



## Vaporox (Pty) Ltd

### Waste Tyre Pyrolysis Plant – draft Scoping Report

Locality: Mogwase, North West Province

Departmental Ref No: NWP/EIA/86/2013

Date: 27 March 2014

**SHANGONI**  
*Management Services (Pty) Ltd*



## DRAFT SCOPING REPORT

**Vaporox (Pty) Ltd**

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Scoping Report**

**Locality: Mogwase, North West Province**

**Departmental Ref No: NWP/EIA/86/2013**

**MARCH 2014**

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## PROJECT DETAILS

**North West Department of Economic Development, Environment,  
Conservation and Tourism**

**Reference No.: NWP/EIA/86/2013**

**Project Title: Vaporox Waste Tyre Pyrolysis Plant, including the storage of dangerous goods (approximately 500m<sup>3</sup> of oil, ±5 tons of chemicals, such as catalysts, and 46 cubic tons of Liquefied Petroleum Gas) and the release of emissions from the pyrolysis plant that will require an Atmospheric Emission License.**

**Project Number: INN-NOR-13-09-02**

**Project Coordinator: Innovative Business Systems (Pty) Ltd**

**Compiled by: Lizette Crous**

**Date: 27 March 2014**

**Location: Pretoria**

**Technical Reviewer: Lourens de Villiers**



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Signature



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## DEFINITIONS

### Air Pollution

According to NEM: AQA means any change in the composition of the air caused by smoke, soot, dust (including fly ash), including cinders, solid particles of any kind, gases, fumes, aerosols and odour substances. [NEM: AQA, (Act 39 of 2004)]

### Air Quality Management Plan

Means a plan referred to in Section 15 of NEM: AQA [NEM: AQA, (Act 39 of 2004)]

### Air Shed Priority Area

Means an area as set out in term of Section 18 of the National Environmental Management: Air Quality Act of 2004, Act No 36 of 2004. [NEM: AQA, (Act 39 of 2004)]

### Ambient Air

Excludes air regulated by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993). [NEM: AQA, (Act 39 of 2004)]

### Atmospheric Emission

Means any emission or entertainment process emanating from a point, non-point or mobile source that results in air pollution. [NEM: AQA, (Act 39 of 2004)]

### Building and Demolition Waste

Means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition [NEM: WA, (Act No. 59, 2008)].

### Demography

The scientific study of human population, especially, with reference to their size, structure and distribution.



## Domestic Waste

Means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes [NEM: WA, (Act No. 59, 2008)].

## Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

- (i) the land, water and atmosphere of the earth;
- (ii) micro-organisms, plant and animal life;
- (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and
- (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

## Environmental Aspects

Elements of an organisation's activities, products or services that can interact with the environment.

## Environmental Degradation

Refers to pollution, disturbance, resource depletion, loss of biodiversity, and other kinds of environmental damage; usually refers to damage occurring accidentally or intentionally as a result of human activities.

## Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

## Environmental Impact Assessment

A study of the environmental consequences of a proposed course of action.

## Environmental Impact Report

A report assessing the potential significant impacts as identified during the environmental impact assessment.

## Environmental Impact

An environmental change caused by some human act.



## General Waste

Means waste that does not pose immediate hazard or threat to health or to the environment, and includes-

- (a) domestic waste;
- (b) building and demolition waste;
- (c) business waste; and
- (d) inert waste [NEM: WA, (Act No. 59, 2008)].

## Hazardous waste

Means any waste that contains organic or inorganic elements compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment [NEM: WA, (Act No. 59, 2008)].

## Land use

Land use is defined as the various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

## Pollution

Pollution means any change in the environment caused by -

- (i) substances;
- (ii) radioactive or other waves; or
- (iii) noise, odours, dust or heat,

emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future [NEM: WA, (Act No. 59, 2008)].

## Pollution Prevention

Pollution prevention can be any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal. [NEM: AQA, (Act 39 of 2004)]



## Public Participation Process

A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.

## Recovery

In terms of the Waste Tyre Regulations, 2009, means the controlled extraction of a material or the retrieval of energy from waste tyres.

## Recycle

In terms of the Waste Tyre Regulations, 2009, means the separation and processing of materials from waste tyres for further use as new products or resources.

## Registered Interested and Affected Party

In relation to an application, means an interested and affected party whose name is recorded in the register opened for that application.

## Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

## Tyre

In terms of the Waste Tyre Regulations, 2009, means a continuous pneumatic covering made of natural rubber or synthetic rubber or a combination of natural and synthetic rubber encircling a wheel, whether new, used or retreaded.

## Vegetation

All of the plants growing in and characterising a specific area or region; the combination of different plant communities found there.

## Waste

As per the definition of the National Environmental Management Waste Act, Act 59 of 2008 - means any substance, whether or not that substance can be reduced, re-used, recycled and recovered—

- (b) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- (c) which the generator has no further use of for the purposes of production;
- (d) that must be treated or disposed of; or



- (e) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but— (i) a by-product is not considered waste; and 3(ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

## **Waste Tyre**

In terms of the Waste Tyre Regulations, 2009, means a new, used, retreaded, or un-roadworthy tyre, not suitable to the retreaded, repaired, or sold as a part worn tyre and not fit for its original intended use.

## **Waste Tyre Processor**

In terms of the Waste Tyre Regulations, 2009, means any person or entity that is engaged in the commercial re-use, recycling or recovery of waste tyres.



## ABBREVIATIONS

<b>AEL</b>	-	Atmospheric Emission License
<b>AIR</b>	-	Atmospheric Impact Report
<b>APPA</b>	-	Atmospheric Pollution Prevention Act, 1965 (Act No.45 of 1965)
<b>AQMP</b>	-	Air Quality Management Plan
<b>AQO</b>	-	Air Quality Officer
<b>BID</b>	-	Background Information Document
<b>CRR</b>	-	Comments Response Report
<b>EAP</b>	-	Environmental Assessment Practitioner
<b>ECA</b>	-	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
<b>EIA</b>	-	Environmental Impact Assessment
<b>EIR</b>	-	Environmental Impact Report
<b>EMF</b>	-	Environmental Management Framework
<b>EMP</b>	-	Environmental Management Programme
<b>GN</b>	-	Government Notice
<b>I&amp;AP</b>	-	Interested and Affected Party
<b>IDP</b>	-	Integrated Development Plan
<b>NAAQS</b>	-	National Ambient Air Quality Standards
<b>NFAQM</b>	-	National Framework for Air Quality Management
<b>NEMA</b>	-	Environmental Management Act, 1998 (Act No. 107 of 1998) as amended
<b>NEM:AQA</b>	-	National Environmental Management: Air Quality Act, 2004 (Act No. 39, 2004)
<b>NWDEDECT</b>	-	North West Department of Economic Development, Environment and Tourism
<b>R</b>	-	Regulation
<b>S&amp;EIR</b>	-	Scoping and Environmental Impact Reporting
<b>SAHRA</b>	-	South African Heritage Resources Agency
<b>SWMP</b>	-	Storm Water Management Plan





## EXECUTIVE SUMMARY

### The Applicant

The applicant is Vaporox (Pty) Ltd. They are planning to lease the proposed site from the landowner, the North West Development Corporation (Pty) Ltd.

### Background description

The Waste Tyre pyrolysis plant is proposed for an industrial site that is currently unused. The site was used for industrial purposes in the past and has existing buildings, road infrastructure and bulk service supplies.

The pyrolysis process is an effective way to eliminate the present build-up of waste tyres in South Africa.

### Project description

The proposed project entails the installation/construction of a Pyrolysis Plant at an existing facility (existing buildings and associated infrastructures) for the pyrolysis of waste tyres. The project will also include the storage of dangerous goods (approximately 500m<sup>3</sup> of oil, ±5 tons of chemicals, such as catalysts, and 46 cubic tons of Liquefied Petroleum Gas) and the release of emissions from the pyrolysis plant. Due to the emissions that will be generated, the plant requires an Atmospheric Emission License.

### Legal requirements and legislative process

As part of the proposed Vaporox Waste Tyre pyrolysis project, listed activities defined under the National Environmental Management Act, Act 107 of 1998 (NEMA, 1998) and the regulations there under will take place. Relevant listed activities triggered by the proposed activities are described further in this Scoping Report (refer to Part 1.5).

It is the intention of this Scoping Report to provide the necessary information pertaining to the proposed activities associated with the project, as required in terms of the Environmental Impact Assessment Regulations (EIA Regulations R543: EIA Regulations in terms of Chapter 5 of the NEMA, 1998, dated June 2010) under the NEMA, 1998. This Scoping Report intends to highlight all information relevant to the proposed Waste Tyre pyrolysis project.

In conjunction to this Application for Environmental Authorisation, the following will also be applied for:

- An Atmospheric Emission License; and
- A Waste Management Licence and its associated Basic Environmental Impact Assessment process.



The diagram below provides a visual representation of the Scoping- and EIA approach followed in terms of NEMA, 1998, and the Environmental Impact Assessment Regulations, dated 2010.



## Anticipated impacts

For the purpose of the Scoping report it is required by Regulation 28 (g) (of Regulation 543) of the EIA Regulations dated 2010, under the NEMA, 1998, that the major potential impacts that the activities, processes and actions may have on the surrounding environment, are identified.

Regulation 31 (of Regulation 543) of the EIA Regulations, 2010, under the NEMA, 1998, requires that an Environmental Impact Assessment Report (EIR) includes an assessment of the status, extent, duration, probability, reversibility, replaceability of resources and mitigatory potential of the major potential environmental impacts of the proposed project be undertaken.

A baseline identification of the major potential impacts has therefore only been included in this Scoping Report. The prediction of the nature of each impact, the evaluation of each impact by rating its significance and the management and mitigation measures adopted to address each impact, will be assessed during the EIR.

The activities associated with the proposed project are described in full in Part 2 and the anticipated impacts of the proposed project are described in Part 7.

The main potential significant impacts that have been identified during the scoping process are:

### Construction Phase

- Soil, surface water and ground water pollution due to incorrect management and disposal of cement and concrete;
- Soil, surface water and ground water pollution due to the run-off of contaminated wash water;
- Soil pollution and degradation due to incorrect management, storage and disposal of construction, general and hazardous waste;
- Generation of noise pollution and nuisance;
- Generation of dust, atmospheric emissions and nuisance;
- Soil, surface water and ground water pollution due to unsanitary conditions onsite;
- Health and safety risks to workers; and
- Soil, surface water and ground water pollution due to the incorrect management, storage and disposal of chemicals.

### Operational Phase:

- Soil, surface water and ground water pollution due to the run-off of contaminated wash water;
- Soil pollution and degradation due to incorrect management, storage and disposal of general and hazardous waste;
- Generation of noise pollution and nuisance;
- Soil, surface water and ground water pollution due to unsanitary conditions onsite;
- Soil, surface water and ground water pollution due to inadequate storage of shredded tyres;



- Pollution of the atmosphere due to release of atmospheric emissions, such as dioxins, furans, particulate matter (PM), oxides of nitrogen (NO<sub>x</sub>), oxides of sulphur (SO<sub>x</sub>), Carbon Dioxide (CO<sub>2</sub>) and Carbon Monoxide (CO), from the pyrolysis process;
- Generation of odourous emissions from the pyrolysis process;
- Generation of emissions from the storage of products of the pyrolysis process;
- Health and safety risks to workers at the facility;
- Soil, surface water and ground water pollution due to the incorrect management, storage and disposal of chemicals, such as catalysts, and oil;
- Soil, surface water and ground water pollution due to incorrect management and disposal of ash generated during the pyrolysis process under abnormal conditions;
- Soil, surface water and ground water pollution due to affected stormwater runoff;
- Increased traffic flow to the site and potential strain on existing road infrastructures as well as creating a higher risk of vehicular accidents on the access roads;
- Fire establishment or explosion as a result of the storage of Liquefied Petroleum Gas (LPG);
- Fire establishment as a result of the storage of feedstock, namely waste tyres; and
- Atmospheric Emissions from the potential burning of waste tyres should a fire arise.

Additional potentially significant impacts may be highlighted at a later stage during the process. The extent of the identified potentially significant impacts will be quantified and will be reported on as part of the EIR.

## Knowledge gaps

The following knowledge gaps and uncertainties have been identified during the scoping process of the proposed Waste Tyre pyrolysis project and require further investigations that will be carried out comprehensively as part of the EIA process for the proposed project:

- All relevant specialist studies need to be conducted for the proposed project. The studies identified during the Scoping Phase only include an Atmospheric Impact Report;
- While impacts have been identified as part of the scoping process, it is required as part of the EIA Phase to fully quantify impacts to all aspects of the environment; and
- Design plans are being developed for the proposed Waste Tyre pyrolysis plant and the associated infrastructures. These designs will be presented as part of the final EIR.



# 1. INTRODUCTION

This draft Scoping Report forms part of an application for environmental authorisation for the Vaporox Waste Tyre pyrolysis plant in Mogwase, North-West Province. The application is made in terms of the EIA Regulations, dated 2010 under the National Environmental Management Act, 1998 (NEMA, 1998) (Act 107 of 1998).

The application process is undertaken on behalf of the applicant, Vaporox (Pty) Ltd. Vaporox appointed Innovative Business Systems (Pty) Ltd as Project Coordinators to oversee the entire EIA project process and to appoint an independent environmental practitioner to assist the applicant in undertaking the process as prescribed in the before mentioned environmental legislation. Innovative Business Systems (Pty) Ltd subsequently appointed Shangoni Management Services.

An application to undertake an Environmental Impact Assessment (Scoping and Environmental Impact Reporting) process was submitted to the identified competent authority (the North West Department of Economic Development, Environment and Tourism). The Department subsequently registered the project and the formal process was thereby initiated. All the findings from the scoping process are included in this report.

This Scoping Report is divided into the following parts:

- Part 1: Introduction (including a description of the project);
- Part 2: Nature and extent of the environment affected by activity;
- Part 3: Applicable legislation and guidelines;
- Part 4: Public Participation Process;
- Part 5: Need and desirability for the project;
- Part 6: Description of alternatives;
- Part 7: Identification of anticipated environmental Impacts;
- Part 8: Plan of study for EIA; and
- Part 9: Conclusion.

## 1.1 Process followed

### 1.1.1 Objectives of the scoping process and the Scoping Report

Scoping is the procedure that is undertaken during the initial stages of the Planning Phase of a project and is used to determine the extent of, and approach to, an EIA. This process is required for the proposed project in terms of the NEMA, 1998, and the EIA Regulations, 2010, there under.



The objectives of the Scoping Process are to:

- Provide an opportunity for the Applicant, relevant Authorities and Interested and Affected Parties (I&APs) to exchange information and express their views and concerns regarding the proposed project before the EIA is undertaken. This is a requirement in terms of Regulation 54 of the EIA Regulations, dated 2010;
- Focus the study on identifying relevant anticipated impacts, issues and concerns, as well as reasonable alternatives (as per Regulation 28 of the EIA Regulations, dated 2010), and knowledge gaps, to ensure that the resulting EIA is useful to the Authorities for decision-making, and addresses the impacts, issues and concerns as identified; and
- Facilitate an efficient assessment process that optimises time, resources and costs.

### 1.1.2 Methodology applied to conducting the scoping process

The figure below indicates the methodology that was applied in conducting the scoping process.

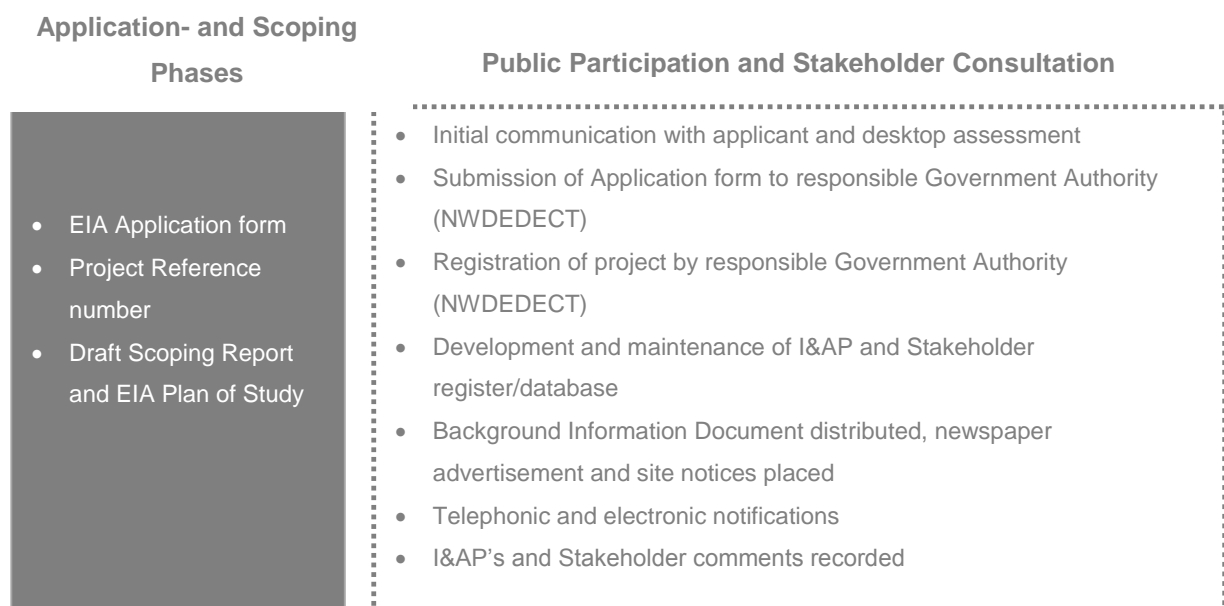


Figure 1: Methodology applied to conducting the scoping process



### 1.1.3 The Scoping Report in terms of the requirements of NEMA, 1998

Regulation 28(1) of the EIA Regulations, 2010 under the NEMA, 1998, lists aspects that must be included in Scoping Reports. Table 1 below indicates the parts where information has been provided as part of this Scoping Report:

*Table 1: The Scoping Report in terms of the EIA Regulations, 2010, under the NEMA, 1998*

Regulation No		Description	Scoping Report Part
R543 Regulation 28(1)(a)		Details of the Environmental Assessment Practitioner (EAP).	Part 1 & Appendix G
	(i)	Details of the EAP who prepared the report.	
	(ii)	Details of the expertise of the EAP to carry out scoping procedures.	
R543 Regulation 28(1)(b)		A description of the proposed activity.	Part 1
R543 Regulation 28(1)(c)		Any feasible and reasonable alternatives that have been identified.	Part 6
R543 Regulation 28(1)(d)		A description of the property on which the activity is to be undertaken and the location of the activity on the property.	Part 1
R543 Regulation 28(1)(e)		A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.	Part 2
R543 Regulation 28(1)(f)		An indication of all legislation and guidelines that have been considered in the preparation of the scoping report.	Part 3
R543 Regulation 28(1)(g)		A description of environmental issues and potential impacts, including cumulative impacts that have been identified.	Part 7
R543 Regulation 28(1)(h)		Details of the public participation process conducted in terms of Regulation 27(a).	Part 4 & Appendix E
	(i)	Steps taken to notify potentially interested and affected parties of the application.	
	(ii)	Proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given.	
	(iii)	A list of all persons or organisations that were identified and registered in terms of Regulation 55 as interested and affected parties in relation to the application.	



