

FODERE TITANIUM ZERO WASTE RECOVERY SOLUTION

Mpumalanga Province
Scoping Report
November 2020

savannah
environmental

t +27 (0)11 656 3237

f +27 (0)86 684 0547

e info@savannahsa.com

w www.savannahsa.com

Prepared for:

Anglo African Metals (PTY) LTD
46 De Stades Road
Colleen Glen
Port Elizabeth
6018

Prepared by:



PROJECT DETAILS

Title	:	Environmental Impact Assessment Process: Scoping Report for the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure near Kwa-Guqa Mpumalanga Province
Authors	:	Savannah Environmental (Pty) Ltd Jana de Jager Gideon Raath Jo-Anne Thomas
Client	:	Anglo African Metals (Pty) Ltd
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Date	:	November 2020

When used as a reference this report should be cited as: Savannah Environmental (2020), Scoping Report for the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure near Kwa-Guqa Mpumalanga Province.

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PURPOSE OF THE SCOPING REPORT AND INVITATION TO COMMENT

Fodere Titanium has developed a disruptive technology for the economic extraction of valuable minerals from mining ore and waste materials. The process offers solutions for simultaneously extracting both vanadium and titanium oxides from slag materials. The technology developed by the Fodere Group is also demonstrated to extract aluminium as aluminium oxide (Al₂O₃), magnesium as magnesium oxide (MgO) and calcium as calcium sulphate/gypsum (CaSO₄). The project is known as the Fodere Titanium Zero Waste Recovery Solution.

The waste recovery plant is proposed to be located on Portion 48 of Farm Elandsfontein 309 JS, approximately 17 km west of eMalahleni town in the eMalahleni Local Municipality (LM) within the Nkangala District Municipality (DM) in Mpumalanga (refer to **Figure 1**). The development area is approximately 4 ha in extent and is contained within the EVRAZ Highveld Steel and Vanadium property. The site is accessible directly off the R104, from the N4 turnoff near Kwa-Guqa informal settlement.

Anglo African Metals (Pty) Ltd (the South African registered company of Fodere Titanium) appointed Savannah Environmental as the independent environmental consultant to undertake the Environmental Impact Assessment (EIA) for the proposed project. The EIA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations, as amended, promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

This Scoping Report represents the findings of the Scoping Phase of the EIA process and contains the following chapters:

- » **Chapter 1** provides background to the proposed project and the environmental impact assessment process.
- » **Chapter 2** provides a description of the Zero Waste Recovery Solution project and technology, including feasible alternatives identified and considered for the project.
- » **Chapter 3** outlines the strategic legal context for waste planning in South Africa, and describes the need and desirability of the project within this context.
- » **Chapter 4** describes the existing biophysical and socio-economic environment affected by the proposed project.
- » **Chapter 5** outlines the process which was followed during the Scoping Phase of the EIA Process.
- » **Chapter 6** provides a description and evaluation of the potential issues and impacts associated with the proposed project.
- » **Chapter 7** provides the conclusions of the Scoping report.
- » **Chapter 8** presents the Plan of Study for the EIA Phase.
- » **Chapter 9** provides a list of all references used in the compilation of the Scoping Report.

The Scoping Report is available for review from **13 November to 14 December 2020** at <https://www.savannahsa.com/public-documents/other/waste-recovery-plant/>. All comments received and recorded during the 30-day review and comment period will be included, considered and addressed within the final Scoping report for the consideration of the National Department of Environment, Forestry and Fisheries (DEFF).

Please submit your comments by **14 December 2020** to:

Nicolene Venter

PO Box 148, Sunninghill, 2157

Tel: 011-656-3237

Fax: 086-684-0547

Email: publicprocess@savannahsa.com

Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

Fodere Titanium has developed a disruptive technology for the economic extraction of valuable minerals from mining ore and waste materials. The process offers solutions for simultaneously extracting both vanadium and titanium oxides from slag materials. The technology developed by the Fodere Group is also demonstrated to extract aluminium as aluminium oxide (Al_2O_3), magnesium as magnesium oxide (MgO) and calcium as calcium sulphate/gypsum ($CaSO_4$). The project is known as the Fodere Titanium Zero Waste Recovery Solution.

Anglo African Metals (Pty) Ltd (the South African registered company of Fodere Titanium) has identified a suitable tailings/slag resource which can be processed using their developed technology at EVRAZ Highveld Steel and Vanadium located between Balmoral and Emalahleni in Mpumalanga. The waste recovery plant is proposed to be located on Portion 48 of Farm Elandsfontein 309 JS, approximately 17 km west of eMalahleni town in the eMalahleni Local Municipality (LM) within the Nkangala District Municipality (DM) in Mpumalanga. The development area is approximately 4ha in extent and is contained within the Highveld Steel property. The site is accessible directly off the R104, from the N4 turnoff near Kwa-Guqa informal settlement.

The main infrastructure associated with the facility includes the following (refer to **Figure 1**):

- » Chemical plant area, where all process chemicals including acid are produced, stored and handled as required by the waste recovery process.
- » Substation and plant utility unit as interface and controlling unit for the electricity utilised by the plant during operation.
- » Slag stockpile.
- » Crushing plant.
- » Mill.
- » Product area for storage of the various products produced through the recovery process.
- » Reagent area, for the storage and handling of reactants utilised in the waste recovery process.
- » A security area.
- » Parking lot.
- » Admin and control room including offices and ablutions for staff.

The plant will be developed to process 2000 tonnes of tailings/slag per month, approximately 3 tons per day and will be primarily fuelled by LPG and Sasol gas brought into site by dedicated transport truck deliveries.

Operation of the plant is anticipated for 24 hours per day, 365 per year (i.e. non-stop operation) and will utilise the slag produced by the Highveld Steel operations.

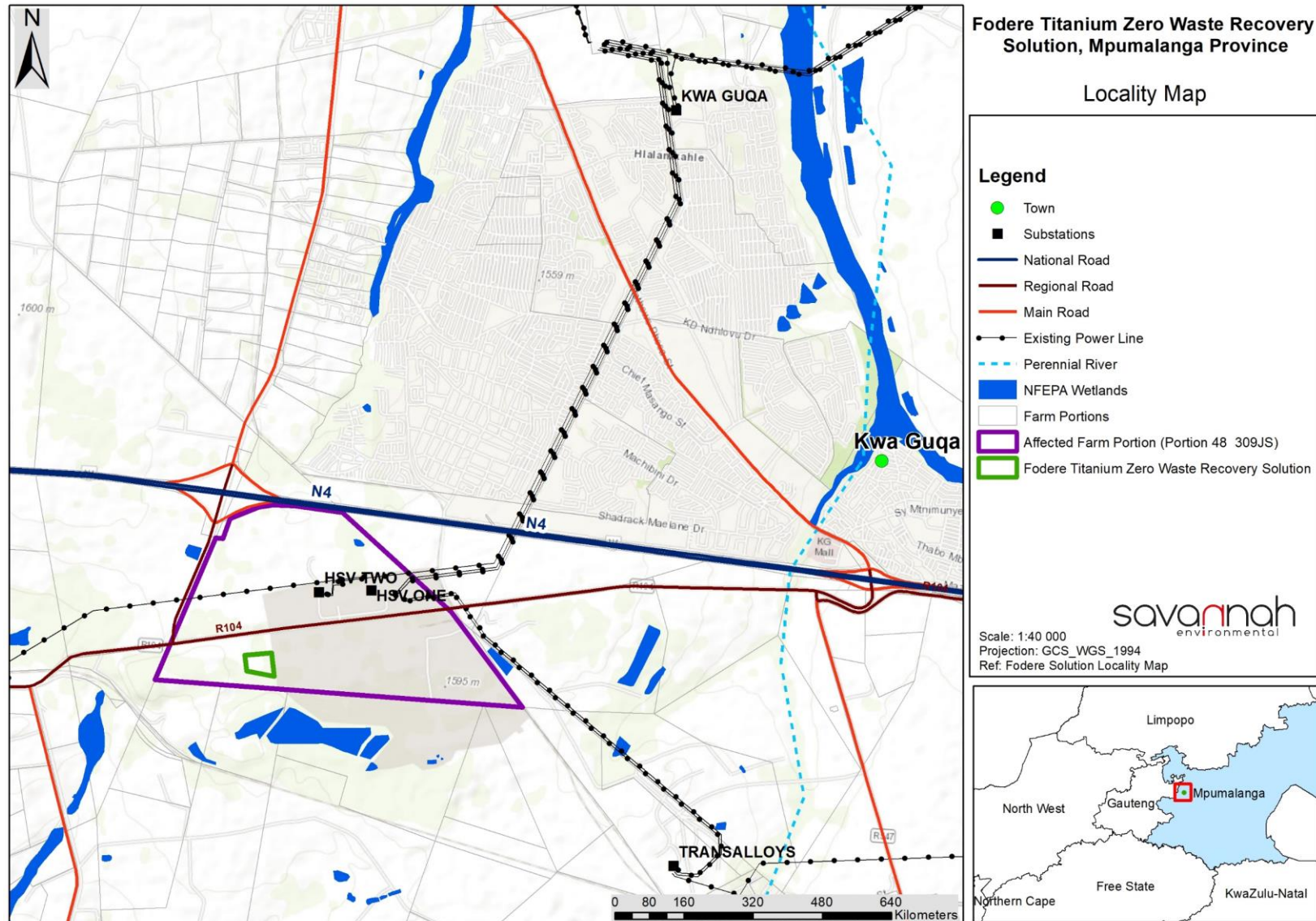


Figure 1: Locality map showing the area proposed for the establishment of the Fodere Titanium Zero Waste Recovery Solution area

1. Environmental Permitting Requirements

The Fodere Titanium Zero Waste Recovery Solution triggers the need for following environmental permits:

- » **Environmental Authorisation (EA)** from the National Department of Environment, Forestry and Fisheries (DEFF), in consultation with the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs, in accordance with the requirements of the National Environmental Management Act (No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations (GNR 326).
- » A **Waste Management License (WML)**, from the DEFF for the recovery of waste, as is proposed as part of the Zero Waste Recovery Solution, as well as the construction of the infrastructure for this purpose trigger such activities, in accordance with the National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA), and the List of Waste Management Activities (GNR 921).
- » An **Atmospheric Emission License (AEL)**, from the Nkangala District Municipality, in accordance with the National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA), and List of Activities resulting in Atmospheric Emissions published in GNR 893.

Anglo African Metals (Pty) Ltd (the South African registered company of Fodere Titanium) appointed Savannah Environmental as the independent environmental consulting company in accordance with NEMA and Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326) in support of an integrated application for Environmental Authorisation (EA) and a Waste Management License (WML). The S&EIA process will also support the future application for an Atmospheric Emission License (AEL).

The EIA process being undertaken for the proposed Fodere Titanium Zero Waste Recovery Solution comprises two phases – i.e. Scoping and Impact Assessment - and involves the identification and assessment of environmental impacts through specialist studies, as well as public participation. The process followed in these two phases is as follows:

- » The **Scoping Phase** includes the identification and description of potential impacts associated with the proposed project through a desktop study and consultation with affected parties and key stakeholders. This phase considers the broader project area in order to identify and delineate any environmental fatal flaws, no-go or sensitive areas, as well as project alternatives in order to determine which should be assessed in more detail in the EIA Phase. Following the public 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 competent authority for acceptance and approval to continue with the EIA phase of the process.
- » 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 considers a proposed development footprint and includes detailed specialist investigations (including field surveys), consideration of feasible alternatives and public consultation. Recommendations of practical and achievable mitigation and management measures are included in an Environmental Management Programme (EMPr) considering all phases of the project. Following a review of the EIA report and

EMPr by stakeholders, this phase culminates in the submission of a Final EIA Report and EMPr to the competent authority for review and decision-making.

2. Potential Impacts Identified

The proposed plant falls within the boundaries of the existing Highveld Steel operational industrial park and is completely transformed due to the industrial activities within the site. Therefore, impacts on flora, fauna and ecological processes are not expected to be associated with the project. Further, the project is not expected to add to alter the visual quality of the area as the site is located within an industrial complex.

Potential environmental impacts and risks identified to be associated with the development of the proposed project include:

- » Construction phase impacts, such as temporary air emissions (dust and vehicle emissions), noise, solid waste and wastewater generation, and Occupational Health and Safety (OHS) issues such as the risk of preventable accidents leading to injuries and/or fatalities.
- » Impacts on heritage sites, such as direct impacts on below-ground archaeological or palaeontological deposits as a result of ground disturbance during construction.
- » Impacts on air quality associated with the operation of the waste recovery process.
- » Impacts on the socio-economic environment, including positive impacts associated with job creation and potential negative intrusion impacts during construction.

The majority of potential impacts identified to be associated with the construction of the project are anticipated to be localised and restricted to the development envelope itself, while operation phase impacts/benefits range from local to regional. No environmental fatal flaws or areas of sensitivity were identified to be associated with the development area. These conclusions will be confirmed through the EIA Phase assessment, which will include independent specialist assessments.

3. Overall Conclusion and Fatal Flaw Analysis

The findings of the desktop Scoping Study indicate that no environmental fatal flaws or areas of sensitivity are associated with the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure. Through a review of relevant policy and planning documentation, it was concluded that the proposed project is in alignment with the local and provincial developmental policies and spatial frameworks. The project is also expected to make a contribution toward the achievement of the national developmental objectives related to industrialisation, mineral beneficiation and waste management.

During the EIA phase, more detailed environmental studies will be conducted in line with the Plan of Study for EIA. These studies will consider the detailed layouts produced by the Applicant, and make recommendations for the implementation of avoidance strategies (if required), and mitigation and management measures to ensure that the final assessed layout retains an environmental impact within acceptable limits.

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CHAPTER 1 INTRODUCTION

Fodere Titanium has developed a disruptive technology for the economic extraction of valuable minerals from mining ore and waste materials. The process offers solutions for simultaneously extracting both vanadium and titanium oxides from slag materials. The technology developed by the Fodere Group is also demonstrated to extract aluminium as aluminium oxide (Al_2O_3), magnesium as magnesium oxide (MgO) and calcium as calcium sulphate/gypsum ($CaSO_4$). The project is known as the Fodere Titanium Zero Waste Recovery Solution.

The waste recovery plant is proposed to be located on Portion 48 of Farm Elandsfontein 309 JS, approximately 17 km west of eMalahleni town in the eMalahleni Local Municipality (LM) within the Nkangala District Municipality (DM) in Mpumalanga (refer to **Figure 1.1**). The development area is approximately 4 ha in extent and is contained within the EVRAZ Highveld Steel and Vanadium (Highveld) property. The site is accessible directly off the R104, from the N4 turnoff near Kwa-Guqa informal settlement.

This Scoping Report consists of the following chapters:

- » **Chapter 1** provides background to the proposed project and the environmental impact assessment process.
- » **Chapter 2** provides a description of the Zero Waste Recovery Solution project and technology, including feasible alternatives identified and considered for the project.
- » **Chapter 3** outlines the strategic legal context for waste planning in South Africa, and describes the need and desirability of the project within this context.
- » **Chapter 4** describes the existing biophysical and socio-economic environment affected by the proposed project.
- » **Chapter 5** outlines the process which was followed during the Scoping Phase of the EIA Process.
- » **Chapter 6** provides a description and evaluation of the potential issues and impacts associated with the proposed project.
- » **Chapter 7** provides the conclusions of the Scoping report.
- » **Chapter 8** presents the Plan of Study for the EIA Phase.
- » **Chapter 9** provides a list of all references used in the compilation of the Scoping Report.

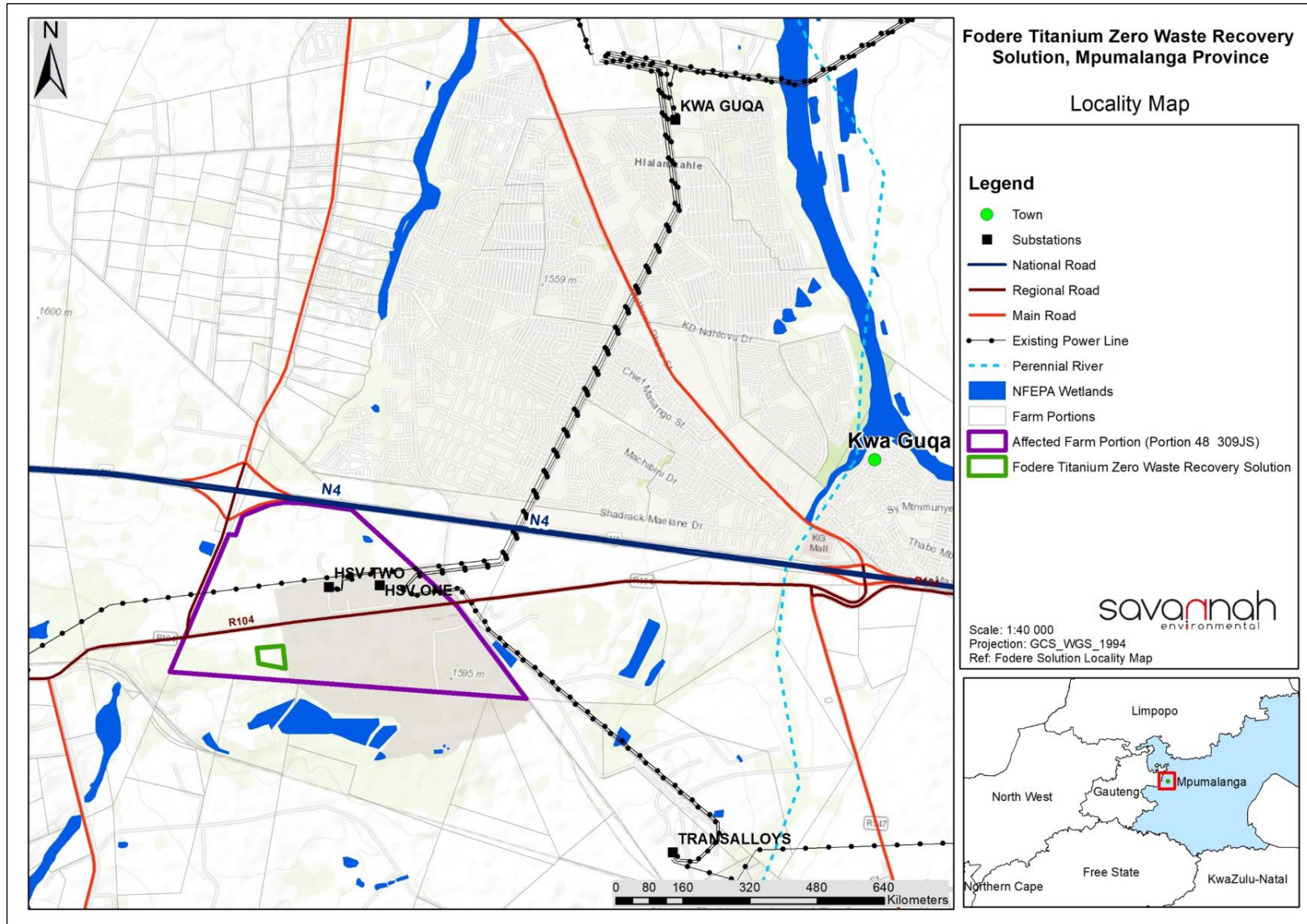


Figure 1.1: Locality map showing the area proposed for the establishment of the Fodere Titanium Zero Waste Recovery Solution area
(Appendix B1)

1.1 Legal Requirements as per the EIA Regulations for the undertaking of a Scoping Report, 2014 (as amended)

The Scoping Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (and amended on 07 April 2017) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998). This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(a)(i) the details of the EAP who prepared the report and (ii) the expertise of the EAP to carry out scoping procedures; including a curriculum vitae	The details of the EAP and the expertise of the EAP have been included in section 1.4 and Appendix A .
(b) the location of the activity, including (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	The location of the project site proposed for the development of the Zero Waste Recovery Solution is included as Figure 1.1 and in Appendix B . The details of the affected properties including the property names and numbers, as well as the SG-codes are included in Table 1.1.
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken	The locality of the project site is illustrated on a locality map included as Figure 1.1 and in Appendix B . The corner point co-ordinates of the project site are included in Appendix B .

