as part of the IDZ planning. This, together with the limited size of the site and surrounding land use render this site of low importance from an agricultural perspective.

5.3.4. Ecological Profile

Vegetation:

The proposed project site is located within 2832CA quarter degree square in terms of the 1:50 000 grid of South Africa. South African National Biodiversity Institute (SANBI) uses this grid system as a point of reference to determine any Red Data plant species or any species of conservation importance occurring in South Africa. This can be used to determine the list of species which may potentially occur within an area. **Table 5.1** provides details of the Red Data plant species which have been recorded in 2832CA grid cell.

Table 5.1: Threatened plant species recorded in 2832CA grid cell

Family	Species	Threat status*	Growth forms
Apocynaceae	<i>Asclepias gordon-grayae</i> Nicholas	EN	Herb
Apocynaceae	<i>Raphionacme lucens</i> Venter & R.L.Verh.	NT	Geophyte
Apocynaceae	<i>Sisyranthus franksiae</i> N.E.Br.	Threatened	Herb
Asphodelaceae	<i>Aloe cooperi</i> Baker subsp. cooperi	Declining	Herb
Asphodelaceae	<i>Aloe linearifolia</i> A.Berger	NT	Herb
Asteraceae	<i>Cineraria atriplicifolia</i> DC.	VU	Herb
Cyperaceae	<i>Cyperus sensilis</i> Baijnath	NT	Hydrophyte
Iridaceae	<i>Freesia laxa</i> (Thunb.) Goldblatt & J.C.Manning subsp. azurea (Goldblatt & Hutchings) Goldblatt & J.C.Manning VU Geophyte Passifloraceae <i>Adenia gummifera</i> (Harv.) Harms var. gummifera	Declining	Climber
Restionaceae	<i>Restio zuluensis</i> H.P.Linder	VU	Dwarf shrub
Santalaceae	<i>Thesium polygaloides</i> A.W.Hill	VU	Herb, parasite

*NT=Near Threatened; VU=Vulnerable; EN=Endangered

Investigations undertaken by NEMAI Consulting as part of the EIA process for the infrastructure within RBIDZ Phase 1F confirmed high levels of degradation of all vegetation types on the proposed development site. There is however some level of sensitivity associated with the remaining vegetation.

Wetland systems were identified on the north-western and eastern portions of the site (Sivest, 2010; Figure 5.3). Of the 188 hectares 65 ha (34%) comprises wetlands with buffers. This leaves 122 ha (65%) that is developable. Impacts associated with infilling of wetlands as a result of development have been assessed and are considered to be of an acceptable significance and magnitude if appropriate mitigation measures are implemented and construction is implemented in a sensitive manner.

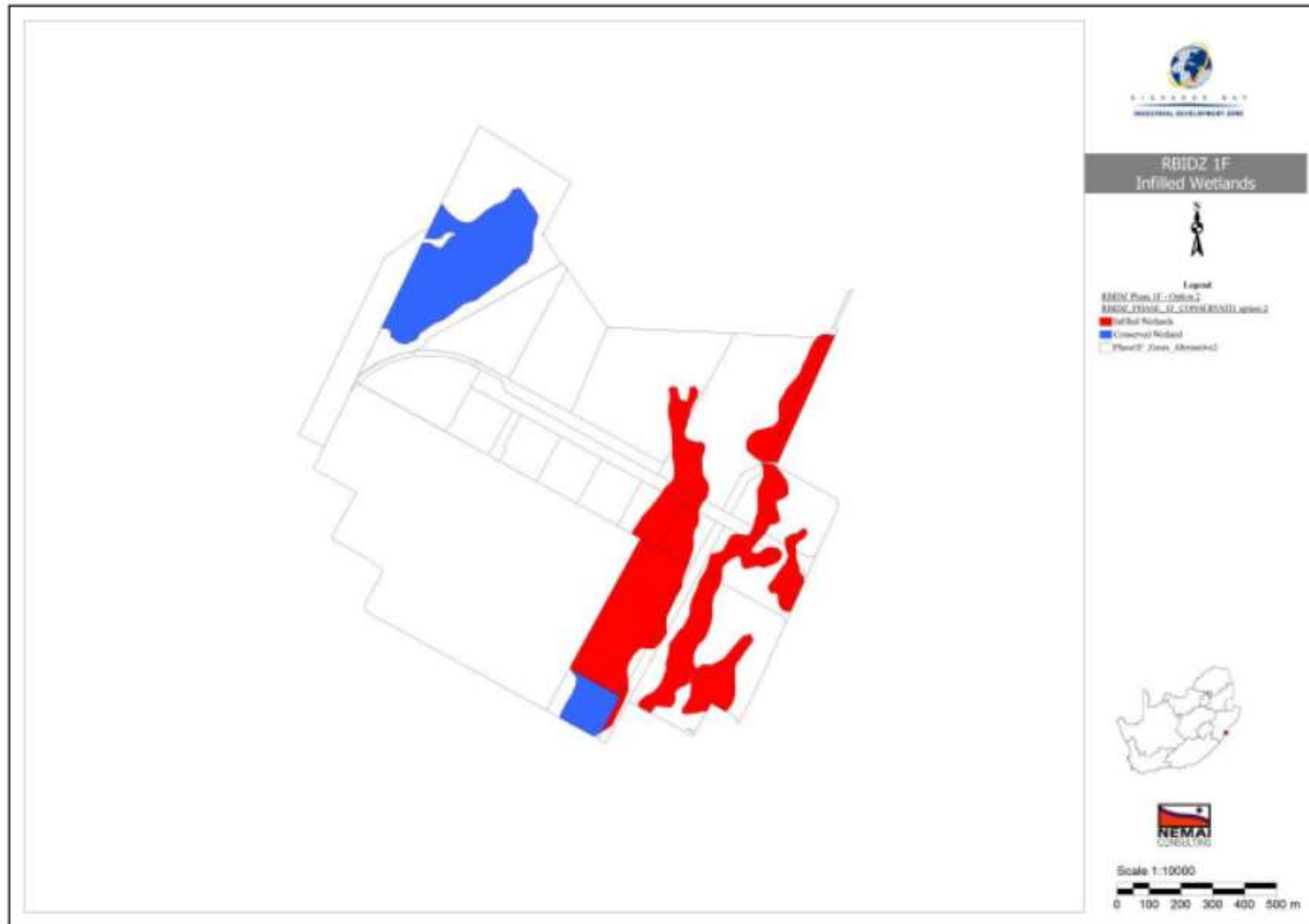


Figure 5.3: Wetlands identified within IDZ 1F, showing wetlands which will be infilled (red) and those to be conserved (blue) (NEMAI Consulting, 2015)

During the Engineering Geological Investigation, slight seepage was encountered in 50% of the test pits excavated at a depth of approximately 2.0m below the surface. Although no seepage was encountered in any of the other test pits, the soils were profiled as being very moist at the base of the test pits indicating that the groundwater is just below the base of the excavation. Seepage is evident in the lower lying portions of the site, covering about 59% of the site. The only 'dry' test pits were those excavated in the northern portion of the site on some 41% near the reservoirs where cover soils are much thicker.

Much of the hydrology is linked with the shallow water table of the coastal plain. Wetlands tend to be an indication of the groundwater/soil surface interface. The wetness regime varies seasonally with associated fluctuations in the local depth to the water table.

Faunal Communities:

Mammals

A diversity of mammal species could potentially occur within the study area. These include Red Duiker, Vervet Monkey, Tete Veld Rat, Natal Multimammate Mouse, Pygmy Mouse and the Wahlberg's Epauletted Fruit Bat (all listed as being of Least Concern), and the Reddish-grey Musk Shrew, Forest Shrew and the Least Dwarf Shrew (all listed as being Data Deficient). The likelihood of occurrence is reduced as a result of the proximity to industrial activities (such as those undertaken by Tata Steel located adjacent to the site), proximity to the town of Richards Bay and vehicle movements along the roads.

Reptiles and Amphibians

According to the Animal Demography Unit (2013), a large number of reptiles could be found on the site. These include the Green Mamba and the Variable Hinged Terrapin (listed as Vulnerable) and the Gaboon Adder (listed as near threatened). Two amphibian species have been recorded within the 2832CA grid cell, i.e. the Spotted Shovel-nosed Frog and the Natal Leaf-folding Frog (both considered to be Vulnerable).

Avifauna

No Important Bird Area (IBA) occurs in the study area. According to the SABAP2 database, 42 species have been recorded from the quarter degree grids 2832CA.

5.4. Air Quality

The Port of Richards Bay is the focal point of the IDZ, and has resulted in the establishment of major industrial facilities. These include the BHP aluminium smelters, Mondi, Tata Steel, Foskor and Richards Bay Minerals. Air pollutants associated with the manufacturing industry include SO₂, NO_x, CO, VOCs and

particulate matter. Other air pollutants are a result of the raw materials used or the industrial process, these include, amongst others, fluoride as particulates or gas from the manufacture of fertiliser and aluminium, sulphur trioxide (SO₃), and odour from the Kraft process. The Richards Bay Coal Terminal and TPT's Richards Bay Terminal handle bulk products and are sources of particulates. The Richards Bay Clean Air Association (RBCAA) established a real time monitoring network to characterise SO₂ and PM₁₀ in Richards Bay and surrounding areas. These data indicate that despite the concentration of major industry, ambient concentrations of SO₂ and PM₁₀ comply with NAAQS, with air quality issues mostly concerning odour. No measurements of NO_x are currently done in Richards Bay.