Regulation No		Description	Scoping Report Part
R543 Regulation 28(1)(h)	(iv)	A summary of the issues raised by interested and affected parties, the date of receipt of, and the response of the EAP to those issues.	Part 4 & Appendix E
R543 Regulation 28(1)(i)		A description of the identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and communities that may be affected by the activity.	Part 6
R543 Regulation 28(1)(j)		A description of the need and desirability of the proposed activity.	Part 5
R543 Regulation 28(1)(k)		Copies of any representations and comments received in connection with the application or the scoping report from interested and affected parties.	Part 4 & Appendix E
R543 Regulation 28(1)(l)		Copies of any minutes of any meetings held by the EAP with interested and affected parties and other role players that record the views of the participants.	Part 4 & Appendix E
R543 Regulation 28(1)(m)		Any responses by the EAP to those representations and comments and views.	Part 4 & Appendix E
R543 Regulation 28(1)(n)		A plan of study for Environmental Impact Assessment (EIA), which sets out the proposed approach to the EIA of the application.	Part 8
	(i)	A description of tasks that will be undertaken as part of the EIA process including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken.	
	(ii)	An indication of the stages at which the competent authority will be consulted.	Part 4 & Part 8
	(iii)	A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity.	Part 7 & Part 8
	(iv)	Particulars of the public participation process that will be conducted during the EIA process.	Part 4 & Part 8
R543 Regulation 28(1)(o)		Any specific information required by the competent authority.	*None at present
R543 Regulation 28(1)(p)		Any other matters required in terms of Section 24(4) (a) and (b) of the Act.	*None at present

*\* No specific requests have been received from the competent authorities to date.*





The EIA process will be undertaken subsequent to the scoping process and will be conducted in accordance with Regulations 31 of the Environmental Impact Assessment Regulations, 2010, under the NEMA, 1998. The EIA document for the proposed project will include detailed information pertaining to anticipated or potential impacts that may be associated with the proposed project.

## 1.2 Details of the Project Applicant

<b>Name of Applicant</b>	Vaporox (Pty) Ltd
<b>Postal Address</b>	PO Box 1856, Heidelberg, 1438
<b>Fax No.</b>	086 679 0029
<b>Email Address</b>	mavimbta@vodamail.co.za
<b>Landowner</b>	North West Development Corporation (Pty) Ltd
<b>Farm name and portion on which the activities take place</b>	Portion 0 of Erf 37, Bodirelo Township, JQ, North West Province
<b>Title Deed Number and 21 Digit Code</b>	T0JQ00840000003700000
<b>Co-ordinates of operation</b>	25°16'12.40"; 27°16'25.36"

## 1.3 Details of the Project Coordinator

<b>Name of firm</b>	Innovative Business Systems (Pty) Ltd
<b>Contact Person</b>	Ditebogo N. Sebesho
<b>Postal address</b>	PostNet Suite #264 Private Bag X21 Bryanston 2021
<b>Telephone No.</b>	072 905 0913
<b>Fax</b>	086 226 2590
<b>E-mail</b>	ditebogo@ibs-africa.com

### **Innovative Business Systems (Pty) Ltd**

Innovative Business Systems specialises in setting up and the implementation of management systems. Service offerings include:

- Management Systems Consulting;
- System Optimisation;
- Technical Audits;



- Quality Assurance;
- Outsourcing; and
- Project Coordination/Management.

## 1.4 Appointed Environmental Assessment Practitioner

<b>Name of firm</b>	Shangoni Management Services (Pty) Ltd.	
<b>Postal address</b>	PO Box 74726 Lynwood Ridge Pretoria 0040	
<b>Telephone No.</b>	(012) 807 7036	
<b>Fax</b>	(012) 807 1014/086 643 5360	
<b>E-mail</b>	lizette@shangoni.co.za	
<b>Team of Environmental Assessment Practitioners on project</b>		
<b>Name</b>	<b>Qualifications &amp; experience to conduct the EIA</b>	<b>Responsibility</b>
Mr Lourens de Villiers	<ul style="list-style-type: none"> <li>• MSc. Water Resource Management (UP)</li> <li>• BSc. (Hons) (PU for CHE)</li> <li>• More than 12 years' experience conducting Environmental Impact Assessments and Waste Management License Applications</li> </ul>	Project Director
Ms Lizette Crous	<ul style="list-style-type: none"> <li>• Post Graduate Certificate Environmental Management (University of London)</li> <li>• More than 2 years' experience conducting Environmental Impact Assessments and Waste Management License Applications</li> </ul>	EAP
Ms Patricia van der Walt	<ul style="list-style-type: none"> <li>• B.Sc. (Hons) (Applied Science in Environmental Technology)</li> <li>• 2 years' experience conducting Environmental Impact Assessments, Waste Management License Applications and Atmospheric Emission License Applications.</li> </ul>	EAP

\* Detailed CVs for the project team are attached (Appendix G).

### Lourens de Villiers – Project Director

Lourens holds a M.Sc. Water Resource Management degree from the University of Pretoria and has ten years' experience in the environmental field. He specializes in compilation and management of Environmental Impact Assessments (EIA's) for commercial, industrial, agri-industrial, mining and



residential developments. Lourens is also actively involved in third party ISO 14001 certification audits in the mining and industrial sectors.

#### **Lizette Crous – Environmental Practitioner**

Lizette obtained a B.Sc. degree specialising in Biodiversity and Ecology from the University of Stellenbosch. She is currently completing a M.Sc. in Environmental Management at the University of London and is responsible for Waste Management License Applications and non-mining Environmental Impact Assessments (EIA) at Shangoni.

#### **Patricia van der Walt – Environmental Practitioner**

Patricia obtained a B.Sc. degree in Microbiology and Life Sciences from the University of Limpopo, majoring in Biochemistry, Physiology and Biology. She went on to complete her B.Sc. Hons (Applied Science) degree in Environmental Engineering at the University of Pretoria, specializing in Environmental management, Air management, Water quality management and Waste management. She is responsible for Environmental Impact Assessments (EIA), Air emission licenses and Waste management licenses at Shangoni.

## **1.5 Current situation**

Currently, waste tyres are disposed of at landfill sites, where they take up valuable air space, and are stockpiled or dumped in residential, rural and industrial areas across South Africa. Some tyres are recycled, but many are burnt, releasing oils that seep into the ground and noxious gases such as carbon monoxide and dioxins ([www.redisa.org.za](http://www.redisa.org.za)). Burning one ton of waste tyres produces approximately 450kg of toxic gases (Splainex Ecosystems Ltd, 2009-2011). In some rural areas, waste tyres are also burnt to generate heat, especially in winter months, resulting in health risks to those inhaling the resultant fumes ([www.redisa.org.za](http://www.redisa.org.za)). In terms of the Waste Classification and Management Regulations (NEM:WA) of 23 August 2013, tyres are seen as general waste and do not require classification (Annexure 1 of the regulations).

The Waste Tyre pyrolysis plant is proposed for an industrial site that is currently unused. The site was used for industrial purposes in the past and has existing buildings, road infrastructure and bulk service supplies.

## **1.6 Proposed activities**

It is estimated that there are approximately 60 million legacy waste tyres in South Africa. These tyres take up space at landfill sites or are burnt, releasing noxious gases such as carbon monoxide and dioxins.



Recycling of waste tyres is one way to eliminate the above mentioned problem. This can be achieved through waste tyre pyrolysis. Pyrolysis is defined as thermal decomposition in an oxygen-free environment.

The first step in the process is the shredding of waste tyres and the removal of steel. The tyres are then heated in a reactor vessel that is devoid of oxygen. The rubber is softened as it heats and the rubber polymers are broken down into smaller molecules. Steel, oil and char are produced from the pyrolysis process. The char is further processed to Carbon black.

The proposed waste tyre pyrolysis plant will process approximately 95 tons of waste tyres per day and will operate 24 hours per day, seven days per week. The waste tyres will be sourced from trucking companies, tyre dealers and nearby mines. Tyres up to tractor size will be used in the process. Approximately seven days' stock of waste tyres ( $\pm 665$  tons) will be stored at the site prior to processing. Off-site storage of tyres is also a possibility.

Produced oil will be stored in tanks and processed Carbon black will be stored in silos and bags. A backup generator will be installed for emergency situations or power failures and approximately 20m<sup>3</sup> of water will be stored at the facility, possibly in JoJo tanks, for the cooler. Vaporox is also considering the installation of micro-turbines to use any excess gases produced in the pyrolysis process for the generation of electricity.

A general pyrolysis process flow is shown in the figure below.



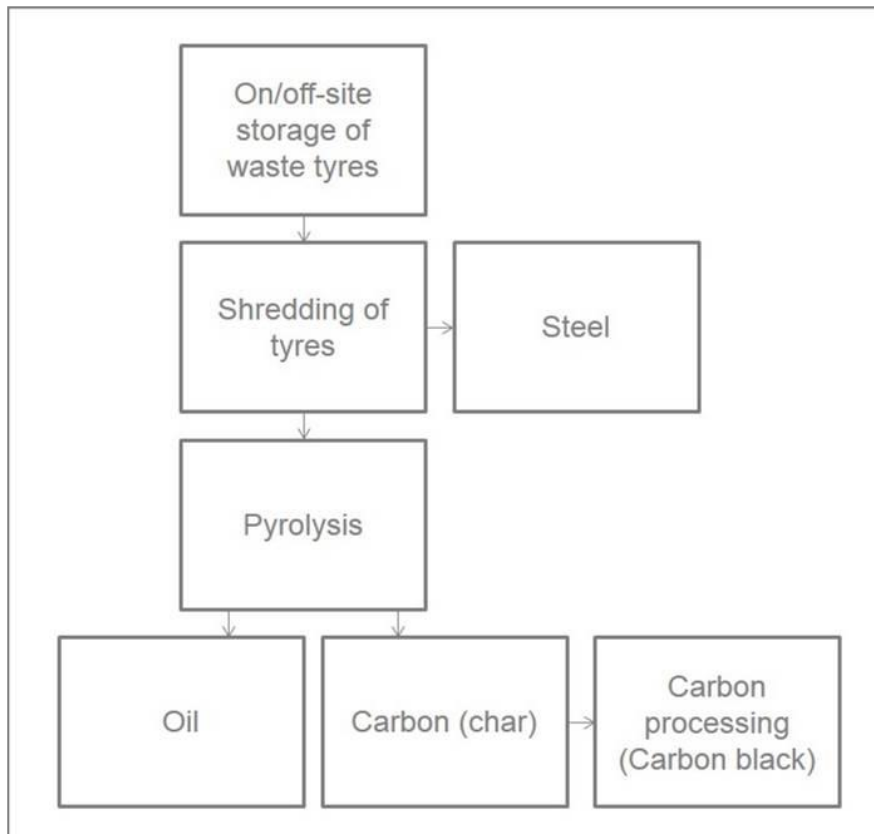


Figure 2: General pyrolysis process flow diagram

The following listed activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) are being applied for:

Table 2: Listed activities in terms of GN. No 545, dated 2010 under NEMA, 1998

Number and date of the relevant notice	Activity No	Description
GN. No. R 545, Listing Notice 2 of 18 June 2010	3	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.  Facilities or infrastructure for the storage of dangerous goods will be constructed. This will include approximately 500m <sup>3</sup> of oil, ±5 tons of chemicals, such as catalysts, in bags and silos and 46 cubic tons of Liquefied Petroleum Gas (LPG).
GN. No. R 545, Listing Notice 2 of 18 June 2010	5	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National



		<p>Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p> <p>The proposed waste tyre pyrolysis plant will require an Atmospheric Emission License in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) for the release of emissions from the plant. The Atmospheric Emission License application will be submitted to the Bojanala Platinum District Municipality – Health and Environmental Services Department.</p>
GN. No. R 545, Listing Notice 2 of 18 June 2010	26	<p>Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), except where such commencement requires basic assessment in terms of Notice of No. R544 of 2010.</p> <p>The proposed waste tyre pyrolysis plant will require an Atmospheric Emission License in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) for the release of emissions from the plant. The Atmospheric Emission License application will be submitted to the Bojanala Platinum District Municipality – Health and Environmental Services Department.</p>

An Atmospheric Emission License Application will be submitted to the Bojanala Platinum District Municipality for the following activity in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), List of Activities which result in Atmospheric Emissions which have or may have a significant detrimental effect on the Environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage (Government Notice No. 893 of 22 November 2013):

No. and date of relevant notice	Activity No	Description	Application
Government Notice No. 893 of 22 November 2013  Category 3: Carbonisation and Coal Gasification	Subcategory 3.4. Char, Charcoal and Carbon Black Production	Production of char, charcoal and the production and use of carbon black.	All installations producing more than 20 tons of char and charcoal.  All installations consuming more than 20 tons per month of carbon black in any processes.

This activity was formerly listed under *Category 3: Carbonization and Coal Gasification, Subcategory 3.4. Char, Charcoal and Carbon Black Production* of Government Notice No. 248 of 31 March 2010.



### 1.6.1 Proposed locality

The proposed site for the Waste Tyre pyrolysis plant is located on Portion 0 of Erf 37, Bodirelo Township, JQ, Mogwase, North West Province. The site is situated within the Moses Kotane Local Municipality of the Bojanala Platinum District Municipality.

Table 3: Administrative and water management boundaries

<b>Province</b>	North West Province
<b>District Municipality</b>	Bojanala Platinum District Municipality
<b>Local Municipality</b>	Moses Kotane Local Municipality
<b>Ward</b>	10
<b>Quaternary Catchment</b>	A22F
<b>Water Management Area (if applicable)</b>	Crocodile (West) and Marico
<b>Air Shed Priority Area</b>	Waterberg-Bojanala National Air Shed Priority Area

Table 4: Direction and distance to the nearest towns

<b>Closest town</b>	<b>Distance from site</b>	<b>Direction from site</b>
Doringpoort	7km	North-west
Sun City	20km	South-west
Rustenburg	41km	South

The site locality map is given in the figure below and is attached in Appendix A. Site photographs are also provided after the site locality map.



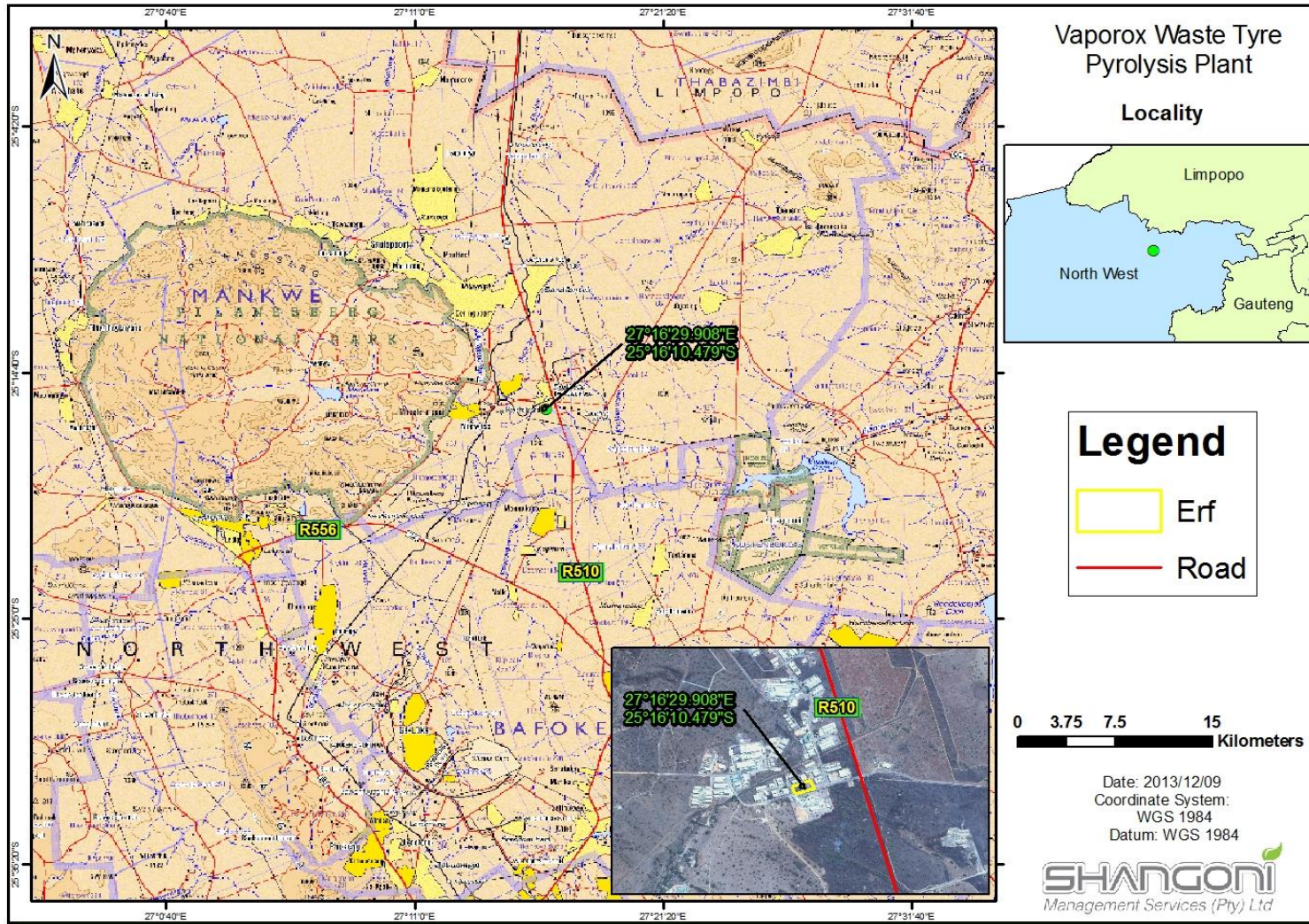


Figure 3: Site locality map







Figure 4: Existing access to the site



Figure 5: Existing building 1





Figure 6: Existing building 2



Figure 7: Existing buildings (building 3 at the back on the right of the photograph)





Figure 8: Inside of building 1



Figure 9: Inside of building 2





Figure 10: Inside of building 3



Figure 11: Open piece of land to the east of the three existing buildings (1)





Figure 12: Open piece of land to the east of the three existing buildings (2)

### 1.6.2 Land tenure and use of immediately adjacent land

Most of the properties surrounding the proposed site are owned by the North West Development Corporation (Pty) Ltd and are used for industrial activities, such as steel works. There is also a bus service across the road from the site (Mvelatrans (Pty) Ltd t/a Bojanala Bus Services).