1.2 Project Overview

Anglo African Metals (Pty) Ltd (the South African registered company of Fodere Titanium) has identified a suitable tailings/slag resource which can be processed using their developed technology at Highveld Steel located between Balmoral and Emalahleni in Mpumalanga. A site for a small-scale industrial plant has been identified within the Highveld Steel property in close proximity to the slag stockpile.

Table 1.1 provides a summary of properties associated with proposed Fodere Titanium Zero Waste Recovery Solution. A comprehensive description of the key infrastructure components associated with the development of the Fodere Titanium Zero Waste Recovery Solution as well as an overview of the processing technology is provided in **Chapter 3** of this draft Scoping Report.

Table 1.1: Summary of the preferred project site identified for the development of the Fodere Titanium Zero Waste Recovery Solution

Province	KwaZulu-Natal
District Municipality	Nkangala District Municipality
Local Municipality	eMalahleni Local Municipality
Ward number(s)	22
Nearest town(s)	Approximately 17km west of eMalahleni town, near Kwa-Guqa informal settlement
Farm name(s) and number(s)	Waste recovery plant: » Portion 48 of Farm Elandsfontein No. 309 JS
SG 21 Digit Code (s)	» TOJS00000000030900004

Current zoning	Waste recovery plant: » Industrial Use
Current land use	General Industrial

1.3 Requirement for an Environmental Impact Assessment Process

The Fodere Titanium Zero Waste Recovery Solution triggers the need for following environmental permits:

- » **Environmental Authorisation (EA)** from the National Department of Environment, Forestry and Fisheries (DEFF), in consultation with the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs, in accordance with the requirements of the National Environmental Management Act (No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations (GNR 326).
- » A **Waste Management License (WML)**, from the DEFF for the recovery of waste, as is proposed as part of the Zero Waste Recovery Solution, as well as the construction of the infrastructure for this purpose trigger such activities, in accordance with the National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA), and the List of Waste Management Activities (GNR 921).
- » An **Atmospheric Emission License (AEL)**, from the Nkangala District Municipality, in accordance with the National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA), and List of Activities resulting in Atmospheric Emissions published in GNR 893.

Anglo African Metals (Pty) Ltd (the South African registered company of Fodere Titanium) appointed Savannah Environmental as the independent environmental consulting company in accordance with NEMA and Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326) in support of an integrated application for Environmental Authorisation (EA) and a Waste Management License (WML). The S&EIA process will also support the future application for an Atmospheric Emission License (AEL).

An EIA is an effective planning and decision-making tool for the project developer as it allows for the identification and management of potential environmental impacts. It provides the opportunity for the developer to be fore-warned of potential environmental issues, and allows for the resolution of issues reported on in the Scoping and EIA Reports as well as a dialogue with interested and affected parties (I&APs). Comprehensive, independent environmental specialist studies are required in accordance with the EIA Regulations to provide the competent authority with sufficient information in order to make an informed decision. The EIA process being undertaken for the proposed Fodere Titanium Zero Waste Recovery Solution comprises two phases – i.e. Scoping and Impact Assessment - and involves the identification and assessment of environmental impacts through specialist studies, as well as public participation. The process followed in these two phases is as follows:

- » The **Scoping Phase** includes the identification and description of potential impacts associated with the proposed project through a desktop study and consultation with affected parties and key stakeholders. This phase considers the broader project area in order to identify and delineate any environmental fatal flaws, no-go or sensitive areas, as well as project alternatives in order to determine which should be assessed in more detail in the EIA Phase. Following the public 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 competent authority for acceptance and approval to continue with the EIA phase of the process.
- » 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 considers a proposed development footprint and includes detailed specialist investigations (including field surveys),

consideration of feasible alternatives and public consultation. Recommendations of practical and achievable mitigation and management measures are included in an Environmental Management Programme (EMPr) considering all phases of the project. Following a review of the EIA report and EMPr by stakeholders, this phase culminates in the submission of a Final EIA Report and EMPr to the competent authority for review and decision-making.

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

In accordance with Regulation 12 of the 2014 EIA Regulations (GN R326), Anglo African Metals (Pty) Ltd (the South African registered company of Fodere Titanium) has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent environmental consultant to undertake the Scoping and EIA process for the Fodere Titanium Zero Waste Recovery Solution and its associated infrastructure. Neither Savannah Environmental nor any of its specialists are subsidiaries of/or are affiliated to Anglo African Metals (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed Fodere Titanium Zero Waste Recovery Solution project.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2 Broad-Based Black Economic Empowerment (B-BBEE) Contributor. The company was established in 2006 with a clear objective to provide services to the infrastructure development sector. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of infrastructure development projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management and has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa.

The Savannah Environmental team comprises:

- » **Jana de Jager:** holds a Bachelor Degree in Environmental Science, an Honours degree in Geography & Environmental Science and is currently undertaking her M.S.c in Ecological Water Requirements. She has 2.5 years of experience in the environmental management field. Her key focus is on undertaking environmental impact assessments, GIS mapping, public participation, environmental management plans and programmes. She is registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).
- » **Gideon Raath:** holds an MSc (Geography and Environmental Management; SU), a BSc Honours (Ecology and Environmental Studies - Cum laude; Wits) and a BSc (Geography and Environmental Management; UJ). His MSc thesis focused on the hydrological impact on the spatial distribution of invasive Eucalyptus trees along the Breede River; while his honours thesis evaluated ethnobotanical relationships around the Rio Tinto copper mine in Phalaborwa. Gideon's experience includes EIA permitting for ~72 different projects, ranging from infrastructure, mining, energy, housing, renewable

energy and the conservation industries. These include Environmental Authorisations (BAR, S&EIR), Water Use Licencing, Waste Licencing, Environmental Compliance Officer compliance auditing, GIS studies and MPRDA permitting. He therefore has wide ranging experience in NEMA, NHRA, NEM:WA, NEM:BA, MPRDA and NWA regulations, having applied them for numerous private and public sector clients across various industries, for small, medium and large projects. Gideon is also an experienced Ecological & Wetland Specialist having conducted ~21 specialist studies, accredited with SACNASP as a professional natural scientist (Pr.Sci.Nat) since 2017. Gideon also has experience beyond the permitting sphere through numerous screening assessments for potential developers, including fatal flaw screenings, regulatory and permitting approval screening as well as ecological and hydrological sensitivity screening. Gideon has also served in an advisory role for various infrastructure and mining projects, assisting with environmental due diligence, bankable feasibility study input and assistance towards financial close.

- » **Jo-Anne Thomas:** holds a Master of Science Degree in Botany (M.S.c Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with SACNASP and a registered Environmental Assessment Practitioner (EAP) with EAPASA (2019/726). She has over 20 years of experience in the field of environmental assessment and management, and the management of large environmental assessment and management projects. During this time, she has managed and coordinated a multitude of large-scale infrastructure EIAs and is also well versed in the management and leadership of teams of specialist consultants, and dynamic stakeholders. She has been responsible for providing technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, EIA studies, environmental permitting, public participation, EMPs and EMPrs, environmental policy, strategy and guideline formulation, and integrated environmental management (IEM). Her responsibilities for environmental studies include project management, review and integration of specialist studies, identification and assessment of potential negative environmental impacts and benefits, and the identification of mitigation measures, and compilation of reports in accordance with applicable environmental legislation.
- » **Nicolene Venter.** She is a Board Member of IAPSA (International Association for Public Participation South Africa). She holds a Higher Secretarial Diploma and has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

Curricula Vitae (CVs) detailing Savannah Environmental team's expertise and relevant experience are provided in **Appendix A**.

CHAPTER 2 PROJECT DESCRIPTION

This chapter provides an overview of the project, technology, and alternative proposed by Anglo African Metals. In addition, detail of the Need and Desirability of the project is provided. The waste recovery plant 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. These will be further refined in the EIA Phase of the process and confirmed through the final design prior to implementation.

2.1 Legal Requirements as per the EIA Regulations for the undertaking of a Scoping Report, 2014 (as amended)

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
3(d)(ii) a description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure	A description of the activities to be undertaken with the development of the proposed project is included in section 3.2
3(g) a motivation for the preferred site, activity and technology alternative	The motivation for the alternatives identified for the proposed project are included in section 3.3.
3(h)(i) details of the alternative considered	
3(h)(ix) the outcome of the site selection matrix	
3(h)(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such	

2.2 Description of the Proposed Project

Anglo African Metals (Pty) Ltd (the South African registered company of Fodere Titanium) has identified a suitable tailings/slag resource which can be processed using their developed technology at Highveld Steel located between Balmoral and Emalahleni in Mpumalanga Province. The waste recovery plant is proposed to be located on Portion 48 of Farm Elandsfontein 309 JS, approximately 17 km west of eMalahleni town in the eMalahleni Local Municipality (LM) within the Nkangala District Municipality (DM) in Mpumalanga. The development area is approximately 4ha in extent and is contained within the EVRAZ Highveld Steel and Vanadium property. The site is accessible directly off the R104, from the N4 turnoff near Kwa-Guqa informal settlement.

The main infrastructure associated with the facility includes the following (refer to Figure 2.1 for an indicative layout¹):

¹ Note that this layout is indicative at this stage and is subject to change following final design

- » Chemical plant area, where all process chemicals including acid are produced, stored and handled as required by the waste recovery process.
- » Substation and plant utility unit as interface and controlling unit for the electricity utilised by the plant during operation.
- » Slag stockpile.
- » Crushing plant.
- » Mill.
- » Product area for storage of the various products produced through the recovery process.
- » Reagent area, for the storage and handling of reactants utilised in the waste recovery process.
- » A security area.
- » Parking lot.
- » Admin and control room including offices and ablutions for staff.

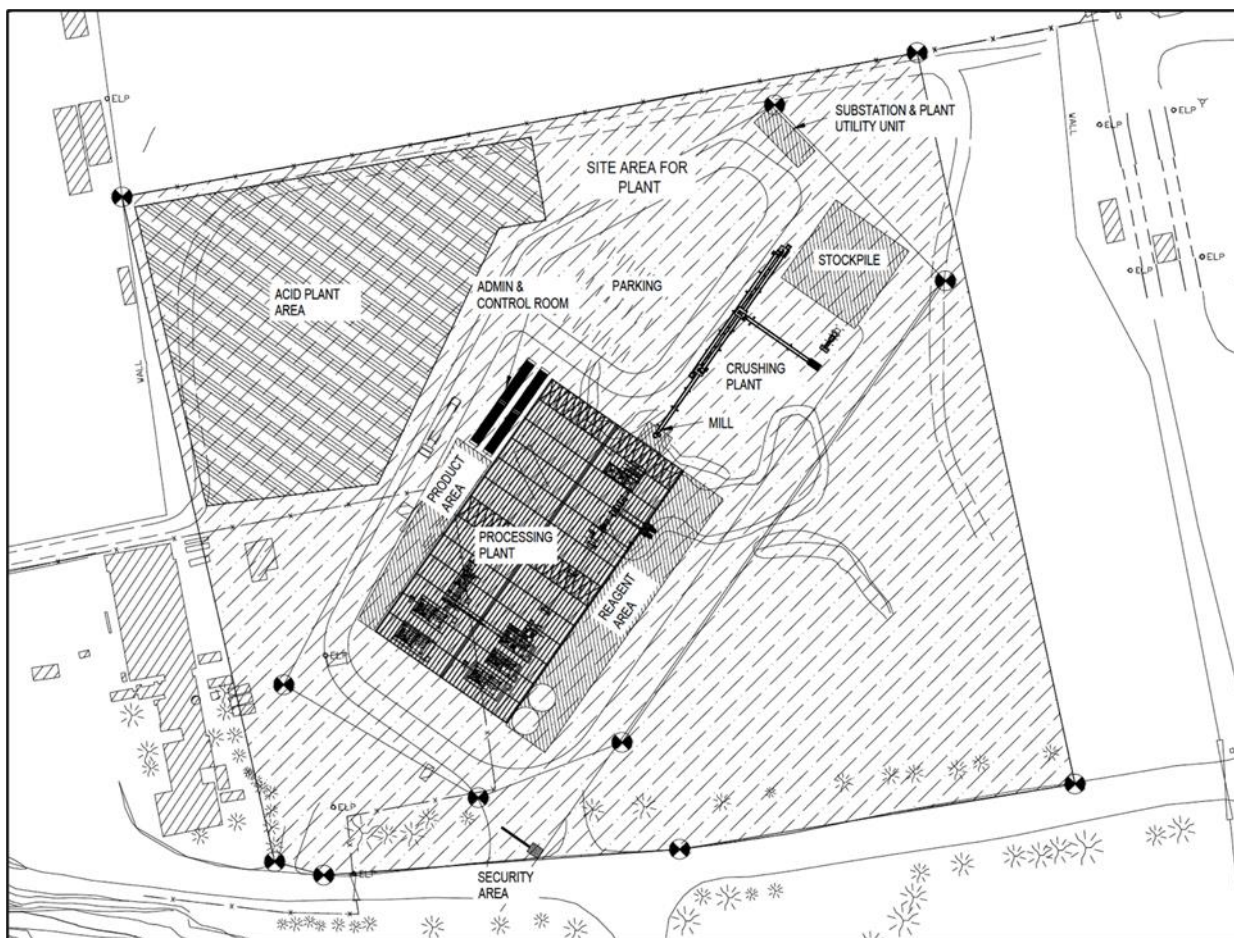


Figure 2.1: Proposed layout of the plant

The plant will be developed to process 2000 tonnes of tailings/slag per month, approximately 3 tons per day and will be primarily fuelled by LPG and Sasol gas brought into site by dedicated transport truck deliveries.

Operation of the plant is anticipated for 24 hours per day, 365 per year (i.e. non-stop operation) and will utilise the slag produced by the Highveld Steel operations.

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

Table 2.1: Details of the proposed Zero Waste Recovery facility, near Kwa-Guqa

Location of the site	Portion 48 of Farm Elandsfontein No. 309 JS,
Landowner	EVRAZ Highveld Steel and Vanadium
Municipal Jurisdiction	Nkangala District Municipality and eMalahleni Local Municipality
Plant processing capacity	2 000 tons of tailings/slag per month
Proposed technology	Pyrometallurgical and hydrometallurgical patented extraction process for high-purity Titanium Dioxide production as well as vanadium, aluminium and magnesium.
Extent of preferred project site	Approximately 350 ha
Extent of the project development footprint	Approximately 4ha
Stack dimensions (Site elevation: 155 m above mean sea)	<ul style="list-style-type: none"> » Stack 1: 20m above ground » Stack 2: 13m above ground
Fuel Sources	LNG will be used to fuel the kiln
Site access	Main access to the project site will be via the existing access from the R104 to Highveld Steel
Associated infrastructure	<ul style="list-style-type: none"> » Internal roads » Internal water, air and gas pipelines » Control and electrical buildings, including a central control room » Administrative buildings » Firefighting systems » Bulk water storage » Storage facilities for fuels, gas and chemicals » Emergency back-up generators » Effluent reticulation systems - i.e. 1) sanitary wastewater system; 2) storm water and rainwater collection system.
Services required	<ul style="list-style-type: none"> » Services agreements for refuse disposal, water, and electricity have been entered into with Highveld Steel in terms of the lease agreement. » Sanitation waste generated in septic tanks system will be emptied as required by a licensed service provider for disposal
Dangerous Goods Storage	<ul style="list-style-type: none"> » Coal is stored in bin of 3m³ » Sodium carbonate stored in bin of 4m³ » Ammonium sulphate stored in bin of 4m³ » Sulphuric acid in 2 tanks of 30m³ (60m³) » Lime is slurried in a 6m³ tank » Sodium hydroxide into solution stored in tank of 20m³ <p>All storage areas will be bunded.</p>
Raw/Process-Water Storage Reservoir	<ul style="list-style-type: none"> » Process water stored on site in a tank of 20 000m³. Process water will be recycled, and no process water effluent will be discharged. » Potable water is to be stored in 2 tanks of 5m³ each, one at ablution block and one at the admin offices. » Water for fire-fighting purposes will be located on site in a 20 000m³ tanks

2.3 Overview of the Technology

The technology developed by Fodere Titanium includes the following approximate process²:

- » Crushing and milling of titanium dioxide (TiO₂) slag to the appropriate size for further treatment.
- » Magnetic separation of entrained metallic iron from the crushed slag, which is used to separate ferroalloy production process.
- » Alkali roasting of the remaining feedstock using a gas fired kiln. Off-gases from the kiln is a combination of mainly carbon monoxide (CO), and carbon dioxide and, a very small concentration of sulphur dioxide. These off gases are passed through the off-gas scrubber to remove SO₂ and the remaining CO₂ and CO is reused in the kiln to supply part of the required heat.
- » The material produced during alkali roasting from the kiln is then leached in water to dissolve vanadium and alumina.
- » A further process produces vanadium pentoxide and recovers aluminium oxide from the leached products in the steps above.
- » The remaining solid or residue after extracting vanadium is treated via leaching and curing sulphuric acid. The SO₂ gases or fumes given out during leaching or roasting are scrubbed off.
- » Iron, magnesium and TiO₂ are recovered from solution via precipitation steps.
- » Precipitated TiO₂ is heated to remove water.
- » The leach solution is neutralised with lime to form calcium sulphate and respective sulphates. The mixture of sulphates is heated in the furnace to produce sulphuric acid which is then used in the leaching step. The solid material after heating in the furnace is mainly calcium silicate which is used for cement production and construction.
- » The remaining material after leaching of titanium, magnesium, aluminium oxide etc is mainly silica sand which is also used for construction.

This process therefore recovers vanadium and titanium oxide from slag materials, with water, carbon monoxide and carbon dioxide, gypsum and synthetic rutile produced at the various stages. These materials are all useful in other processes and are planned to be collected and sold to third parties. The process itself therefore results in no further waste production, while simultaneously utilising a common waste type – i.e. slag.

2.4 Project Alternatives

In accordance with the requirements of Appendix 3 of the 2014 EIA Regulations (GNR 326), an EIA process must contain a consideration of alternatives, which can include site (i.e. development footprint), activity, technology and site access alternatives, as well as the “do-nothing” alternative. Alternatives are required to be assessed in terms of social, biophysical, economic and technical factors.

The sections which follow provide details of the feasible alternatives identified and assessed for the proposed project.

² Note that due to intellectual property and commercial sensitivity of this process, only a high level summary is provided providing an understanding of the main components of the process

2.4.1 Location Alternatives

The project proponent has identified the preferred site within the Highveld Steel operational Industrial Park due to:

- » it being located in a large existing industrialised area surrounded by several heavy industries and mining operations. It is a brownfields site that has already undergone extensive transformation.
- » feedstock (i.e. slag materials) for the recovery process is readily available from the slag resource located next to the preferred site limiting material transport cost and implications.
- » utility services for potable water, electricity, and refuse removal is provided by Highveld Steel.
- » a railway siding is located adjacent to the project site which may be beneficial for transporting products and materials from the facility in future.

No feasible alternative sites have been identified for assessment with this Scoping Report.

2.4.2 Design and Layout Alternatives

The proposed project infrastructure will have a development footprint of approximately 4ha, to be located within the greater Highveld Steel property of approximately 350ha. The design and layout thereof are determined by the footprint of the existing infrastructure and slag resource situated on the property, as well as the specific requirements of Highveld Steel, the landowner. No feasible design or layout alternatives were identified for the proposed project.

2.4.3 Activity Alternatives

No activity alternatives are associated with the development of the proposed project due to the specific requirements for the zero-waste recovery solution facility. Therefore, no activity alternatives are considered for the project.