A study commissioned in 2005 assessed these conditions and identified impact areas where air quality limits are exceeded or are in danger of being exceeded (Thorn-Ex, 2010). The buffer zones that were derived from this study are reflected in Figure 5.4, which shows the severity of these air quality constraints for the IDZ. The study also showed the potential adverse risks to the environment and human health should industry operate at their full permit allocations. The zones are defined in Table 5.2 below.

Table 5.2: Air Quality Buffer Zone Descriptions (Thorn-Ex, 2010)

BUFFER ZONE	IMPLICATIONS FOR MANAGEMENT
Potential Health Impact Zone (99th Percentile)	The zone incorporates mainly the CBD and the industrial areas surrounding it and Arboretum. It demands a priority focus for decision-making. Further industrial development resulting in SO ₂ emissions should preferably not be considered within this zone until such time as the concentrations are within acceptable limits. These levels will have to be determined by the City of uMhlatuze. Industries cannot be allowed to operate at full permit capacity in this zone.
Nuisance Zone	The zone areas where people may experience discomfort due to unpleasant odours. It falls within the critical zone.
Management Zone	The main part of Richards Bay falls within this zone including the industrial areas, CBD, Arboretum and Brackenham. This zone could result in possible health implications. The ambient monitoring network should be expanded to ensure representative monitoring within this zone.
Alert Zone (LOAEL & Alert Thresholds)	The main pollutants of concern in this zone are PM10 around the harbour and SO ₂ at the CBD and surroundings. Any further industrial development within this zone resulting in these two pollutants should be carefully considered since effects may be noticed by sensitive individuals, and actions to reduce these effects

BUFFER ZONE	IMPLICATIONS FOR MANAGEMENT
	may be needed. (LOAEL: The lowest level at which adverse effects for a specific pollutant have been observed).
Environmental Impact Zone	Areas where possible negative impacts on vegetation growth could occur.

IDZ 1F is located within an area identified as being sensitive from a health impact perspective.

uThungulu DM AQMP promotes sustainable development, i.e. protection of air quality while encouraging development. The municipality drafted and AQMP in 2014, and plans to have it adopted by council and included in the next revision of the IDP. The AQMP promotes strong stakeholder cooperation for development in of the IDZ. The Umhlathuze Local Municipality air pollution control by-law is in an advanced stage of development.

5.5. Heritage features of the region

5.5.1. Heritage and archaeology

The surveys undertaken in the area adequately captured the heritage resources. The heritage resources identified have low local significance ratings. Almost all of the sites are archaeological and have previously been identified during heritage impact assessments conducted by Gavin Anderson. The only built environment heritage resource is 5.5km to the north of the proposed development area. The buildings at this site are associated with the railway infrastructure and are well away from the development. There are no known sites which require mitigation or management plans. No further heritage work is recommended for the proposed development.

5.5.2. Palaeontology (Fossils)

The area is underlain by yellowish redistributed sand which is rated as having low fossil sensitivity. A palaeontological assessment is therefore not necessary for this development.

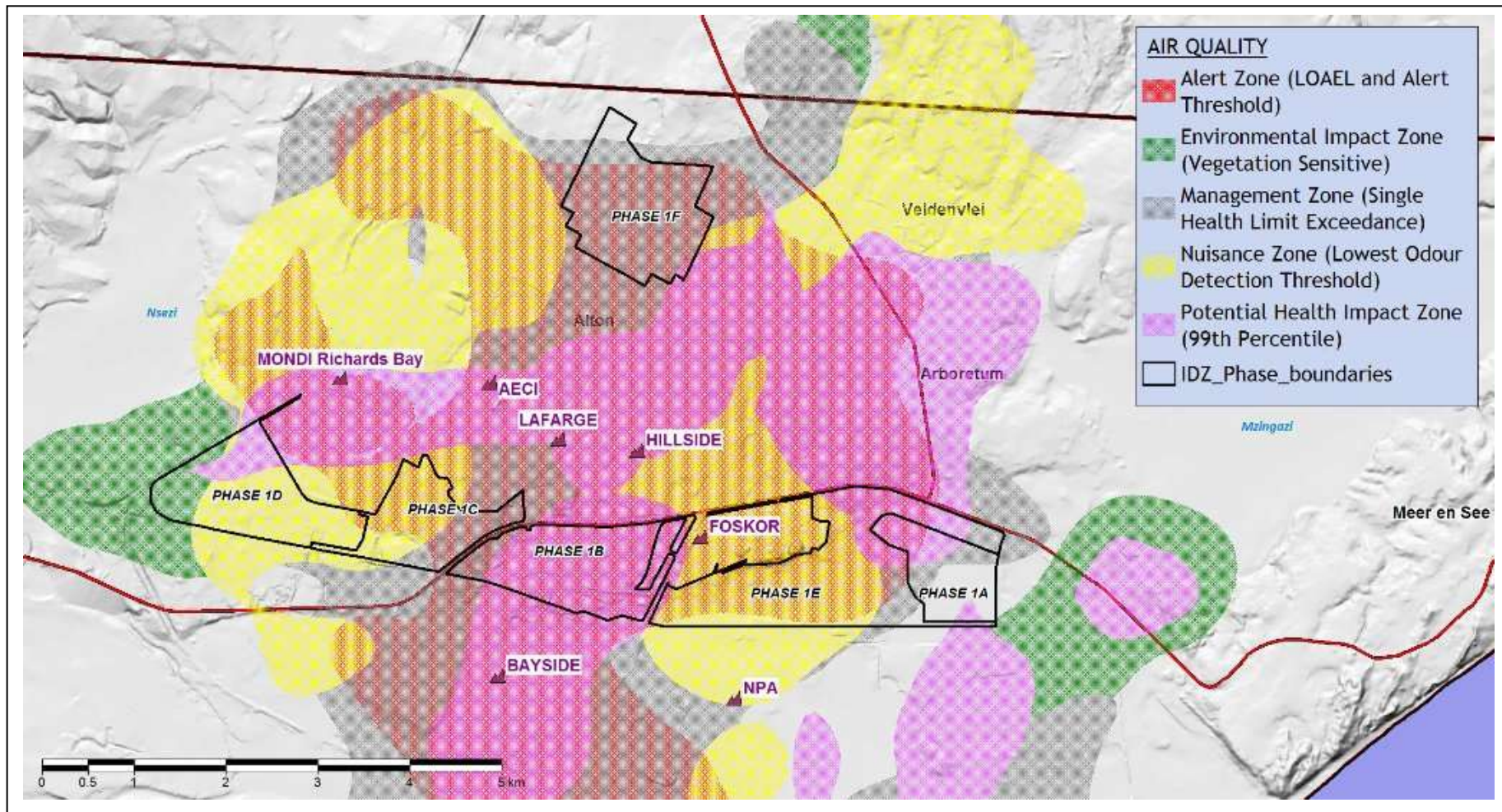


Figure 5.4: Air quality constraints in the IDZ.

5.6. Social Characteristics of the Site and Surrounding Areas

The purpose of the section is to provide an overview of the current socio-economic baseline environment and context in which the proposed project will take place within the ULM, which is located within the jurisdiction of the UDM, in the KZN Province. This section of the report will provide a strategic understanding of the socio-economic profile of the study area, in order to develop a better understanding of the socio-economic dynamics as a background to the development of the project. The data presented in this section has been largely derived from the KZN Census 2011 Municipal Report, latest municipalities IDP's and the Census Survey 2011 (Stats SA), as well as the Local Government Handbook 2012.

The area has the following general characteristics:

- » The population of the UDM in 2011 was approximately 907 519 people, of which 33 459 people reside in the ULM.
- » The most dominant population group is the Black population throughout the province, district and local municipality. The black population comprises 87.7% of the ULM population and the most spoken language in the ULM is Zulu.
- » The female population is slightly more prominent in the UDM, ULM and KZN.
- » 67.4% of the ULM population comprise the Economically Active Population (EAP); this implies that there is a larger human resource base for development projects to involve the local population with the ULM. The dependency ratio is high at 48.2% of the ULM population which puts pressure the EAP and local municipalities.
- » There is high unemployment rate in the LM (31%) with a large economically active population seeking employment opportunities. Local workers should be utilised as much as possible for the proposed development in order to alleviate local unemployment
- » The ULM has a high number of households which falls within a low income category and within the poverty level. Poverty level and the majority of the population falling within the low income level in the ULM is approximately 56.5% which demonstrates the need for job creation; the high demand for employment can be addressed (although marginally) through direct job creation during the construction and operation phase of the proposed development.
- » The education levels in the ULM area are generally low. Almost half of the population aged 20 years and older in the municipality have only some secondary education or less (in the ULM this being 46.5% of the population); this indicates that almost half of the local population are semi- skilled or unskilled. This reflects the relatively poor education of the region.

- » The skills profile of the area indicates that the availability of local labour for the proposed project which is largely limited to low-skilled construction workers, semi-skilled workers and a small number of skilled workers available
- » Majority of the population live in urbanised areas within formal dwellings.
- » ULM area is considered to be generally well serviced in terms of the extent and level of infrastructure available in terms of basic services however the ULM has weak/poor quality basic services and infrastructure. There is however no landfill site within the study area.
- » The economic sectors that have shown a slight increase over the years are financial and mining. The increase in the mining sector has been significant in that this sector is the second largest economic contributor above community services.

SCOPING OF ISSUES ASSOCIATED WITH THE GAS TO POWER PLANT

CHAPTER 6

This chapter serves to describe and evaluate the identified potential environmental impacts associated with the construction and operation of the gas to power plant within RBIDZ Phase 1F. This has been undertaken with the aim of determining the feasibility of undertaking the development within the study area, and identifying issues which will be assessed further and confirmed in the EIA phase.