The adjacent land owners of the proposed site are listed in the table below and shown in the figure thereafter. Also refer to Part 4 for more detail regarding the Public Participation Process.

Table 5: Adjacent land owners of the proposed site

Adjacent Land Owner
North West Development Corporation (Pty) Ltd
Mvelatrans (Pty) Ltd t/a Bojanala Bus Services
New Era Recycling (Part of the New Era Group)
Durab Manufacturing
Four Tops Engineering Service CC





Figure 13: Properties adjacent to the proposed site

### 1.6.3 Design

Designs for the Waste Tyre pyrolysis plant have not been finalised as yet as will be included in subsequent reports.



## 2. NATURE AND EXTENT OF THE ENVIRONMENT AFFECTED BY ACTIVITY

### 2.1 Geology

According to Mucina & Rutherford (2006), the northern areas that are covered by Central Sandy Bushveld (the vegetation type of the site) are underlain by sedimentary rocks belonging to the Waterberg Group, Mokolian Erathem. These are mostly sandstone, shale and siltstone rocks of the Vaalwater Formation and sandstone, siltstone and conglomerate rocks of the Alma Formation. Large parts of the southern and eastern areas are underlain by granite rocks belonging to the Lebowa Granite Suite and granophyre (fine-grained igneous) rocks belonging to the Rashoop Granophyre Suite. Both of these suites belong to the Bushveld Complex, Vaalian (Mucina & Rutherford, 2006).

As shown in the figure below, the site is underlain by felsic, intermediate rocks of the Lebowa Granite Suite, Bushveld Complex (Vaalian).



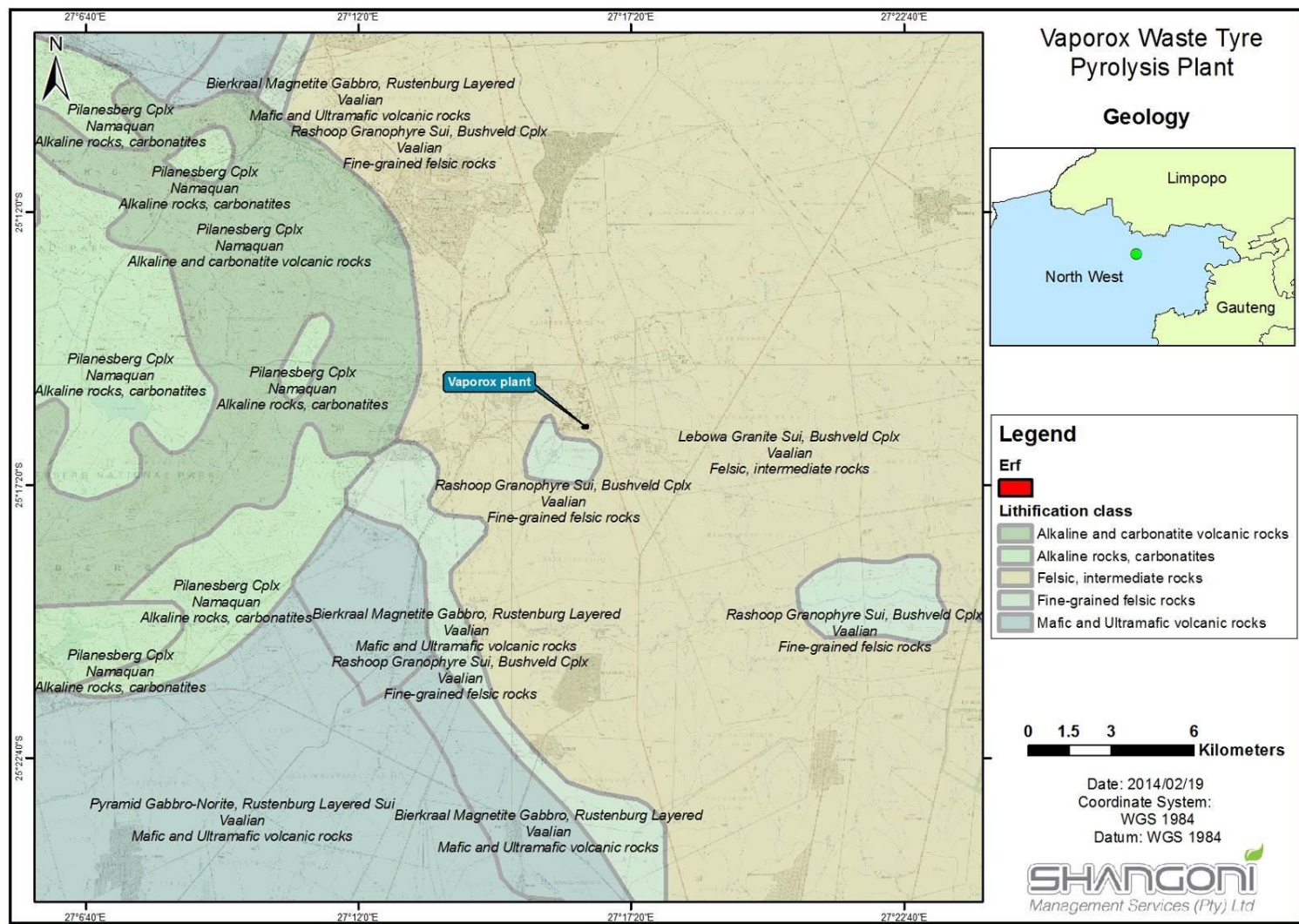


Figure 14: Geology of the site



## 2.2 Regional climate

### 2.2.1 Rainfall

The mean annual rainfall at the site area is 401 – 600mm per annum (AGIS, 2007). The figure below shows the annual monthly rainfall at the site for 2012, as compiled from Numerical Weather Prediction (NWP) Meteorological Data (Crown, 2009).

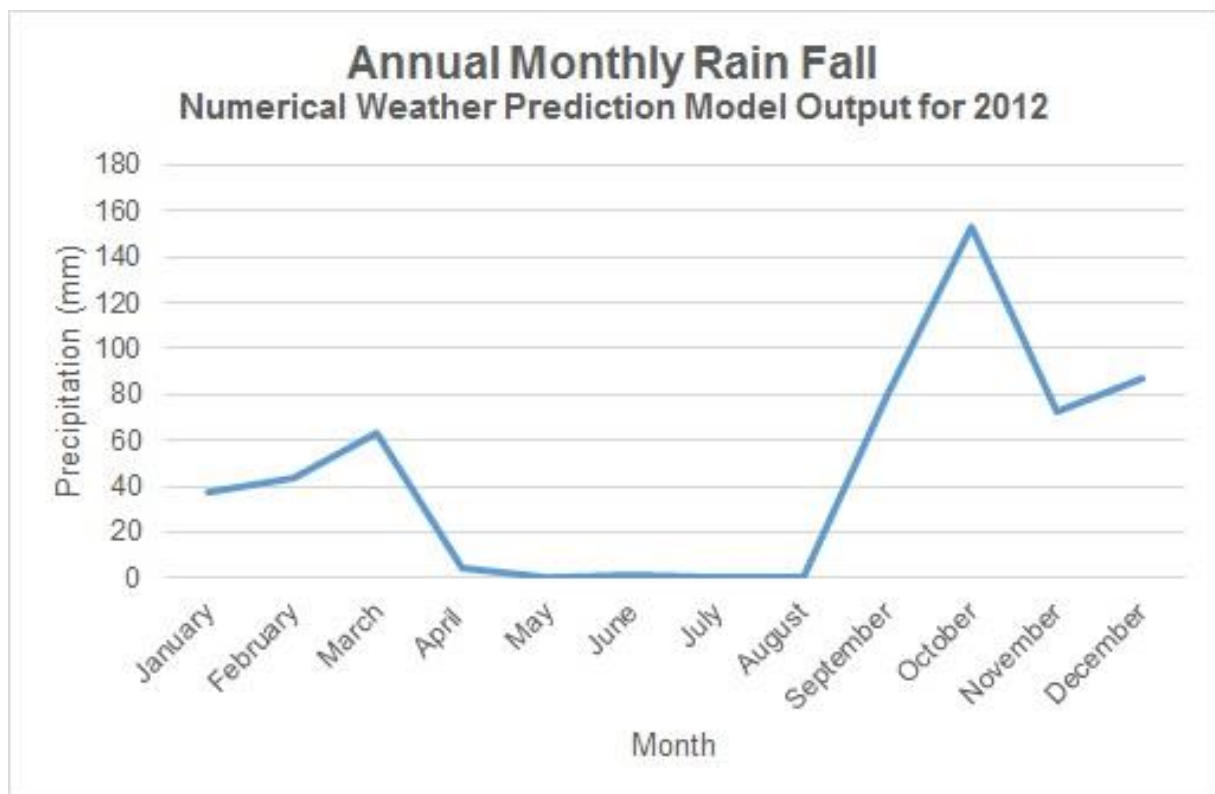


Figure 15: Annual monthly rainfall at the site (Crown, 2009)

### 2.2.2 Temperature

According to the AGIS Comprehensive Atlas, 2007, the maximum mean annual temperature for the site is between 29.1°C and 31°C and the minimum mean annual temperature for the site area is between 2.1°C and 4°C. The figure below shows the annual monthly average temperature at the site for 2012, as compiled from Numerical Weather Prediction (NWP) Meteorological Data (Crown, 2009).



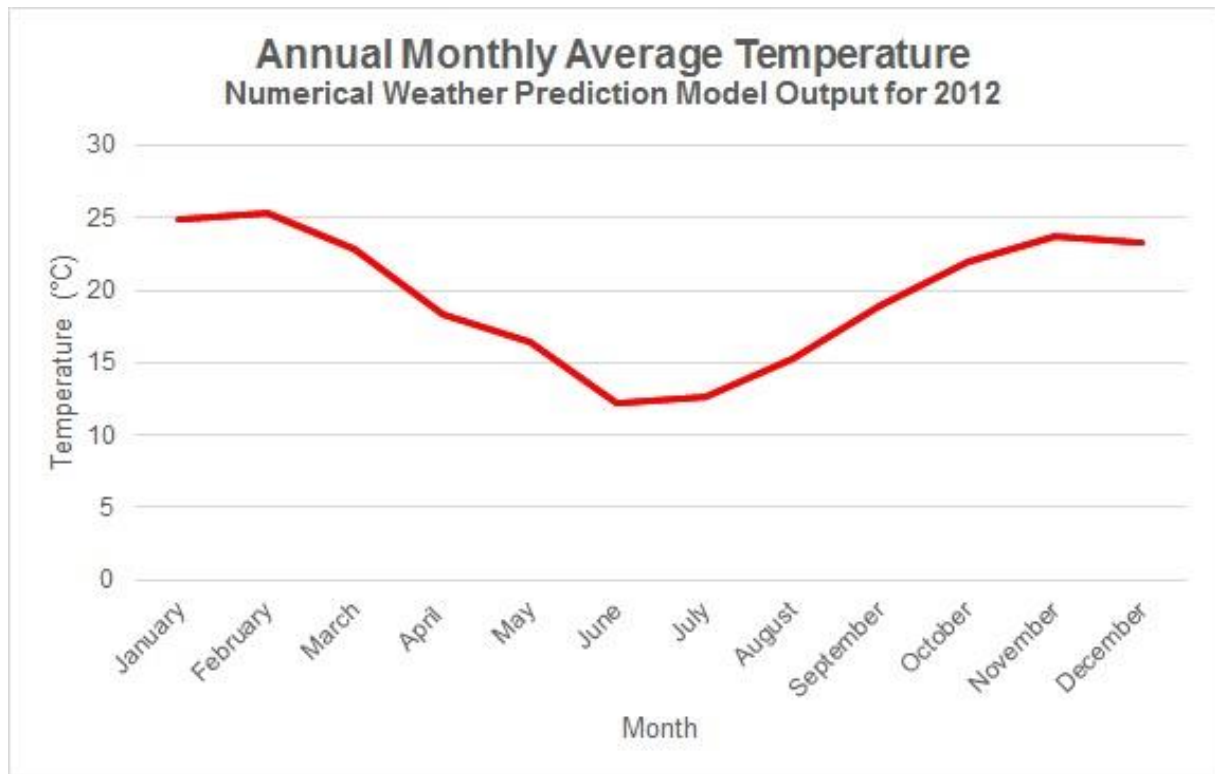


Figure 16: Annual Monthly Average Temperature at the site (Crown, 2009)

### 2.2.3 Evaporation

The Mean Annual Evaporation of the area is 1 700-1 800mm per annum (DWAF, 2010).

### 2.2.4 Wind

The figure below shows the annual and seasonal prevailing wind direction at the site for 2012, as compiled from Numerical Weather Prediction (NWP) Meteorological Data (Crown, 2009). The prevailing wind direction at the site is from the South east-east.



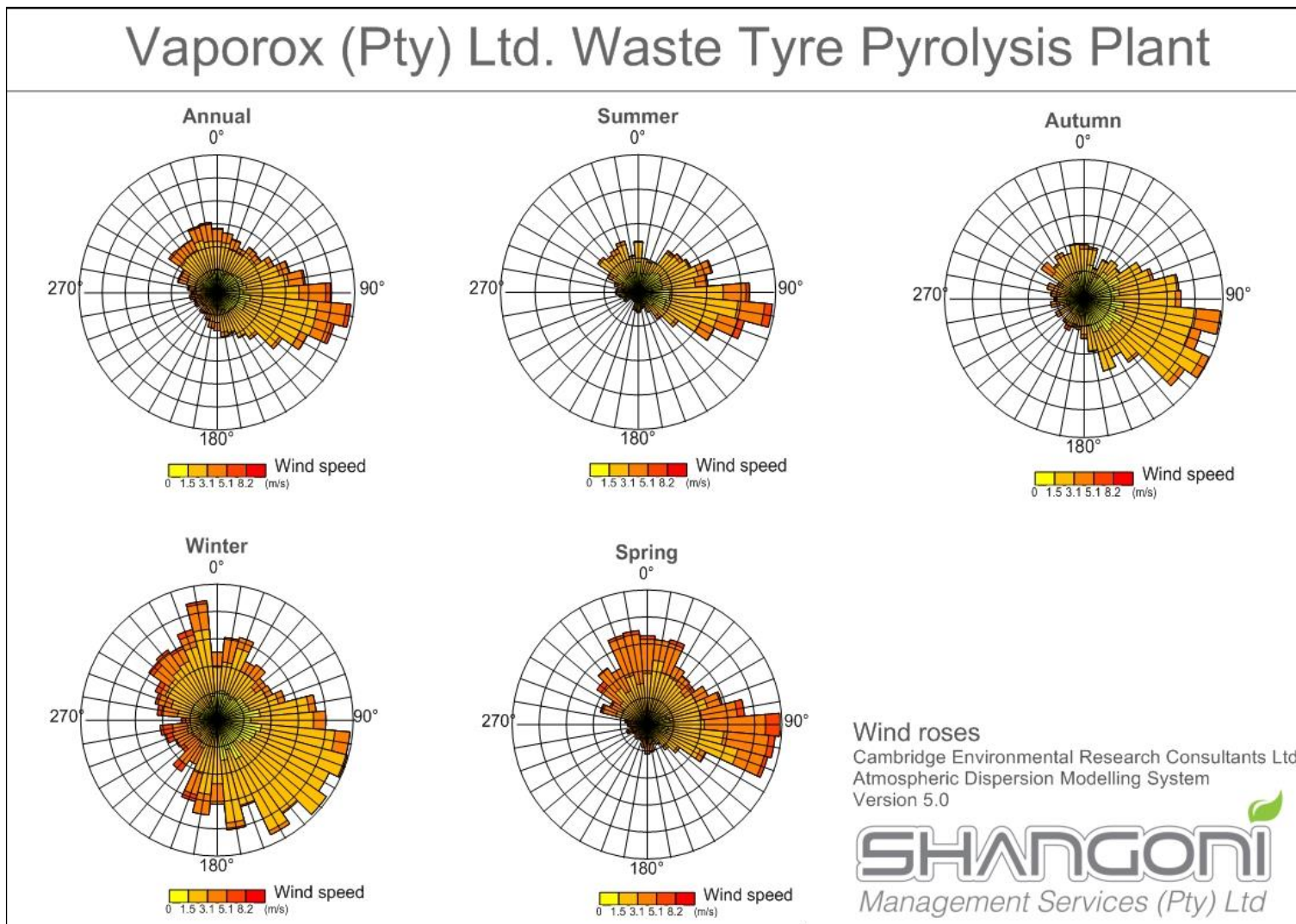


Figure 17: Wind roses showing the prevailing wind direction at the site (Crown, 2009)

## 2.3 Topography

According to Mucina and Rutherford (2006), areas covered by Central Sandy Bushveld (the vegetation type of the site), are characterised by low, undulating areas that are sometimes found between mountains, as well as catenas and sandy plains (Mucina and Rutherford, 2006). A catenas is defined as a group of soils that are found together within a landscape and share the same parent material.

As can be seen in the figure below, the site slopes downwards from the eastern to western part of the site. The elevation is 1 092 metres above sea level (masl) on the eastern boundary of the site and 1 085 metres above sea level on the western boundary of the site. Existing Building 1 is situated at an average elevation of 1088masl, Existing Building 2 is situated at an average elevation of 1088masl and Existing Building 3 is situated at an average elevation of 1087masl. According to the AGIS Comprehensive Atlas (2007), the slope of the site is between 0 and 5%.