2.4.4 Technology Alternatives

No technology alternatives for similar zero waste recovery solutions as proposed by the project proponent exist. Although, other methods of recovery from titanium-bearing minerals are practiced, they are either not suitable for treating titanium dioxide (TiO₂) slag or are not capable of recovering both titanium and vanadium oxides. Also, the project proponent has developed a proprietary process to extract titanium from steel slag and refine titanium and other industrial minerals and chemicals with a lower carbon footprint than existing processes, which they intend to implement for this proposed project. As such, the selected technology is regarded the most suitable and appropriate for this development type, and no technology alternatives are assessed for the project as part of this Scoping process.

2.4.5 The "Do-Nothing" Alternative

The 'do-nothing' alternative is the option of the project proponent not constructing the proposed facility. This would result in no environment or social impacts (positive or negative) as a result of the development of the proposed project. However, the benefits associated with the processing and recovery of various products from the slag resource would also be foregone. This alternative will be assessed within the EIA Phase of the process.

CHAPTER 3 STRATEGIC CONTEXT AND POLICY

This Chapter provides an overview of the policy and legislative context within which the development of a waste recovery plant such as that being considered in this report is proposed. It identifies environmental legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process which may be applicable to or have bearing on the proposed project.

3.1 Legal Requirements as per the EIA Regulations for the undertaking of a Scoping Report, 2014 (as amended)

This chapter of the draft Scoping Report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are considered in the assessment process;	The policy and legislative context for the development of the Zero Waste recovery facility and associated infrastructure has been considered throughout this chapter on a national, provincial and local level.
(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report.	
(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments.	
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	The need and desirability for the development of the proposed Zero Waste recovery facility is included in Section 3.6.

3.2 National policies and strategic documents

The following national policies are considered to be relevant to the development of the Fodere Titanium Zero Waste Recovery Solution.

3.2.1 National Environmental Management: Waste Act (Act 59 of 2008)

The National Environmental Management: Waste Act (Act 59 of 2008) (NEM: WA) is the primary piece of legislation which regulates waste management in South Africa.

The main objectives of the NEM: WA are as follows:

- » Promote an integrated approach in dealing with waste which focuses on prevention, minimization and responsible disposal of waste.

- » Ensure that waste is properly managed in order to minimise its potential to cause damage to the socio-economic and bio-physical environments.
- » To build capacity and assist the South African industrial sector to properly manage waste by requiring provinces and municipalities to develop integrated waste management plans that are co-ordinated and aligned with the relevant integrated development plans and other plans and programmes of provincial and national government.
- » To provide guidance to regulatory authorities.
- » To assist the industrial sector in moving to improved waste management practices.
- » To provide for industry waste management plans at a national level for industries that cross provincial boundaries as well as at a provincial level for industry specific to a particular province.
- » To ensure that a National Waste Management Strategy is established within two years of the Act coming into effect, in order to realize the Republic's obligations in terms of relevant international agreements.
- » To ensure alignment of provincial and national waste management standards.
- » To promote the principles of reduce, re-use, recover, recycle.
- » To ensure responsible waste disposal.
- » To prevent pollution and ecological degradation.

The objects of the NEM: WA promote the principles of the waste hierarchy, which is an international and best practice waste management approach that informs waste management in South Africa. The waste management hierarchy consists of options for waste management during the lifecycle of waste, arranged in descending order of priority. All stakeholders must apply the waste management hierarchy in making decisions on how to manage waste (**Figure 3.1**).

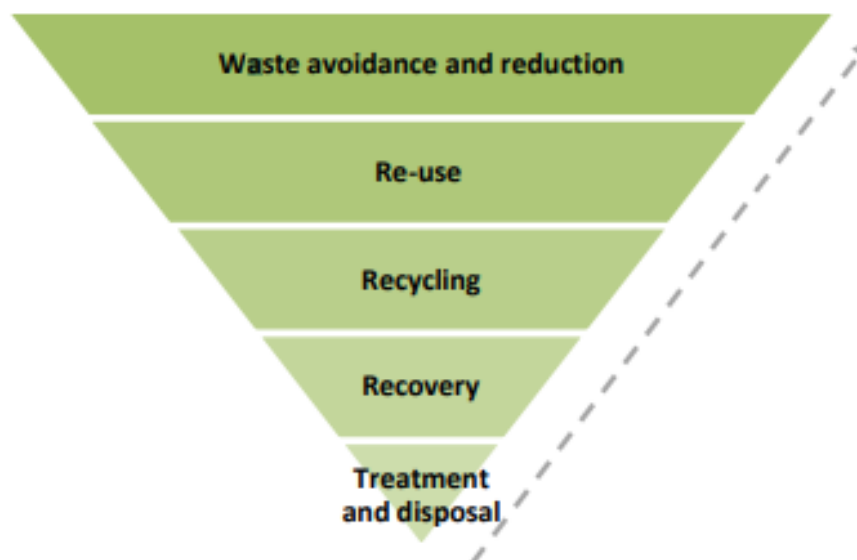


Figure 3.1: Waste Management Hierarchy (source: NWMS, 2018)

Since the promulgation of the NEM: WA several regulations and standards regarding waste management have been developed to improve the waste management legal framework and governance. The pertinent regulations are listed below:

- » List of Waste Management Activities that have or are likely to have a Detrimental Effect on the Environment (GN. R 921 of 2013)
- » National Norms and Standards for the Storage of Waste (GN 926 of 2013)

- » National norms and standards for sorting, shredding, grinding, crushing, screening or baling of general waste (GN 1093 of 2017)

3.2.2 National Waste Management Strategy (NWMS, 2018)

The National Waste Management Strategy (NWMS) is a legislative requirement of the NEM: WA. The overall purpose of the NWMS is to give effect to the objectives of the NEM:WA. The NWMS provides a plan to give practical effect to the NEM:WA, and as such it seeks to ensure that the responsibility for waste management is properly allocated.

The 8 strategic goals of the NWMS are as follows:

- Goal 1: Promote waste minimisation, re-use, recycling and recovery of waste.
- Goal 2: Ensure the effective and efficient delivery of waste services.
- Goal 3: Grow the contribution of the waste sector to the green economy.
- Goal 4: Ensure that people are aware of the impact of waste on their health, wellbeing and the environment.
- Goal 5: Achieve integrated waste management planning.
- Goal 6: Ensure sound budgeting and financial management for waste services.
- Goal 7: Provide measures to remediate contaminated land.
- Goal 8: Establish effective compliance with and enforcement of the Waste Act.

3.2.3 The White Paper on Integrated Pollution and Waste Management for South Africa, 2000

The White Paper places emphasis on preventative strategies which aims to minimise waste and prevent pollution. The White Paper recognises the crucial role which the private sector and civil society plays along with the government to ensure sustainable and effective pollution and waste management in South Africa. One of the fundamental approaches of this policy is to prevent pollution, minimise waste, and to control and remediate impacts. According to the White Paper, management of waste will be implemented in a holistic and integrated manner, and will extend over the entire waste cycle, from "cradle to grave", including the generation, storage, collection, transportation, treatment, and final disposal of waste.

Through the implementation of the White Paper, the government aims to:

- » Encourage the prevention and minimisation of waste generation and thus pollution at source;
- » Encourage the management and minimisation of the impact of unavoidable waste from its generation to its final disposal;
- » Ensure the integrity and sustained "fitness for use" of all environmental media , i.e. air, water and land;
- » Ensure that any pollution of the environment is remediated by holding the responsible parties accountable;
- » Ensure environmental justice by integrating environmental considerations with the social, political and development needs and rights of all sectors, communities and individuals; and
- » Prosecute non-compliance with authorisations and legislation.

3.2.4 New Growth Path Framework, 2010

The New Growth Path Framework (NGPF) (2011) was developed to ensure that economic policy in South Africa reflects the importance of job creation to address the key issues the country faces, such as joblessness, poverty and inequality. The aim of the NGPF is to restructure the economy of South Africa to improve its performance not only in composition and growth rates, but also in terms of labour absorption.

One of the identified means of achieving this objective is through the increase in local processing of South Africa's natural resources. As one of the key sectors in which employment is created, the manufacturing sector has been targeted to create 350 000 jobs by 2020 by the NGPF. The NGPF therefore supports and promotes the investment into the mineral beneficiation and manufacturing sectors to encourage activities that may lead to large-scale employment generation. The NGPF further emphasises the importance of job creation in the green economy.

The Fodere Titanium Zero Waste Recovery Solution will provide employment opportunities which could assist in addressing poverty issues.

3.2.5 National Development Plan (NDP), 2030

Informed by the objectives outlined by the NGPF, the National Development Plan (NDP) 2030 aims to eliminate poverty and reduce inequality by 2030 through the identification of different sectors that play a pivotal role in its effective implementation. The manufacturing sector has been identified as one of the key sectors in which job creation may be promoted and the NDP encourages the development of local manufacturing.

The importance of stimulating business activity, such as labour-intensive manufacturing, close to dense townships has been highlighted in the NDP to encourage job creation in areas in which unemployment is prevalent. Another goal outlined in the NDP is South Africa's transition to an environmentally sustainable, climate-change resilient, low carbon-economy, which is envisaged through a zero-waste society. The NDP highlights the importance of recognising major opportunities in the manufacturing sector, such as waste reutilisation, and aims to promote the technical capacity of clean technologies that may provide the country with growth opportunities in the carbon-constrained global economy. The NDP emphasises the need for industrial manufacturing to move towards greener industries over time.

The Fodere Titanium Zero Waste Recovery Solution will provide employment opportunities which could assist in addressing poverty issues.

3.2.6 Beneficiation Strategy for the Minerals Industry of South Africa (2011)

The development of the Beneficiation Strategy for the Minerals Industry of South Africa (2011) was informed by the NGPF's identification of mineral beneficiation being one of the priority areas in which employment opportunities may be created. The Beneficiation Strategy aims to create a competitive advantage in the mineral sector on the basis of the existing comparative advantage associated with the mineral resource endowments in the country. The Beneficiation Strategy aligns itself with other national industrialisation programmes that aim to improve the quantity and quality of exports, promote the creation of decent employment and diversify the economy.

Given the low levels of mineral beneficiation in the country, the aim of the Beneficiation Strategy is to place focus on developing mineral value chains in South Africa to facilitate the expansion of beneficiation

initiatives in the country. Although the country has seen some expansion in value-addition facilities such as manufacturing and mineral processing, the Strategy seeks to further increase South Africa's capacity to export goods that are not only ores or semi-processed goods.

The Fodere Titanium Zero Waste Recovery Solution will assist in meeting the objectives of this strategy through provision of in value-addition facilities for mineral beneficiation in the country.

3.2.7 Industrial Policy Action Plan (IPAP) 2018/19-2020/21

The Industrial Policy Action Plan (IPAP) 2018/19-2020/21 is guided by government's overall policy objectives to promote economic and industrial growth and address the key challenges identified therein, such as poverty, inequality and unemployment. The objective of the IPAP is to promote long-term industrialisation and industrial diversification in South Africa in the midst of a global deindustrialisation. The IPAP therefore aims to reindustrialise the South African economy to double exports through a number of interventions to support transformation within the industry. This radical economic transformation is guided by its objective of creating sustainable jobs, particularly for the marginalised and most vulnerable in society.

The manufacturing sector has been identified as a priority area to lead the way for IPAP's objectives. Furthermore, greater waste management has been pinpointed to be vital in the meeting of these objectives and the IPAP promotes the recycling of manufacturing by-products to meet South Africa's objective of becoming a zero-waste society.

3.2.8 Operation Phakisa

Operation Phakisa is an initiative of the South African government. This initiative was designed to fast track the implementation of solutions on critical development issues. This is a unique initiative to address issues highlighted in the National Development Plan (NDP) 2030 such as poverty, unemployment and inequality. Through Operation Phakisa, Government aims to implement priority programmes better, faster and more effectively.

The Chemical and Waste Economy is one of Operation Phakisa's seven labs. The overall goal in this regard is "how can the contribution of the chemicals and waste economy be increased to reach the MTSF and NDP targets on GDP and job creation, while reducing the negative environmental and health impact of chemicals and waste".

Slag (beneficiation opportunity) is identified as one of the waste areas identified for prioritisation.

3.2.9 Highveld Priority Area Air Quality Management Plan

The Highveld area in South Africa is associated with poor air quality, and elevated concentrations of criteria pollutants occur due to the concentration of industrial and non-industrial sources. The Highveld Priority Area (HPA) was declared in terms of Section 18 of the National Environmental Management: Air Quality Act 39 of 2004 by the then Minister of Environmental Affairs in terms of Government Notice No1123 dated 13 November 2007.

The priority area covers 31 106 km² (refer Figure 3.2) including parts of Gauteng and Mpumalanga Provinces, with a single metropolitan municipality, three district municipalities, and nine local municipalities, as follows:

- » Ekurhuleni Metro, Lesedi LM (Sedibeng DM) in Gauteng Province
- » Govan Mbeki LM, Dipaleseng LM, Lekwa LM, Msukalekwa LM and Pixley ka Seme LM in Gert Sibande DM in Mpumalanga Province
- » Victor Khanye LM, Emalahleni LM & Steve Tshwete LM in Nkangala DM in Mpumalanga Province

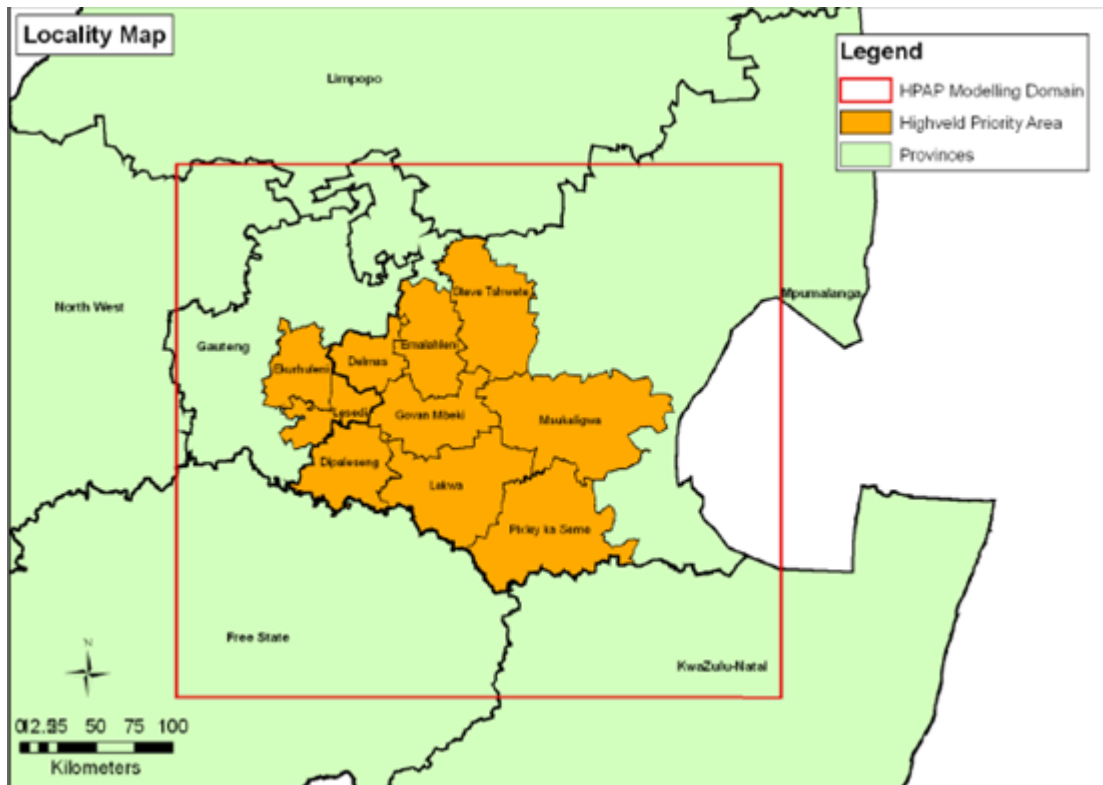


Figure 3.2: Map of the Highveld Priority Area Source

As the area overlaps provincial boundaries, the Department of Environmental Affairs (DEA) functions as the lead agent in the management of the priority area and is required in terms of Section 19(1) of the National Environmental Management: Air Quality Act (Act 39 of 2004) (AQA) to develop an Air Quality Management Plan (AQMP) for the priority area.

The baseline assessment for the HPA provides a succinct presentation of the major issues to be addressed, specifically highlighting the geographical areas of concern within the HPA where dedicated Air Quality Management (AQM) interventions are to be focused. The HPA Air Quality Management plan (AQMP) was developed and gazetted on 02 March 2012 in GNR144. The primary motivation of the priority area AQMP is to achieve and maintain compliance with the ambient air quality standards across the HPA, using the Constitutional principle of progressive realisation of air quality improvements. The AQMP for the HPA provides the framework for implementing departments and industry to include AQM in business planning to ensure effective implementation and monitoring.

The plan has been designed at a strategic level, indicating high-level tasks for responsible parties. The specific planning at an operational level, such as budgeting, human resource allocation, and detailed activity planning, has been excluded from the plan. This is to allow parties to tailor their implementation activities to their specific context, particularly organisational constraints, while still achieving the overall objective of the AQMP. The activities listed in the plan must be unpacked further by responsible parties into organisation-specific activity and intervention plans, and captured in the policy and strategic documents, such as business and investment plans, Integrated Development Plans (IDPs), and Environmental Implementation Plans (EIPs).

Included in this management plan are seven goals, each of which has a further list of objectives that have to be met. The goals for the Highveld Priority area are as follows:

- » Goal 1: By 2015, organisational capacity in government is optimised to efficiently and effectively maintain, monitor and enforce compliance with ambient air quality standards.
- » Goal 2: By 2020, industrial emissions are equitably reduced to achieve compliance with ambient air quality standards and dust fallout limit values.
- » Goal 3: By 2020, air quality in all low-income settlements is in full compliance with ambient air quality standards.
- » Goal 4: By 2020, all vehicles comply with the requirements of the National Vehicle Emission Strategy.
- » Goal 5: By 2020, a measurable increase in awareness and knowledge of air quality exists.
- » Goal 6: By 2020, biomass burning and agricultural emissions will be 30% less than current.
- » Goal 7: By 2020, emissions from waste management are 40% less than current.

Goal 2 applies directly to the project, the objectives associated with this goal (as well as the activities applicable to industries for each objective) include:

- » Emissions are quantified from all sources;
 - Establish and maintain a site emissions inventory that includes all point and diffuse sources for all significant pollutants.
 - Submit emissions inventory report as per emission reporting regulations.
- » Gaseous and particulate emissions are reduced;
 - Submit AIR report using a regulated modelling approach.
 - Develop and implement a maintenance plan for each plant.
 - Schedule and conduct repairs to coincide with plant offline times.
 - Incorporate equipment changes into the maintenance schedule.
 - Operate plants with minimum disruption e.g. back-up plan for energy consumption/generation.
- » Fugitive emissions are minimised;
 - Develop fugitive emission management plan.
 - Implement appropriate interventions, e.g. a leak detection and repair program.
- » Emissions from dust generating activities are reduced;
 - Develop and implement dust reduction programmes in line with industry best practice, considering technology and management interventions.
 - Investigate feasibility of using alternative means for haulage, e.g. conveyors, rail.
 - Plan and carry out regular fleet maintenance.
 - Investigate opportunities to market waste as raw material inputs to other industries.
- » Greenhouse gas emissions are reduced;
 - Include greenhouse gas emissions in site emissions inventory.
 - Develop and implement a site energy efficiency plan.
 - Consider climate change implications in air quality management (AQM) decision making.
 - Investigate opportunities for co-generation.
 - Investigate feasibility of renewable energy
- » Incidences of spontaneous combustion are reduced;
- » Abatement technology is appropriate and operational;
 - Install and/or maintain appropriate air pollution abatement technology compliant with requirements of AEL and achieving Section 21 emission standards.
 - Train operators to ensure optimal operation of abatement equipment.
- » Industrial Air Quality Management (AQM) decision making is robust and well-informed, with necessary information available;

- Establish sector information sharing fora.
- Conduct international benchmarking within the sectors.
- Make sector emission performance information available for company benchmarking.
- » Clean technologies and processes are implemented;
 - Investigate feasibility of introducing clean technologies on plant-specific basis.
 - Implement feasible technology options on plant-specific basis.
 - Investigate possibility of switching to clean fuels at times of poor dispersion.
 - Investigate alternative design and process options to improve plume dispersion.
 - Implement feasible alternative design and process options.
- » Adequate resources are available for AQM in industry;
 - Revise organograms to create air quality structure and designation, where needed.
 - Optimise environmental management resource availability to accommodate air quality function.
 - Fill AQM posts with appropriately skilled staff, where needed.
 - Input into financial planning to implement emission abatement and measurement requirements of AEL and Section 21 emission standards.
 - Investigate the possible use of offset programs to reduce financial investments.
- » Ambient air quality standard and dust fallout limit value exceedances as a result of industrial emissions are assessed; and,
 - Conduct ambient air quality monitoring in accordance with AEL requirements.
 - Conduct dust fallout monitoring in accordance with legislative requirements, and consider advances in monitoring technology.
 - Report ambient monitoring results to relevant AQO and publish on SAAQIS.
 - Update AIR submissions.
- » A line of communication exists between industry and communities.
 - Conduct quarterly consultative community meetings.