The potential impacts of the proposed gas to power plant (i.e. construction, operation and decommissioning phases) are identified, described and evaluated in this chapter in accordance with the requirements of the EIA Regulations. In accordance with the objectives of the scoping study (as defined in Chapter 3 of this report), this has been informed by a review of existing baseline information and desk-top investigations.

The majority of the environmental impacts are expected to occur during the construction phase with developments of this nature. Environmental issues associated with construction and decommissioning activities of the PV facilities are similar and include, among others:

- » Impacts on Ecology, including fauna and flora within and around the site.
- » Impacts on soil and agricultural potential of the development footprint.
- » Impacts on heritage resources, including archaeological and palaeontological resources, within the development footprint.
- » Impacts on the social aspects of the affected communities within and around the study area.

Environmental issues specific to the operation of the gas to power plant could include, among others:

- » Impacts on ambient noise levels in the area.
- » Impacts on ambient air quality of the area.
- » Impacts on the social aspects of the affected communities within and around the study area.

The sections which follow provide a summary of the findings of the scoping study undertaken for the construction and operation phases of the proposed facility. Impacts associated with the decommissioning phase are expected to be similar to those associated with construction and are therefore not repeated. Impacts of

the proposed facility are described and evaluated, and recommendations are made regarding further studies required within the EIA phase of the process.

6.1. Methodology for Impact and Risk Assessment during the Scoping Phase

The following methodology was used to describe and evaluate the main issues and potential risks and impacts associated with the proposed facilities during the scoping phase:

- » The identification of potential sensitive environments and receptors that may be impacted on by the proposed facility and the types of impacts (i.e. direct, indirect and cumulative) that are most likely to occur. This was achieved through a review of existing baseline information and desk-top investigations to define sensitivities.
- » Description of the nature, significance, consequence, extent, duration and probability of potential impacts, as well as the degree to which these impacts are reversible, may cause irreplaceable loss of resources and can be avoided, managed or mitigated during the construction and operation phases.
- » The identification of potential risks to the development and the environment, and identification of 'No-Go' areas within the broader area, where applicable.
- » The compilation of a summary of the potential impacts that will be considered further in the EIA Phase through specialist assessments.

6.2. Description and Evaluation of Impacts

6.2.1. Potential Impacts on Ecology

Impact			
<p>Potential impacts on ecology are expected to be largely limited to the construction phase of the development. As described in Chapter 5, there are high levels of degradation of all vegetation types on the proposed development site. There is however some level of sensitivity associated with the remaining vegetation.</p> <p>Wetland systems were identified on the north-western and eastern portions of the site. These wetlands maintain a diverse and valuable range of plant communities and are still considered to be of conservation value. The proposed development site does not infringe on these wetland systems.</p>			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Impacts on vegetation	<ul style="list-style-type: none"> » Clearance of vegetation will result in the loss of natural vegetation from the development footprint » Damage to vegetation cover due to construction vehicle traffic movement during construction and maintenance activities » Damage to vegetation due to accidental hydrocarbon spillages » Disturbance of natural vegetation along access or construction roads through trampling and construction vehicle traffic 	Local	None identified at this stage
Potential loss of rare, endangered or protected species	Development of the site may result in loss of rare, endangered or protected vegetation species	Local	None identified at this stage
Impacts on fauna	<ul style="list-style-type: none"> » Habitat loss due to vegetation clearing within the proposed site » Disturbance to fauna during the construction phase » Damage to habitat and animals due to movement of vehicles during construction and operation 	Local	None identified at this stage
Impacts on wetland systems	» Development of the site will result in the infill of a portion of a wetland (refer to Figure 5.3). This impact has been	Local	Development within wetland

	<p>assessed in a separate EIA study (NEMAI Consulting, 2015) and has been concluded to be of an acceptable significance and magnitude if appropriate mitigations measures are implemented and construction is implemented in a sensitive manner.</p> <ul style="list-style-type: none"> » Development of the site may result in impacts on wetland systems in the surrounding area as a result of runoff from the site (through contaminated stormwater or sedimentation as a result of erosion) 		<p>areas should be avoided as far as possible</p>
<p>Establishment and spread of declared weeds and alien invader plants from disturbed areas, which can lead to the eventual replacement of indigenous vegetation</p>	<p>Major factors contributing to invasion by alien invader plants include excessive disturbance to vegetation, creating a window of opportunity for the establishment of alien invasive species. In addition, regenerative material of alien invasive species may be introduced to the site by machinery traversing through areas with such plants or materials that may contain regenerative materials of such species. Consequences of the establishment and spread of invasive plants include:</p> <ul style="list-style-type: none"> » Change in vegetation structure leading to change in or loss of various habitat characteristics » Change in plant species composition » Altered and reduced food resources for fauna » Change in soil chemical properties » Fragmentation of sensitive habitats » Change in flammability of vegetation, depending on alien species » Impairment of wetland function. 	<p>Local to Regional</p>	<p>None identified at this stage</p>
<p>Cumulative impacts</p>	<p>Cumulative impacts are expected to include:</p> <ul style="list-style-type: none"> » Loss of natural vegetation and species of conservation concern within the region » Increased potential for invasion by alien plant species 	<p>Local to Regional</p>	<p>None identified at this stage</p>

Description of expected significance of impact

Impacts on ecological resources are likely to occur at the extent of the site. As a result of the largely disturbed nature of the site, it is expected that the development would not result in any irreplaceable loss of resources and the consequences of the impacts are expected to be limited. Impacts can be minimised through the implementation of appropriate mitigation measures. Overall impacts are expected to be low in significance.

Due to the limited footprint of the proposed development, cumulative impacts are expected to be limited.

Gaps in knowledge & recommendations for further study

The condition of vegetation on the site should be verified during the EIA phase through the undertaking of a field study. This study should confirm the presence of natural vegetation as well as rare, endangered or protected vegetation species and/or sensitive habitats.

6.2.2. Impacts on soil and agricultural potential

Impact

Potential impacts associated with the proposed development include:

- Soil degradation during the construction phase
- Loss of agricultural land due to the direct impact by the infrastructure's footprint during all phases of the project
- Loss of soil resources as a result of erosion during all phases of the project

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Loss of agricultural land	<ul style="list-style-type: none"> » Development of the facility will result in the loss of land which could otherwise be used for agricultural purposes. » The agricultural potential of the site is considered to be low. In addition, the location of the site within the IDZ makes this site unsuitable for use for agricultural purposes. 	Local	None
Soil degradation during the construction phase	Soil degradation due to construction activity though, for example, contamination from accidental spillages, will negatively affect soil formation, natural weathering processes, moisture levels and soil stability. This will, in turn, affect biological processes operating in the soil. Soil degradation includes erosion (i.e. due to water and wind), soil removal, mixing, wetting, compaction, pollution, salinisation, crusting,	Local	None

	and acidification. Impacts on soil degradation are primarily related to the construction phase with insignificant impacts in the post construction and decommissioning phases.		
Loss of topsoil due to soil stripping, wind and water erosion	Soil erosion is a natural process whereby the ground level is lowered by wind or water action and may occur as a result of inter alia chemical processes and/or physical transport on the land surface. Accelerated erosion is a common occurrence on construction sites where soil is loosened and vegetation cover is stripped. This impact can be largely minimised through the implementation of appropriate mitigation measures.	Local	None
Cumulative impacts	Cumulative impacts relate to the increased potential for erosion in the region and increased risk of sedimentation of surrounding wetlands.	Local to Regional	None
<p>Description of expected significance of impact</p> <p>As a result of the limited agricultural potential of the site due largely to local climatic factors, the construction of the proposed projects are expected to be very unlikely to occur and will not result in the irreplaceable loss of resources. Impacts of the proposed projects on agricultural potential are expected to be of very low significance. No mitigation is required in this regard.</p> <p>There is the potential for the loss of soil resources through erosion, particularly during the construction phase. This impact can be effectively minimised through the implementation of appropriate mitigation measures including implementation of an appropriate stormwater management plan and regular monitoring of the occurrence, spread and potential cumulative effects of erosion. Impacts post-mitigation are expected to be of low significance.</p>			
<p>Gaps in knowledge & recommendations for further study</p> <p>None. As a result of the low significance of impacts, no further studies are required to be undertaken. Mitigation measures for the management of soil erosion and risk of contamination must however be included within the Environmental Management Programme (EMPr) for the project.</p>			

6.2.3. Impacts on heritage resources

Impact			
The construction of the proposed projects could directly impact on graves, archaeological sites and historical sites.			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance and destruction of archaeological sites and graves.	Construction activities could result in irreversible damage or destroy heritage resources and depletion of the archaeological record of the area.	Local	None
Description of expected significance of impact			
No heritage sites of significance are known to occur within the proposed development footprint. It is therefore unlikely that impacts in this regard will occur. Should impacts occur, these would be local in extent and may result in irreplaceable loss of resources but the consequences are expected to be low. Impacts of the proposed projects on heritage resources are expected to be of very low significance.			
Gaps in knowledge & recommendations for further study			
The heritage resources in the area proposed for development are sufficiently recorded. The previous surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. No further heritage work is recommended for the proposed development. Mitigation measures for the management of soil erosion and risk of contamination must however be included within the Environmental Management Programme (EMPr) for the project.			

6.2.4. Impacts on ambient noise levels

Impact			
Construction and operation of the facility may add to the noise levels in the area. Land uses in the study area are comprised of open space areas and surrounding industrial areas. Noise levels in the study area are currently generated mostly by vehicular traffic and surrounding industries.			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Increased noise levels	<ul style="list-style-type: none"> » Noise impact may result during the construction phases of the proposed development. » Operation of the gas to power plant may impact on the noise levels in the area » Traffic associated with the construction and operation of the facility may increase noise levels in the area 	Local	None

Description of expected significance of impact

The facility is located more than 1000m from the closest potential noise-sensitive receptors and therefore the potential of a noise impact would be low. This is in line with point 5.4 (h) of SANS 10328:2003, that states that if industry is to be situated further than 1,000m from noise-sensitive developments the activity is unlikely to have any acoustical implications.