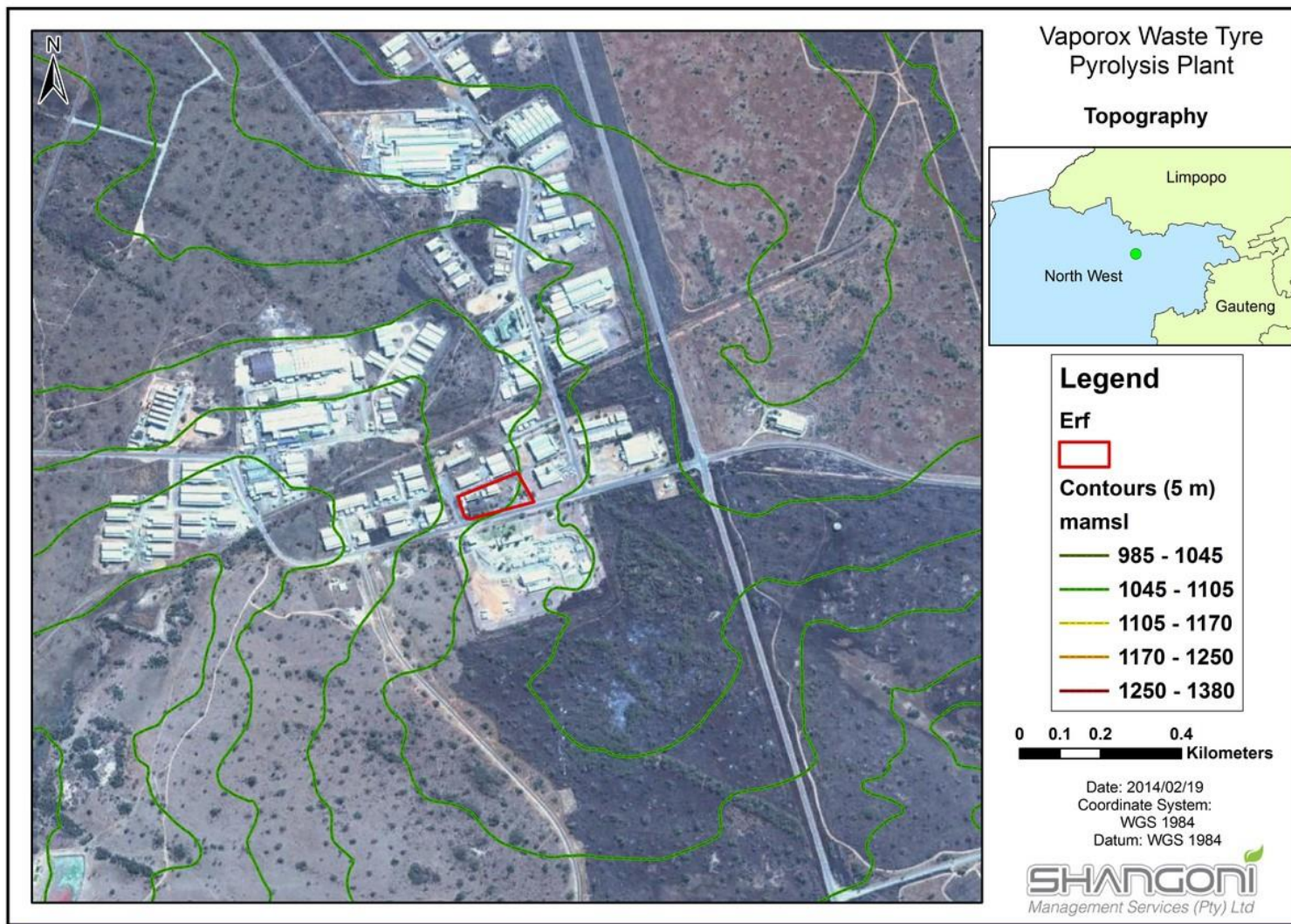


Figure 18: Topography of the site

## 2.4 Soils

In general, soils underlying Central Sandy Bushveld (the vegetation type of the site), are deep Hutton or Clovelly soils that are well-drained and often have a catenary sequence of Hutton at the top and Clovelly on the lower slopes. Shallow Glenrosa soils may also occur and the main land types are Ac, Ba, Bb, Bd and Fa (Mucina & Rutherford, 2006).

As shown in the figure below, the site is characterised by one soil type, namely S21. S21 soils are an association of Class 13 and 16 soils and are undifferentiated, shallow soils. The soils may receive water runoff from associated rocks (water intake areas) and have restricted land use options. The land type of the site is Fa4 according to the AGIS Comprehensive Atlas (2007). The clay content of this land type varies between 4 and 40% for the A horizon, between 4 and 10% for the E horizon and between 4 and 57% for the B21 horizon (AGIS, 2007).



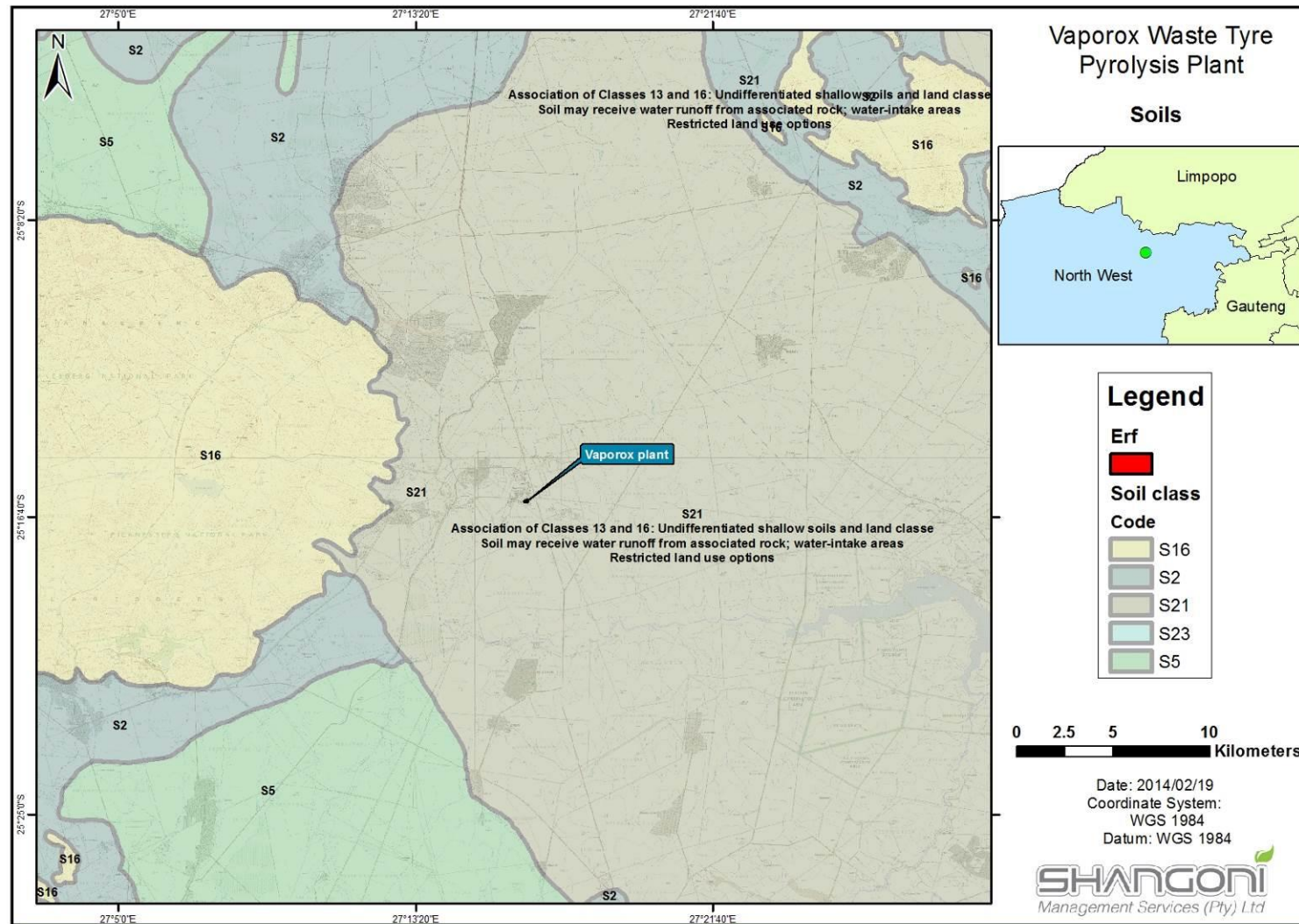


Figure 19: Soil type present at the site

## 2.5 Land use and land capability

The property is zoned as Industrial land and three existing buildings, erected by the previous owners/tenants are present on the site, together with associated infrastructures such as roads and the entrance gate. The buildings and associated infrastructures cover approximately half of the property and the remaining areas is open land.

According to the AGIS Comprehensive Atlas (2007) the land capability of the property is “Moderate Potential Agricultural Land”. The dominant land use surrounding the property is industrial uses, urban/built-up areas, residential areas, bush veldt and a municipal landfill site. A number of the adjacent properties are also owned by the North West Development Corporation. In the wider area surrounding the site, a number of mines, the Pilanesberg National Park and the Vaalkop Dam Nature Reserve are present.

## 2.6 Vegetation

As the site was disturbed previously when buildings were constructed, only half of the site has remaining vegetative cover present. Due to the disturbed nature of the vegetation onsite, a desktop assessment was undertaken at this stage to describe the nature of any natural vegetation surrounding the site.

As shown in the figure below, the vegetation type of the area and site is Central Sandy Bushveld (SVcb 12). This bushveld is found at an elevation of between 850 and 1 450 metres above sea level in the Mpumalanga, Limpopo, North-West and Gauteng Provinces. The vegetation type is listed as “Vulnerable” with a conservation target percentage of 19%. Currently, less than 3% of the vegetation type areas are statutorily conserved in a number of nature reserves such as the Skuinsdraai and Doorndraai Dam Nature Reserves. A further 2% is conserved in other reserves, such as private reserves and the Wallmansthal SANDF Property (Mucina & Rutherford, 2006).

### 2.6.1 Dominant species

Important and biologically important taxa within the Central Sandy Bushveld vegetation type are given in the tables below.

Table 6: Important taxa within the Central Sandy Bushveld (Mucina & Rutherford, 2006)

Taxa	Species
Tall trees	<i>Acacia burkei</i> (d), <i>A. robusta</i> , <i>Sclerocarya birrea</i> subsp. <i>caffra</i>
Small trees	<i>Burkea africana</i> (d), <i>Combretum apiculatum</i> (d), <i>C. zeyheri</i> (d), <i>Terminalia sericea</i> (d), <i>Ochna pulchra</i> , <i>Peltophorum africanum</i> , <i>Rhus leptodictya</i> .
Tall shrubs	<i>Combretum hereroense</i> , <i>Grewia bicolor</i> , <i>G. monticola</i> , <i>Strychnos pungens</i> .





<b>Low shrubs</b>	<i>Agathisanthemum bojeri</i> (d), <i>Indigofera filipes</i> (d), <i>Felicia fascicularis</i> , <i>Gnidia sericocephala</i> .
<b>Geoxylic suffrutex</b>	<i>Dichapetalum cymosum</i> (d).
<b>Woody climber</b>	<i>Asparagus buchananii</i> .
<b>Graminoids</b>	<i>Brachiaria nigropedata</i> (d), <i>Eragrostis pallens</i> (d), <i>E. rigidior</i> (d), <i>Hyperthelia dissoluta</i> (d), <i>Panicum maximum</i> (d), <i>Perotis patens</i> (d), <i>Antheophora pubescens</i> , <i>Aristida scabrivalvis</i> subsp. <i>scabrivalvis</i> , <i>Brachiaria serrata</i> , <i>Elionurus muticus</i> , <i>Eragrostis nindensis</i> , <i>Loudetia simplex</i> , <i>Schmidtia pappophoroides</i> , <i>Themeda triandra</i> , <i>Trachypogon spicatus</i> .
<b>Herbs</b>	<i>Dicerocaryum senecioides</i> (d), <i>Barleria macrostegia</i> , <i>Blepharis integrifolia</i> , <i>Crabbea angustifolia</i> , <i>Evolvulus alsinoides</i> , <i>Geigeria burkei</i> , <i>Hermannia lancifolia</i> , <i>Indigofera daleoides</i> , <i>Justicia anagalloides</i> , <i>Kyphocarpa angustifolia</i> , <i>Lophiocarpus tenuissimus</i> , <i>Waltheria indica</i> , <i>Xerophyta humilis</i> .
<b>Geophytic herb</b>	<i>Hypoxis hermerocallidea</i> .
<b>Succulent herb</b>	<i>Aloe greatheadii</i> var <i>davyana</i> .

Table 7: Biogeographically important taxa (Central Bushveld endemics) within the Central Sandy Bushveld (Mucina & Rutherford, 2006)

Taxa	Species
<b>Graminoid</b>	<i>Mosdenia leptostachys</i> .
<b>Herb</b>	<i>Oxygonum dregeanum</i> subsp. <i>canescens</i> var. <i>dissectrum</i> .

### 2.6.2 Alien invasive species

A number of alien plants are widely scattered at low densities within the Central Sandy Bushveld vegetation type. These alien species include *Cereus jamacaru*, *Eucalyptus* species, *Lantana camara*, *Melia azedarach*, *Opuntia ficus-indica* and *Sesbania punicea*.



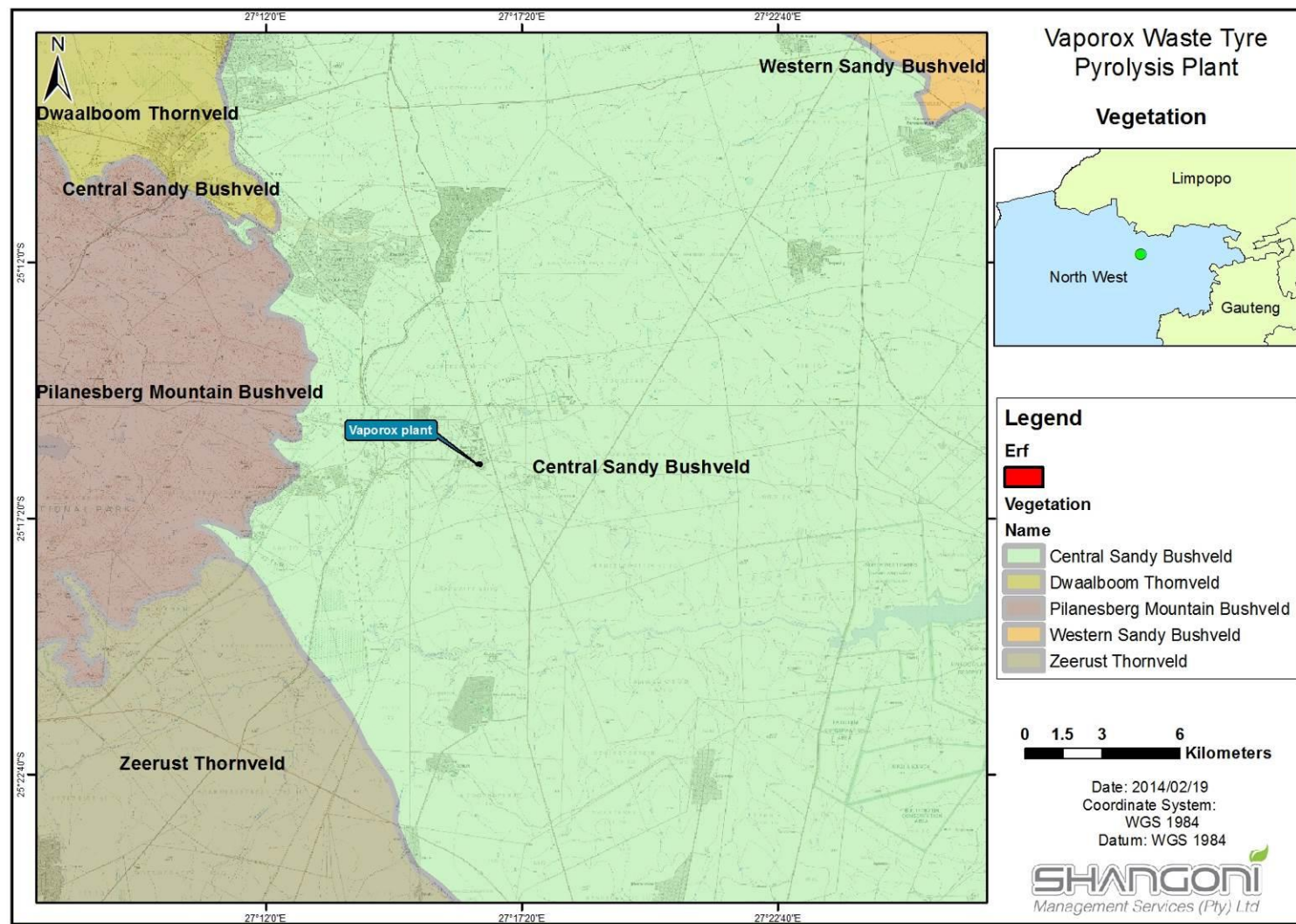


Figure 20: Vegetation type at the site



## 2.7 Animal life

### 2.7.1 Commonly occurring species

According to the South African Biodiversity Information Facility (SIBIF), the following animal species commonly occur in the vicinity of the project site.

Table 8: List of commonly occurring insect species in the vicinity of the site (SANBI, 2009)

Scientific name	Common name
<i>Crocisaspidia chandieri</i>	Species of Apidae (bees)
<i>Lipotriches rubella</i>	Species of Apidae (bees)
<i>Amegilla sp.</i>	Species of Blue-banded Bee
<i>Anthophora sp.</i>	Species of Apidae (bees)
<i>Megachile sp.</i>	Species of Leafcutter Bee
<i>Xylocopa caffra</i>	Species of Carpenter Bee

Table 9: List of commonly occurring fish species in the vicinity of the site (SANBI, 2009)

Scientific name	Common name
<i>Oreochromis mossambicus</i>	Mozambique Tilapia
<i>Pseudocrenilabrus philander</i>	Southern Mouthbrooder
<i>Tilapia sparrmanii</i>	Banded Tilapia
<i>Chetia flaviventris</i>	Canary Kurper
<i>Barbus unitaeniatus</i>	Slender Barb
<i>Barbus paludinosus</i>	Straightfin Barb

### 2.7.3 Endangered species

The following tables show the IUCN (International Union for Conservation of Nature and Nature Resources) Red List of Threatened Species that are found in the North West Province. Importantly, these species are not necessarily present at the specific project site. The following abbreviations are used: EN: Endangered; VU: Vulnerable; NT: Near Threatened; and LC: least concern.