3.3 Provincial policies and strategic documents

Fostering economic growth that creates jobs and reduces poverty and inequality in the Mpumalanga province is the main goal of the Mpumalanga Economic Growth and Development Path (MEGDP) (2011). The Provincial Government of Mpumalanga has set to achieve the following between 2011 and 2021 (Mpumalanga Provincial Government, 2011):

- » Reduce the unemployment rate from 28% in 2011 to 15% in 2021 through the creation of approximately 719 000 jobs
- » Increase the income level of 620 000 individuals above the poverty line
- » Increase the Human Development Index (HDI) from 0.50 by increasing literacy levels from 40 000 individuals per annum to 63 000 individuals per annum and life expectancies from 51 years to 62 years
- » Reduce the Gini-coefficient from 0.65 to 0.55 by 2020
- » Increase the economic growth rate to between 5 and 7 percent per annum to achieve the targets listed above.

The MEGDP outlines the importance of the manufacturing industries in the Mpumalanga Province as one of the largest contributors to the provincial economy and one of the biggest absorbers of employment (Mpumalanga Provincial Government, 2011). The manufacturing sector is therefore considered critical to the economic growth and job creation objectives set out in the province. The Provincial Government of Mpumalanga has targeted the creation of 47 000 jobs in the manufacturing sector and intends to target sectors that ensure beneficiation, invest in industrial infrastructure to encourage enterprise development, and recruit technology and skills from outside the borders of Mpumalanga, amongst others.

In the MEGDP, the Mpumalanga Provincial Government also highlights the importance of its transition to a green economy and has placed its focus on developing a Clean and Green Development Strategy to fulfil Mpumalanga's contribution to transitioning South Africa to a low-carbon economy.

In 2016, Mpumalanga drafted a **Green Economy Sector Plan**, which identified four core implementation pillars. One of these pillars related to green towns and urban centres and focused on expansion of recycling activities and waste beneficiation. Although the proposed project is not directly linked to the priorities identified in the Draft Green Economy Plan, it does support the overall vision of transition towards a green economy.

A greater emphasis on the industrialisation activities is articulated in the **Mpumalanga Industrial Development Plan (2016)**, which sets "a clear commitment towards industrialisation by the Provincial Government, through enabling infrastructure development and resource allocation, among others". The plan proposes the establishment of the Mining and Metals Industrial Centre of Competence in the region of eMalahleni and Middleburg, where the proposed project is to be located. The Centre of Competence is envisaged to be situated in a technology park, which is likely to be situated outside the location of the proposed project. Nonetheless, these plans emphasise the concentration of mining and mineral activities, knowledge and technologies that the area, where the proposed project is located, currently possess. This suggests that the proposed development is generally in line with the provincial industrial vision for the area.

3.4 Local policies and strategic documents

3.4.1 Nkangala District Municipality

i) Integrated Development Plan

The developmental objectives set in the **Nkangala District Municipality Integrated Development Plan (NDMIDP) 2017/18-2021/22** include the alleviation of poverty, promotion of infrastructural development, and creation of employment opportunities by developing the physical, socio-economic and institutional environment in the district. As manufacturing is one of the sectors which dominates the economic base of the district, the NDMIDP targets further diversification of manufacturing activities as a key source of achieving the objectives of the NDMIDP.

The development plan specifically emphasises that industrial areas such as Columbus Steel in Steve Tshwete and Highveld Steel in eMalahleni should be maintained and enhanced through service maintenance and upgrading programmes. Furthermore, the NDMIDP recommends that developmental focus be placed on these areas, which already contain industrial infrastructure for future manufacturing and industrialisation. The NDMIDP also calls for development and mainstreaming of the green economy and as such, the development of green jobs.

ii) Air Quality Management Plan

Section 15(2) of the NEM:AQA requires each municipality to include an Air Quality Management Plans (AQMPs) in its integrated development plan contemplated in Chapter 5 of the Municipal Systems Act (No. 32 of 2000). The NDM in partnership and consultation with DEA, DARDLEA and its Highveld Priority Area – Implementation Task Team (HPA-ITT) partners developed and adopted an Air Quality Management Plan (AQMP) in June 2015.

The main elements of the NDM AQMP includes:

- » Local Government Capacity Goal: By 2017-18 NDM undertake organisational capacity review and developed Air Quality Management structures, have provided adequate budgets and human resources and a measurable increase in awareness and knowledge of air quality exists;
- » Industrial Emission Reduction Goals that includes meeting Minimum Emission Standards, the emissions standards for controlled emitters, Ferroalloy sector , Clay Brick sector, Power generation sector, and any emissions standards;
- » Household Fuel Combustion Emission Reduction Goal: By 2018 fuel usage by households have been quantified, local emission factors determined and impact to air quality assessed; undertaken of household emission reduction options and Health risk assessments conducted;
- » Mining Emission Reduction Goal: By 2018 emissions from open cast and underground mining operations as well as underground fires and burning of discard coal have been quantified and impact to air quality assessed;
- » Transport Emission Reduction Goal: By 2017 all local authorities undertake vehicle emissions testing, developed public transport plans and integrate into IDPs □ Veld Burning Emission Reduction Goal: By 2018 veld burning emissions have been quantified spatially and temporally to allow impact to air quality assessed and veld burning emission reduction action plans developed.

3.4.2 eMalahleni Local Municipality

The **eMalahleni Local Municipality Integrated Development Plan (ELMIDP) 2017/18-2021/22** sets out to empower the communities within the municipality by facilitating an environment, which fosters sustainable economic development and social transformation. The eMalahleni LM aims to provide spatial transformation and social cohesion, sustainable and affordable services, clean administration and good governance, financial viability and socio-economic growth and a safe environment.

The municipality has identified comparative advantages in the mining, manufacturing and utilities sectors, and has placed substantial focus on the development of projects and skills in these sectors. The ELMIDP also provides for the strong support of existing industrial and manufacturing activities and recommends that new industrial development be consolidated along the N4 and N12 Development Corridors, which is the area where the proposed project is to be developed.

The **eMalahleni Spatial Development Framework (SDF) (2015)** provides for further insight into the developmental and land zoning objectives for the area, where the proposed project is to be developed. As indicated in **Figure 3.3**, the SDF shows that the project is to be located within the area that is zoned for heavy industrial land use. Considering the nature of the project, its location is in direct alignment with the current spatial development vision for the area.

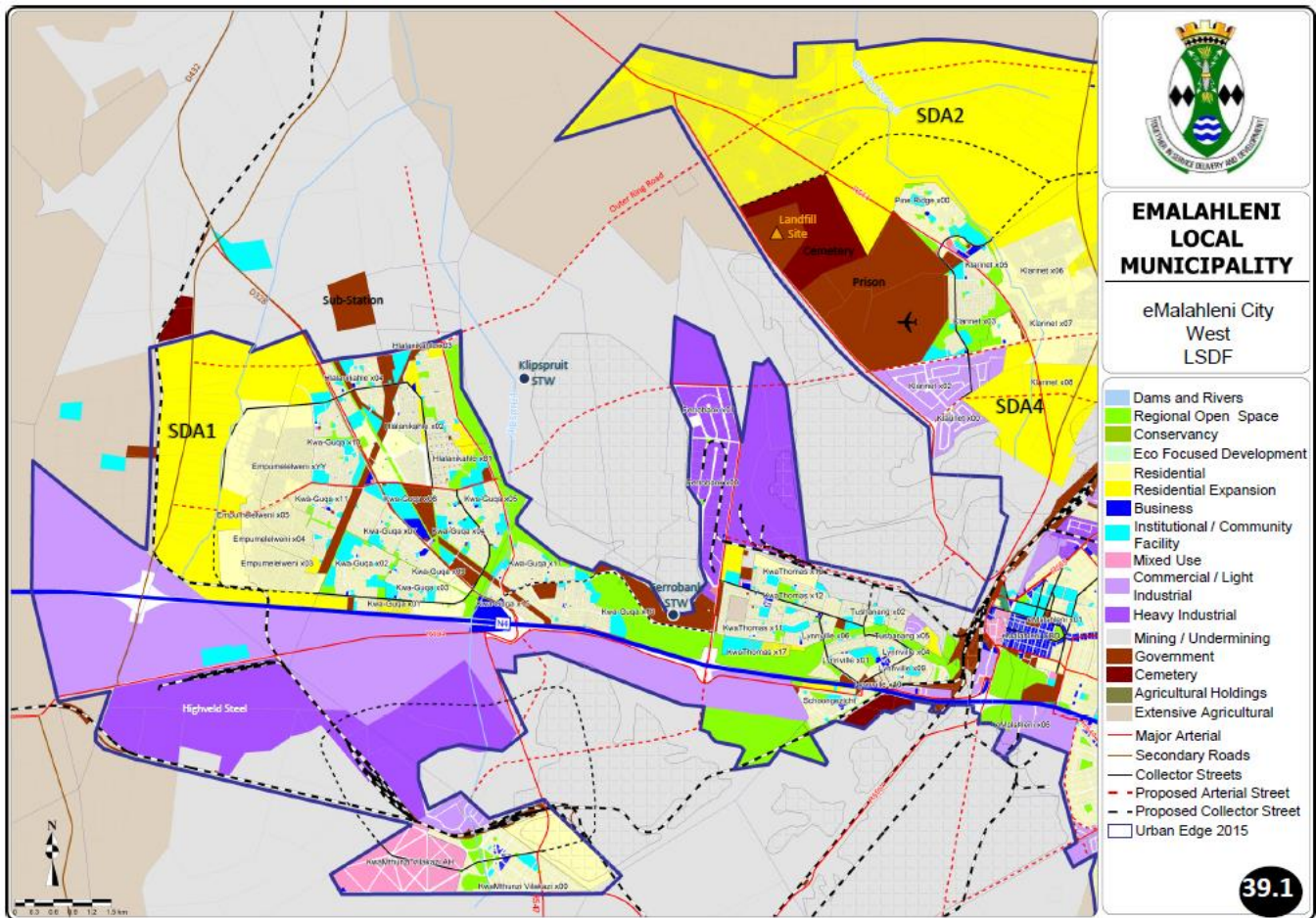


Figure 3.3: Local SDF (Emalahleni LM, 2015)

3.5 Conclusion

Overall, it can be concluded that the proposed project is in alignment with the local and provincial developmental policies and spatial frameworks. The project is also expected to make a contribution toward the achievement of the national developmental objectives related to industrialisation, mineral beneficiation and waste management.

3.6 Need and Desirability of the Proposed Zero Waste Solution Facility

Appendix 2 of the 2014 EIA Regulations requires that a Scoping Report include a motivation for the need and desirability of a proposed development including the need and desirability of the activity in the context of the preferred location. The need and desirability of a development needs to consider whether it is the right time and right place for locating the type of land-use/activity being proposed. Need and desirability is therefore equated to the wise use of land and should be able to answer the question of what the most sustainable use of land is.

This section of the report provides an overview of the anticipated suitability of the proposed project being developed at the preferred project location from a national, regional, and site-specific perspective in the context of the relevant policies and plans. Potential impacts associated with the project which have been identified to date during the Scoping Phase are described separately in Chapter 6 of this Scoping Report.

3.6.1 Need and Desirability from a National and Regional Perspective

The presence of waste slag material and slag resources generated by the steel industry has various environmental impacts on water resources, soils, air quality and general aesthetic of an area. It is estimated that 52% of unclassified waste generated in South Africa during 2017 consisted of slag (DEA, 2018). Waste recovery from slag materials has however become an economically viable option for the re-use of by-products from the steel industry. The re-use options for recovered slag materials range from building and road construction, cement manufacturing, aggregates, and as liming agent in agricultural soils (IISI and UNEP, 1997).

As detailed in the sections above, Operation Phakisa is a national initiative designed to fast-track the implementation of solutions on critical development issues as highlighted the National Development Plan (DEA, 2018). Slag waste and its associated beneficiation opportunities have been identified as a priority waste area in terms of Operation Phakisa.

The Fodere Zero Waste Recovery Solution project aims to develop a saleable product (i.e. vanadium and titanium oxides) from a waste source (i.e. slag materials). The waste recovery solution process of the project will deliver maximum benefits from waste slag materials, which aids in the reduction of slag waste disposed of at slag waste disposal areas by Highveld Steel. This process contributes towards achieving the objectives of the NEM: WA and the NWMS through implementation of the waste management hierarchy by reducing waste material for disposal and recovering materials from waste. In addition, given that the proposed project consists of a zero-waste recovery solution, no process waste will be generated which is also in line with the objectives of the NEM: WA and NWMS.

The overall manufacturing process of the proposed facility will be a first of its kind due to its ability to recover materials, specifically titanium, from low quality slag feedstock. Given that the state-of-the-art facility will be located in South Africa, great benefits can be obtained by the project through the utilisation of its environmentally and socially responsible technology.

3.6.2 Receptiveness of the proposed project site to development of the Zero Waste Recovery Solution

The project proponent has identified the preferred site within the Highveld Steel operational Industrial Park due to:

- » it being located in a large existing industrialised area surrounded by several heavy industries and mining operations. It is a brownfields site that has already undergone extensive transformation.
- » feedstock (i.e. slag materials) for the recovery process is readily available from from the slag resource located next to the preferred site limiting material transport cost and implications.
- » utility services for potable water, electricity, and refuse removal is provided by Highveld Steel.
- » a railway siding is located adjacent to the project site which may be beneficial for transporting products and materials from the facility in future.

Based on the consideration of various technical aspects explored in the sections below, the selected site was deemed suitable for the project.

Extent of the site: The zero-waste recovery plant and its associated infrastructure requires an area of land approximately 4ha in extent. The affected property is approximately 350ha, which is sufficient to accommodate the proposed project while still allowing for the avoidance of environmental sensitivities.

Site access: Access to the site is obtained via the existing access points at the Highveld Industrial Park entrance from the R104, from the N4 turnoff.

Current land use considerations: The property is located within the Highveld Industrial Park and is zoned for industrial use. The proposed development is therefore considered to be compatible with the surrounding land use.

Environmental sensitivity of the site: The site is located within an area which has already undergone extensive transformation and therefore no environmental sensitivities are anticipated to limit the development within the identified site.

Integrated Environmental management: The project within the proposed site complies with the objective of integrated environmental management and the principles of sustainable development taking into account economic, social and environmental factors.

CHAPTER 4 STRATEGIC CONTEXT AND POLICY

This chapter provides a description of the local environment. This information is provided in order to assist the reader in understanding the possible effects of the project on the environment within which it is proposed to be developed. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the Fodere Titanium Zero Waste Recovery Solution have been described. This information has been sourced from existing information available for the area to provide the context within which this Scoping process is being conducted.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(g)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	<p>The environmental attributes associated with the development of the Fodere Titanium Zero Waste Recovery Solution is included as a whole within this chapter. The environmental attributes that are described within this chapter includes the following:</p> <ul style="list-style-type: none"> » The regional setting of the broader study area and the project site indicates the geographical aspects associated with the Fodere Titanium Zero Waste Recovery Solution. This is included in Section 4.2. » The climatic conditions for the project area have been included in Section 4.3. » Topographical profile is described in Section 4.4. » The air quality profile and details of potential sensitive receptors are included in Section 4.5. » An overview of geology and soils in the region is provided in Section 4.6. » The ecological characteristics of the project site and the surrounding areas are described in Section 4.7. » Visual aspects of the study area are described in Section 4.8. » The heritage and cultural aspects (including archaeology and palaeontology) has been included in Section 4.9. » The social and socio-economic characteristics associated with the broader study area and the project site has been included in Section 4.10.

A more detailed description of each aspect of the affected environment will be included in the specialist reports to be included in the EIA report.

4.2 Regional Setting

4.2.1 Spatial context and regional linkages

The waste recovery plant is proposed to be located on Portion 48 of Farm Elandsfontein 309 JS, approximately 17 km west of eMalahleni town in the eMalahleni Local Municipality (LM) within the Nkangala District Municipality (DM) in Mpumalanga. The development area is approximately 4 ha in extent and is contained within the Highveld Steel property and Highveld Industrial Park operational boundary. The site is accessible directly off the R104, from the N4 turnoff near Kwa-Guqa informal settlement.

The Mpumalanga Province is located north of the Kwazulu-Natal Province, sharing borders with Swaziland and Mozambique in the east (Mpumalanga Provincial Government, 2017). The Mpumalanga Province is the second smallest province in South Africa at 76 495 km², comprising 6.5% of South Africa's total land area (Global African Network, 2017). With a population of approximately 442 867, Mpumalanga is South Africa's third most densely populated province after Kwazulu-Natal and Gauteng, with approximately 60 people per square kilometre (Quantec, 2020f). The Mpumalanga Province is divided into three district municipalities (DMs) – Ehlanzeni DM, Gert Sibande DM and Nkangala DM – which contain 18 local municipalities collectively.

The Nkangala District comprises six local municipalities, namely Victor Khanye LM, eMalahleni LM, Steve Tshwete LM, Emekhazeni LM, Thembisile Hani LM, and Dr J S Moroka LM (**Figure 4.1**). Covering a total area of 16 756 km², the Nkangala DM makes up 22% of the Mpumalanga Province's land mass and has a population of approximately 1 572 051 (Nkangala District Municipality, 2017b; Quantec, 2020d). The Nkangala DM is abundant with minerals and natural resources and is said to be at the economic hub of the Mpumalanga Province. The Nkangala DM is host to the Maputo Corridor, which brings further opportunity for its economic growth (Nkangala District Municipality, 2017b). The economy of the Nkangala DM is driven by electricity, manufacturing and mining (Nkangala District Municipality, 2017b).



Figure 4.1: The six municipalities located in the Nkangala District Municipality (Municipalities of South Africa, 2018)

The eMalahleni LM has a geographical area of approximately 2 677 km² and consists of a number of towns, including Balmoral, Clewer, Coalville, Hlalanikahle, Kendal, Kriel, KwaGuqa, Lynnville, Matla, Minnaar, New Largo, Ogies, Paxton, Phola, Rietspruit, Thubelihe, Van Dyks Drif, Wilge, and eMalahleni (Nkangala District Municipality, 2017a). The eMalahleni LM contains one of the major urban concentrations in the Nkangala DM and the Municipality Province as a whole (Nkangala District Municipality, 2017a).

Predominantly an industrial area, the eMalahleni LM contains 27 economic hubs consisting of 883 businesses with main sectors such as manufacturing, trade, transport and finance and community services (Nkangala District Municipality, 2017a). Further aiding its economic development, the eMalahleni LM is located close to Gauteng with the N4 and N12 national roads facilitating transportation of goods manufactured in the municipality (Nkangala District Municipality, 2017a). The eMalahleni LM is considered a “gateway municipality” into the province for all but one of the nine provinces in South Africa (Emalahleni Local Municipality, 2016).