Gaps in knowledge & recommendations for further study

The potential for noise impacts as a result of the proposed project is expected to be low. No further studies in this regard are therefore required. Mitigation measures for the minimisation of noise levels during the construction and operation phase must however be included within the Environmental Management Programme (EMPr) for the project.

6.2.5. Impacts on ambient air quality

Impact			
Richards Bay is further characterised by very poor air quality conditions. IDZ 1F is located within an area identified as being sensitive from a health impact perspective.			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Dust and air emissions due to construction vehicles and activities.	During construction, clearing and excavations may result in dust, which could be a nuisance to people in the surrounding areas. Dust is a nuisance that can be managed during construction through use of appropriate dust control measures.	Local	None identified at this stage
Emissions from the gas to power station during operation	During normal operation of the plant ambient air quality conditions will be primarily impacted by emissions from the stack exhausts. Burning natural gas produces nitrogen oxides (NO _x =NO+NO ₂) and carbon dioxide (CO ₂). Natural gas contains very little sulphur and no particulates, therefore the emissions of sulphur dioxide (SO ₂) and particulates including PM ₁₀ are negligible. Methane (CH ₄) is a primary component of natural gas and may also be emitted when natural gas is not combusted completely in the power generation process. Methane can also be emitted from leaks and losses during storage and transportation. NO ₂ is a criteria air pollutant with known risks to human health.	Local and regional	None identified at this stage

	NO _x is not regarded as a problem pollutants in Richards Bay, the emphasis has historically been on SO ₂ and PM ₁₀		
Emissions of greenhouse gases	Contribution to global warming and climate change - CO ₂ and CH ₄ are greenhouse gases.	Transboundary	None identified at this stage
Cumulative impacts	Cumulative impacts on local air quality as a result of increasing industrial development in the area.	Regional	None identified at this stage

Description of expected significance of impact

Impacts during construction are largely expected to be associated with dust emissions. This impact is likely to occur and is typically limited to the immediate vicinity of the proposed site, the consequences of which are expected to be limited. With appropriate mitigation such as dust suppression through a watering management program, this impact can be marginal or of low significance.

Operation of the gas to power plant is expected to result in relatively low emissions to the atmosphere as a result of the fuels to be used (ultimately natural gas). Despite the benefit of relatively low emissions per unit, the combined emissions of the all combustion turbines are expected to be potentially significant. Unless adequately mitigated, these emissions have the potential to negatively impact ambient air quality. The primary concerns are potential health impacts and associated ecological impacts. Pollutant concentrations are expected to be highest in the immediate vicinity of the plant, dispersing rapidly with increasing distance from the proposed site. The nearest residential area is located more the 1.5km to the north-west of the site. There is the potential for impacts on human health to occur. This should be confirmed through a detailed study within the EIA phase of the process. This study must also consider the cumulative impacts of other industrial developments within the Richards Bay area.

Gaps in knowledge & recommendations for further study

There is the potential for impacts on ambient air quality to occur as a result of the proposed development, specifically during the operational phase. A detailed air quality impact assessment must be undertaken for the project in order to confirm the significance of the potential impact and to recommend appropriate mitigation measures for implementation.

An Air Emissions License will be required to be obtained for the project. The air quality impact assessment must be undertaken in such a manner as to support this application.

6.2.6. Impacts on the social environment

Construction phase

The **potential positive impacts** which could arise as a result of the construction activities include the following:

- » Socio-economic benefits could accrue through job creation (primarily lower skilled levels) during the construction phase. The local community could thus benefit in this regard;
- » It is anticipated that the more skilled positions could be filled by individuals from South Africa;
- » Should employment be linked to training and capacity building it would further the positives in this regard;
- » At this stage it is not anticipated that local procurement would be achievable for the technology requirements associated with a project of this nature. Local procurement would be more focused on the procurement of general construction materials, goods and services.

Impact:

Direct employment opportunities and skills development:

The construction of the proposed project will require a workforce and therefore direct employment will be generated. The proposed development will create employment opportunities for the local community. This is therefore a positive social impact. The proponent has indicated that training will be provided to employees associated with the proposed project.

Desktop Sensitivity Analysis of the Site:

People from the ULM and nearby towns are most likely going to benefit

Issue	Nature	Extent of Impact	No-Go Areas
Direct employment opportunities and skills development	The creation of employment opportunities and skills development opportunities during the construction phase for the country and local economy	Local-regional	None

Description of expected significance of impact

The potential impact is expected to be positive, probable, short term, with a moderate intensity and have a low - medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. In terms of reversibility of the impact and irreplaceable loss of resources, this is not applicable to this type of impact. The potential impact may be enhanced with possible enhancement measures which will be elaborated in the SIA EIA phase.

Gaps in knowledge & recommendations for further study

It is recommended that a detailed SIA is undertaken to determine actual impact of job creation and skills development.

Impact:

Economic multiplier effects:

There are likely to be opportunities for local businesses to provide services and materials for the construction phase of the facilities. The local service sector will also benefit. The economic multiplier effects from the use of local goods and services opportunities will include, but is not limited to, construction materials and equipment and workforce essentials such as services, safety equipment, ablution, accommodation, transportation and other goods. In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and local economy. Also the injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area.

Desktop Sensitivity Analysis of the Site:

The ULM and nearby towns are most likely going to benefit

Issue	Nature	Extent of Impact	No-Go Areas
Economic multiplier effects	Significance of the impact from the economic multiplier effects from the use of local goods and services	Local-regional	None

Description of expected significance of impact

The potential impact is expected to be positive, probable, short term, with a low intensity and have a low - medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. In terms of reversibility of the impact and irreplaceable loss of resources, this is not applicable to this type of impact. The potential impact may be enhanced with possible enhancement measures which will be elaborated in the SIA EIA phase.

Gaps in knowledge & recommendations for further study

It is recommended that this impact is further assessed in the EIA phase of the SIA.

The **potential negative impacts** which could arise as a result of the construction activities include the following:

- » A large number of construction vehicles utilising the regional road of the R619 and internal access roads within the IDZ 1F for a period of approximately 18 months during the construction phase could have a negative impact on the roads. Construction vehicles crossing over the roads to access the site could increase the risk of accidents as well as continuous utilisation of the road over the construction period with heavy construction vehicles could increase the wear and tear on the roads utilised, regional roads and internal access roads;

- » An influx of workers and jobseekers to an area (whether locals are employed or outsiders are employed) could increase the safety risks in the local area and have an impact on the local social dynamics. Should locals be employed it could minimise the perceived and actual risk in this regard;
- » An influx of an outside workforce could put pressure on municipal services, as indicated from the local policies reviewed. Therefore introducing an external workforce to the local area will put pressure on local services and local community. This would, however, also depend on the size of the workforce.
- » During the construction phase adjacent landowners could be negatively affected by the dust, noise and negative aesthetics created as a result of the construction activities.

Impact:			
Safety and security impacts:			
An increase in crime is often associated with construction activities. The perceived loss of security during the construction phase of the proposed project due to the influx of workers and/or outsiders to the area (as influxes of construction workers, newcomers or jobseekers are usually associated with an increase in crime), may have indirect effects, such as increased safety and security issues for neighbouring properties and damage to property, such as the risk of veld fire, stock theft, crime and so forth.			
Desktop Sensitivity Analysis of the Site:			
Areas of concern include the impacted farmland and adjacent areas			
Issue	Nature	Extent of Impact	No-Go Areas
Safety and security impacts	Temporary increase in safety and security concerns associated with the influx of people in the study area during the construction phase	Local	None at this stage
Description of expected significance of impact			
The potential impact is expected to be negative, improbable, short term, with a low intensity and have a low significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact. The potential impact may be avoided with possible mitigation measures which will be elaborated in the SIA EIA phase.			
Gaps in knowledge & recommendations for further study			
A site visit and consultations with key stakeholders will need to take place in the EIA phase in order to determine the perceived safety and security risks associated with the proposed developments.			

Impact:			
<u>Impacts on daily living and movement patterns:</u>			
An increase in traffic due to heavy vehicles could create short-term disruptions and safety hazards for current road users. Transportation of project components and equipment to the proposed study area will be transported using vehicular / trucking transport.			
Desktop Sensitivity Analysis of the Site:			
Employees and industries in the study area that currently utilize the nearby roads			
Issue	Nature	Extent of Impact	No-Go Areas
Impacts on daily living and movement patterns	Temporary increase in traffic disruptions impacting local communities movement patterns and increased safety risks for road users	Local	None
Description of expected significance of impact			
The potential impact is expected to be negative, probable, short term, with a moderate intensity and have a low-medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact. The potential impact may be mitigated with possible mitigation measures which will be elaborated in the SIA EIA phase.			
Gaps in knowledge & recommendations for further study			
Consultations with key stakeholders will need to take place in the EIA phase in order to determine the impact on daily living and movement patterns.			