Table 10: IUCN Red List of threatened mammal species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Graphiurus ocularis</i>	Spectacled Dormouse	LC
<i>Mystromys albicaudatus</i>	White-tailed Mouse	EN
<i>Pronolagus rupestris</i>	Smith's Red Rock Hare	LC



Table 11: IUCN Red List of threatened insect species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Anax ephippiger</i>	Vagrant Emperor	LC
<i>Anax imperator</i>	Blue Emperor	LC
<i>Anax speratus</i>	Orange Emperor	LC
<i>Cacyreus virilis</i>	Alternative Bush Blue	LC
<i>Capys alphaeus</i>	Orange-banded Protea Butterfly	LC
<i>Crocothemis sanguinolenta</i>	Little Scarlet	LC
<i>Diplacodes lefebvrii</i>	Black Percher	LC
<i>Frankenbergerius forcipatus</i>	-	DD
<i>Ischnura senegalensis</i>	Common Bluetail	LC
<i>Orthetrum chrysostigma</i>	Epaulet Skimmer	LC
<i>Lestes pallidus</i>	Pallid Springwing	LC
<i>Nesiothemis farinosa</i>	Black-tailed Skimmer	LC
<i>Orthetrum trinacria</i>	Long Skimmer	LC
<i>Palpopleura deceptor</i>	Deceptive Widow	LC
<i>Pantala flavescens</i>	Globe Skimmer	LC
<i>Paternympha narycia</i>	Spotted-eye Brown	LC
<i>Pseudagrion kersteni</i>	Kersten's Sprite	LC
<i>Rhyothemis semihyalina</i>	Phantom Flutterer	LC
<i>Sympetrum fonscolombii</i>	Red-veined Darter	LC
<i>Tramea basilaris</i>	Keyhole Glider	LC
<i>Trithemis annulata</i>	Violet Dropwing	LC
<i>Trithemis arteriosa</i>	Red-veined Dropwing	LC
<i>Trithemis furva</i>	Navy Dropwing	LC
<i>Trithemis kirbyi</i>	Orange-winged Dropwing	LC
<i>Tuxentius calice</i>	White Pierrot	LC

Table 12: IUCN Red List of threatened reptile species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Acontias percivali</i>	Percival's Legless Skink	LC
<i>Chamaeleo dilepis</i>	Common African Flap-necked Chameleon	LC
<i>Lygodactylus nigropunctatus</i>	Black-spotted Dwarf Gecko	LC
<i>Psammophis subtaeniatus</i>	Stripe-bellied Sand Snake	LC



Table 13: IUCN Red List of threatened millipede (*Diplopoda*) species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Doratogonus levigatus</i>	-	LC
<i>Doratogonus rugifrons</i>	-	LC

Table 14: IUCN Red List of threatened snail and slug (*Gastropoda*) species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Biomphalaria pfeifferi</i>	-	LC
<i>Galba truncatula</i>	-	LC

Table 15: IUCN Red List of threatened fish species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Barbus brevipinnis</i>	Shortfin Barb	NT
<i>Barbus motebensis</i>	Marico Barb	VU
<i>Barbus rapax</i>	Southern Papermouth	LC
<i>Barbus sp. nov. 'Waterberg'</i>	Waterberg Shortfin Barb	NT
<i>Barbus trimaculatus</i>	Threespot barb, Threespot barb (FB)	LC
<i>Chetia flaviventris</i>	Canary Kurper	LC
<i>Chiloglanis pretoriae</i>	Shortspine Suckermouth	LC
<i>Labeo rosae</i>	Rednose Labeo	LC
<i>Labeo umbratus</i>	Moggel	LC
<i>Labeobarbus aeneus</i>	Vaal-orange Smallmouth Yellowfish	LC
<i>Labeobarbus kimberleyensis</i>	Largemouth Yellowfish, Vaal-orange Largemouth Yellowfish	NT
<i>Alopias vulpinus</i>	Common Thresher Shark	VU
<i>Dasyatis chrysonota</i>	Blue Stingray	LC
<i>Deania profundorum</i>	Arrowhead Dogfish	LC
<i>Deania quadrispinosa</i>	Longsnout Dogfish	NT
<i>Isurus oxyrinchus</i>	Shortfin Mako	VU
<i>Labeo capensis</i>	Orange River Mudfish	LC

Table 16: IUCN Red List of threatened crustacea (*Malacostraca*) species (IUCN, 2013)

Scientific name	Common name	Red List Status
<i>Potamonautes calcaratus</i>	-	LC
<i>Potamonautes sidneyi</i>	Sidney's River Crab	LC
<i>Potamonautes unispinus</i>	Single-spined River Crab	LC



## **2.8 Surface water**

### **2.8.1 Catchment areas**

The site lies within the A22F quaternary catchment as shown in the figure below. This quaternary catchment region is situated within the Crocodile (West) and Marico Water Management Area. The main rivers within this Water Management Area give rise to the Limpopo River at their confluence (DWAF, 2004).



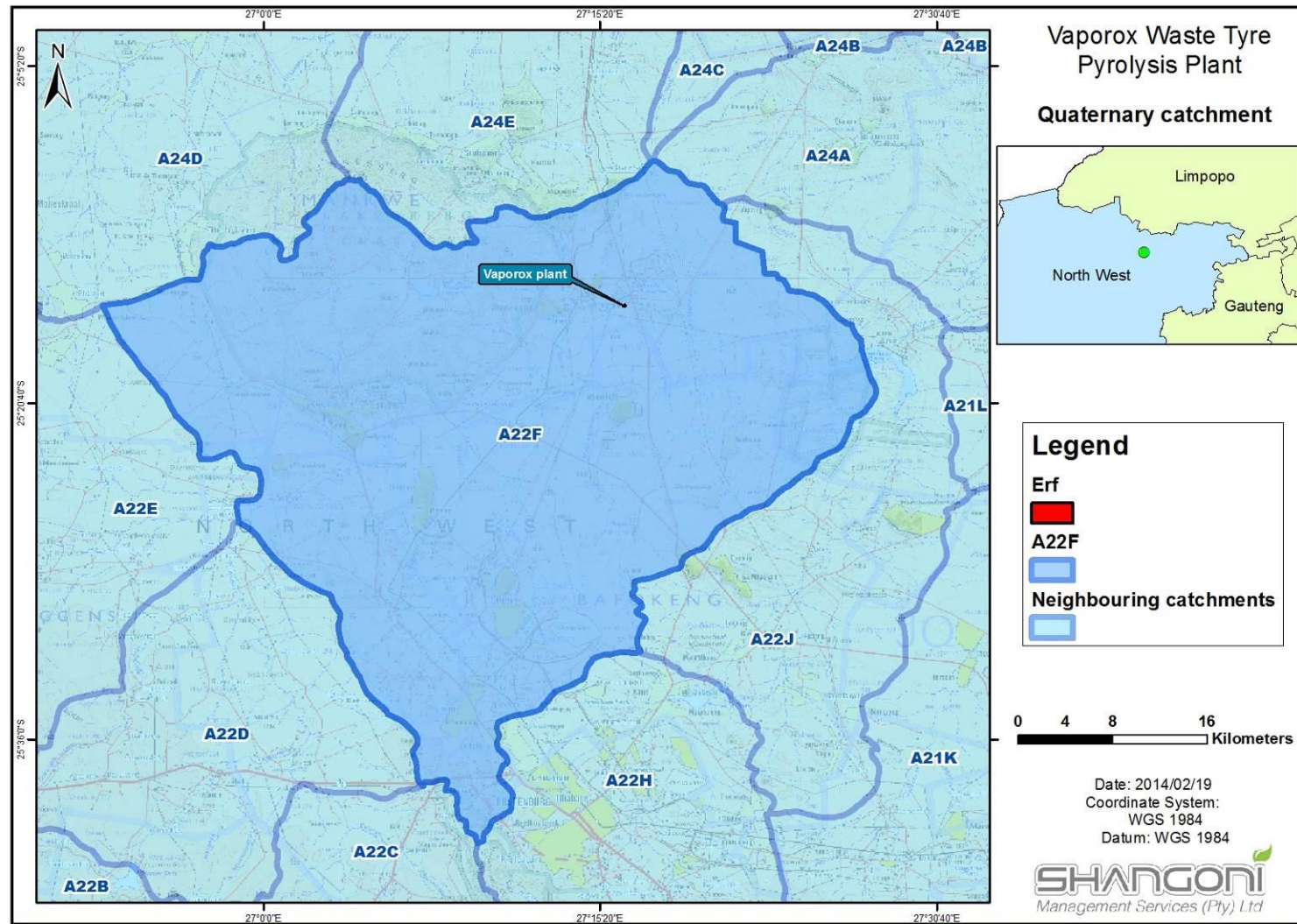


Figure 21: Quaternary catchment within which the site lies

### **2.8.2 Mean annual runoff (MAR)**

The total Natural Mean Annual Runoff for the Crocodile (West) and Marico Water Management Area is 855 million m<sup>3</sup>/annum and the Ecological Reserve is 164 million m<sup>3</sup>/annum (DWAF, 2004).

### **2.8.3 Surface water quantity and use**

No surface water is used or will be used on the property as an existing municipal water supply is present to the site.

### **2.8.4 Water authority**

The relevant water authority is the Department of Water Affairs, Hartebeespoort Regional office.

## **2.10 Groundwater**

### **2.10.1 Aquifer type**

The aquifer type of the area is d3, intergranular and fractured aquifers with median borehole yields of 0.5-2 litres/second (Geohydrological Map Sheet 2526, 1999). The aquifers are classified as “minor” aquifers (DWA, 2012).

The groundwater recharge is approximately 4mm per annum and the baseflow is approximately 2mm per annum in the area of the site (DWAF, 2010).

### **2.10.2 Depth of water tables**

The depth to the water level is approximately 19mbgl (metres below ground level) in the area of the site (DWAF, 2010).

### **2.10.3 Groundwater use**

No groundwater is or will be used on the property as an existing municipal water supply is present to the site.

### **2.10.4 Groundwater quality**

The groundwater quality, in terms of mean TDS (total dissolved solids), underlying the area of the site is 418mg/ℓ (DWAF, 2010).

## **2.11 Sensitive landscapes**

As shown in the figure below, there are no sensitive areas on the proposed site itself. Sensitive areas include for example, wetlands and Critical Biodiversity Areas (CBAs) as determined in Provincial





Biodiversity Conservation Plans. According to the Biodiversity Conservation Plan for the North-west Province, areas surrounding the proposed site have been designated as Biodiversity Conservation Areas, Terrestrial CBA Category 1 and 2 (shown in green on the figure below).

According to the South African Biodiversity Institutes Biodiversity GIS database, no wetlands are present on the site (SANBI, 2004).



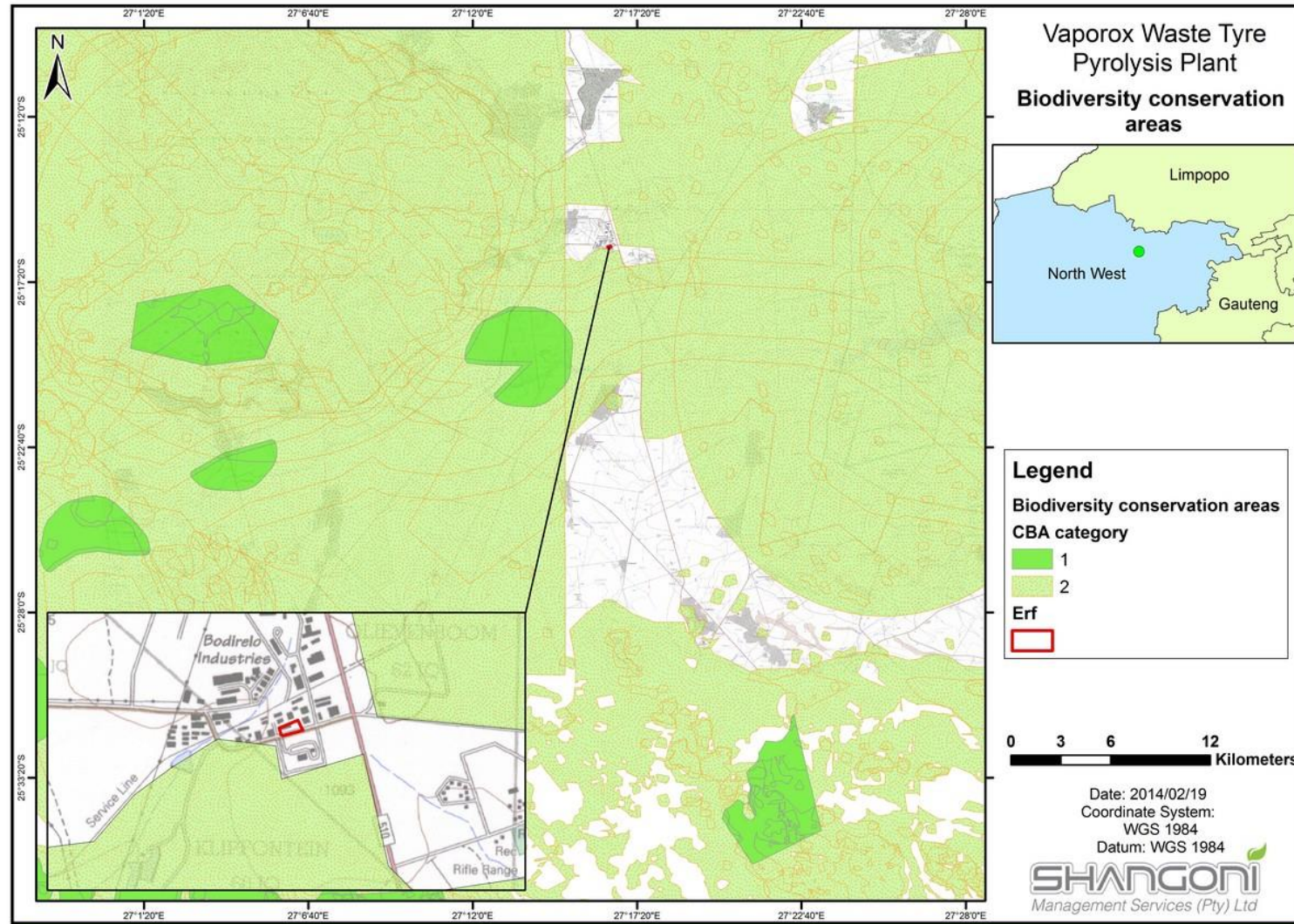


Figure 22: Sensitive areas in the vicinity of the site

## 2.12 Sites of archaeological and cultural interest

Approximately half of the site has been disturbed in the past by previous owners by the construction of three buildings and associated infrastructures. No information is available relating to the possible presence or absence of any sites of cultural heritage (historical and/or archaeological). The South African Heritage Resources Agency has been informed of the proposed development and Shangani is awaiting feedback from them as to whether a Heritage Impact Assessment is required as part of this Environmental Impact Assessment process.

## 2.13 Air Quality

One of the main environmental impacts from the pyrolysis of waste tyres is the generation of atmospheric emissions. Gases generated and potentially released into the atmosphere from the pyrolysis plant can contain a mixture of atmospheric pollutants. The potential pollutants include dioxins, furans, particulate matter (PM), oxides of nitrogen (NO<sub>x</sub>), oxides of sulphur (SO<sub>x</sub>), Hydrocarbon (HC) gases, Carbon Dioxide (CO<sub>2</sub>), Volatile Organic and Carbon Monoxide (CO) (University of California Riverside, 2006). It is estimated that the pyrolysis of one (1) ton of waste tyres (including steel, which will not be the case for this project), produces ±0.1 ton of gas, of which the composition is mostly hydrogen and hydrocarbons (Fels & Pegg, unknown).

An Atmospheric Impact Report will be compiled for this proposed project and will include a detailed investigation relating to the generation of atmospheric emissions as well as details such as dispersion modelling results and an Impact Assessment. The information from the Atmospheric Impact Report will be incorporated in detail into the draft Environmental Impact Assessment Report for this project. An Atmospheric Emission License will also be submitted to the Bojanala Platinum District Municipality.

The proposed site is situated within the Waterberg-Bojanala National Air Shed Priority Area, as declared in Government Notice No. 495 of 2012 and amended by Government Notice No. 154 of 8 March 2013. As an Air Shed Priority Area, the area within which the site lies is considered to exceed ambient air quality standards, resulting in negative impacts on human health and air quality. The Bojanala Platinum District consists of a number of atmospheric pollution sources, such as a power station, many open-cast mining operations, heavy and light industries, a refinery, motor vehicles as well as houses where coal is used for domestic heat generation (DEA, 2014). The Air Quality Management Plan for this Air Shed Priority Area will be taken into consideration during the compilation of the Atmospheric Impact Report.

## 2.14 Noise

The proposed Waste Tyre Pyrolysis plant will likely generate noise during the construction and operational phase. The noise levels will be further evaluated during the Environmental Impact



Assessment Phase of the project, when the significance of the noise and potential nuisance generated by the plant, will be rated.

The proposed plant will be located within an existing Industrial Area and the site is also zoned for Industrial purposes. Other industries adjacent to the site also generate varying levels of noise.

## **2.15 Visual aspects**

The proposed site is situated on the corner of a road crossing (Ramokoka Drive and an unnamed road) and is clearly visible to passing motorists on both roads. The site is also visible from neighbouring properties on all sides. The surrounding land uses are also industrial and the area is zoned as Industrial land. Most of the buildings in the area therefore have an industrial appearance.

As existing buildings will be used for the proposed waste tyre pyrolysis plant, no additional buildings will be constructed on the site. The waste tyre storage area will, however, be established on open land on the eastern part of the site. The tyres will also be visible from the road and adjacent properties.



## 2.16 Socio-economic aspects

The site is situated within the Moses Kotane Local Municipality, Bojanala Platinum District Municipality, North West Province.

### 2.16.1 Demography

According to the 2011 census, 242 554 people formed part of the 75 193 households in the Moses Kotane Local Municipality. The average household size is 3.2 people per household. The growth rate in the municipality is 0.22% per annum. There are 98.8 men for every 100 women (Statistics South Africa, 2011) in the municipality and the table below shows the age structure of the municipality.

Table 17: Moses Kotane Local Municipality age structure -Census 2011 (Statistics South Africa, 2011)

Age Group	Percentage of population (%)
Under 15 years of age	29.2
15 to 64 years of age	63.1
Over 65 years of age	7.7
<b>Total</b>	<b>100</b>

### 2.16.2 Major economic activities

The economy of the region is mostly dominated by the mining industry. This industry contributes 42% of the GDP (Gross Domestic Product) and 39% of employment opportunities in the province. The second largest industry is the agricultural industry that contributes 13% of the GDP and 18% of the employment opportunities in the province. The tourism industry is also very important in the province (Moses Kotane Local Municipality, 2013/2014) and the Pilanesberg National Park is situated approximately 6,3km to the west of the proposed site.