The site falls within Zone A: The Highveld/energy hub area as defined in the Environmental Management Framework for the Olifants and Letaba Rivers Catchment Areas (OLEMF). The zone represents the current powerhouse of South Africa with extensive coal fields that cover almost all of the area, numerous large coal mines, 6 coal fired power stations (soon to be 7), several major industries and towns that are located in the area.

4.2.2 Major towns and settlements

The proposed waste recovery plant is to be located within the Highveld Industrial Park. The closest towns to the park are Empumelweni, KwaGuqa and KwaMthunzi Vilakazi (formerly known Clewer), which are approximately 3.9km, 5.9km and 7km from the proposed site, respectively.

- » Empumelweni and KwaGuqa are townships located north of the proposed project site and separated from it by an open space and the N4 national road.
- » KwaMthunzi Vilakazi is settlement comprising of agricultural holdings and a township, which is older than the town of eMalahleni itself. It is located close to the Kusile and Kendal Power Stations and is surrounded by a number of collieries and mines.

4.2.3 Locational Factors and Major Tourism attractions

Featuring mainly underground and opencast mines, the eMalahleni LM is considered to be the most industrialised LM in the Nkangala DM (Emalahleni Local Municipality, 2016). The eMalahleni LM possesses the largest concentration of power stations in the country and is thought to be the “energy heartbeat” of South Africa (Emalahleni Local Municipality, 2016).

While eMalahleni is known for its coal mines and power stations, the municipality is in the process of rebranding itself as the tourist destination by taking advantage of its tourism resources, such as the Witbank Nature Reserve and the Ezemvelo Nature Reserve, which are currently weekend tourist attractions for Gauteng residents (Emalahleni Local Municipality, 2016).

4.3 Climatic Conditions

The study area is situated in the Mpumalanga Highveld Region in the summer rainfall region of southern Africa. The climate is temperate with warm summers and cold, dry winters. Precipitation usually occurs in summer, as mist, rain and hail; convectional thunderstorms are common and the source of most precipitation. Hail can be expected to occur an average of 6 days per year. The average annual rainfall is between 624mm and 713mm with 85% of this falling in the high rainfall months between October and March. The highest rainfall in 24 hours was 129mm, recorded at Ogies on 19 December 1986.

Average temperatures ranged between 11.3°C and 20.7°C. The highest temperatures occur in January and the lowest in June/July. During the day, temperatures increase to reach maximum at around 15:00 in the afternoon. Ambient air temperature decreases to reach a minimum at around 05:00 i.e. just before sunrise. Sharp frosts are common in winter. Frost can be expected from the beginning of May until mid-September, with an average of 58 frost days per year.

Wind is predominantly northerly, easterly and east-south-easterly, with wind speeds of greater than 5 m/s, especially during the day. Winds from the north-westerly sector winds are also predominant during the day, albeit at slightly lower overall wind speed. The night-time wind rose shows a decrease in the northerly and the north-westerly winds and an increase in the easterly and east-south-easterly winds. The night-time is also characterised by an increase in the frequency of calm wind conditions.

Maximum evaporation occurs in summer, from October to January, due to high summer temperatures.

4.4 Topographical profile

The proposed project site lies at an altitude between 1,480 and 1,560 metres above sea level (masl). In general, the topography of the site slopes downwards from north to south at a gradient of approximately 1m per 70 m and from west to east at a gradient of approximately 1m per 30 m.

4.5 Air quality profile

The project area is located within the Highveld Priority Area (HPA). The Highveld Airshed was the second priority area declared by the minister. This required that an Air Quality Management Plan for the area be developed. The plan includes the establishment of emissions reduction strategies and intervention programmes based on the findings of a baseline characterisation of the area. The implication of this is that all contributing sources in the area will be assessed to determine the emission reduction targets to be achieved over the following few years.

Ambient air quality data is measured at the Department of Environmental Affairs, Forestry and Fisheries (DEFF)-managed Witbank station (located approximately 9 km east of the proposed project location). Data from this station for the periods 2015, 2017 and 2018 indicated that ambient particulate concentrations are elevated in the Emalahleni area.

Time series plots (mean with 95% confidence interval) of ambient SO₂, NO₂ and PM₁₀ concentrations measured at Witbank (DEFF) show the variation of these pollutants over daily, weekly and annual cycles.

Increased NO₂ concentrations during peak traffic times illustrate the contribution of vehicle emissions to the ambient NO₂ concentrations. Elevated winter (June, July and August) concentrations of SO₂ and NO₂ shows the contribution of residential fuel burning to the ambient SO₂ and NO₂ concentrations.

Monthly variation of PM₁₀ and PM_{2.5} shows a typical Highveld signature of elevated concentrations during winter months due to the greater contribution from domestic fuel burning, wind erosion from uncovered soil and the lack of the settling influence of rainfall.

4.5.1 Sensitive Receptors

Sensitive receptors within a 10 km radius of the proposed operations (refer Figure 4.2) include the residential areas of Kwa-Guqa, eMumelweni and Hlalanikahle to the north, the residential areas of Ackerville, Thushanang, Schoongezicht and Lynnville to the east and Clewer to the south. KwaGuqa is a township west of the industrial town of eMalahleni and is the largest populated area within close proximity to the proposed development site (approximately 1 500 m north of the proposed development site at its closest point). There are also numerous schools, clinics and hospitals in the nearby residential areas. There are a large number of operations within a 50km radius that are sources of major emissions, including seven power stations and numerous mines.

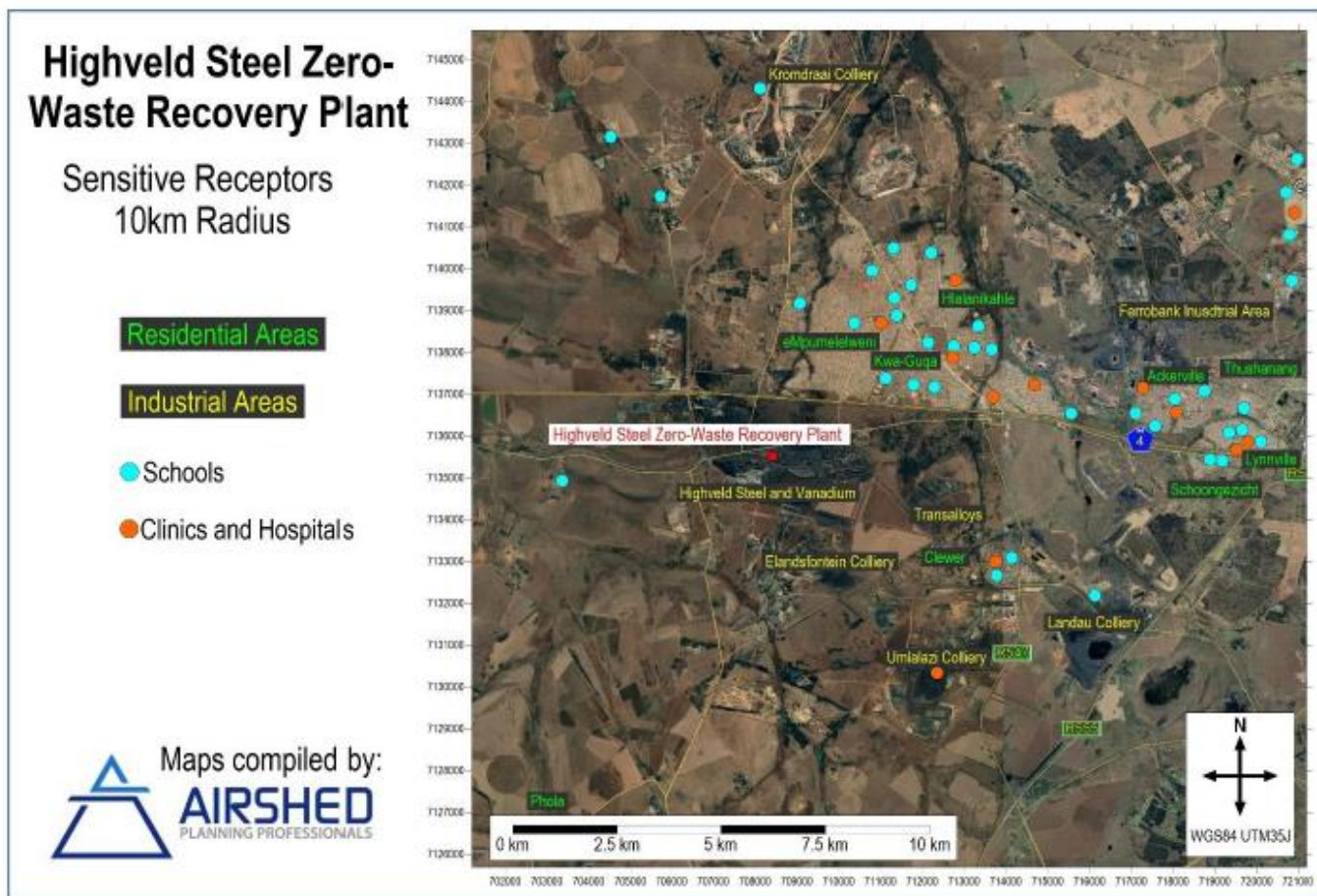


Figure 4.2: Sensitive receptors within 10km of the project site

4.6 Geology and Soils

According to Golder (2013), the study area is underlain by sub-horizontal sediments of the Karoo Sequence. The Karoo Sequence consists of the older Dwyka formation at the base, followed by the Eccca, Beaufort and Lebombo groups. The sediments in the area of investigation comprise shale, carbonaceous shale, sandstone and coal of the Eccca Group.

A dolerite sill has intruded into the Karoo sediments to the north west of the site.

The soils are of the plinthic catena: dystrophic (rich in organic matter, usually in the form of suspended plant colloids, but of a low nutrient content) and/or mesotrophic (intermediate levels of primary productivity, with intermediate levels of mineral nutrients required by plants).

4.7 Ecological Profile of the Study Area and the Development Area

The study area is situated within the Grassland Biome and within the Mesic Highveld Grassland Bioregion. The proposed development site is located in a large existing industrialised area surrounded by several heavy industries and mining operations. It is a brownfields site that has already undergone extensive transformation. No natural vegetation remains on the site.

The study area falls within an area that is currently not protected. The study area is not situated within close proximity (within 10km) of an IBA. According to SAPAD (Q1, 2019) the John Cairns Private Nature Reserve is situated ± 9.5 km southeast of the study area. There are no other protected or conservation areas situated within 10 km of the study area (Scientific Terrestrial Services CC, 2019). No sensitive areas fall within the site (refer to Figure 4.3).

4.8 Visual Aspects

The region within which the study area is situated is characterised by gently rolling topography with no prominent natural landforms. The vegetation cover consists mainly of grazing and cropland, interspersed with clumps of exotic trees, mainly Eucalyptus and wattle.

The area to the west is characterised by relatively low levels of development (with the exception of the Kusile Power Station). A number of large industrial and mining complexes are located to the north, east and south of the Highveld Steel property. In these areas, the pre-existing visual landscape has been significantly altered by expansive infrastructure and landforms that contrast with their surroundings due to their geometric shapes and are generally dark colours. The proposed development site falls within the Highveld Steel property, which has been transformed to industrial uses.

4.9 Heritage Profile

Established in 1903, the town of eMalahleni (Witbank) was named after a ridge of white rock located near the present railway station, which was a halting place for transport wagons and a place of trading (Emalahleni LM, 2015). The principal language in the eMalahleni LM is Zulu, followed by Afrikaans and Northern Sotho.

The LM's concentration of industrial activities is reflected in its heritage places that exhibit a rich historical background, specifically industrial and military history, architectural and engineering sites and historical gravesites (Emalahleni Local Municipality, 2016). The town has a number of cultural heritage sites, such as the Battle of Bakenlaagte site, Clewer railway station and the Roodebloem farmstead.

The town of KwaGuqa is host to a number a valuable heritage resources including historical church buildings and houses, the Indian Cemetery and structures associated with mining activities (Emalahleni LM, 2015). The conservation and protection of these heritage places, especially those around the town of eMalahleni and KwaGuqa, have been identified as a priority for government (Emalahleni Local Municipality, 2016).

The proposed plant falls within the boundaries of the existing Highveld Industrial Park and is completely transformed due to the industrial activities within the site. No heritage sensitive features were identified in the study area during the desktop heritage study undertaken for the proposed project.

According to the SAHRIS palaeontology sensitivity map, most of the area in the vicinity of the site is of very highly sensitivity.

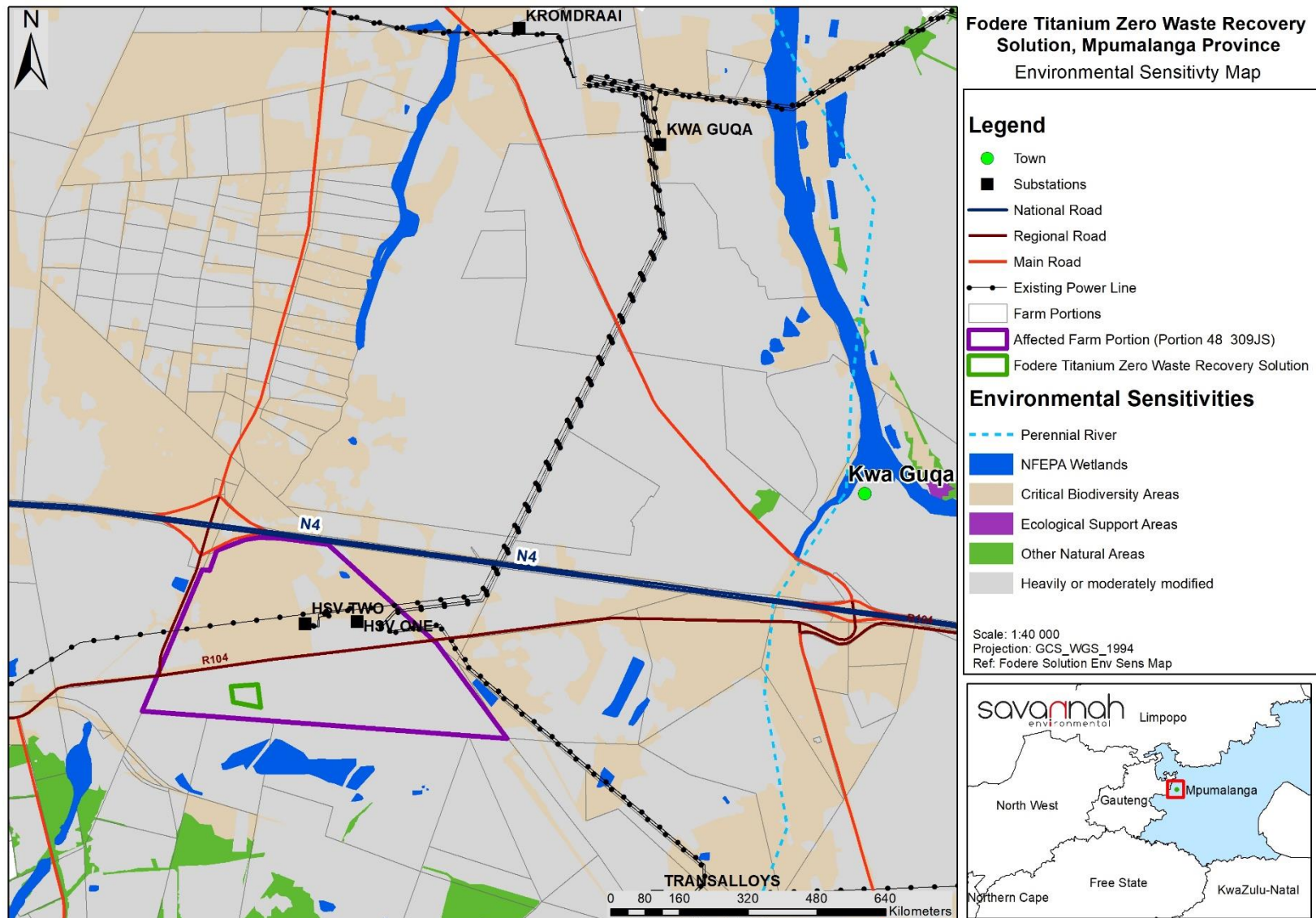


Figure 4.3: Environmentally sensitive areas identified in the vicinity of the site

4.10 Social Context

4.10.1 Demographic Profile

Population Demographics

In 2019, the eMalahleni LM had a population of approximately 477 938 people comprising of 145 605 households (Quantec, 2020f). The average household size of in the region was approximately 3.3 people during the year (Quantec, 2020f). The eMalahleni LM has the second largest population concentration in the Mpumalanga Province and accounts for the largest proportion of population in the Nkangala District, as well as the highest population growth in the District (Emalahleni Local Municipality, 2016; Quantec, 2020d).

Of the total population, 84.9% are Black African and 12.7% are White, with the remaining 2.4% being Coloured, Indian or Asian (Quantec, 2020f). The majority of residents in the municipality fall in the 30 to 44 age category (30.0%), followed closely by the 15 to 29 age category (27.0%) (Quantec, 2020e). The male population exceeds that of the female population by approximately 9.2 percentage points (Quantec, 2020e).

The demographic profile in the eMalahleni LM is indicative of the economic structure of the municipality and its historical development, which was dependent on the establishment of the mining and electricity generation sectors. Areas that have a relatively large presence of the mining sector, tend to have a higher proportion of male population and population within a working age group due to the settlement structures designed to accommodate a single-living, working male population employed in the mining sector.

Income Levels

According to the Census 2011³, nearly half of households (46.0%) in the eMalahleni LM earned between R0 and R3 200 a month, with over 9 161 households (6.5%) having no source of income (Stats SA, 2011). In 2012, the average annual household income in the eMalahleni LM was ranked third after Steve Tshwete and Govern Mbeki (Emalahleni Local Municipality, 2016). However, it could be argued that due to the proximity of the location of the municipality relatively to the economic hubs of Ekurhuleni and Johannesburg, many of the higher income groups of households who have members working in the municipality reside outside the eMalahleni LM.

Education Levels

Approximately 5.5% of adults aged 20 and above in the eMalahleni LM have no formal schooling whatsoever as of 2019 (Quantec, 2020d). Approximately 9.0% of adults have some primary schooling; 4.1 per cent of adults have completed only primary schooling (Quantec, 2020d).

The majority of adults in the region have at least some secondary schooling (35.5%), while 30.1% of the adult population have obtained a matric certificate. Approximately 13.3% of adults aged 20 and above

³ The use of 2011 data is due to the unavailability of the more recent data on income levels at a local municipality level.

in the eMalahleni LM have obtained a higher education qualification, with 10.8% having obtained a diploma or certificate and 2.5% having obtained at least a Bachelor's degree.

The low to moderate levels of education correlates with the types of industries which comprise the economic base of the municipality, such as the mining industry that is known to have many low- to semi-skilled workers.

4.10.2 The Economy

In 2019, the eMalahleni LM's economy was valued at R45 826 million (in current prices), contributing 13.4% to Mpumalanga Province's total economy's gross value added (GVA) (Quantec, 2020g). Accounting for nearly half of this value (47%), the mining and quarrying sector was by far the biggest contributor to the municipality's economy in 2019. The sector with the highest economic growth rate, though, was the construction sector with a Compounded Annual Growth Rate (CAGR) of 4.3% between 2010 and 2019. Over the same period, the manufacturing and electricity, water and gas sectors contracted by 0.4% and 0.5%, respectively.

4.10.3 Labour Force and Employment Structure

Labour Force Composition

Of the total working age population in the eMalahleni LM, approximately 47.7% were employed in 2019 (Quantec, 2020c). However, as 110 264 individuals were not economically active (NEA)⁴, the municipality had an unemployment rate of 30.3% during the year.