Impact:			
<u>Pressure on economic and social infrastructure impacts from an in-migration of people:</u>			
The in-migration of people to the area as either non-local workforce of construction workers and/or jobseekers could result in pressure on economic and social infrastructure (municipal services) due to in migration of construction workers and jobseekers and pressure on local population (rise in social conflicts and social dynamics). Influx of people into the area, especially by job seekers, could further lead to a temporary increase in the level of crime, cause social disruption and put pressure on municipal services.			
Desktop Sensitivity Analysis of the Site:			
Sensitive areas in the ULM include Richards Bay			
Issue	Nature	Extent of Impact	No-Go Areas
Pressure on economic and social infrastructure impacts from an in-migration of people	Added pressure on economic and social infrastructure during construction phase as a result of in-migration of people	Local-regional	None

Description of expected significance of impact

The potential impact is expected to be negative, improbable, short term, with a low intensity and have a low significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact. The potential impact may be mitigated with possible mitigation measures which will be elaborated in the SIA EIA phase.

Gaps in knowledge & recommendations for further study

Consultations with key stakeholders (ward councillor and municipalities) will need to take place in the EIA phase.

Impact:

Nuisance Impacts (noise & dust):

Impacts associated with construction related activities include noise, dust and disruption to adjacent properties is a potential issue. The proposed site is located within an industrial area, so the impact will be less significant.

Desktop Sensitivity Analysis of the Site:

Areas of concern include adjacent landowners

Issue	Nature	Extent of Impact	No-Go Areas
Nuisance Impacts (noise & dust)	Nuisance impacts in terms of temporary increase in noise and dust, on site and on roads to access the site	Local	None

Description of expected significance of impact

The potential impact is expected to be negative, probable, short term, with a low intensity and have a low significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact. The potential impact may be mitigated with possible mitigation measures which will be elaborated in the SIA EIA phase.

Gaps in knowledge & recommendations for further study

A site visit and consultations with key stakeholders (impacted and adjacent landowners) will need to take place in the EIA phase in order to determine the extent of this impact.

Operation Phase

The **potential positive impacts** which could arise as a result of the operation phase include the following:

- » During the operational phase employment opportunities would be created which could result in benefits to unemployed individuals within the local communities.
- » Capacity building and skills development throughout the life of the facility could be to the benefit of the employees and could assist them in obtaining transferable skills.
- » During the operational phase local procurement for general materials, goods and services (e.g. Transport, catering and security) and other spin-off benefits could materialise.

Impact:			
<u>Direct employment opportunities and skills development:</u>			
The operation phase (20-25 years) of the proposed development will require a workforce and therefore direct employment will be generated. Primarily skilled and high skilled personal will be required during the operation phase. The proponent has also indicated that training will be provided for employees during the operation phase.			
Desktop Sensitivity Analysis of the Site:			
A limited number of local community members are likely going to benefit from this positive impact.			
Issue	Nature	Extent of Impact	No-Go Areas
Direct employment opportunities and skills development	The creation of long term employment opportunities and skills development opportunities during the operation phase for the country and local economy	Local-regional	None
Description of expected significance of impact			
The potential impact is expected to be positive, probable, long term, with a minor intensity and have a low - medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. In terms of reversibility of the impact and irreplaceable loss of resources, this is not applicable to this type of impact. The potential impact may be enhanced with possible enhancement measures which will be elaborated in the SIA EIA phase.			
Gaps in knowledge & recommendations for further study			
It is recommended that a detailed SIA is undertaken to determine actual impact of job creation and skills development opportunities during the operation phase.			

Impact:			
<u>Economic multiplier effects:</u>			
There are likely to be opportunities for local businesses to provide services and materials for the operation phase of the development. The local service sector will also benefit from the proposed development. In terms of business opportunities for local companies, expenditure during the operation phase will create business opportunities for the regional and local economy. Also the injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area.			
Desktop Sensitivity Analysis of the Site:			
The ULM and Richards Bay area are most likely going to benefit from this positive impact.			
Issue	Nature	Extent of Impact	No-Go Areas
Economic multiplier effects	Significance of the impact from the economic multiplier effects from the use of local goods and services	Local-regional	None
Description of expected significance of impact			
The potential impact is expected to be positive, probable, long term, with a minor intensity and have a low significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. In terms of reversibility of the impact and irreplaceable loss of resources, this is not applicable to this type of impact. The potential impact may be enhanced with possible enhancement measures which will be elaborated in the SIA EIA phase.			
Gaps in knowledge & recommendations for further study			
It is recommended that this impact is further assessed in the EIA phase of the SIA.			

Impact:
<u>Development energy infrastructure:</u>
Approximately 90% of South African electricity comes from coal-fired power stations, with Eskom being the dominant electricity producing company generating 95% of all electricity in South Africa (as detailed in the SA Yearbook 2009/2010). The demand for electricity in South Africa has grown, on average, at more than 4% over the past few years, with a simultaneous reduction in the surplus generating capacity due to limited commissioning of new generation facilities. The Integrated Resource Plan (IRP) 2010 developed by the Department of Energy projected that an additional capacity of up to 56 539MW of generation capacity will be required to support the country's economic development and ensure adequate reserves over the next twenty years. In order to meet this required generation capacity, the IRP includes a mix of generation technologies, including a nuclear fleet of 9.6 GW; 6.3 GW of coal; 17.8 GW of renewables; and 8.9 GW of other generation sources, including gas. The generation of power is also needed to ensure the sustainability of existing industry, as well as attracting new industry to the area.
Desktop Sensitivity Analysis of the Site:
N/A

Issue	Nature	Extent of Impact	No-Go Areas
Development of energy infrastructure	Positive long-term impacts from the generation of energy	Local-regional-national	None
Description of expected significance of impact			
The potential impact is expected to be positive, probable, long term, with a moderate intensity and have a medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact.			
Gaps in knowledge & recommendations for further study			
None at this stage in the process.			

The **potential negative impacts** which could arise as a result of the operation phase include the following:

- » The permanent visual impact associated the plant would alter the landscape. Perceptions with regards to the intensity of such an impact are expected to differ among landowners, stakeholders and other individuals. It is anticipated that each person would experience such an impact in a different way depending on their perception of gas to power plant itself, the activities undertaken on the surrounding area, their interest in the project and their exposure to the project on a daily basis. However the landscape has already been altered due to the industrial activities nearby. Therefore the aesthetics from the gas to power plant is expected to have a low intensity impact.
- » The proposed development is located in an industrial area so the visual implications would have a very minor negative impact on areas sense of place.

Impact:

Visual impact and impacts on sense of place:

The sense of place is developed over time as the community embraces the surrounding environment, becomes familiar with its physical properties, and creates its own history. The sense of place is created through the interaction of various characteristics of the environment, including atmosphere, visual resources, aesthetics, climate, lifestyle, culture and heritage. Importantly though it is a subjective matter and is dependent on the demographics of the population that resides in the area and their perceptions regarding trade-offs. An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. The social impacts associated with the impact on sense of place relate to the change in the landscape character and visual impact from the proposed gas to power facility. The landscape in the area has already been altered due to the industrial activities nearby. Therefore the aesthetics from the gas to power plant is expected to have a low intensity impact and a low impact on the areas sense of place.

Desktop Sensitivity Analysis of the Site:			
Sensitive receptors include the impacted and adjacent landowners			
Issue	Nature	Extent of Impact	No-Go Areas
Visual impact and impacts on sense of place	Visual impacts and sense of place impacts associated with the operation phase of the project	Local	None
Description of expected significance of impact			
The potential impact is expected to be negative, probable, long term, with a moderate intensity and have a low-medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact. The potential impact may be mitigated with possible mitigation measures which will be elaborated in the SIA EIA phase.			
Gaps in knowledge & recommendations for further study			
Due to the position of the gas to power plant located within the RBIDZ 1F, no further studies are required.			

Cumulative Impacts

The Richards Bay gas to power plant is located within the identified RBIDZ area most suitable for the rollout of the development of industrial activities within the KZN Province. This implies that projects of the same nature will be consolidated in one area creating a node, and ultimately aiming to reduce the potential for cumulative impacts associated with such developments when spatially fragmented. The site is located in close proximity to Tata Steel and the proposed gas to power plant is located in the IDZ 1F, an area planned for further industrial development. Possible cumulative impacts as a result of other industrial projects in the area could have cumulative negative and positive impacts for the local community. Cumulative impacts have been considered as part of the scoping social impact assessment and identified where relevant.

Cumulative Impact:

Cumulative impacts of employment opportunities, business opportunities, skills development, socio-economic development:

The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. Benefits to the local, regional and national economy through employment and procurement of services could be substantial should many renewable energy facilities proceed.

Desktop Sensitivity Analysis of the Site:

People from the ULM and nearby towns are most likely going to benefit from job opportunities and economic benefits from the industrial developments in

area.			
Issue	Nature	Extent of Impact	No-Go Areas
Cumulative impacts of employment opportunities, business opportunities and skills development	An increase in employment opportunities, skills development and business opportunities with the establishment of other industrial developments	Local-regional	None
Description of expected significance of impact			
The potential impact is expected to be positive, probable, long term, with a moderate intensity and have a medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. In terms of reversibility of the impact and irreplaceable loss of resources, this is not applicable to this type of impact. The potential impact may be enhanced with possible enhancement measures which will be elaborated on in the SIA EIA phase.			
Gaps in knowledge & recommendations for further study			
An in-depth community needs assessment (CNA) will need to be carried out to confirm that the real needs of communities are addressed (in line with the local government) by development programmes in order to significantly contribute towards local economic growth, SED and ED. A detailed SIA is also recommended to determine the actual impact of employment opportunities, business opportunities, skills development, socio-economic development opportunities.			