### 2.16.3 Unemployment and employment

The 2011 census found that the official unemployment rate was 37.9% and the youth unemployment rate (15 to 34 years of age) was 47.4%. The dependency ratio was 58.6 per 100 people between the ages of 15 and 64 years (Statistics South Africa, 2011).



### 3. APPLICABLE LEGISLATION AND GUIDELINES

The table below provides an indication of the main legislation, policies and/or guidelines applicable to the proposed project.

Table 18: Applicable legislation, policies and / or guidelines

Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
<b>Laws of General Application</b>		
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)	-	To establish a Constitution with a Bill of Rights for the RSA.
Environment Conservation Act, 1989 (Act No. 73 of 1989, as amended)	North West Department of Economic Development, Environment, Conservation and Tourism	To control environmental conservation.
National Environmental Management Act, 1998 (Act No. 107 of 1998). National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008).	North West Department of Economic Development, Environment, Conservation and Tourism	To provide for the integrated management of the environment, and to regulate the 'Duty of Care' Principle.
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000, as amended)	-	To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.
<b>Air Quality and Noise</b>		
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Bojanala Platinum District Municipality	To reform the law regulating air quality to protect the environment by providing reasonable measures for the prevention of pollution. To provide for national norms and standards regulating air quality monitoring, management and control.
<b>Water Management</b>		
National Water Act (NWA), 1998 (Act No. 36 of 1998)	Department of Water Affairs	To provide for fundamental reform of the law relating to water resources.
<b>Waste Management</b>		
National Environmental Management: Waste Act (Act No. 59 of 2008)	North West Department of Economic Development, Environment, Conservation and Tourism	To reform the law regulating waste management in order to protect health and the environment by providing



Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
		reasonable measures for the prevention of pollution and ecological degradation.
National Environmental Management: Waste Act (Act No 59 of 2008) – Waste Classification and management regulations (GNR. 634 of 23 August 2013)	North West Department of Economic Development, Environment, Conservation and Tourism	To regulate the classification and management of waste in a manner that supports and implements the provisions of the Waste Act.
GNR. 926 of 29 November 2013 – National Norms and Standards for the Storage of Waste	North West Department of Economic Development, Environment and Tourism	To provide a uniform national approach to the management of waste storage facilities, to ensure best practice in the management of waste storage facilities and to provide minimum standards for the design and operation of new and existing waste storage facilities.
GNR. 634 of 23 August 2013 – Waste Classification and Management Regulations	North West Department of Economic Development, Environment and Tourism	To regulate the classification and management of waste in a manner that supports and implements the provisions of the Waste Act, to establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Licence, to prescribe requirements for the disposal of waste to landfill, to prescribe requirements and timeframes for the management of certain wastes and to prescribe general duties of waste generators, transporters and managers.
Environmental Conservation Act, 1989, Waste Tyre Regulations, 2008.	North West Department of Economic Development, Environment and Tourism	To regulate the management of waste tyres by providing for the regulatory mechanisms.
<b>Biodiversity</b>		
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	North West Department of Economic Development, Environment, Conservation and Tourism	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	North West Department of Agriculture and Rural Development	To provide for control over the utilisation of the natural agricultural resources of South Africa in order to promote the conservation of the soil, the water



Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
		sources and the vegetation and the combating of weeds and invader plants.
National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)	North West Department of Agriculture and Rural Development	To reform the law on veldt and forest fires.
Agricultural Pest Act, 1983 (Act No. 36 of 1983, as amended) – GN R276 of 5 March 2004	North West Department of Agriculture and Rural Development	To regulate plants, plant products and other regulated articles when imported into South Africa.
<b>Soil and Land Management</b>		
National Environmental Management Act, 1998 (Act No. 107 of 1998). National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008).	North West Department of Economic Development, Environment, Conservation and Tourism	To provide for the integrated management of the environment and to regulate the 'Duty of Care' Principle.
Environment Conservation Act, 1989 (Act No. 73 of 1989, as amended)	North West Department of Economic Development, Environment, Conservation and Tourism	To control environmental conservation.
<b>Heritage and Archaeological Resources</b>		
National Heritage Resources Act No 25 of 1999 (Act No. 25 of 1999, as amended)	South African Heritage Resources Agency	To introduce an integrated and interactive system for the management of the national heritage resources; to promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations.
<b>Protected Areas</b>		
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003, as amended)	North West Department of Economic Development, Environment, Conservation and Tourism	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
<b>Planning of New Activities</b>		
National Environmental Management Act, 1998 (Act No. 107 of 1998). National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008).	North West Department of Economic Development, Environment, Conservation and Tourism	To provide for the integrated management of the environment and to regulate the 'Duty of Care' Principle.





Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
EIA Regulations R 543, R 544, R 545 and R 546, dated 18 June 2010) under the NEMA, 1998	North West Department of Economic Development, Environment, Conservation and Tourism	To regulate and control the authorisation of certain listed activities.
Government Notice (GN) 921: “List of waste management activities that have, or are likely to have a detrimental effect on the environment”, dated 2013.	North West Department of Economic Development, Environment, Conservation and Tourism	To regulate and control the authorisation of certain waste-related listed activities.



## 4. PUBLIC PARTICIPATION PROCESS

### 4.1 Objectives of the Public Participation Process (PPP)

Section 24 of the Constitution of the Republic of South Africa of 1996 guarantees everyone the right to an environment that is not harmful to their health and well-being and to have the environment protected for the benefit of present and future generations. In order to give effect to this right, the National Environmental Management Act (NEMA), 1998, as amended, came into effect.

In terms of Section 24(4) of the NEMA, 1998, as amended, procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, ensure, with respect to every application:

- Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;
- That the findings and recommendations flowing from an investigation, the general objective of integrated management laid down in NEMA, 1998, as amended, and the principles of environmental management set out in Section 2 of NEMA, 1998, as amended, are taken into account in any decision made by the organ state in relation to any proposed policy, programme, process, plan or projects, consequences or impacts; and
- Public information and participation procedures which provide all integrated and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures.

One of the general objectives of integrated environmental management laid down in Section 23(2) (d) of NEMA, 1998, as amended, is to: “ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment”.

The National Environmental Management Principles as stipulated in NEMA, 1998, as amended state:

- “Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have an opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantage persons must be ensured”.



## 4.2 Legislation and guidelines followed for the PPP

The public participation process for this project was conducted by Shangoni Management Services in terms of:

- The procedures and provisions in terms of the NEMA 1998, as amended;
- Chapter 6 of the EIA Regulations of 2010;
- GN 807; Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and
- Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000.

Refer to Appendix E for an extract regarding the required public participation process to be followed, taken from the relevant legislation and guidelines

## 4.3 Public Participation Process followed

### 4.3.1 Identification and registration of I&APs and key stakeholders

The table below lists adjacent landowners that were identified and notified (by means of e-mail and/or registered post) of the proposed project. Copies of the notifications to the I&APs have been included in Appendix E.

*Table 19: List of adjacent landowners identified and notified*

Company Name	Contact Person
North West Development Corporation (Pty) Ltd	Mrs Tebogo Kesiamang
Mvelatrans (Pty) Ltd t/a Bojanala Bus Services	Mr Albert Snyders
New Era Recycling (Part of the New Era Group)	Mr Danie Van Rooyen
Durab Manufacturing	Mr Anton Jonker
Four Tops Engineering Service CC	Mr Essau Motloug

All organs of state that may have jurisdiction in respect of the proposed project are considered to be registered I&APs.

The following organs of state were notified of the proposed project:

- Moses Kotane Local Municipality;
- Bojanala Platinum District Municipality;
- North West Department of Agriculture and Rural Development;
- North West Department of Finance;
- North West Department of Local Government and Traditional Affairs;
- North West Department of Human Settlements, Public Safety and Liaison;
- North West Department of Public Works, Roads and Transport;
- North West Department of Social Development;



- North West Department of Health;
- Department of Water Affairs;
- South African Heritage Resources Agency;
- Pilanesberg National Park; and
- Vaalkop Dam Nature Reserve.

Copies of the notifications to the organs of state have been included in Appendix E and examples are included in the following pages.

### **4.3.2 Methods of notification**

#### **4.3.2.1 Advertisements**

The proposed project was advertised in two local newspapers, the Beeld and the Rustenburg Herald, on the 21<sup>st</sup> of February 2014. These newspapers were found to be the most appropriate newspapers in terms of their accessibility to I&APs in the vicinity of the proposed site. A copy of the advertisements and proof of their placement is attached in Appendix E and is also given in the figures below.







#### 4.3.2.2 Placement of site- and public notices

Notice was also given to Interested and Affected Parties (I&APs) by the placement of notice boards. Notice boards were placed at noticeable and conspicuous places. A copy of the site notice and photographs of the site notices are attached in Appendix E and are also given in the figures below.



*Figure 25: Site notice 1 at the entrance gate to the proposed site*





*Figure 26: Site notice 2 on the perimeter fence of the proposed site*





VAPOROX (PTY) LTD.	VAPOROX (PTY) LTD.
<b>PUBLIC NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION, WASTE MANAGEMENT LICENSE AND AN ATMOSPHERIC EMISSION LICENSE</b>	<b>PUBLIEKE KENNISGEWING TER AANSOEK VIR OMGEWINGSMAGTIGING, AFVALBESTUURSLISENSIE EN 'N ATMOSFERIESE LISENSIE</b>
<p>Notice is hereby given that an application for environmental authorisation in terms of the EIA Regulations of 2010 (Regulations in terms of Chapter 5 of the National Environmental Management Act of 1998, as amended) has been lodged with the North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT). Notice is also given of a Waste Management License Application in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and an Atmospheric Emission License Application in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).</p> <p><b>Reference Numbers:</b> NWDEDECT: NWP/EIA/88/2013 and NWP/WMBP3/2013/14.</p> <p><b>Applicant:</b> Vaporox (Pty) Ltd.</p> <p><b>Project Names:</b></p> <ul style="list-style-type: none"> <li>Vaporox Waste Tyre Pyrolysis Plant, including the storage of dangerous goods (approximately 500m<sup>3</sup> of oil, ±5 tons of chemicals, such as catalysts, and 48 cubic tons of Liquefied Petroleum Gas) and the release of emissions from the pyrolysis plant that will require an Atmospheric Emission License (Environmental Authorisation Application in terms of NEMA, 1998)</li> <li>Vaporox Waste Tyre Pyrolysis Plant (Waste Management License application in terms of NEMWA, 2008)</li> </ul> <p><b>Project Location:</b> Portion 0 of Erf 37, Bodirelo Township, JQ, North West Province.</p> <p><b>Activity Description:</b> The project will entail the following: The construction and operation of a waste tyre pyrolysis plant. The following authorisation and license applications are required for proposed activities at the plant:</p> <ul style="list-style-type: none"> <li>Application for Environmental Authorisation</li> <li>Waste Management License application</li> <li>Atmospheric Emission License application</li> </ul> <p><b>Legislation:</b>  <b>National Environmental Management Act, 1998 (Act No. 107 of 1998):</b> Listing notice 2, R. 545 of 18 June 2010, Activity No. 3: The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</p> <p><b>Listing notice 2, R. 545 of 18 June 2010, Activity No. 5:</b> The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 and 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p> <p><b>Listing notice 2, R. 545 of 18 June 2010, Activity No. 26:</b> Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), except where such commencement requires a basic assessment in terms of Notice of No. 544 of 2010.</p> <p><b>Waste Management License Application</b> according to GN 921 of 29 November 2013 [National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)]; Category A, No. 2, Category A, No. 3, Category A, No. 5 and Category A, No. 12.</p> <p><b>Atmospheric Emission License Application</b> according to GN 248 of 31 March 2010 [National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)]; Category 3: Carbonization and Coal Gasification; 3.4. Char, charcoal and carbon black production; Char, charcoal and carbon black production (excluding electrode paste production); All installations.</p> <p><b>Invitation to Participate:</b> Should you require any additional information or wish to register as I&amp;AP and/or inform us of any other I&amp;APs and/or organisation and/or organ of state who should be notified, please submit your name, contact information, and interest in the matter in writing to Shangoni Management Services at the below address not later than 31 March 2014.</p> <p><b>Environmental Consultants: Shangoni Management Services (Pty) Ltd</b>                  PO Box 74728, Lynnwood Ridge, Pretoria, 0040                  Tel: (012) 807 7036, Fax: (012) 807 1014 / 086 643 5360, E-mail: <a href="mailto:lizette@shangoni.co.za">lizette@shangoni.co.za</a></p> <p><b>Project Coordinator: Innovative Business Systems Management Consultants (Pty) Ltd</b>                  PostNet Suite #264, Private Bag X21, Bryanston, 2021                  Tel: 072 905 0913, Fax: 086 226 2590, E-mail: <a href="mailto:info@ibs-africa.com">info@ibs-africa.com</a>, <a href="http://www.ibs-africa.com">www.ibs-africa.com</a></p> <p><b>Project Officials:</b></p> <ul style="list-style-type: none"> <li>Application for Environmental Authorisation (NWDEDECT): Ms Queen Imasiku; 014 567 3597</li> <li>Waste Management License Application (NWDEDECT): Ms Joyce Mautsu; 018 389 5091</li> </ul>	<p>Neem kennis dat 'n aansoek om omgewingsmagtiging in terme van die OIS Regulasies van 2010 (Regulasies in terme van Hoofstuk 5 van die Wet op Nasionale Omgewingsbestuur van 1998, soos gewysig) ingedien is by die Noordwes Departement van Ekonomiese Ontwikkeling, Omgewing, Bewaring en Toerisme. Neem ook kennis van 'n Afvalbestuurslisensie Aansoek in terme van die Wet op Nasionale Omgewingsbestuur: Afval Wet, 2008 (Wet Nr. 59 van 2008) en 'n Atmosferiese Emissie Lisensie Aansoek in terme van die Wet op Nasionale Omgewingsbestuur: Lug Kwaliteit Wet, 2004 (Wet Nr. 39 van 2004).</p> <p><b>Verwysingsnommers:</b> NWDEDECT: NWP/EIA/88/2013 and NWP/WMBP3/2013/14.</p> <p><b>Applikant:</b> Vaporox (Pty) Ltd.</p> <p><b>Projek Name:</b></p> <ul style="list-style-type: none"> <li>Vaporox Pirolyse Aanleg vir gebruikte bande, insluitend die berging van gevaarlike goedere (ongeveer 500m<sup>3</sup> olie, ±5 ton chemikalieë, soos katalisators, en 48 kubieke ton Vloeibare Petroleum Gas) en die vrystelling van emissies van die pirolyse-aanleg wat 'n atmosferiese emissie lisensie benodig (Aansoek om Omgewingsmagtiging in terme van die Wet op Nasionale Omgewingsbestuur, 1998)</li> <li>Vaporox Pirolyse Aanleg vir gebruikte bande (Afvalbestuurslisensie Aansoek in terme van die Wet op Nasionale Omgewingsbestuur: Afval Wet, 2008)</li> </ul> <p><b>Ligging:</b> Gedeelte 0 van Erf 37, Bodirelo Dorpsgebied, JQ, Noordwes Provinsie.</p> <p><b>Beskrywing van aktiwiteit:</b> Die projek behels die volgende: Die konstruksie en operasie van 'n afval-band pirolyse aanleg. Die volgende magtiging- en lisensie aansoeke word benodig vir voorgestelde aktiwiteite by die aanleg:</p> <ul style="list-style-type: none"> <li>Aansoek om Omgewingsmagtiging</li> <li>Afvalbestuurslisensie Aansoek</li> <li>Atmosferiese Lisensie Aansoek</li> </ul> <p><b>Wetgewing:</b>  <b>Wet op Nasionale Omgewingsbestuur, 1998 (Wet Nr 107 van 1998):</b> Lyskennisgewing 2, R. 545 van 18 Junie 2010, Aktiwiteit Nr 3: Die konstruksie van fasiliteite of infrastruktuur vir die berging, of berging en hantering van gevaarlike goedere, waar sodanige berging plaasvind in hours met 'n gekombineerde kapasiteit van meer as 500 kubieke meter.</p> <p><b>Lyskennisgewing 2, R. 545 van 18 Junie 2010, Aktiwiteit Nr 5:</b> Die konstruksie van fasiliteite of infrastruktuur vir enige proses of aktiwiteit wat vereis dat 'n permit of lisensie in terme van nasionale of provinsiale wetgewing wat die generering of vrystelling van uitlaat, besoedeling of uitlooiel beheer en wat nie geïdentifiseer is in Kennisgewing Nr. 544 van 2010 of ingesluit is in die lys van afvalbestuurs-aktiwiteite gepubliseer in terme van artikel 19 en 20 (b) van die Wet op Nasionale Omgewingsbestuur: Afval Wet, 2008 (Wet Nr. 59 van 2008) in welke geval daardie Wet van toepassing sal wees.</p> <p><b>Lyskennisgewing 2, R. 545 van 18 Junie 2010, Aktiwiteit Nr 26:</b> Die aanvang van 'n aktiwiteit, wat 'n atmosferiese lisensie vereis in terme van artikel 21 van die Wet op Nasionale Omgewingsbestuur: Lug Kwaliteit Wet, 2004 (Wet Nr. 39 van 2004), behalwe waar sodanige inwerkingtreding vereis dat 'n basiese assessering in terme van 'n kennisgewing van Nr 544 van 2010 sal geld.</p> <p><b>Afvalbestuurslisensie Aansoek</b> volgens GK 921 van 29 November 2013 (Nasionale Omgewingsbestuur: Afval Wet, 2008 (Wet Nr. 59 van 2008): Kategorie A, Nr. 2, Kategorie A, Nr. 3, Kategorie A, Nr. 5 en Kategorie A, Nr. 12.</p> <p><b>Atmosferiese Lisensie Aansoek</b> volgens GK 248 van 31 Maart 2010 in terme van die Wet op Nasionale Omgewingsbestuur: Lug Kwaliteit Wet, 2004 (Wet Nr. 39 van 2004); Kategorie 3: Karbonisasie en steenkoolverpasing; 3.4. Koolteer, houtskool en koolstof poeier produksie; Koolteer, houtskool en koolstof poeier (uitsluitend elektrode pasta produksie); Alle installasies.</p> <p><b>Publieke Deelname Uitnodiging:</b> Vir enige naraak, of indien u as belanghebbende en/of geaffekteerde party wil registreer of ons wil inlig van enige ander partye en/of organisasie en/of staatsinstelling wat in kennis gestel moet word, kan u gerus vir Shangoni Management Services kontak by die ondergenoemde kontakbesonderhede, nie later as 31 Maart 2014 nie.</p> <p><b>Omgewingskonsultante: Shangoni Management Services (Pty) Ltd.</b>                  Postbus 74728, Lynnwood Ridge, Pretoria, 0040                  Tel: (012) 807 7036, Faks: (012) 807 1014 / 086 643 5360, E-pos: <a href="mailto:lizette@shangoni.co.za">lizette@shangoni.co.za</a></p> <p><b>Projekkoördineerder: Innovative Business Systems Management Consultants (Pty) Ltd</b>                  PostNet Suite #264, Private Bag X21, Bryanston, 2021                  Tel: 072 905 0913, Faks: 086 226 2590, E-pos: <a href="mailto:info@ibs-africa.com">info@ibs-africa.com</a>, <a href="http://www.ibs-africa.com">www.ibs-africa.com</a></p> <p><b>Projek beamptes:</b></p> <ul style="list-style-type: none"> <li>Aansoek om Omgewingsmagtiging (NWDEDECT): Mej Queen Imasiku; 014 567 3597</li> <li>Afvalbestuurslisensie Aansoek (NWDEDECT): Mej Joyce Mautsu; 018 389 5091</li> </ul>

Figure 27: Wording of the notice board



#### **4.3.2.3 Notification Letter and Background Information Document**

Notification letters and the Background Information Document (BID) developed for the proposed project provide background information pertaining to the project and are intended to inform I&APs of the project. The BID also includes a registration form which potential I&APs, stakeholders and organs of state are encouraged to complete in order to register as I&APs for the proposed project.