The unemployment rate in 2019 was slightly lower in the Nkangala District and the Mpumalanga Province with unemployment rates of 33.3% and 30%, respectively. The labour participation rate of the eMalahleni LM was approximately 10 percentage points higher than that in the Nkangala DM and Mpumalanga Province during the year. These findings are in line with eMalahleni LM being the "economic hub" of the province.

Employment Structure

The mining and quarrying sector accounted for the largest percentage of jobs created in the eMalahleni LM in 2019, with 29% of the employed population in the municipality being absorbed by this sector (Quantec, 2020a). The next highest contributor to employment during the year was the wholesale and retail trade, catering and accommodation sector, accounting for 16% of total jobs in the region. The agriculture, forestry and fishing sector was the eMalahleni LM's smallest contributor to employment in 2019 at 2%.

Approximately 20% of the employed in the eMalahleni LM were active in the informal sector in 2019. Of the remaining 80% employed in the formal sector, approximately 17% were considered skilled workers,

⁴ NEA persons are those who are not actively seeking employment due to various reasons including being discouraged to look for employment opportunities.

while the majority of workers (62%) in eMalahleni LM were classified as semi-skilled. Low-skilled workers accounted for approximately 21% of employment in the municipality in 2019.

4.10.4 Status of infrastructure and basic service delivery

Basic service delivery

In 2019, 72.8% of households in the eMalahleni LM had access to electricity. Of the households who did not have access to electricity, 23.9% utilised candles for lighting while the remaining households made use of paraffin, gas, solar and other unspecified sources for lighting (Quantec, 2020b).

The majority of the population (88.3%) in the eMalahleni LM had access to piped water within 200m of their dwelling in 2019, with 53.9% and 25.0% having access to piped water inside their dwelling and inside their yard, respectively. Approximately 8.6% of individuals who did not have access in their dwelling or yard had access to piped water within 200m of their dwelling; 6.1% of households had access to piped water beyond 200m from their dwelling. The remaining 5.4% made use of other water sources, such as boreholes, rainwater tanks, wells, water-carriers, water vendors and other unspecified sources.

In 2019, 68.0% of the eMalahleni population had refuse removal done by their local authority, with approximately 66.6% having their refuse removed by the local authority at least once a week. Other means of refuse removal in the municipality included the use of their own rubbish dump (21.3%) and communal refuse dumps and other unspecified means (3.8%). The remaining 7.0% of residents in eMalahleni LM did not have access to refuse removal.

Approximately 70.7% of households in the eMalahleni LM had access to a flush or chemical toilet in 2019. The other toilet facilities, pit latrine and bucket latrines, were used by 24.7% of households in eMalahleni. Approximately 4.6% of the population in the region had no toilet facilities in 2019. This may be an indication of a sanitation problem in the municipality.

Status of Social Facilities

The eMalahleni LM boasts a number of healthcare facilities. The municipality has six hospitals, 15 fixed clinics and three mobile clinics (Emalahleni LM, 2020). There is at least one clinic in every town. It has been suggested, however, that due to the population size in Lynnville, KwaGuqa and Hlalanikahle, there may be a need for the development of more clinics.

In terms of safety, the municipality has a total of five police stations in eMalahleni, Kriel, Phola, Vosman and Ogies (Emalahleni LM, 2019). However, safety remains a matter of concern in the municipality as there is a high prevalence of crime due to a large number of unemployed youth and drug abuse in the community. The establishment of satellite police stations have been identified as a need in many communities in the region (Emalahleni LM, 2020).

As of 2015, the eMalahleni LM has 34 preschools, 58 primary schools and 19 secondary schools, with an identified lack of education facilities in Hlalanikahle (Emalahleni LM, 2015). In terms of higher education, there are four tertiary facilities in the municipality, namely the Tshwane University of Technology, Pretoria University, UNISA and eMalahleni College (Emalahleni LM, 2015). The municipality also has other tertiary institutions such as the Mpondozankomo Technical College in Ackerville and the Coal Training College in Klipfontein. The development of additional adult basic education and training (ABET) and other skills training facilities in the municipality has been identified to be necessary to improve the socio-economic status of the population given the low literacy and employment levels.

4.10.5 Site related information: zone of influence baseline

The site-related information section investigates the various dynamics of the proposed site. As of 2015, the eMalahleni LM has six major industrial areas, which consist of approximately 591 developed and 279 vacant industrial erven (Emalahleni Local Municipality, 2015). The proposed waste recovery plant is planned to be located in one of the existing industrial areas, the Highveld Industrial Park.

The Highveld Industrial Park is approximately 10km west from the CBD and has an estimated area of 1 700ha (Emalahleni Local Municipality, 2015). The two nearest towns to the Highveld Industrial Park are the KwaGuqa township, which is located approximately 5.9km from the complex, and the small town of Clewer, which is located approximately 7.0km away from the complex. The Highveld industrial Park is leasing infrastructure and property, which previously formed part of the Integrated Steelworks operation of Highveld Steel, to tenants operating industrial processes. The proposed waste recovery plant will therefore be situated in an area which is already cordoned off for manufacturing purposes. Subsequently, it is expected that the proposed plant will have very little additional effect on the surrounding areas.

CHAPTER 5 APPROACH TO UNDERTAKING THE SCOPING PHASE

An Environmental Impact Assessment (EIA) process refers to that process (in line with the 2014 EIA Regulations, as amended (GNR 326)) 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** and the **EIA Phase**.

The EIA process is illustrated below in Figure 5.1.



Figure 5.1: The Phases of an Environmental Impact Assessment (EIA) Process.

The Scoping process for the Zero Waste Recovery Solution is being undertaken in accordance with Section 24 (5) of the National Environmental Management Act (No. 107 of 1998) (NEMA). In terms of the 2014 EIA Regulations (GNR 326) and Listing Notices 1 to 3 (GNR 327, 325 and 324), and the List of Waste Management Activities (GNR 982) published in terms of the National Environmental Management: Waste Act (No. 58 of 2002) (NEM:WA), a full Scoping and EIA (S&EIA) process is required to be undertaken in support of an application for Environmental Authorisation (EA) and Waste Management License (WML) for the project.

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 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.

5.1 Legal Requirements as per the EIA Regulations for the undertaking of a Scoping Report, 2014 (as amended)

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(d) a description of the scope of the proposed activity, including (i) all listed and specified activities triggered	All relevant listed activities triggered by the development of the Zero Waste Recovery Solution and a description of

Requirement	Relevant Section
and (ii) a description of the activities to be undertaken, including associated structures and infrastructure	the activities which form part of the development have been included in section 5.2 and Table 5.1 and 5.2.
e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are considered in the assessment process;	The specific environmental legislation and policies applicable to the development are considered in Table 5.6.
(g)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs	The details of the public participation process undertaken as part of the EIA process for the Zero Waste Recovery Solution has been described and is included in section 5.3.2.
(g)(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them	No comments have yet been received on the project. Comments received during the Scoping phase 30-day review period, will be included in the Comments and Responses Report within the Final Scoping Report.

5.2 Relevant Listed Activities

Table 5.1 contains all the listed activities identified in terms of NEMA, the EIA Regulations of 8 December 2014 (GNR 326) and Listing Notices (GNR 327, GNR 325, and GNR 324) which are triggered by the development of the project, and for which Environmental Authorisation has been applied.

Table 5.1: Listed activities identified in terms of the Listing Notices (GNR 327, GNR 325 and GNR 324) published under NEMA on 08 December 2014 (as amended in April 2017)

Notice Number	Activity Number	Description of listed activity
Listing Notice 1 (GNR 327) of April 2017	14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres. Storage facilities for fuels, gas and chemicals will be required and will have a combined capacity of less than 500m³.
Listing Notice 2 (GNR 325) of April 2017	6	The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent An Atmospheric Emissions License (AEL) is required under the NEM: AQA for the processing or recovery of metallurgical slag by the application of heat (Sub-category 4.20 of GNR893 published on 22 November 2013 under the National Environmental Management: Air Quality Act, No 39 of 2004).

In terms of the listed activities defined under the National Environmental Management: Waste Act (GNR 921), the following 'listed activities' are triggered by the development of the project, and for which a Waste Management License (WML) has been applied.

Table 5.2: Listed activities identified in terms of the Listed Activities (GNR921) published under NEM: WA on 29 November 2013 (as amended by GG 37604 dated 2 May 2014 and GG 39020 dated 24 July 2015)

Notice Number	Activity Number	Description of listed activity
GN 921 of 29 November 2013, as amended	Category B 3	The recovery ⁵ of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises. <i>The plant will be developed to process 2000 tonnes of tailings/slag per month, approximately 3 tons per day.</i>
GN 921 of 29 November 2013, as amended	Category B 4	The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage. <i>The technology proposed to process the waste will utilise pyrometallurgical and hydrometallurgical patented extraction process for high-purity Titanium Dioxide production as well as vanadium, aluminium and magnesium.</i>
GN 921 of 29 November 2013, as amended	Category B 10	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity). <i>A plant of approximately 4ha in extent will be developed to process the waste.</i>

5.3 Objectives of the Scoping Phase

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 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.

⁵ "recovery" means the controlled extraction of a material or the retrieval of energy from waste to produce a product

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 alternatives.
- » 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.

5.4 Overview of the Scoping Phase

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 Integrated Application for Environmental Authorisation (EA) and Waste Management License (WML) to the competent authority (i.e. the National DEFF) in terms of Regulations 5 and 16 of the EIA Regulations 2014, as amended in April 2017 (GNR326).
- » Undertaking a public participation process throughout the Scoping phase in accordance with Chapter 6 of GNR326 in order to identify issues and concerns associated with the proposed project.
- » Undertaking of independent specialist studies in accordance with Appendix 6 of GNR326 and relevant specialist protocols as appropriate.
- » Preparation of a Scoping Report and Plan of Study for EIA in accordance with the requirements of Appendix 2 of GN R326.
- » Preparation of a Comments and Responses Report detailing key issues raised by I&APs as part of the Scoping phase.

The tasks are discussed in detail below.

5.4.1 Authority Consultation and Application for Authorisation

Consultation with the National Department of Environment, Forestry and Fisheries (DEFF), the Competent Authority for this project, and the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs, the commenting authority, will be undertaken throughout this Scoping phase. To date, this consultation has included the following:

- » Submission and approval of the public participation plan;
- » Submission of the application for EA and WML to DEFF;
- » Submission of this Scoping Report for review by I&APs, the Organs of State and the competent and commenting authorities.

A record of all authority correspondence undertaken prior to and within the Scoping Phase is included in **Appendix C1**.

5.4.2 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. 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 achieve the following:

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 project.
- » Adequate review periods are provided for I&APs to comment on the findings of the Scoping and EIA Reports.

The restrictions enforced in terms of Government Gazette 43096 which placed the country in a national state of disaster limiting the movement of people to curb the spread of the COVID-19 virus has placed some limitations on the commencement and continuation of the public consultation as part of the EIA process. Considering these limitations, a public participation plan (**Appendix C2**) and consultation process has been designed by Savannah Environmental and approved by DEFF to cater for the undertaking of the public participation process which includes I&APs, the competent authority, directly impacted landowners/ occupiers, adjacent landowners/occupiers, relevant Organs of State departments, Municipalities, ward councillors and other key stakeholders.

The traditional means and opportunities available for the undertaking of public participation will still be covered and implemented as part of the public participation plan considering the current limitations.

Alternative means of undertaking consultation has been designed and will be implemented by Savannah Environmental to ensure that I&APs are afforded sufficient opportunity to raise comments on the project through an interactive web-based platform readily available and accessible to any person illustrating interest in the project and enables the public participation process to be undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014, as amended.

This online stakeholder engagement platform allows the EAP to visually present details regarding the project and our consultation documentation, including project maps and plans, presentations and posters regarding the project, and reports available for review. The use of online tools enables stakeholders and I&APs to explore the project-specific content in their own time, and allow them to participate in a meaningful way in the consultation process. The online platform allows for instant feedback and comments to be submitted by I&APs, in so doing saving time for the stakeholder and also giving the assurance that their comments have been submitted for inclusion in the project reporting. The online stakeholder engagement platform considered the limitations applied by the Disaster Management Act Regulations prohibiting the gathering of people, as well as limitations which certain I&APs may have in terms of access to computers and internet as well as access to public spaces not open for operation or which have restricted access.

Key tasks undertaken in the Scoping Phase to ensure effective participation includes the following:

- » Distribution of project related information in the form of notification letters and a background information document at the outset of the EIA process.
- » Identification of stakeholders and I&APs, including:
 - * all organs of state which have jurisdiction in respect of the activity to which the application for EA and WML relates;
 - * owners, person in control of and occupiers of the 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;
 - * the municipal councillor of the ward in which the 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.
- » Radio live reads.
- » 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, sms's, whatsapp, 'please call me' and consultation meetings or virtual focus group meetings.
- » Release of the Scoping and EIA reports for 30-day review periods.

The following sections detail the tasks which were undertaken as part of the public participation process within the Scoping Phase to date.

i. Stakeholder identification

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 the completion of a registration and comment sheet. Key stakeholders and affected and surrounding landowners have been 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.

ii. Database of Interested and Affected Parties

As per Regulation 42 of the EIA Regulations, 2014 (as amended in April 2017), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C3** for a listing of the recorded parties). The register of I&APs contains the details of⁶:

- » 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; and
- » 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

The EIA process was announced with an invitation to the organs of state, potentially affected and neighbouring landowners and general public to register as I&APs and to actively participate in the EIA process. This was achieved via the following:

- » Placement of site notices announcing the EIA process on 11 November 2020 at visible points along the boundary of the project site, in accordance with the requirements of the EIA Regulations. Photographs and the GPS coordinates of the site notices are contained in **Appendix C4**.
- » Placement of advertisements announcing the EIA process for the project and inviting members of the public to register themselves as I&APs on the project database and announcing the availability of the Scoping Report in the Witbank News on 13 November 2020. The tear sheets of the newspaper advert will be contained in Appendix C4 of the Final Scoping Report.

⁶ Note that addresses and contact details are not contained within the register presented to the public in line with the requirements of the Protection of Personal Information (POPI) Act (Act 4 of 2013).

- » Radio adverts (live reads) on a local community radio station will be undertaken announcing the project and the availability of the scoping report and where I&APs can register their details should they require any further information.
- » Compilation of a background information document (BID) for the project in order to provide information regarding the project and the EIA process (refer to **Appendix C5**). The BID has been distributed to identified stakeholders and I&APs together with a notification letter on 13 November 2020. The BID is also available electronically on the Savannah Environmental website (<https://www.savannahsa.com/public-documents/other/waste-recovery-plant/>).
- » Distribution of EIA process notification letters notifying registered I&APs of the project and of the availability of the Scoping Report for review to organs of state, potentially affected and neighbouring landowners as well as stakeholders/I&APs via email on 13 November 2020. The evidence of this process notification is contained in **Appendices C6**. I&APs have been encouraged to view the Scoping Report and submit written comment. The Scoping Report has been circulated to Organs of State via CD or electronic transfer (Dropbox, WeTransfer, etc), as per individual request.

iv. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their views, issues and concerns regarding the project, various opportunities will be provided in the scoping phase and will continue to be provided to I&APs to note their issues during the remainder of the EIA process. I&APs are being consulted through the following means:

- » **Focus group meetings:** Virtual focus group meetings will be held with key government departments, stakeholders and landowners during the scoping phase of the process. The purpose of these focus group meetings is to introduce the project and EIA process, to facilitate comments on the EIA process and Scoping Report, as well as to record any issues or concerns raised by stakeholders regarding the project. As per the approved public participation plan, these meetings will be held via virtual platform. The minutes of these meetings will be included in the final Scoping Report for review and acceptance by the DEFF.
- » **One-on-one consultation meetings** for example with directly affected or surrounding landowners. As per the approved public participation plan, these meetings will be held via virtual platform.
- » **Telephonic** consultation sessions.
- » Written, faxed or e-mail correspondence.

No comments have yet to be received on the project. All comments received during the 30-day review period will be included in **Appendix C6** and minutes of all meetings held during the review period will be included in **Appendix C7** within the Final Scoping report.

Table 5.3: Summary of Public Participation Process

Activity	Date
The EIA process and availability of the scoping report was advertised in the Witbank News.	13 November 2020
Placement of site notices, on-site and in public places.	11 November 2020
Distribution of process notification letters and background information documents to organs of state departments, ward councillors, landowners within the study area, neighbouring landowners and stakeholder groups.	13 November 2020

Activity	Date
Distribution of notification letters for the availability of the scoping report to organs of state departments, ward councillors, landowners within the study area, neighbouring landowners and stakeholder groups.	13 November 2020
Review period for the Scoping Report for public comment.	13 November – 13 December 2020

v. Identification and Recording of Issues and Concerns

No comments have yet been received on the project, any comment received will be included within the Comments and Responses report and submitted with the final scoping report. Comments received during the Scoping phase 30-day review period, will be included in the Comments and Responses Report within the Final Scoping Report. The Comments and Responses Report is included as **Appendix C8**.

5.5 Review of the Scoping Report

The Scoping Report has been made available for review from **13 November – 13 December 2020** and download from the Savannah Environmental website, www.savannahSA.com.

5.6 Identification and Evaluation of Issues

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulation 19 and 21 of the 2014 EIA Regulations.

The requirement for the submission of a Screening Report (**Appendix P** for the proposed development is applicable as it triggers Regulation 19 of the 2014 EIA Regulations (as amended). **Table 5.4** provides a summary of the specialist assessment requirements identified for the project site in terms of the screening tool and responses to each assessment requirement based on the nature and extent of the project.

Table 5.4: Sensitivity ratings from the DEFF's web-based online Screening Tool associated with the development of the Zero Waste Recovery Solution and associated infrastructure

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Agricultural Assessment Impact	High Sensitivity	The area proposed for the facility falls within the Highveld Steel property and industrial boundary and has been highly transformed by historical activities. The site is zoned for industrial use. No agricultural activities are present on the site or in the vicinity thereof. No specialist study has been undertaken in this regard due to the current zoning and land use.
Landscape/Visual Assessment Impact	Not specified within screening tool	The area proposed for the facility falls within the Highveld Steel property in close proximity to existing industrial infrastructure. The development of the facility will not add to the already transformed visual quality of the area. Therefore, no specialist study has been

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
		undertaken as part of this study.
Archaeological and Cultural Heritage Impact Assessment	Medium Sensitivity	A Heritage Scoping Assessment including consideration of archaeological resources has been undertaken for the proposed project (Appendix G)
Palaeontology Impact Assessment	Not specified within screening tool but defined as high sensitivity by SAHRIS	A Heritage Scoping Assessment including consideration of palaeontological resources has been undertaken for the proposed project (Appendix G)
Terrestrial Biodiversity Impact Assessment	Very High Sensitivity	The proposed development site is located in a large existing industrialised area surrounded by several heavy industries and mining operations. It is a brownfields site that has already undergone extensive transformation. No natural vegetation remains on the site. Therefore, no specialist study has been undertaken.
Aquatic Biodiversity Impact Assessment	Low Sensitivity	There are no watercourses located on the site or in close proximity thereof. Therefore, no specialist study has been undertaken.
Civil Aviation Assessment	Medium Sensitivity	The CAA will be included in the scoping and EIA process to determine any potential impacts.
Plant Species Assessment	Medium Sensitivity	The proposed development site is located in a large existing industrialised area surrounded by several heavy industries and mining operations. It is a brownfields site that has already undergone extensive transformation. No natural vegetation remains on the site. Therefore, no specialist study has been undertaken.
Animal Species Assessment	Low Sensitivity	The proposed development site is located in a large existing industrialised area surrounded by several heavy industries and mining operations. It is a brownfields site that has already undergone extensive transformation. No natural vegetation remains on the site. Therefore, no specialist study has been undertaken.

Based on the results of the screening, and from experience on similar projects and in the study area, the EIA project team has identified the following issues as requiring investigation.