Cumulative Impact:			
<u>Cumulative impact with large scale in-migration of people:</u>			
The development of large-scale industrial projects in the local area will likely draw a large number of labour, businesses and jobseekers to the area. If the local labour force cannot be sourced locally or the local labour pool is inadequate for the industrial projects, outside labour will likely move to the area to fill the gap. The area may experience an influx of new residents who may move to the area looking for job opportunities; which will have effects on the existing population during the construction period that could entail problems of housing, sanitation, water usage and solid waste disposal.			
Desktop Sensitivity Analysis of the Site:			
Sensitive areas includes Richards Bay			
Issue	Nature	Extent of Impact	No-Go Areas
Cumulative impact with large-scale in-migration of people	Negative impacts and change to the local economy with an in-migration of labourers, businesses and jobseekers to the area.	Local-regional	None
Description of expected significance of impact			
The potential impact is expected to be negative, probable, long term, with a low intensity and have a low-medium significance. This will be confirmed during			

the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact. The potential impact may be mitigated with possible mitigation measures which will be elaborated on in the SIA EIA phase.

Gaps in knowledge & recommendations for further study

It is recommended that a detailed SIA study is undertaken to assess this impact further.

Cumulative Impact:

Cumulative impacts on the sense of place and landscape (visual impacts):

The visual impact further industrial developments is likely to change the immediate landscape of the area. The cumulative impact of other industrial developments in the area could alter the nature of the landscape. The potential impact of industrial developments on the landscape is an issue that needs to be taken into consideration. However the surrounding immediate area is located within the RBIDZ 1F, an area designated for future industrial development.

Desktop Sensitivity Analysis of the Site:

Sensitive receptors includes the immediate area of influence; landowners in the study area

Issue	Nature	Extent of Impact	No-Go Areas
Visual impact and impacts on sense of place assessment	Visual impacts and change in the sense of place impacts associated with the establishment of other industrial developments in the area	Local	None

Description of expected significance of impact

The potential impact is expected to be negative, highly probable, long term, with a moderate intensity and have a medium significance. This will be confirmed during the EIA phase following detailed investigations and assessment of impacts. The potential impact can be reversed and there is no irreplaceable loss of resources associated with the potential impact. The potential impact may be mitigated with possible mitigation measures which will be elaborated on in the SIA EIA phase.

Gaps in knowledge & recommendations for further study

Due to the area being located within the RBIDZ 1F, no further visual studies are recommended.

CONCLUSIONS

CHAPTER 7

Richards Bay Gas Power 2 (Pty) Ltd, an Independent Power Producer (IPP), is proposing the establishment of a gas to power plant and associated infrastructure on a site located on erven 17455, 17443 and 17442 within the Richards Bay Industrial Development Zone 1F, located within the Umthlathuze Municipality, Kwazulu-Natal Province. The power station will have a capacity of up to 300MW. This project is to be developed in response to the Department of Energy's request for projects to be developed by Independent Power Producers in order to provide alternative power generation technologies as part of the technology mix for the country.

This Scoping Study has been undertaken in accordance with the EIA Regulations published in Government Notice 38282 of 4 December 2014, in terms of Section 24(5) of the National Environmental Management Act (NEMA; Act No 107 of 1998). This Scoping Report is aimed at detailing the nature and extent of this facility, identifying potential issues associated with the proposed project, and defining the extent of studies required within the EIA. This was achieved through an evaluation of the proposed project through consideration of existing information and previous studies undertaken for the IDZ and specifically for Phase 1F.

This chapter concludes the Scoping Report and provides an evaluation of the identified potential environmental risks and impacts associated with the construction and operation phases of the gas to power plant. Recommendations regarding investigations required to be undertaken within the EIA are provided within the Plan of Study for EIA, contained within Chapter 8 of this scoping report.

7.1. Evaluation of the Proposed Project

Potential impacts associated with the proposed gas to power project are expected to occur during both the construction and operational phases. The majority of potential impacts identified to be associated with the construction of the project are anticipated to be localised. Impacts associated with air quality during the operational phase are expected to occur at a local, regional and potentially transboundary level.

From the scoping study undertaken, the following conclusions have been made regarding potential impacts associated with the proposed project:

- » Impacts on ecological resources, including loss of remaining patches of natural vegetation and loss of species of conservation concern, are likely to occur at the extent of the site. As a result of the largely disturbed nature of the site, it is expected that the development would not result in any irreplaceable loss of resources and the consequences of the impacts are expected to be limited. Impacts can be minimised through the implementation of appropriate mitigation measures. Overall impacts are expected to be low in significance. Due to the limited footprint of the proposed development, cumulative impacts are expected to be limited.
- » As a result of the limited agricultural potential of the site due largely to local climatic factors, the construction of the proposed projects are expected to be very unlikely to occur and will not result in the irreplaceable loss of resources. Impacts of the proposed projects on agricultural potential are expected to be of very low significance. No mitigation is required in this regard. No further studies in this regard are required.
- » There is the potential for the loss of soil resources through erosion, particularly during the construction phase. This impact can be effectively minimised through the implementation of appropriate mitigation measures including implementation of an appropriate stormwater management plan and regular monitoring of the occurrence, spread and potential cumulative effects of erosion. Impacts post-mitigation are expected to be of low significance.
- » The heritage resources in the area proposed for development are sufficiently recorded. The previous surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. It is therefore unlikely that impacts in this regard will occur. Should impacts occur, these would be local in extent and may result in irreplaceable loss of resources but the consequences are expected to be low. Impacts of the proposed projects on heritage resources are expected to be of very low significance. No further studies in this regard are therefore required.
- » The facility is located more than 1000m from the closest potential noise-sensitive receptors and therefore the potential of a noise impact would be low. This is in line with point 5.4 (h) of SANS 10328:2003, that states that if industry is to be situated further than 1,000m from noise-sensitive developments the activity is unlikely to have any acoustical implications. No further studies in this regard are therefore required.
- » There is the potential for impacts on ambient air quality to occur as a result of the proposed development, specifically during the operational phase. Impacts during construction are largely expected to be associated with dust emissions. This impact is likely to occur and is typically limited to the immediate vicinity of the proposed site, the consequences of which are expected to be limited. With appropriate mitigation such as dust suppression through a watering management program, this impact can be marginal or of low significance. Operation of the gas to power plant is expected to result in relatively low

emissions to the atmosphere as a result of the fuels to be used (ultimately natural gas). Despite the benefit of relatively low emissions per unit, the combined emissions of the all combustion turbines are expected to be potentially significant. Unless adequately mitigated, these emissions have the potential to negatively impact ambient air quality. The primary concerns are potential health impacts and associated ecological impacts. Pollutant concentrations are expected to be highest in the immediate vicinity of the plant, dispersing rapidly with increasing distance from the proposed site. The nearest residential area is located more the 1.5km to the north-west of the site. There is the potential for impacts on human health to occur. This should be confirmed through a detailed study within the EIA phase of the process. This study must also consider the cumulative impacts of other industrial developments within the Richards Bay area.

- » Impacts on the social environment are expected during both the construction and operational phases. Both positive and negative impacts are anticipated to occur. The most important potential social benefits associated with the construction and operations of the project refer to the job opportunities and possible socio-economic spin-offs created. New economic activities such as this project having the potential to assist with the developmental challenges that much of province is faced with, providing employment and skills development to local community and contributing to the social, economic and institutional development of the local area. Additional employment and associated indirect economic benefits could improve the quality of life of the local community. The main negative impacts are associated with the influx of in-migrants and intrusion impacts associated with the construction phase from the gas to power plant. The extent of the negative impacts and possible benefits would be further assessed during the EIA phase when these would be investigated in more detail.

No environmental fatal flaws or impacts of very high significance were identified to be associated with the proposed project on the identified site at this stage in the process. This conclusion must however be confirmed through a detailed investigation of the development footprint within the EIA Phase of the process.

7.2. Risks Associated with the Proposed Project

A potential risk associated with the development of the gas to power plant will be potential conflict with the land-use of the area. However, as the land is located within the identified Industrial Development Zone, and has been allocated for the purposes of the project, this conflict is considered to be negligible for this project.

The most significant risk associated with the project is the potential for increase in air quality impacts associated with the operational phase of the project.

Burning natural gas produces nitrogen oxides and carbon dioxide (CO₂). Natural gas contains very little sulphur and no particulates, therefore the emissions of these pollutants are negligible. Methane (CH₄) is a primary component of natural gas and may also be emitted when natural gas is not combusted completely in the power generation process. Methane can also be emitted from leaks and losses during storage and transportation. NO₂ is a criteria air pollutant with known risks to human health. Detailed investigation of impacts of the gas to power station on air quality will be required to be undertaken in order to confirm the significance of potential impacts and risks in terms of human health.

7.3. Recommendations

At this stage in the process, there are no environmental fatal flaws identified to be associated with the gas to power station located within the RBIDZ Phase 1F, and there is no reason for the project not to be evaluated further in a detailed EIA study. During the EIA phase more detailed environmental studies will be conducted in line with the Plan of Study contained in Chapter 8 of this report. These studies will consider the detailed layouts produced by the developer and make recommendations for the implementation of avoidance strategies (if required), mitigation and management measures to ensure that the final assessed layout retains an acceptable environmental impact.

PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

CHAPTER 8

This Scoping Report includes a description of the nature and extent associated with the development of the proposed gas to power plant within the Richards Bay IDZ Phase 1F with details regarding the Scoping Phase, as well as the issues identified, described and evaluated. This chapter provides the Plan of Study for the Environmental Impact Assessment (EIA) which is relevant to the development phase for the project, based on the outcomes of the Scoping Study and associated specialist investigations.

The key findings of the Scoping Phase are used to inform the Plan of Study for EIA together with the requirements of the NEMA EIA Regulations of 2014 and applicable guidelines. The Plan of Study describes how the EIA Phase will proceed and includes details of the detailed specialist studies required to be undertaken for those potential impacts recorded to be of potential significance.