The Notification Letters and BID were made available to all landowners adjacent to the proposed site, as well as to all organs of state that may have jurisdiction over any aspect of the activity.

Copies of the notification letters and BID and proof of their distribution to the adjacent landowners and organs of state are attached under Appendix E. Proof of postage of the notification letters is given in the figures below. Further proofs are also attached under Appendix E.



### List of REGISTERED LETTERS Lys van GEREgistreerde BRIEWE (with an insurance option/met 'n versekeringsopsie) Full tracking and tracing/Volledige volg en spoor

**Post Office**

Name and address of sender:  
Naam en adres van afsender: Shangani Management Services (Pty) Ltd  
P.O. Box 74726 Lynnwood Ridge 0040

Enquiries/Navroep  
Toll-free number  
Tollvry nommer  
**0800 111 502**

No.	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Klientafskrif
1	Bojanta Platinum District Municipality PO Box 1993 Rustenburg 0300 At Quality Officer - Fanie Mose					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 853 ZA CUSTOMER COPY 30102R
2	Bojanta Platinum District Municipality PO Box 1993 Rustenburg 0300 At Quality Officer - Ms Evelyn Molele					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 918 ZA CUSTOMER COPY 30102R
3	Bojanta Platinum District Municipality PO Box 1993 Rustenburg 0300 Mr. P. Molele					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 935 ZA CUSTOMER COPY 30102R
4	Bojanta Platinum District Municipality PO Box 1993 Rustenburg 0300 At Quality Officer - Amanda Bubu					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 921 ZA CUSTOMER COPY 30102R
5	Department of Water Affairs Private bag 4537 Hartbeespoort 0310 Seterenzel Ntshangase					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 895 ZA CUSTOMER COPY 30102R
6	Moses Koneke Local Municipality - Ward 10 Private bag X1011 Mogenese 0814 Mr. Mamba Lerato Sibha					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 904 ZA CUSTOMER COPY 30102R
7	Moses Koneke Local Municipality Private bag X1011 Mogenese 0814 Sharon Yasepal					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 881 ZA CUSTOMER COPY 30102R
8	Mvelakweni (Pty) Ltd t/a Bojanta Bus Services PO Box 6014 Rustenburg 0300 Mr. Abasi Sydney (Indra) Land Owen					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 042 ZA CUSTOMER COPY 30102R
9	N.W. Dept of Agric and Rural Development Private bag X2024 Mmabatho 2735 HOB: kgabane mabagane					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 878 ZA CUSTOMER COPY 30102R
10	N.W. Department of Finance Private bag X2040 Mmabatho 2735 HOB: m					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 011 ZA CUSTOMER COPY 30102R

Number of letters posted (10) Total R R R R

Signature of client Handtekening van klient Drwa

Signature of accepting officer Handtekening van aanneembeampte \_\_\_\_\_

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys beskikbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

Date stamp  
LETTERS  
POST OFFICE  
1 FEB 2011  
3  
0041  
Datumstempel

701248

### List of REGISTERED LETTERS Lys van GEREgistreerde BRIEWE (with an insurance option/met 'n versekeringsopsie) Full tracking and tracing/Volledige volg en spoor

**Post Office**

Name and address of sender:  
Naam en adres van afsender: Shangani Management Services (Pty) Ltd  
P.O. Box 74726 Lynnwood Ridge 0040

Enquiries/Navroep  
Toll-free number  
Tollvry nommer  
**0800 111 502**

No.	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Klientafskrif
1	N.W. Dept of Health Private bag X2026 Mmabatho 2735 HOB: mag-Gen. Dr. M. Redebe					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 798 943 ZA CUSTOMER COPY 30102R
2	N.W. Dept of Human Settlements, Public Works and Urban Private bag X2145 Mmabatho 2735 HOB: Mr M kgabane					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 798 912 ZA CUSTOMER COPY 30102R
3	N.W. Dept of Local Gov. and Traditional Affairs Private bag X2024 Mmabatho 2735 HOB: Mankwala Motlogelwa					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 798 926 ZA CUSTOMER COPY 30102R
4	N.W. Dept. of Public Works, Roads and Trans Private bag X2037 Mmabatho 2735 HOB: Mr. Mankwala Motlogelwa					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 798 890 ZA CUSTOMER COPY 30102R
5	North West Department of Social Dev Private bag X2037 Mmabatho 2735 HOB: Mankwala Motlogelwa					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 966 ZA CUSTOMER COPY 30102R
6	North West Dev Corporation (Pty) Ltd PO Box 4410 Mogenese 0814 Ms Tshogo Lesibang (Indra) Land Owen					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 039 ZA CUSTOMER COPY 30102R
7	Pietersburg National Park PO Box 1201 Mogenese 0814 Park manager - Johnson Mankwa					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 952 ZA CUSTOMER COPY 30102R
8	Vaalkop Dam Nature Reserve PO Box 1486 Mmabatho 2735 Park manager - M.M. Swart					REGISTERED LETTER Afskrif R100 tot R2000 RD 942 799 949 ZA CUSTOMER COPY 30102R
9						
10						

Number of letters posted (8) Total R R R R

Signature of client Handtekening van klient Drwa

Signature of accepting officer Handtekening van aanneembeampte \_\_\_\_\_

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R200,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys beskikbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

Date stamp  
LETTERS  
POST OFFICE  
1 FEB 2011  
3  
0041  
Datumstempel

701248

Figure 28: Proof of postage of notification letters

### 4.3.3 I&AP Register

Once all adjacent landowners, organs of state and the public were notified of the proposed project, an I&AP Register (as also provided in Appendix E) was compiled. The table below provides an extract of the I&AP Register indicating the organs of state and other I&APs that have been registered.

Table 20: Registered I&APs

No.	Department	Name
<b>Organs of State</b>		
1	Moses Kotane Local Municipality	Sharon Rasepal
2	Moses Kotane Local Municipality – Ward 10	Cllr. Martha Lerato Zitha
3	Bojanala Platinum District Municipality	Mr R. Mulaudzi
4	Bojanala Platinum District Municipality	Air Quality Official - Amanda Bubu
5	Bojanala Platinum District Municipality	Air Quality Official - Ms Evelyn Molotsi
6	Bojanala Platinum District Municipality	Air Quality Official - Fannie Mnisi
7	North West Department of Agriculture and Rural Development	HOD: Dr Kgabi Mogajane
8	North West Department of Finance	HOD: Mr Maanda
9	North West Department of Local Government and Traditional Affairs	HOD: Monnapula Motlogelwa
10	North West Department of Human Settlements, Public Safety and Liaison	HOD: Mr MI Kgantsi
11	North West Department of Public Works, Roads and Transport	HOD: Mr. Makgothi Thobakgale
12	North West Department of Social Development	Advocate Matshidiso Cordelia Mogale
13	North West Department of Health	Maj. Gen. Dr M. Radebe
14	Department of Water Affairs	Sebenzile Ntshangase
15	South African Heritage Resources Agency	TBC
No.	Interest/Company/Entity	Name
<b>Registered I&amp;APs</b>		
1	Park Manager- Pilanesberg National Park	Mr Johnson O. Maoka
2	Bojanala Platinum District Municipality	Mr Thapelo H. Mathekga

Refer also to Appendix E for a detailed I&APs Register including contact information for all registered organs of state and I&APs.

### 4.3.4 Public meeting(s)

No public meeting has been held nor is one anticipated at present.



#### **4.3.5 Access and opportunity to comment on written submissions**

This draft Scoping Report will be made available to I&APs and key stakeholders for review and commenting for a period of forty days. The report will also be submitted to the North West Department of Economic Development, Environment, Conservation and Tourism to obtain their comments.

An electronic copy of the draft Scoping Report will also be posted on Shangoni Management Services' website ([www.shangoni.co.za](http://www.shangoni.co.za)) for public comment for the same review period of forty days.

#### **4.3.6 Consultation with the relevant Authorities**

##### **4.3.6.1 Application form in terms of the NEMA, 1998**

The applicable Environmental Authorisation application form under NEMA, 1998, was submitted to the North West Department of Economic Development, Environment, Conservation and Tourism on the 17<sup>th</sup> of January 2014. A reference number (NWP/EIA/86/2013) was issued by NWDEDECT on the 7<sup>th</sup> of February 2014. The letter of acknowledgement indicating the above mentioned reference number is attached as Appendix G.

##### **4.3.6.2 Authorities meeting(s)**

No meetings have been held with any of the competent authorities nor are such meetings anticipated at present.

#### **4.3.7 Further consultation with relevant Authorities**

No further consultation has occurred.

#### **4.3.8 Comments and Responses**

To date, no comments have been received on the proposed project. All comments received in future will be included in a comments and responses report and also under Appendix E.

#### **4.3.9 Conclusions of the PPP**

In conclusion, the Public Participation exercise has provided adequate information to enable an understanding of what the proposed project activities would entail and to address the concerns and comments received during the scoping process.



## 5. NEED AND DESIRABILITY FOR THE ACTIVITY

A need and desirability for this project is evident from the following perspectives:

### 5.1 Developer / Applicant

The proposed project will generate a source of income for the applicant, Vaporox (Pty) Ltd and is therefore desirable from an economic point of view. In terms of the REDISA Plan, it is proposed that waste tyre producers (manufacturers and importers) will be charged a waste management fee of R2.30 + VAT for every kilogram of new tyre rubber produced. These funds will then be used for the development and support of recyclers, such as Vaporox (Pty) Ltd. Vaporox will also generate revenue from the selling of the products from the pyrolysis process, namely steel, purified oil and Carbon Black.

Obtaining Environmental Authorisation for the proposed pyrolysis plant and licensing the facility in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) will mean that the facility will be one of only a few waste tyre pyrolysis plants, licensed in terms of environmental legislation, in the area and Province. This legal compliance will ensure that the facility can operate for the foreseeable future without the risk of prosecution for non-compliance to the law. Together with registration as a Recycler with REDISA (Recycling and Economic Development Initiative of South Africa), the legal compliance should also ensure a supply of waste tyres to the facility from waste tyre producers.

### 5.2 Local community, District and Provincial Benefit

It is estimated that there are approximately 60 million legacy waste tyres in South Africa and approximately 11 million tyres are added to this total every year. These tyres are found in landfill sites, where they take up valuable space, as well as in stockpiles in residential, rural and industrial areas across South Africa. Many of the tyres are burnt, releasing liquids and noxious gases such as carbon monoxide and dioxins. In some rural areas, waste tyres are also burnt to generate heat, especially in winter months, resulting in health risks to those inhaling the resultant fumes ([www.redisa.org.za](http://www.redisa.org.za)).

Recycling of waste tyres is one way to eliminate the above mentioned problem and can be achieved through waste tyre pyrolysis. Local landfill sites will benefit from more landfill airspace being available for other waste types and people in the local, district and provincial areas will benefit from cleaner air and decreased health risks, as tyre burning will be prevented.

#### Local Community

The unemployment rate for the Moses Kotane Local Municipality was 37.9% according to the 2011 census (Statistics South Africa, 2011). The proposed project will generate approximately 20 new, direct employment opportunities and more than 30 new, indirect employment opportunities during the



construction phase. During the operational phase, approximately 20 permanent employment opportunities will be generated. These employment opportunities will act as a source of income for a number of households within the local municipal area. The proposed project will also stimulate other businesses, such as waste tyre collectors, especially as part of the REDISA Plan.

**District and Provincial Benefit**

The proposed project will form part of the country wide REDISA system and will assist in the establishment of REDISA. In doing so, the network of REDISA Transporters, Depots, Recyclers, Collection Points, Secondary Industries and Manufacturers/Importers will grow and be strengthened, leading to ever increasing employment opportunities. It is estimated that the REDISA Plan, through the establishment of the new waste tyre recycling industry, will create approximately 10 000 new employment opportunities ([www.redisa.org.za](http://www.redisa.org.za)).



## 6. IDENTIFIED ALTERNATIVES

The following definition of “alternatives” is given in the EIA Regulations of 18 June 2010: “alternatives”, in relation to the proposed activity, *means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-*

- a) *the property on which or location where it is proposed to undertake the activity;*
- b) *the type of activity to be undertaken;*
- c) *the design or layout of the activity;*
- d) *the technology to be used in the activity;*
- e) *the operational aspects of the activity; and*
- f) *the option of not implementing the activity”.*

Typically, alternative assessments are conducted to assist in comparing various projects or attributes of projects that will occur. The most critical comparison is evaluating any proposed project against the No-Go option. The alternatives assessment then considers alternatives to project site selection for the proposed development; alternatives to layout of the development; and alternatives to construction methodologies and/or materials used for the development.

The alternatives assessment was conducted using a simple cost-benefit analysis of each proposed alternative, through assessing various environmental attributes. These attributes can include physical (geology and soils, surface water quality and quantity, groundwater quality and quantity); biophysical (flora and fauna, sensitive environments); and social attributes (site of archaeological or cultural importance, land use issues, social health and welfare).

The impact of the each alternative was then evaluated in terms of whether it has a positive, negative, or no impact. In this instance, the impact is not evaluated in terms of significance but rather whether or not it will arise. Positive impacts are assigned a value of 1; no impact a value of 0; and a negative impact a value of -1.

By adding all of the attribute scores for each alternative, a suitability score is derived that indicates the preferred alternative. A total positive score indicates the project benefits outweigh the potential negative impacts, while a total negative score indicates the project environmental costs outweigh the potential benefits. Essentially, the highest scoring alternative is then carried forward for full impact evaluation.





## 6.1 No-Go Option

The potential impact of the preferred project option on environmental and socio-economic attributes identified during the assessment phase is evaluated against the potential impact of the No-Go option on the same attributes. The summary of this assessment is provided in the table below.

Table 21: Development vs. No-Go option

Attribute	Development Option	No-go Option
<b>Physical environment</b>		
Air Pollution	-1	0
Noise Pollution	-1	0
Water Quality	0	0
Water Quantity	0	0
Visual Aesthetics	1	-1
<b>Biophysical environment</b>		
Fauna and Flora	0	0
Sensitive Environments	0	0
<b>Social environment</b>		
Traffic	-1	0
Impact on property values	1	-1
Safety and security	1	-1
Local and regional economy	1	0
Infrastructure development	1	0
<b>Total</b>	<b>2</b>	<b>-3</b>

As can be seen in the table above, the development option (the Waste Tyre Pyrolysis plant) is preferred to the No-Go option (no use of the existing buildings at the site), as derived from comparative analysis. While the development option has negative impacts in terms of air and noise pollution and the generation of traffic, it also has benefits in terms of visual aesthetics (as the existing, derelict buildings will be fixed), property values, safety and security, infrastructure development and the local and regional economy. The positive social impacts outweigh the negative environmental impacts to give an overall positive score of “2”, whereas the No-Go Option results in a negative score of “-3”.

## 6.2 Alternatives considered

### 6.2.1 A: Activity alternatives

The proposed activity is the recycling and recovery of waste tyres through the use of a pyrolysis processes.



Currently, most tyres are disposed of to landfill or accumulate at various facilities or on vacant land where they are unmanaged. Alternative methods to dispose of, recycle or re-use the waste tyres include the following:

- **Alternative A1:** Tyres can be retreaded, whereby the remaining tread is removed and a new tread (rubber strip) is fused to the old “skeleton” of the tyre using vulcanisation. The quality of the retreaded tyre is, however, not high;
- **Alternative A2:** Tyres can be mechanically or cryomechanically milled/ground up and the rubber pieces used in other applications, such as for sport surfaces, carpets, playgrounds etc. If the rubber is ground up into a very fine powder, the powder can be used to reinforce new rubber products. These applications do not produce atmospheric emissions, but have a high energy usage and there is a limited market for the products;
- **Alternative A3:** It has often been attempted to reclaim scrap rubber products, but the process is difficult and costly. The quality of the reclaimed rubber is also not high and the re-selling of the reclaimed rubber as a raw material is therefore problematic; and
- **Alternative A4:** Pyrolysis presents an opportunity to produce valuable products from the waste tyres and can also result in less negative environmental impacts than for example, the burning of tyres or their disposal to landfill. The solid Char can be used as a smokeless fuel, to reinforce new rubber products or as activated Carbon. The oils can be used as fuels, a source of chemicals due to the oil’s mixture of organic compounds, or as a feedstock for the petroleum industry. Gases from the pyrolysis process consist of non-condensable organics like CO, CO<sub>2</sub>, H<sub>2</sub>, H<sub>2</sub>S, CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub> and C<sub>3</sub>H<sub>6</sub>, and can be used as a fuel for the pyrolysis process (Juma *et al.*, 2006).

Pyrolysis is seen as the most viable option at this stage and is also the type of recycling plant that the applicant would like to establish.