Table 5.5: Specialist consultants appointed to evaluate the potential impacts associated with the Zero Waste Recovery Solution

Issue	Specialist	Refer Appendix
Heritage (including Archaeology & Palaeontology)	PGS Heritage	Appendix E
Air Quality	AirShed Planning Professionals	Appendix D
Socio-economic	Urban Econ Development Economists	Appendix F

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.

5.7 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.

5.8 Assumptions and Limitations of the EIA Process

In conducting this Scoping report, the following general assumptions have been made:

- » It is assumed that the project site identified represents a technically suitable site for the establishment of the Zero Waste Recovery Solution and associated infrastructure (i.e. based on the surrounding land use, access to the site, access to infrastructure etc.)
- » This Scoping report has been prepared based on information available at the time of undertaking the study. More detailed information will be available for consideration in the EIA phase of the process.

Refer also to the specialist studies contained in **Appendices D-F**.

5.9 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 of December 2014, published under Chapter 5 of NEMA (as amended in GNR R326 in Government Gazette No 40772 of April 2017)
- » 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 are to be addressed in the EIA. A listing of relevant legislation is provided in **Table 5.6**. A more detailed review of legislative requirements applicable to the project will be included in the EIA phase.

Table 5.6: Initial review of the relevant environmental policies, legislation, guidelines and standards applicable to the Zero Waste Recovery Solution

Legislation/ Policy/Guideline	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 324 – 327 of December 2014, as amended in April 2017) » 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) » Appeals against decisions made by authorities (S43)
National Environmental Management: Waste Act (Act No. 59 of 2008)	<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 in support of an application for Waste Management Licenses. » The storage of waste must be undertaken in terms of the relevant norms and standards.
Environment Conservation Act (Act No. 73 of 1989)	<ul style="list-style-type: none"> » National Noise Control Regulations (GN R154 dated 10 January 1992) » 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)

Legislation/ Policy/Guideline	Applicable Sections
	<ul style="list-style-type: none"> » 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)
<p>National Environmental Management: Biodiversity Act (Act No. 10 of 2004)</p>	<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 151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or Protected Species Regulations). » 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 (GN 37886 of August 2014).
<p>National Environmental Management: Air Quality Act (Act No. 39 of 2004)</p>	<ul style="list-style-type: none"> » Government Gazette 37054 of 22 November 2013 provides a list of activities which require an Air Emissions License and provides the emission thresholds that need to be complied with. » Government Notice 1210 in Government Gazette 32816 dated 24 December 2009 details the National Ambient Air Quality Standards (Commencement date: 24 December 2009). » 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. » Regulations regarding Air Dispersion Modelling were promulgated in Government Gazette No. 37804 and recommend a suite of dispersion models to be applied for regulatory practices as well as guidance on modelling input requirements, protocols and procedures to be followed. The Regulations Regarding Air Dispersion Modelling are applicable: <ul style="list-style-type: none"> a) in the development of an air quality management plan, as contemplated in Chapter 3 of the AQA; b) in the development of a priority area air quality management plan, as contemplated in Section 19 of the AQA; c) in the development of an atmospheric impact report, as contemplated in Section 30 of the AQA; and,

Legislation/ Policy/Guideline	Applicable Sections
	d) in the development of a specialist air quality impact assessment study, as contemplated in Chapter 5 of the AQA. » Specific requirements of the Highveld Priority Area Air Quality Management Plan are applicable.
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	» 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).
National Water Act (Act No. 36 of 1998)	» Under S21 of the Act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation. » In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of the 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) » GNR 509 of 2016 provides the requirements for General Authorisation relating to impeding or diverting the flow of water in a watercourse (section 21(c)) or altering the bed, banks, course or characteristics of a watercourse (section 21(i)) » GNR 267 of 2017 provides Regulations regarding the Procedural Requirements for Water Use Licence Applications and Appeals'.
The Hazardous Substances Act No. 15 of 1973	» 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.
Provincial Legislation	
Mpumalanga Biodiversity Sector Plan (MBSP, 2015)	» The process of conservation planning involves extensive mapping of vegetation types, transformation, species data, ecological processes and threats.
Nkangala District Municipality Final Integrated Development Plan (2017/18 – 2021/2022)	» The IDP identifies key issues which have to be focused on by the municipality and the public. » Development strategies need to be established for addressing the key issues
eMalaheni Local Municipality Spatial Development Framework	» A SDF is a statutory document which divides the municipality into zones in order to guide and manage development.

Legislation/ Policy/Guideline	Applicable Sections
(SDF) (2020)	<ul style="list-style-type: none"> » The objectives of a scheme can be summarized as follows: <ul style="list-style-type: none"> * To enable the comprehensive management of all erven (both private and public sector) within the Municipality; * To promote and implement the applicable planning and development legislation and principles as adopted by the relevant National, Provincial and Municipal spheres of government from time to time; * To promote and implement the Vision and Strategies of the Integrated Development Plan in the realization of quality environments * To manage land-use rights, to provide facilitation over use rights, to manage urban growth and development and to manage conservation of the natural environment in order to: » Achieve co-ordinated and harmonious development in a way that will efficiently promote public safety, health, order, convenience and to protect the general welfare of the inhabitants of the Municipality; » Promote integrated and sustainable development through-out the area of jurisdiction; » Promote sustainable environmental management, conserve and protect environmentally sensitive areas. » Promote all forms of development and growth through sound planning principles that would support a mix of land-uses managed in an appropriate manner
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.
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.	<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
International Finance Corporation (IFC) Performance Standards and Environmental and Social Sustainability (January 2012)	<ul style="list-style-type: none"> » The International Finance Corporation's (IFC) Performance Standards (PSs) on Environmental and Social Sustainability were developed by the IFC and were last updated on 1 January 2012. » Performance Standard 1 requires that a process of environmental and social assessment be conducted, and an ESMS appropriate to the nature and scale of the project, and commensurate with the level of its environmental and social risks and impacts, be established and maintained. The above-mentioned standard is the overarching standard to which all the other standards relate. Performance Standard 2 through to 8 establish specific requirements to avoid, reduce, mitigate or compensate for impacts on people and the environment, and to improve conditions where appropriate. While all relevant social and environmental risks and potential impacts should be considered as part of the assessment, the standards 2 and 8 describe potential social and environmental impacts

Legislation/ Policy/Guideline	Applicable Sections
	<p>that require particular attention specifically within emerging markets. Where social or environmental impacts are anticipated, the developer is required to manage them through its ESMS consistent with Performance Standard 1.</p> <ul style="list-style-type: none"> » Given the nature of the proposed project, it is anticipated (at this stage of the process) that Performance Standards 1, 2, 3, 4, and 8 may be applicable to the project.
The Equator Principles (June 2003)	<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 choose to model the Equator Principles on the environmental standards of the World Bank and the social policies of the International Finance Corporation (IFC).

CHAPTER 6 SCOPING OF POTENTIAL ISSUES

This Chapter provides an overview of the potential impacts and risks associated with the establishment of Fodere Titanium Zero Waste Recovery Solution and associated infrastructure near Kwa-Guqa Mpumalanga Province, identified at this stage of the process through a desktop review of available existing information and studies previously completed for the identified project site.

The proposed plant falls within the boundaries of the existing Highveld Steel industrial site and is completely transformed due to the industrial activities within the site. Therefore, impacts on flora, fauna and ecological processes are not expected to be associated with the project. Further, the project is not expected to add to alter the visual quality of the area as the site is located within an industrial complex.

Potential environmental impacts and risks identified to be associated with the development of the proposed project include:

- » Construction phase impacts, such as temporary air emissions (dust and vehicle emissions), noise, solid waste and wastewater generation, and Occupational Health and Safety (OHS) issues such as the risk of preventable accidents leading to injuries and/or fatalities.
- » Impacts on heritage sites, such as direct impacts on below-ground archaeological or palaeontological deposits as a result of ground disturbance during construction.
- » Impacts on air quality associated with the operation of the waste recovery process.
- » Impacts on the socio-economic environment, including positive impacts associated with job creation and potential negative intrusion impacts during construction.

The purpose of the Scoping Study is to identify, describe and evaluate the main issues and potential impacts of the proposed project based on a desktop assessment of existing information and to make recommendations for further studies required to be undertaken in the EIA phase. This is a preliminary assessment based on the information available during the Scoping Phase. A detailed assessment of impacts will be undertaken during the Impact Assessment Phase of the process.

6.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of the EIA Regulations, 2014 - Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts (aa) can be reversed (bb) may cause irreplaceable loss of resources and (cc) can be avoided, managed or mitigated.	The impacts and risks identified to be associated with the construction and operation phase of the Fodere Titanium Zero Waste Recovery Solution have been included in Section 6.2 . Impact tables have been included for each relevant field of study which considers the nature, significance, consequence, extent, duration and probability of the impacts, as well the reversibility of the impacts, the loss of resources and avoidance, management or mitigation.
(g)(vii) positive and negative impacts that the proposed	The positive and negative impacts associated with the

Requirement	Relevant Section
activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	Fodere Titanium Zero Waste Recovery Solution have been included in Section 6.2.
(g)(viii) the possible mitigation measures that could be applied and level of residual risk	Possible mitigation has been included in Section 6.2.

6.2 Evaluation of Potential Impacts associated with the Construction Phase, Operation and Decommissioning phases

6.2.1 Impacts on Ambient Air Quality

The construction and operation of the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure has the potential to impact on ambient air quality in the study area.

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Particulate and Gaseous pollutant emissions	Elevated ambient concentrations of particulate and gaseous atmospheric pollutants as a result of operation activities.	Local	None identified at this stage

Description of expected significance of impact

The extent of incremental impacts due to the Highveld Steel Zero-Waste Recovery Plant are expected to be localised to the vicinity of the operations, possibly outside the Highveld Steel Industrial Park Boundary and possibly at the closest sensitive receptor locations. The duration of the impacts is expected to be long-term (for the life of the project) while the magnitude of impacts is expected to be low to medium, depending on the height at which pollutants are released, abatement equipment design, and mitigation measures employed to minimise fugitive emissions. If all fugitive sources are properly managed, no residual impact is expected post closure.

Given that particulate concentrations in the study area are already elevated, it is possible that cumulative impacts could be high in magnitude. It is therefore recommended that best available technologies be employed to mitigate point source and fugitive particulate emissions.

Gaps in knowledge & recommendations for further study

- » Specific information required in relation to the emission source(s) and site(s) to be assessed includes:
 - * Source information: Emission rate, exit temperature, volume flow, exit velocity, etc.;
 - * Site information: Site building layout, terrain information, land use data;
 - * Meteorological data: Wind speed, wind direction, temperature, cloud cover, mixing height;
 - * Receptor information: Locations using discrete receptors and/or gridded receptors.
- » It is assumed that all point sources from the operations will comply with the MES for processing or recovery of metallurgical slag as required by legislation.
- » Detailed air quality impact assessment to be undertaken within the EIA Phase of the process.

6.2.2 Impacts on Heritage Resources (Archaeology and Palaeontology)

Due to the level of disturbance of the area no impact on heritage resources is envisaged.			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Direct impact to archaeological sites, historical sites and burial sites	The construction phase could directly impact on surface and subsurface archaeological sites.	Local	None identified at this stage
Damage or destruction of unmarked graves	Damage or destruction of unmarked graves during the construction of project infrastructure.	Local	None identified at this stage
Damage or destruction of fossil materials	Damage or destruction of fossil materials during the construction of project infrastructure to a maximum depth of those excavations.	Local	None identified at this stage
Description of expected significance of impact			
No highly significant impacts to archaeological or palaeontological materials/resources are expected as a result of the development. It is however possible that artefacts will be revealed during construction activities. Due to the generally low cultural significance of the archaeological materials, the intensity of impacts is not expected to be high. Due to the very high sensitivity rating for palaeontological heritage resources in the area, the magnitude of impact on these resources (should this occur) would be considered high. The preliminary impact analysis shows that the unmitigated impact on palaeontological resources is predicted to be low negative, with a post-mitigation impact of low negative. Chance finds of unknown heritage resources is predicted that the unmitigated impact to be low negative, with a post-mitigation impact of low negative. The significance of this impact will be confirmed during the EIA Phase.			
Gaps in knowledge & recommendations for further study			
<ul style="list-style-type: none"> » In line with the National Heritage Resources Act (Act 25 of 1999) a Phase 1 Archaeological Impact Assessment should be undertaken by both a heritage consultant and a palaeontologist. » The subsurface archaeological and palaeontological record can never be fully understood without excavation, and the EIA Phase report will make recommendations on how to proceed should fossils or heritage finds be discovered during construction activities. 			

6.2.3 Social Impacts

Considering the project background and the socio-economic environment of the region in which the proposed plant is to be located, the following impacts are most likely to be raised and will need to be investigated in the EIA phase in greater detail.			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Increase in Production and GDP-R of the national and local economies due to capital expenditure: Stimulation of national and local economies due to capital expenditure which will increase	A positive impact to production and GDP-R due to the investment made.	The scale of the impact will be from the local to the national level.	None identified at this stage

production and GDP-R.			
Description of expected significance of impact			
The construction of the waste recovery plant in the Highveld Steel complex will require capital investments. Given the capacity of the eMalahleni LM, the municipality's economy should see an increase in production and GDP-R due to the plant's construction. Furthermore, the procurement of capabilities from other parts of the country will also see an increase in the national economy. Overall, the impact will possibly be of medium significance (positive) due to injected investment, which will further improve the GDP-R of the eMalahleni LM and the country in general.			
Temporary employment creation in local communities and elsewhere in the country: creation of direct, indirect and induced employment opportunities related to the construction of the proposed waste recovery plant.	Job creation will reduce unemployment as a result of the construction of the waste recovery plant.	The impact will occur at national and local levels.	None identified at this stage
Description of expected significance of impact			
Approximately 3 out of 10 individuals in the eMalahleni LM are unemployed. The construction of the waste recovery plant in the Highveld Steel complex may produce an increase in employment opportunities for those individuals who are directly employed in the construction and indirectly for those involved in the provision of services to those directly involved. Given the nature of the construction and the levels of skills in the LM, it is unlikely that the local population will absorb all the employment opportunities provided. However, given the large number of low-skilled (21%) and semi-skilled (62%) workers in the municipality, the construction phase will still present a large number of opportunities for the unemployed. The impact is expected to have medium significance (positive) due to the number of jobs expected to be created and the temporary nature of the impact.			
Skills development due to the creation of new employment opportunities: Skills will be created and/or enhanced for benefitting employees during the construction phase.	The impact is positive as it develops skills that are beneficial for future employment.	The impact will occur at national and local levels.	None identified at this stage
Description of expected significance of impact			
Given the skill demographics of the population in the eMalahleni LM, the new employment opportunities driven by the construction of the waste recovery plant in the Highveld Steel complex will provide those low- to semi-skilled workers an opportunity to develop new skillsets or enhance their existing skills. This will in turn benefit these individuals through increased future job prospects. This impact will be of medium significance (positive) due to the long-term benefits associated with skills development.			
Household income will lead to the improved standard of living for households directly or indirectly benefitting from employment opportunities: Income will be temporarily derived from the	The impact is positive as it improves the standard of living for the benefitting households.	The impact will occur from local to national levels.	None identified at this stage

employment created during the construction phase.			
Description of expected significance of impact			
Per capita income in the eMalahleni LM is ranked higher than the Nkangala DM's average annual household income and the second-highest in the Mpumalanga Province. However, the average monthly income of resident within eMalahleni remains low. Furthermore, the manufacturing sector has seen decreases in growth and therefore employment opportunities in this sector will lead to an increase in household income for those involved in this sector. This impact may thus be of medium significance (positive) due to the temporary income earned by employees.			
Sustainable increase in production and GDP-R of the national and local economies due to operations expenditure: Increase in production and GDP-R of national and local economies.	A positive impact to production and GDP-R due to operational expenditure.	The scale of the impact is from local to national.	None identified at this stage
Description of expected significance of impact			
The eMalahleni LM has a comparative advantage in the manufacturing sector and the sector remains an important contributor the overall economy in the municipality. However, manufacturing has seen a decrease (-0.4%) in GVA between 2010 and 2019. The development of the processing plant in the Highveld Steel complex may therefore see an increase in the size of the local economy due to the contributions from the plant. This impact will possibly be of medium to high significance (positive) due to the long-term of benefits and the size of operational expenditure, which will further improve the GDP of eMalahleni LM.			
Long-term employment creation in local communities and elsewhere in the country during operation: It involves the creation of direct, indirect and induced opportunities related to the operation of the proposed facility.	A positive impact on job creation will occur as a reduction in unemployment as a result of the operation of the power plant, will take place.	The impact will occur from local to national levels.	None identified at this stage
Description of expected significance of impact			
As of 2019, the unemployment rate in the eMalahleni LM is 30.3%. As one of the goals of the development of the waste recovery plant in the Highveld Steel complex is the creation of job opportunities, the eMalahleni LM will provide an opportunity for unemployed individuals to be absorbed into the workforce of the proposed plant. The development of other businesses within the Highveld Steel complex has previously seen over 300 workers who had been previously retrenched in the complex finding employment in these new businesses. As such, a similar result is expected from the development of the new plant. The impact may have medium significance (positive) due to the sustainability of the potentially notable number of jobs to be created.			
Skills development due to the creation of employment opportunities: Skills will be created and/or enhanced during the operations phase for employees.	The impact is positive as it develops skills that can be used in similar projects in future.	The impact will occur from local to national levels.	None identified at this stage

<p>Description of expected significance of impact</p> <p>Approximately 62% of workers in the eMalahleni LM are semi-skilled, while 21% are considered low-skilled workers. The employment opportunities which may arise due to development of the waste recovery plant will enable these individuals to acquire new skills or enhance their existing skillset. Individuals who will be absorbed into the labour supply at the plant will therefore have higher future prospects. This impact will be of medium significance (positive) due to the long-term benefits associated with skills development.</p>			
Household income will improve the standard of living for households directly or indirectly benefitting from employment opportunities: Income will be derived from the sustainable employment created during the operations phase.	The impact is positive as it improves the standard of living for the benefitting households for a sustainable period.	The impact will occur from local to national levels.	None identified at this stage
<p>Description of expected significance of impact</p> <p>Given the availability of new employment opportunities, this impact may be of medium significance (positive) due to the long-term income earned by employees.</p>			
Increase in government revenue stream due to payroll taxes and income taxes: Payroll and income taxes during operations will increase government revenue.	The impact is positive as it will increase municipal and national fiscal revenue which can be used to the benefit of society.	The impact will occur at the municipal and national levels.	None identified at this stage
<p>Description of expected significance of impact</p> <p>It is expected that local and national governments will see an increase in income through the increase in rates and taxes (on a local level) and income and business taxes (on a national level) due to the operations of the plant. The impact may be of medium significance (positive) due to the long-term nature of the impact and the revenue to be derived by local and national government spheres.</p>			
<p>Gaps in knowledge & recommendations for further study</p> <ul style="list-style-type: none"> » Information on total, breakdown and local content of capital expenditure is required to determine direct and multiplier effects of the project on the local and national economies. Duration of construction phase information is required. » Information on employment to be created locally and at other scales is required. The duration of employment information is required. » Information on the types of skills to be developed during construction, as well as the percentage of different skill-level opportunities made available to the local labour, is required. » The employment to be created locally and at other scales information required. » The total amount to be sent on labour during construction is required. » The duration of employment information required. » Data regarding operational expenditure, local content, and its breakdown per industry are required. Duration of operation phase information required. » The employment that will be created locally and at other scales are required. » The duration of employment information required. » Skills development programmes to be implemented during the operations phase. 			

- » The employment to be created locally and at other scales information required.
- » The duration of employment information required.
- » The duration of operations and the rates and taxes to be paid during operations.