8.1. Aims of the EIA Phase

The EIA Phase to be undertaken for the gas to power plant will aim to achieve the following:

- » Provide an overall description of the social and biophysical environment affected by the development of the proposed facility.
- » Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed facility.
- » Identify and recommend appropriate mitigation measures for potentially significant environmental impacts.
- » Undertake a fully inclusive public involvement process to ensure that I&APs are afforded the opportunity to participate, and that their issues and concerns are recorded.

The EIA will address potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with each life-cycle stage of the development including design, construction, operation and decommissioning; and will aim to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed projects. The detailed facility layout will be assessed through detailed specialist studies. As required in terms of the EIA Regulations the assessment will include consideration of the 'do nothing' alternative.

8.2. Authority Consultation

Consultation with the regulating authorities has been undertaken in the Scoping phase and will continue throughout the EIA process. On-going consultation will include the following:

- » Submission of a Final Scoping Report following a 30-day review period (and consideration of comments received).
- » Submission of a Draft EIA Report for review and comment.
- » Submission of a Final EIA Report following a 30-day review period.
- » Consultation and a site visit (if required) in order to discuss the findings and conclusions of the EIA Report.

8.3. Assessment of Potential Impacts and Recommendations regarding Mitigation Measures

Through the Scoping Study, the following issues were concluded to have impacts of low significance:

- » Impacts on agricultural potential and soils
- » Impacts on heritage resources
- » Noise impacts

As concluded by this scoping study, no further studies in this regard are required to be undertaken. Mitigation measures are however required to be included within the project Environmental Management Programme (EMPr), which is to be compiled in the EIA Phase of the process.

A summary of the issues which require further investigation within the EIA phase, as well as the proposed activities to be undertaken in order to assess and ground-truth the significance of these potential impacts is provided within **Table 8.1**. The specialists involved in the EIA Phase are also reflected within this table. These specialist studies will consider the development footprint proposed for the facility and all associated infrastructure, as well as any feasible and reasonable alternatives identified for the project.

Table 8.1: Issues requiring further investigation during the EIA Phase and activities to be undertaken in order to assess the significance of these potential impacts relevant to the Richards Bay gas to power facility

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Ecological Impact Assessment Ecology (flora and fauna)	<p>Fieldwork is required in order to verify the condition of vegetation on the site. This study will aim to confirm the presence of natural vegetation as well as rare, endangered or protected vegetation species and/or sensitive habitats.</p> <p>The specialist study to be undertaken in the EIA phase will:</p> <ul style="list-style-type: none"> » Assess local and regional impacts (direct and indirect) associated with the proposed infrastructure » Include a detailed assessment considering direct, indirect and cumulative impacts for all phases of the project » Make detailed mitigation suggestions for the planning, construction and operational stages, which will be included in the construction and operational phase EMPs. 	Gerhard Botha of Savannah Environmental
Air quality impact assessment	<p>The scope of work for the air quality study will include the following:</p> <ul style="list-style-type: none"> » Providing an overview of legislative and regulatory requirements pertaining to atmospheric emissions and ambient air quality, as well as international air quality guidelines and standards. » Evaluating estimated emissions, and comparing estimated emissions to existing and future local and international limits. » Determining existing sources of emissions from other industries in the area. » Obtaining information regarding existing air quality in the area. » The compilation of a detailed emission inventory for the proposed power plant for construction, operations and decommissioning. The inventory will be based on activity data such as the proposed generation technology; air pollution abatement technology, fuel type, and fuel quality and consumption. » Air dispersion modelling using a model recommended by the DEA to predict ambient concentrations of air pollutants resulting from the plant emissions during construction, operations and decommissioning, using existing ambient concentrations to assess the cumulative effect. The modelling should use at least one year of representative meteorological data. » Applying the air dispersion model to determine incremental and cumulative pollutant concentrations in the ambient air as a result of the construction and operational phases. 	Mark Zunckel and team of uMoya-NILU Consulting (Pty) Ltd

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<ul style="list-style-type: none"> » Results should be compared with National Ambient Standards and be made available for a Health Risk Assessment (HRA). » A Health Risk Assessment (HRA) to assess the risk associated with the predicted ambient concentrations in potentially affected communities. 	
Social Impact Assessment	<p>The main aim for the social report will be to determine the social impacts that may arise from the proposed facilities. The proposed approach that will be used for the SIA study will be based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on the international best practice, the key objectives in the SIA process will include:</p> <ul style="list-style-type: none"> » Describing and obtaining an understanding of the proposed development (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA; » Collecting baseline data on the current social environment and historical social trends; » Identifying and collecting data on the Social Impact Assessment variables and social change processes related to the proposed intervention. This requires consultation with affected individuals and communities; » Assessing and documenting the significance of social impacts associated with the proposed project; » Assessing the project (including any feasible alternatives) and identifying potential mitigation and enhancement measures; » Developing an Environmental Management Programme. <p>Data Collection</p> <p>Primary and secondary data sources will be utilised to inform the study in aid of the objectives of the study. Primary data sources for the SIA will include the following (refer to Figure 16):</p> <ul style="list-style-type: none"> » A site visit will be undertaken. Observations will also be made while on site and within the study area. » Meetings will be undertaken to collect information from representatives of key stakeholder groups. These included individuals both directly and indirectly associated with the proposed development. The meetings will mostly be undertaken face-to-face and where not possible telephonically. A project specific questionnaire will be developed and utilized for the semi-structured interviews. These meetings will form the basis of the primary data collection and 	Candice Hunter of Savannah Environmental (with external review by Neville Bews)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>assisted with the gathering of baseline information as well as establishing the stakeholder’s perceptions, interests and concerns on the proposed development.</p> <p>Secondary data collection methods mostly centred on desktop study will be gathered and analysed for the purpose of the study, in which the following documents will be examined:</p> <ul style="list-style-type: none"> » Project maps; » A desktop aerial study of the affected area through the use of the latest version of Google Earth Pro 2015; » The 2011 South African Census Survey and the Local Government Handbook; » Planning documentation such as District Municipality (DM) Integrated Development Plans (IDPs), Spatial Development Framework (SDF) and Environmental Management Framework (EMF) as well as the Local Municipality (LM) IDPs and policies; » Relevant guidelines, policies and plan frameworks » Other similar specialist studies and relevant information where there have been cross-cutting issues, such as the EIAs undertaken for previous gas to power plants in the KZN Province and other parts of South Africa; » Literature reviews of social issues associated with gas to power plants. <p>Information that is relevant to the projects will be identified and assessed from these sources within the context of the pre-construction, construction, operational and decommissioning phases of the proposed projects. The evaluation of the social impacts will involve the assessment of both quantitative and qualitative data and the use of professional judgement. Quantitative data collected through national sources or local level interviews will be assessed and analysed with sociological techniques. However, qualitative data collected using the same methodology is more open to interpretation. In addition, what is a major impact to one person, one household or one community may be a minor impact to another according to specific personal circumstances. Hence, the results may not lend themselves easily to being ranked or assessed in exactly the same way as environmental data.</p> <p>Public Participation Process</p> <p>The Public Participation Process (PPP) plays an important part in the EIA process. The process of stakeholder disclosure consultation is an ongoing overarching requirement that applies to the entire SIA process, and where possible, the PPP and SIA processes have been integrated. Effective</p>	

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>consultation with stakeholders is important to understand the concerns and requirements of affected communities and ensuring their participation in the formulation and refinement of the project design. Relevant stakeholders are informed about the proposed project and thereafter are able to register and participate in the environmental impact assessment process. The communications during the PPP and written submission of comments will be reviewed and issues raised through this process will be incorporated into the SIA where relevant. The PPP involves raising awareness of the proposed development by providing information about the proposed project to all interested and affected parties and providing an opportunity for these parties to raise any issues and/or concerns regarding the projects. Consultations are of critical importance in gaining insights into the key environment and social issues and concerns of communities and other stakeholders, and in aiding the development of potential strategies for addressing these impacts.</p> <p>Assessment of Significance of Issues In line with the Regulations, and based on qualitative findings of the activities, each potentially significant impact will therefore be assessed with regard to:</p> <ul style="list-style-type: none"> » The nature of the impact (including the status which may be positive, negative or neutral); » The extent and the duration of the impact; » The probability of the impact occurring; » The degree to which the impact can be reversed; » The degree to which the impact may cause irreplaceable loss of resources; » The degree to which the impact can be mitigated; and » Cumulative and residual impacts. <p>Within this framework, there is the responsibility to propose mitigation or enhancement measures where relevant in order to reduce the significance of the negative impact and increase the significance of a positive impact. Impacts will be quantified on the basis of a standard methodology to be provided by the Environmental Assessment Practitioner.</p>	
Assessment of Cumulative Impacts	<ul style="list-style-type: none"> » Assess the potential for cumulative impacts associated with combined impacts of other developments in the broader region. » Identify positive cumulative impacts associated with the establishment of alternative energy facilities in the broader region. 	Savannah Environmental

8.4. Methodology for the Assessment of Potential Impacts

Direct, indirect and cumulative impacts of the above issues, as well as all other issues identified will be assessed in terms of the following criteria:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
 - * local extending only as far as the development site area – assigned a score of 1;
 - * limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
 - * will have an impact on the region – assigned a score of 3;
 - * will have an impact on a national scale – assigned a score of 4; or
 - * will have an impact across international borders – assigned a score of 5.
- » The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2–5 years) – assigned a score of 2;
 - * medium-term (5–15 years) – assigned a score of 3;
 - * long term (> 15 years) – assigned a score of 4; or
 - * permanent – assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0–10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and

- * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » the **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.
- » the *degree* to which the impact can be *mitigated*.