6.3 Evaluation of Potential Cumulative Impacts Associated with the project

Impacts of a cumulative nature place the direct and indirect impacts of the proposed project into a regional (refer Figure 6.1) and national context, particularly in view of similar or resultant developments and activities in the region. Potential cumulative impacts associated with Fodere Titanium Zero Waste Recovery Solution and associated infrastructure are described below, and will be assessed in detail as part of the subsequent EIA phase to be conducted for the project.

Impact

Cumulative impacts, in relation to an activity, refer to the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited to effects that can be evaluated meaningfully (DEAT, 2004). It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For practical purposes a sub-regional scale of 10km is considered for the evaluation of cumulative impact of industrial facilities.

Predominantly an industrial area, the eMalahleni LM contains 27 economic hubs consisting of 883 businesses with main sectors such as manufacturing, trade, transport and finance and community services. The site for the proposed development is located within the existing Highveld Steel property.

Potential cumulative impacts relate to:

- » Impacts on ambient air quality: There are a large number of operations within a 50km radius that are sources of major emissions, including seven power stations and numerous mines. Given that the project is located within the HPA, all contributing sources in the area must be assessed to determine the emission reduction targets to be achieved over the following few years.
- » Impacts on heritage resources: Impacts on heritage resources as a result of the proposed project are expected to be of low significance and therefore the potential for cumulative impacts is expected to be low.
- » Impacts on the social environment: Potential positive impacts are expected, including:
 - * The proposed project will contribute to the improved efficiency of resource usage related to slag material
 - * The manufacturing sector in the local municipalities have been shrinking resulting in job shedding. A holistic approach to the revitalisation of the manufacturing activities along its value chain is required to assist in a sector-wide turnaround.

Summary of the nature, significance, consequence, extent, duration and probability of the impacts

- » The above mentioned impacts are considered to be probable, although it is anticipated that the extent, duration, and magnitude of these impacts can be minimised to levels where this impact can be regarded as having low significance through the implementation of appropriate mitigation measures.

» Based on the limited scale of the project (i.e. 4ha in extent with a throughput capacity of 2000 tonnes of slag per day), the contribution of the project to cumulative impacts is expected to be limited.

Gaps in knowledge & recommendations for further study:

- » Each specialist study will consider and assess the cumulative impacts of proposed, approved and authorised renewable projects in the area.
- » Cumulative impacts will be fully assessed and considered in the EIA phase.

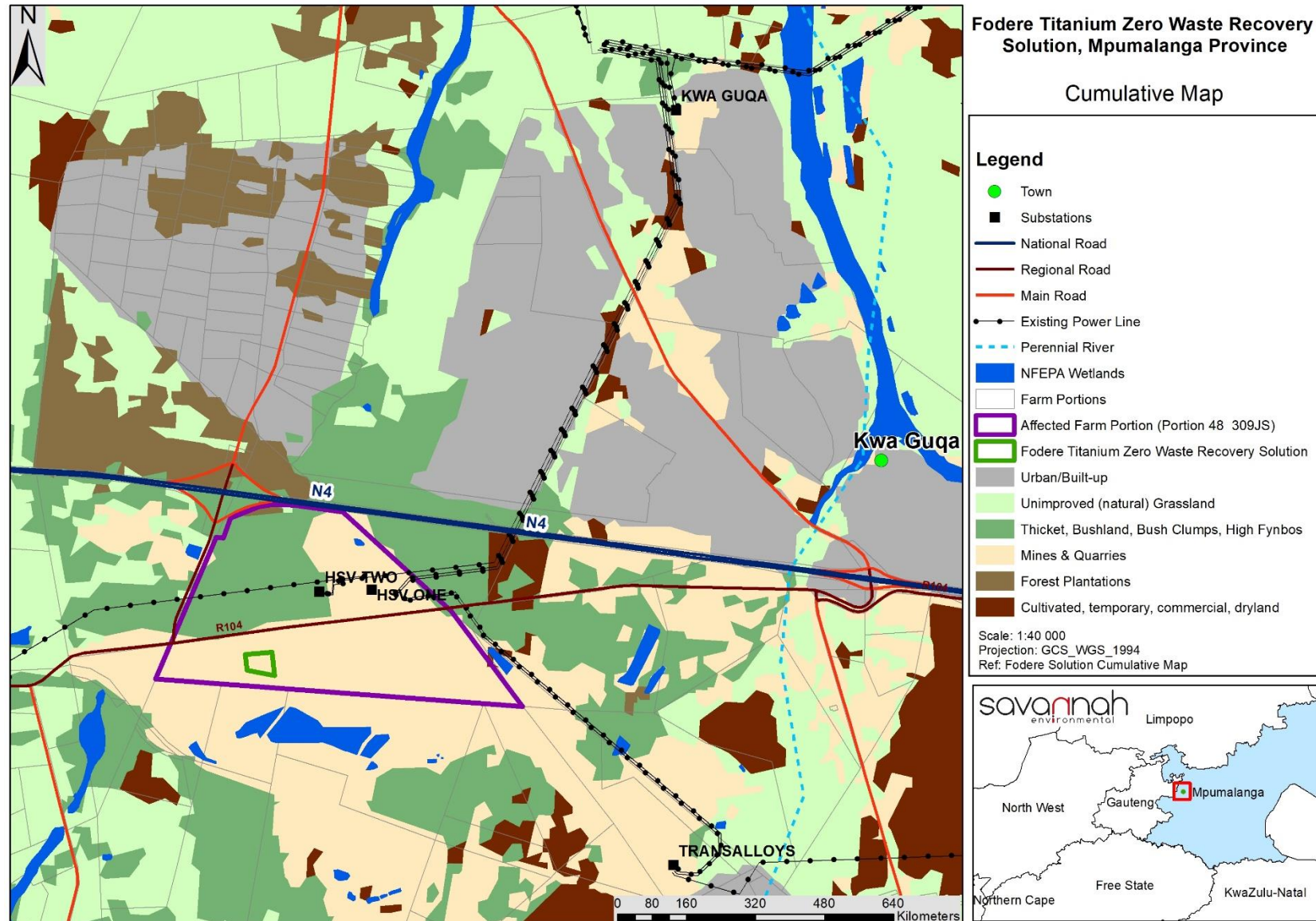


Figure 6.1: Map illustrating land use in the vicinity of the proposed development site

CHAPTER 7 CONCLUSIONS

This Scoping Report is aimed at detailing the nature and extent of the proposed development, identifying and describing potential issues associated with developing the project on the identified project site, identifying potential environmental fatal flaws and/or areas of sensitivity, and defining the extent of studies required to be undertaken as part of the detailed EIA phase. This has been achieved through considering available information from previous studies undertaken within the project site and input from the project team with experience on similar projects. This Scoping Report has been compiled in terms of the 2014 EIA Regulations (GNR 326) published in terms of Section 24(5) of NEMA.

A summary of the conclusions of the evaluation of the potential impacts identified to be associated with the project is provided in **Section 7.2**. Recommendations regarding investigations required to be undertaken within the detailed EIA phase are provided within the Plan of Study for EIA (**Chapter 8**).

7.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(xi) a concluding statement indicating the preferred alternatives, including the preferred location of the activity.	An overall conclusion and fatal flaw analysis regarding the Fodere Titanium Zero Waste Recovery Solution is included within Section 7.3 .

7.2 Conclusions drawn from the Evaluation of the Proposed Project

The Fodere Titanium Zero Waste Recovery Solution and associated infrastructure on Portion 48 of Farm No. 309, approximately 17 km west of eMalahleni town in the eMalahleni Local Municipality (LM) within the Nkangala District Municipality (DM) in Mpumalanga. The development area is approximately 4 ha in extent and is contained within the EVRAZ Highveld Steel and Vanadium property and Highveld Industrial Park boundary. The site is accessible directly off the R104, from the N4 turnoff near Kwa-Guqa informal settlement.

The project site was been identified by the project proponents as the preferred area for development due to:

- » it being located in a large existing industrialised area surrounded by several heavy industries and mining operations. It is a brownfields site that has already undergone extensive transformation.
- » feedstock (i.e. slag materials) for the recovery process is readily available from from the slag resource located next to the preferred site limiting material transport cost and implications.
- » utility services for potable water, electricity, and refuse removal is provided by Highveld Steel.
- » a railway siding is located adjacent to the project site which may be beneficial for transporting products and materials from the facility in future.

The main infrastructure associated with the facility includes the following:

- » Chemical plant area, where all process chemicals including acid are produced, stored and handled as required by the waste recovery process.
- » Substation and plant utility unit as interface and controlling unit for the electricity utilised by the plant during operation.
- » Slag stockpile.
- » Crushing plant.
- » Mill.
- » Product area for storage of the various products produced through the recovery process.
- » Reagent area, for the storage and handling of reactants utilised in the waste recovery process.
- » A security area.
- » Parking lot.
- » Admin and control room including offices and ablutions for staff.

The Scoping study included the identification of potential impacts associated with the project through a desktop study (considering existing information and previous assessments undertaken for the development area) and consultation with affected parties and key stakeholders.

7.2.1 Potential Impacts Identified

The proposed plant falls within the boundaries of the existing Highveld Industrial Park and is completely transformed due to the industrial activities within the site. Therefore, impacts on flora, fauna and ecological processes are not expected to be associated with the project. Further, the project is not expected to add to the visual quality of the area as the site is located within an industrial complex. The removal of the slag is expected to contribute positively to the visual impact of the existing developments in the area.

Potential environmental impacts and risks identified to be associated with the development of the proposed project include:

- » Construction phase impacts, such as temporary air emissions (dust and vehicle emissions), noise, solid waste and wastewater generation, and Occupational Health and Safety (OHS) issues such as the risk of preventable accidents leading to injuries and/or fatalities.
- » Impacts on heritage sites, such as direct impacts on below-ground archaeological or palaeontological deposits as a result of ground disturbance during construction.
- » Impacts on air quality associated with the operation of the waste recovery process.
- » Impacts on the socio-economic environment, including positive impacts associated with job creation and potential negative intrusion impacts during construction.

A preliminary evaluation of the extent and significance of potential impacts associated with the development of the project have been detailed in Chapter 6. The majority of potential impacts identified to be associated with the construction of the project are anticipated to be localised and restricted to the development envelope itself, while operation phase impacts/benefits range from local to regional. No environmental fatal flaws or areas of sensitivity were identified to be associated with the development area. These conclusions will be confirmed through the EIA Phase assessment, which will include independent specialist assessments.

7.3 Overall Conclusion and Fatal Flaw Analysis

The findings of the desktop Scoping Study indicate that no environmental fatal flaws or areas of sensitivity are associated with the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure. Through a review of relevant policy and planning documentation, it was concluded that the proposed project is in alignment with the local and provincial developmental policies and spatial frameworks. The project is also expected to make a contribution toward the achievement of the national developmental objectives related to industrialisation, mineral beneficiation and waste management.

During the EIA phase, more detailed environmental studies will be conducted in line with the Plan of Study for EIA contained in **Chapter 8** of this Scoping Report. These studies will consider the detailed layouts produced by the Applicant, and make recommendations for the implementation of avoidance strategies (if required), and mitigation and management measures to ensure that the final assessed layout retains an environmental impact within acceptable limits.

CHAPTER 8 PLANT OF STUDY

This Scoping Report includes a description of the nature and extent of the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure located within the Highveld Steel property on Portion 48 of Farm Elandsfontein No. 309 near Kwa-Guga. Details of the Scoping Study undertaken and the issues identified, described and evaluated are also included. The Scoping Study concluded that no fatal flaws are expected to be associated with the project and that the studies should proceed to the EIA Phase. This chapter provides the Plan of Study for the Environmental Impact Assessment (EIA) based on the outcomes of the Scoping Study and associated specialist investigations.

The EIA Phase of the study will include detailed specialist studies for those impacts recorded to be of potential significance, as well as on-going public consultation. The key findings of the Scoping Phase (which includes inputs from authorities, stakeholders, the public, the proponent and the EIA specialist team), together with the requirements of the NEMA EIA Regulations and applicable guidelines, are used to inform the Plan of Study for the EIA.

8.1 Legal Requirements as per the EIA Regulations for the undertaking of a Scoping Report, 2014 (as amended)

This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(h) a plan of study for the undertaking of the environmental impact assessment process to be undertaken	A plan of study for the undertaking of the EIA phase for the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure is included within Sections 8.2 to 8.8 of this chapter.

8.2 Aims of the EIA Phase

The EIA Study to be undertaken for the Fodere Titanium Zero Waste Recovery Solution and associated infrastructure will aim to achieve the following:

- » Provide a description of all components of the project, including identified feasible alternatives.
- » Provide an overall description of the economic, social and biophysical environment affected by the development of the proposed project.
- » Provide a description of the positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
- » Assess potentially significant impacts (direct, indirect and cumulative, where required).
- » Identify and recommend appropriate measures to avoid, manage and mitigate 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. This process will include

consultation with I&APs, the public review of the EIA report for a 30-day period and the undertaking of focus group meetings and public meetings.

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 project. The assessment will include detailed specialist studies.

8.3 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 which will include all comments and issues raised during the review period as well as appropriate responses to the comments.
- » Submission of an EIA Report and EMPr for review and comment. The report will be made available for a 30-day review period.
- » Submission of a Final EIA Report and EMPr following a 30-day review period which will include all comments and issues raised during the review period as well as appropriate responses to the comments received.
- » Consultation and an authority site visit (if required) in order to discuss the findings and conclusions of the EIA Report.

8.4 Consideration of Alternatives

Due to the nature of the project, involving specific technology and the requirement to be located within close proximity of the feedstock (i.e. slag), no feasible alternatives have been identified for the proposed project. The assessment will therefore include consideration of the preferred (and only) technology and site alternatives and consideration of the 'do nothing' alternative.

8.5 Assessment of Potential Impacts and Recommendations regarding Mitigation Measures

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 responsible for these studies are also reflected within this table. These specialist studies will assess direct, indirect and cumulative impacts associated with the development footprint proposed for the Zero Waste Recovery Solution and all associated infrastructure, as well as the do nothing alternative.

Table 8.1: Issues requiring further investigation during the EIA Phase and activities to be undertaken in order to assess the significance of potential impacts

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
<p>Air Quality Impact Assessment</p>	<p>Due to the relatively short distance to sensitive receptors (especially to the north of the operations) the assessment of impact as a result of emissions from the proposed Highveld Steel Zero-Waste Recovery Plant is considered to fall within the scope of a Level 2 assessment (i.e. for assessment of air quality impacts as part of license application or amendment processes, where impacts are the greatest within a few kilometres downwind (less than 50km)).</p> <p>The execution phase (i.e. dispersion modelling and analyses) will firstly involve gathering specific information in relation to the emission source(s) and site(s) to be assessed. This includes:</p> <ul style="list-style-type: none"> » Source information: Emission rate, exit temperature, volume flow, exit velocity, etc.; » Site information: Site building layout, terrain information, land use data; » Meteorological data: Wind speed, wind direction, temperature, cloud cover, mixing height; » Receptor information: Locations using discrete receptors and/or gridded receptors. <p>The model uses this specific input data to run various algorithms to estimate the dispersion of pollutants between the source and receptor. The model output is in the form of a predicted time-averaged concentration at the receptor. These predicted concentrations are compared with the relevant ambient air quality standard or guideline. Post-processing can be carried out to produce contour plots that can be prepared for reporting purposes.</p> <p>The following steps will be followed for the execution phase of the assessment:</p> <ul style="list-style-type: none"> » Decide on meteorological data input; » Prepare all meteorological model input files; » Select control options in meteorological model; » Review emissions inventory and ambient measurements; » Decide on modelling domain and receptor locations; » Prepare all dispersion model input files: <ul style="list-style-type: none"> * Control options; * Meteorology; * Source data; * Receptor grid and discrete receptors; » Review all modelling input data files and fix where necessary; 	<p>AirShed Planning Professionals</p>

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<ul style="list-style-type: none"> » Simulate source groups per pollutant and calculate air concentration levels for regular and discrete grid locations for the operational phase of the project using the AERMOD Modelling Suite; » Compare against National Ambient Air Quality Standards (NAAQS) and international guidelines; » Preparation of draft AIR; and, » Preparation of final AIR. 	
Heritage Impact Assessment	<p>The undertaking of the heritage impact assessment will include the following:</p> <ul style="list-style-type: none"> » Undertaking of a field survey of the footprint area is done inclusive of a palaeontological field assessment to confirm the assessed status of the site. » Compilation of a Heritage Impact Assessment Report including recommendations for monitoring and/or mitigation to be implemented. 	PGS Heritage
Socio-Economic Impact Assessment	<p>It is recommended that a full EIA level Socio-Economic Impact Assessment be conducted as part of the EIA phase. Overall, the following impacts are envisaged to be investigated in greater detail during the EIA phase:</p> <ul style="list-style-type: none"> » During construction: <ul style="list-style-type: none"> * Increase in Production and GDP-R of the national and local economies due to capital expenditure. * Temporary employment creation in local communities and elsewhere in the country. * Skills development due to the creation of new employment opportunities. * Household income will lead to the improved standard of living for households directly or indirectly benefitting from employment opportunities. » During operations: <ul style="list-style-type: none"> * Sustainable increase in Production and GDP-R of the national and local economies due to operations expenditure. * Long term employment creation in local communities and elsewhere in the country. * Skills development due to the creation of employment opportunities. * Household income will improve the standard of living for households directly or indirectly benefitting from employment opportunities. * Increase in government revenue stream due to payroll taxes and income taxes. » Cumulative impacts: <ul style="list-style-type: none"> * Improved mineral resource efficiency. * Reverse of negative trends in local manufacturing activities in relation to employment and GDP- 	Urban-Econ Development Consultants

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>R.</p> <p>During the EIA phase, the following approach to the assessment of socio-economic impacts will be followed:</p> <ul style="list-style-type: none"> » Review of comments and feedback received on the scoping report from the Interested and Affected Parties (I&APs). » Determine the approach towards addressing the received comments, i.e. additional data collection or inclusion of the identified issues in the analysis during the EIA phase. » Undertake a site visit and collect primary data, where required. » Amend the baseline information based on the collected information. » Gather project data from the client and undertake economic impact modelling exercise. » Analyse, and where possible, quantify the potential socio-economic impacts ensuring that all issues and impacts raised by the I&APs are addressed. » Assess cumulative effects of the project. » Rate the impacts according to the methodology supplied by the environmental specialist applicable to the EIA phase. » Formulate the mitigation plan. » Produce the report for the submission to the authorities and review by the I&APs. » Obtain comments from I&APs on the submitted report and amend it accordingly responding to the comments and issues raised, if applicable. 	

8.6 Methodology for the Assessment of Potential Impacts

Direct, indirect and cumulative impacts of the above issues identified through this Scoping Study 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 into the EIA Report for the project. 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 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 competent authority for decision-making.

8.7 Public Participation Process

A public participation process will be undertaken by Savannah Environmental during the EIA phase in accordance with the approved Public Participation Plan. Consultation with affected and adjacent landowners/occupiers, key stakeholders and I&APs will be on-going 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 project, and to comment on the findings of the EIA Phase. In order to accommodate the varying needs of stakeholders and I&APs within the broader area surrounding the project site, 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, through the following means:

- » Virtual focus group or public meetings will be held (pre-arranged and I&APs invited to attend) using the most suitable virtual platform.
- » One-on-one consultation meetings will be held via an appropriate forum (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 received via the Savannah Environmental online stakeholder engagement platform or in writing.

The EIA Report will be made available for a 30-day review period prior to finalisation and submission to the DEFF for decision-making.

8.8 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	Anticipated timeframe
Make Scoping Report available to the public, stakeholders and authorities for review and comment	13 November – 14 December 2020
Finalisation of Scoping Report, and submission of the Final Scoping Report to DEFF	December 2020 - January 2021
Authority acceptance of the Final Scoping Report and Plan of Study to undertake the EIA	February 2021
Undertake specialist studies	January – February 2021
Make EIA Report and EMPr available to the public, stakeholders and authorities for review and comment	March 2021
Finalisation of EIA Report, and submission of the Final EIA Report to DEFF	April 2021

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