The **significance** is determined by combining the criteria in the following formula:

S = (E+D+M) P; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

As the developer has the responsibility to avoid and/or minimise impacts as well as plan for their management (in terms of the EIA Regulations), the mitigation of significant impacts will be discussed. Assessment of mitigated impacts will demonstrate the effectiveness of the proposed mitigation measures.

The results of the specialist studies and other available information will be integrated and synthesised by the Savannah Environmental project team. The EIA Report will be compiled in terms of the requirements of the EIA Regulations and will include:

- » The details and expertise of the **EAP** who prepared the report.
- » The **location** of the activity and a locality map illustrating the location of the proposed activity.

- » A **description** of the scope of the proposed activity including all listed activities triggered and a description of associated structures and infrastructure.
- » The **policy and legislative** context within which the development is located and an explanation of how the development complies and responds to the legislation and policy context.
- » The **need and desirability** of the proposed development of the activity in the context of the preferred location.
- » A motivation for the **preferred development footprint** within the approved site.
- » A description of the **process** followed to reach the proposed development footprint within the approved site, including:
 - * details of the development footprint considered;
 - * details of the public participation process undertaken in terms of Regulation 41 of the 2014 EIA Regulations, including copies of supporting documents;
 - * a summary of issues raised by interested and affected parties and the manner in which the issues were incorporated;
 - * the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
 - * the impacts and risks identified including the nature, significance, consequence extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated;
 - * the methodology used for determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks;
 - * positive and negative impacts that the activity and alternatives will have on the environment and the community;
 - * possible mitigation measures to be applied and the level of residual risk;
 - * a motivation for not considering alternative development locations (if applicable);
 - * a concluding statement indicating the preferred alternative development location; and
 - * a full description of the process followed to identify, assess and rank impacts of the activity and associated infrastructure on the preferred location including all environmental issues and risks that have been identified and an assessment of the significance of each issue and risk and the extent to which the issue/risk can be avoided or mitigated.
- » An **assessment** of the identified potentially significant impacts and risks.

- » A summary of the **findings and recommendations** of any specialist report and an indication as to how these findings and recommendations have been included.
- » An **environmental impact assessment** containing a summary of key findings, an environmental sensitivity map and a summary of the positive and negative impacts and risks of the proposed activity.
- » **Recommendations** from specialist, the recording of proposed impact management **objectives** and the impact management **outcomes** for inclusion in the **EMPr** as well as inclusion as conditions of authorisation.
- » The final **alternatives** which respond to the impact management measures, avoidance and mitigation measures identified.
- » Any aspects which were **conditional** to the findings of the assessment.
- » Description of the assumptions, uncertainties and gaps in knowledge relating to the assessment and mitigation measures proposed.
- » An **opinion** as to whether the proposed activity should or should not be authorised and the conditions thereof.
- » An undertaking under **affirmation** by the EAP in relation to the correctness of the information, the inclusion of comments and inputs from stakeholders and Interested and affected parties, the inclusion of inputs and recommendations from the specialists and any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.
- » Any specific information that may be required by the competent authority.

The Draft EIA Report will be released to the public and relevant Organs of State for a 30-day review period. The comments received from I&APs will be captured within a Comments and Response Report, which will be included within the Final EIA Report, for submission to the authorities for decision-making.

8.5. Public Participation Process

A public participation process will be undertaken by Savannah Environmental during the EIA phase. Consultation with key stakeholders and I&APs will be ongoing throughout the EIA Phase. Through this consultation process, stakeholders and I&APs will be encouraged to verify that their issues were recorded in the Scoping Phase and to identify additional issues of concern or highlight positive aspects of the PV facility, and to comment on the findings of the EIA Phase. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their inputs, various opportunities will be provided for stakeholders and I&APs to be involved in the EIA Phase of the process, as follows:

- » Focus group or public meetings (pre-arranged and I&APs invited to attend).

- » One-on-one consultation meetings (for example with directly affected and surrounding landowners).
- » Telephonic consultation sessions (consultation with various parties from the EIA project team, including the public participation consultant, lead EIA consultant as well as specialist consultants).
- » Written, faxed or e-mail correspondence.

The Draft EIA Report will be made available for a 30-day review period prior to finalisation and submission to the DEA for decision-making. In order to provide an overview of the findings of the EIA process and facilitate comments, a public meeting may be held during this public review period, depending on the specific needs of the stakeholders in the area.

8.6. Key Milestones of the Programme for the EIA

The envisaged key milestones of the programme for the EIA Phase are outlined in the following table (and include indicative dates):

Key Milestone Activities	Proposed timeframe
Make Draft Scoping Report available to the public, stakeholders and authorities	13 November 2015 to 14 December 2015
Finalisation of Scoping Report, and submission of the Final Scoping Report to DEA	December 2015
Authority acceptance of the Final Scoping Report and Plan of Study to undertake the EIA	February 2016
Undertake specialist studies and public participation process	January 2016 to March 2016
Make Draft EIA Report and EMPr available to the public, stakeholders and authorities	March 2016
Finalisation of EIA Report, and submission of the Final EIA Report to DEA	April 2016
Authority review period and decision-making (107 calendar days)	April 2016 – August 2016

REFERENCES

CHAPTER 9

- Aucamp, I.C., Woodbourne, S., Perold, J.J., Bron, A. and Aucamp, S.-M. (2011). Looking beyond social impact assessment to social sustainability. In Vanclay, F. and Esteves, A.-M. *New Directions for Social Impact Assessments*, Cheltenham, UK: Edward Elgar.
- Census 2011 Community Profiles Database. Statistics South Africa.
- CSIE, DME and Eskom. 2001. South African Renewable Energy Resource Database. Available from: www.csir.co.za/environmentek/sarerd/contact.html
- Environmental Management Framework (EMF) Report for Richards Bay Port Expansion Area and Industrial Development Zone (IDZ) (2011)
- Franke, V. & Guidero, A. (2012). *Engaging local stakeholder: A Conceptual Model for Effective Donor- Community Collaboration*. Institute for Homeland Security Solutions.
- Frith, A. 2011. Mapping South Africa with dot distribution: Census 2011. Available from: <http://dotmap.adrianfrith.com/>
- Green Economy Strategy for KwaZulu Natal Province (2012)
- IFC. (2007). *Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets*. International Finance Corporation: Washington.
- Interorganizational Committee on Principles and Guidelines for Social Impact Assessment. US Principles and Guidelines – Principals and guidelines for social impact assessment in the USA. *Impact Assessment and Project Appraisal*, 21(3): 231-250.
- KZN Department of Economic Development and Tourism Strategic Plan 2013/14-2017/18
- KZN Provincial Growth and Development Strategy (PGDS) (2011)
- KZN Provincial Growth and Development Strategy (PGDS) 2011-2030 (Version 29.2- September 2013)
- KwaZulu Natal Provincial Spatial Development Framework (PSDF)
- National Climate Change Response Green Paper (DEA, 2010)
- National Development Agency (NDA). (2014). *Beyond 10 years of unlocking potential*. Available from: http://www.nda.org.za/?option=3&id=1&com_id=198&parent_id=186&com_task=1
- National Energy Act (2008)
- National Environmental Management Act 107 of 1998 (NEMA)
- National Development Plan (2030)
- National Integrated Resource Plan South Africa (2010-2030)

- NEMAI Consulting, September 2014. Richards Bay Industrial Development Zone Phase 1F – Installation of Bulk Infrastructure Services, Richards Bay, KwaZulu Natal: Draft Scoping Report.
- NEMAI Consulting, September 2015. Richards Bay Industrial Development Zone Phase 1F - Environmental Impact Assessment Report.
- Richards Bay Industrial Development Zone (RBIDZ). (2015). Available from: <http://www.rbidz.co.za/pages/home.aspx>
- SIVEST, August 2010. Environmental Risk Assessment of Richards Bay IDZ 1A, 1B, 1C, 1D & 1F.
- South African LED Network (SA LED Network). (2010). Networking Practitioners Developing Local Economies. Available from: <http://led.co.za/>
- State of the Environment Report (SOER). 2005. Northern Cape Province. Department of Tourism, Environment and Conservation. CSIR Environmental.
- Statistics South Africa. (2014). Education: A Roadmap out of poverty? Available from: <http://beta2.statssa.gov.za/?p=2566>
- Strategic Infrastructure Projects (SIPs)
- The Constitution Act 108 of 1996
- THORN-EX, September 2010. Environmental Risk Evaluation and Guidelines for the Richards Bay Industrial Development Zone.
- THORN-EX, February 2011. Richards Bay Industrial Development Zone - Water Use Licence Application: Phase 1A.
- UMHLATHUZE MUNICIPALITY (2012 – 2017). uMhlathuze Municipal Integrated Development Plan.
- uMhlathuze Local Municipality (ULM) Integrated Development Plan (IDP) (2012-2017)
- uMhlathuze Spatial Development Framework (SDF) (2007)
- UNEP, 2002. EIA Training Resource Manual. 2nd Ed. UNEP.
- United Nations Economic and Social Commission for Asia and the Pacific (UN). (2001). Guidelines for Stakeholders: Participation in Strategic Environmental Management. New York, NY: United Nations.
- uThungulu District Municipality (UDM) Integrated Development Plan (IDP) (2012/2013-2014/2015)
- uThungulu District Municipality (UDM) Spatial Development Framework (SDF) (2012)
- Vanclay, F. 2003. Conceptual and methodological advances in Social Impact Assessment. In Vanclay, F. & Becker, H.A. 2003. The International Handbook for Social Impact Assessment. Cheltenham: Edward Elgar Publishing Limited.
- White Paper on Energy Policy of the Republic of South Africa (1998)
- White Paper on Renewable Energy of the Republic of South Africa (2003)