### 6.2.2 B: Location alternatives

Three location alternatives can be considered for this proposed project. The first is to construct the Waste Tyre Pyrolysis plant on an undeveloped property (Alternative B1), the second is to utilise a property with existing infrastructures suited for the proposed project (Alternative B2) and the third is to utilise a property with existing infrastructures, but which are not suited for the proposed project (Alternative B3).

**Alternative B1:** The use of an undeveloped property would entail the purchase or leasing of open land by the applicant and the development of the property from scratch. This would include the installation of all bulk services as well as the construction of the necessary buildings within which the pyrolysis plant would then be installed. This alternative would entail significant financial costs for site establishment, in addition to the costs for the pyrolysis plant itself, and is therefore not economically feasible. It is also possible that such an undeveloped site may lie within a Critical Biodiversity Area in



terms of the North West Biodiversity Conservation Plan and its development could therefore result in negative impacts in terms of fauna and flora loss.

**Alternative B2:** The use of a property with existing buildings which are suited to the proposed project is the preferred alternative and is the situation at the proposed site. The proposed site has three existing buildings that can be used for the pyrolysis process and associated processes, such as the storage of chemicals and products (e.g. steel, oil and Carbon black). Most of the site is already in a disturbed site (where the buildings are situated) and an open area remains where waste tyres can be stored prior to processing. Existing bulk services exist to the property, although the bulk services supply system would need to be repaired. An existing road and access gate is also present at the proposed site and the site is located close to main access roads to Mogwase CBD.

**Alternative B3:** The use of a property with existing buildings that are not suitable to the proposed project, such as a property where the existing buildings were used for offices or as houses, is not a feasible alternative for the following reasons: The buildings would not be big enough nor designed for industrial use and would need to be demolished so that suitable buildings could be constructed. This would entail significant financial costs, in addition to the costs for the pyrolysis plant itself, and is therefore not economically feasible.

### 6.2.3 C: Site layout alternatives

On the proposed site, there are limited site layout alternatives that can be considered. The alternatives include which of the three existing buildings are used for the pyrolysis plant, the storage of raw materials, such as chemicals, and the storage of product, such as steel, Carbon black and oil. The ideal use of each of the three buildings is being considered as part of the planning phase for the project. It is anticipated that Buildings 1 and 3 will be used for storage purposes and Building 2 for the pyrolysis plant itself. As only one half of the site is still open space, this area will be used for the storage of waste tyres prior to their processing.

### 6.2.4 D: Process and Design alternatives

The Waste Tyre Pyrolysis process is a relatively new process and is to a certain extent still being perfected. A number of process alternatives are being considered and the process that will be followed at the proposed plant has not yet been finalised. Process alternatives include, for example, the way in which the feedstock (waste tyres) will be cleaned, by either using water or compressed air. Other alternatives include the way in which the feedstock will be introduced into the reactor, such as through a gravity feed system or a bottom feeding system, and the type of reactor that will be used, for example a horizontal or vertical reactor. Vertical reactors can be fluidized bed, entrained bed or fixed bed reactors. The process can also be a continuous or batch process.

All these alternatives are being considered during the current design of the Waste Tyre Pyrolysis plant.



## 7. IDENTIFICATION OF ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This part of the document focuses on the identification of the major potential impacts the activities, processes and actions may have on the surrounding environment. It indicates the major impacts that these activities may have on the environmental components associated with the site, as required in terms of Regulation 28 (g) of R.543 of the EIA Regulations, 2010, under the NEMA, 1998.

### 7.1 Project phases and activities to be undertaken

For the purposes of this impact assessment, the project timeframe will be subdivided into the following four phases:

- Design and Planning Phase;
- Construction/Installation Phase;
- Operational Phase; and
- Decommissioning Phase.

Potential cumulative impacts were also identified, where applicable. Below is a summary of the main components/steps for each project phase.

#### 7.1.1 Design and planning Phase

- Designing, planning and sourcing of the Waste Tyre Pyrolysis plant technology;
- Designing and planning of the waste tyre storage area;
- Designing and sourcing of the atmospheric emission abatement measures;
- Designing and sourcing of the storage vessels, such as for the storage of oil, chemicals and Liquefied Petroleum Gas;
- Designing and sourcing of the water storage vessels/containers;
- Designing or sourcing of the backup generator; and
- Compilation of plans for the restoration of existing roofs, buildings, floors, ablution facilities, electrical systems, pipeline systems (water and sewage) and geysers.

#### 7.1.2 Construction and Installation Phase

- Fixing and revamping the existing buildings;
- Resurfacing or fixing existing concrete floors within the existing buildings;
- Replacement of vandalised electrical cables and stolen pipes;
- Replacement of all geysers;



- Restoration of all ablution facilities;
- Installation/construction of the Waste Tyre Pyrolysis plant and its associated infrastructures;
- Installation/construction of oil storage tanks and other storage structures, such as for the storage of chemicals, like catalysts, and end products, such as Carbon black;
- Installation of the backup generator;
- Installation/construction of the water storage tank(s);
- Demarcation or construction of the waste tyre storage area; and
- Concurrent rehabilitation of disturbed areas, where applicable.

### 7.1.3 Operational Phase

- The storage of waste tyres (onsite and possibly also off-site);
- The shredding of waste tyres to remove the steel within each tyre;
- The processing of the shredded tyres in the pyrolysis plant;
- The cleaning/scrubbing of gas produced during the pyrolysis process;
- The extraction of purified, water cooled oil;
- The extraction of Carbon (Char) and its further processing to Carbon black;
- The storage of removed steel;
- The storage of purified oil in storage tanks;
- The storage of Carbon black in silos and bags;
- The removal of product (steel, oil and Carbon black) from the site; and
- The pumping of sewage off site into the municipal sewage system.

### 7.1.4 Decommissioning Phase

Closure and decommissioning of the pyrolysis plant is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the North West Department of Economic Development, Environment, Conservation and Tourism prior to decommissioning.

## 7.2 Impacts identified

The main impacts identified for the proposed project are listed below. The environmental impact assessment report will include a full risk assessment of all environmental impacts. The Environmental Management Programme (EMP) will set out mitigation measures to be implemented during the Construction/Installation, Operational and Decommissioning Phases. Refer to Part 8 of this Scoping Report for the Impact Assessment methodology that will be followed as part of the EIA process.

### 7.2.1 Design and Planning Phase

The table below lists the potential impacts during the Design and Planning Phase.



Table 22: Potential impacts during Design and Planning Phase

<b>Impact: Air pollution (Generation of dust)</b>	
Contributing aspects	Inadequate design of the waste tyre storage area.
<b>Impact: Air pollution (Generation of air emissions)</b>	
Contributing aspects	Inadequate design of abatement measures for atmospheric emissions generated by the pyrolysis process and its associated processes.
	Inadequate design of storage vessels, such as those for the storage of oil, chemicals and Liquefied Petroleum Gas (LPG).
	Inadequate design of the Waste Tyre Pyrolysis plant.
<b>Impact: Environmental Noise</b>	
Contributing aspects	Inadequate design of the Waste Tyre Pyrolysis plant.
<b>Impact: Soil, surface and/or groundwater pollution</b>	
Contributing aspects	Inadequate design of storage vessels, such as those for the storage of oil, chemicals and Liquefied Petroleum Gas (LPG).
	Inadequate design of the Waste Tyre Pyrolysis plant.
	Inadequate design of the ablution facilities.
	Inadequate design, repair and/or replacement of the sewage pipeline system.
<b>Impact: Injury or possible death</b>	
Contributing aspects	Inadequate design (i.e. unsafe operating conditions) of the Waste Tyre Pyrolysis plant.
<b>Impact: Soil erosion</b>	
Contributing aspects	Inadequate design of the waste tyre storage area.
<b>Impact: Resources wastage</b>	
Contributing aspects	Inadequate design of water storage vessels.
	Inadequate design or ineffective operation of the backup generator.
	Inadequate design of the Waste Tyre Pyrolysis plant.
	Inadequate design, repair and/or replacement of the water pipeline system.

## 7.2.2 Construction/Installation Phase

The table below lists the potential impacts during the Construction Phase.

Table 23: Potential impacts during Construction/Installation Phase

<b>Impact: Soil Pollution and Degradation</b>	
Contributing aspects	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
	Incorrect management, storage and disposal of concrete and cement.
	Incorrect management, storage and disposal of chemicals.
	Incorrect management, storage and disposal of construction, general and hazardous waste.



	Incorrect management and disposal of contaminated wash water or wastewater.
	Unsanitary conditions on site.
	Loss of topsoil due to ineffective topsoil removal and storage.
<b>Impact: Air pollution and nuisance (generation of dust)</b>	
Contributing aspects	Construction vehicles not adhering to speed limits on the site.
	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
	Ineffective dust suppression.
<b>Impact: Air pollution and nuisance (generation of air emissions)</b>	
Contributing aspects	Vehicle emissions released from the additional construction vehicles and equipment used during the construction phase and clearance of vegetation.
	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
<b>Impact: Environmental Noise and nuisance</b>	
Contributing aspects	Noise generated by additional construction vehicles and equipment during the construction activities.
	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
<b>Impact: Surface and/or groundwater pollution</b>	
Contributing aspects	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
	Incorrect management, storage and disposal of concrete and cement.
	Incorrect management, storage and disposal of chemicals.
	Incorrect management, storage and disposal of construction, general and hazardous waste.
	Unsanitary conditions on site.
	Incorrect management and disposal of contaminated wash water or wastewater.
	Spillages from cleaning equipment used for construction (e.g. cement mixers).
<b>Impact: Injury or possible death</b>	
Contributing aspects	Inadequate training of employees or contractors on risks associated with construction phase, such as working at heights.
	Safety hazards may occur if equipment is not handled in the correct manner.
	If employees do not receive the correct PPE for their specific responsibilities.
	If employees do not adhere to safety rules implemented at the construction site.
<b>Impact: Soil erosion</b>	



Contributing aspects	Soil erosion due to clearance of vegetation.
	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
	Inadequate concurrent rehabilitation.

### 7.2.3 Operational Phase

The table below lists the potential impacts during the Operational Phase.

Table 24: Potential impacts during Operational Phase

Impact: Soil Pollution	
Contributing aspects	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
	Incorrect management, storage and disposal of chemicals and fuels.
	Incorrect management, storage and disposal of general and hazardous waste.
	Unsanitary conditions on site.
	Incorrect management and disposal of contaminated wash water or wastewater.
	Leaking or broken sewage pipes.
	Contamination of stormwater runoff.
	Incorrect storage of waste tyres and shredded tyres resulting in leachate formation.
	Inadequate storage of oil, such as on a permeable surface.
	Inadequate storage of ash.
Impact: Air pollution (Generation of dust)	
Contributing aspects	Vehicles not adhering to speed limits on the site.
	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
Impact: Air pollution and nuisance (generation of air emissions)	
Contributing aspects	Release of atmospheric emissions from potential burning of stockpiled tyres due to unsafe storage practices that result in the establishment of fires.
	Potential establishment of fires due to the inadequate storage of diesel and oil.
	Atmospheric emissions from the pyrolysis plant.
	Inadequate or ineffective storage of Carbon black and other products from the pyrolysis process.
	Atmospheric emissions due to an inefficient emission abatement system.
	Atmospheric emissions from diesel generator on site.
	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.





	Inadequate storage of ash.
	Increased traffic flow to the site.
<b>Impact: Environmental Noise</b>	
Contributing aspects	Noise generated by the pyrolysis process and vehicles travelling to and from the facility.
	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
<b>Impact: Surface and/or groundwater pollution</b>	
Contributing aspects	Workers and/or contractors being uneducated in terms of how their activities can negatively impact on the environment.
	Incorrect management, storage and disposal of chemicals and fuels.
	Incorrect management, storage and disposal of general and hazardous waste.
	Unsanitary conditions on site.
	Incorrect management and disposal of contaminated wash water or wastewater.
	Contamination of stormwater runoff.
	Leaking or broken sewage pipes.
	Incorrect storage of waste tyres and shredded tyres resulting in leachate formation.
	Inadequate storage of oil, such as on a permeable surface.
	Inadequate storage of ash.
<b>Impact: Surface and/or groundwater quantity impacts (Municipal water supply)</b>	
Contributing aspects	Leaking or broken water storage vessels.
	Leaking or broken water pipelines.
<b>Impact: Injury or possible death</b>	
Contributing aspects	Inadequate training of employees or contractors on risks associated with operational activities.
	Safety hazards may occur if equipment is not handled in the correct manner.
	If employees do not receive the correct PPE for their specific responsibilities.
	If employees do not adhere to safety rules implemented at the construction site.
<b>Impact: Soil erosion</b>	
Contributing aspects	Possible soil erosion due to incorrectly managed stormwater runoff.
<b>Impact: Resources wastage</b>	
Contributing aspects	Leaking or broken water storage vessels.
	Leaking or broken water pipelines.
	Inefficient or ineffective operation of the backup generator.
	Inefficient or ineffective operation of the Waste Tyre Pyrolysis plant.



### 7.2.4 Decommissioning Phase

Closure and decommissioning of the pyrolysis plant is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the North West Department of Economic Development, Environment, Conservation and Tourism prior to decommissioning.

### 7.2.5 Cumulative Impacts

The following potential cumulative impacts have been identified and will be investigated further during the EIA phase:

Table 25: Cumulative impacts

<b>Impact: Air pollution and nuisance (generation of air emissions)</b>	
Contributing aspects	Atmospheric emissions generated at the proposed pyrolysis plant will add to atmospheric emissions released by all other sources within the municipal area and beyond. The combined release of atmospheric emissions within the Bojanala Platinum District Municipality and the Waterberg District Municipality is governed in terms of the Waterberg-Bojanala National Air Shed Priority Area's Air Quality Management Plan
<b>Impact: Environmental Noise</b>	
Contributing aspects	Noise generated at the proposed pyrolysis plant will add to existing noise levels as generated by the other industries within the Bodirelo Industrial Site, Mogwase

## 7.3 Conclusion on impacts identified

In general the expected environmental impacts from the construction and operation of the Waste Tyre Pyrolysis plant and associated infrastructures do not indicate that the proposed activities would have irreversible detrimental effects on the receiving environment. However, further specialist studies and investigations will be carried out during the EIA phase and will thus be taken into consideration when conducting the risk (impact) assessment for the proposed project. Information obtained during the abovementioned phase will be included in the EIR. Refer to Part 8 of this Scoping Report for further information.

## 7.4 Specialist Studies Identified

- Atmospheric Impact Report.



## 7.5 Processes to be undertaken to ensure that impacts are mitigated

Mitigation measures need to be identified to ensure that impacts from the proposed activity are reduced as far as possible. The following mitigation measures objectives will be kept in mind while mitigation measures are identified:

- To find more environmentally sound ways of undertaking specific activities;
- To enhance any environmental and social benefits of a proposed activity;
- To avoid, minimise or remedy negative environmental impacts; and
- To ensure that any residual negative environmental impacts are environmentally acceptable.

Identifying appropriate mitigation measures will be conducted in a hierarchal manner:

1. Preventative measures will be identified to avoid, where possible, negative impacts that may arise as a result of the proposed activity;
2. Measures will be identified to minimise and/or reduce the negative impacts to “as low as practicable” levels; and
3. Measures will be identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced any further (Department of Environmental Affairs, 2006).

Proposed mitigation measures will be communicated to the applicant for review as part of Draft Environmental Management Plan (EMP). The applicant will comment on the feasibility and practicality of implementing the mitigation measures. The mitigation measures may be adjusted based on the applicant's comments.



## 8. PLAN OF STUDY FOR EIA

In accordance with of Regulation 28 (of Regulation 543) of the EIA Regulations (2010), under the NEMA, 1998, the knowledge gaps identified and a description of the tasks that will be undertaken as part of the EIA process, including any specialist reports or specialised processes (including the manner in which such tasks will be undertaken), are discussed in this part of the Scoping Report.

### 8.1 Tasks to be undertaken as part of the EIA process

The Environmental Impact Assessment process will be conducted subsequent to the Scoping process and will be undertaken in accordance with the Regulation 31 of the EIA Regulations of 18 June 2010. The Environmental Impact Report (EIR) for the proposed project will include detailed information relating to the potential or anticipated impacts that may arise as a result of the proposed activity.

The EIR and draft EMP in accordance with NEMA (1998) and as per the EIA Regulations R.543 of 18 June 2010, will include, but is not limited to, the following:

- Details of the Environmental Assessment Practitioner (EAP);
- Expertise of the EAP to carry out an EIA;
- A detailed description of the proposed activity;
- A description of the property on which the activity is to be undertaken and the location of the activity on the property;
- A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;
- Details of the public participation process followed;
- A description of the need and desirability of the proposed activity;
- A description of the identified alternatives to the proposed activity, including advantages and disadvantages that the proposed activity may have on the environment and the community that may be affected by the activity;
- An indication of the methodology used in determining the significance of potential environmental impacts;
- A description and comparative assessment of all alternatives identified during the environmental impact assessment process;
- A summary of the findings and recommendations of any specialist report or report on a specialised process (no specific requests have been received from the competent authorities to date);
- A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;



- An assessment of each identified potentially significant impact, including cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources, and the degree to which the impact can be mitigated;
- A description of any assumptions, uncertainties and gaps in knowledge;
- A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- An environmental impact statement;
- A draft environmental management programme containing the aspects contemplated in the regulations, including, but not limited to, environmental management objectives and goals, mitigation measures and management of significant impacts, a description of persons responsible for mitigation implementation, description of time periods applicable to mitigation implementation, and monitoring and performance assessment;
- Inclusion of technical and supporting information;
- Copies of any specialist reports and reports on specialised processes complying with regulation;
- Any specific information that may be required by the competent authority; and
- Any other matters required in terms of sections 24(4)(a) and (b) of the Act.

Compilation of the EIR and draft EMP will be conducted according to the EIA Regulations of 18 June 2010 (R.543) as per NEMA, 1998, and will include, but is not limited to, the following:

- The compilation of the EIR as stipulated in Regulation 31 of R.543 (18 June 2010), as per NEMA, 1998;
- The draft EIR and EMP will be submitted to the applicant for input prior to its submission for public and competent authority comment;
- Public Participation will be conducted in accordance with the EIA Regulations of 18 June 2010 (R.543). This will include submission of the draft EIR and EMP to the competent authority and the public in order to obtain their comments for a period of 40 days [R543(56)];
- All comments, objections and/or representations received during the Public Participation Process will be included and addressed in the final EIR and this document will be finalised;
- The final EIR and draft EMP will be submitted to the client to obtain their inputs;
- Registered Interested and Affected Parties will be given an opportunity to comment on the final EIR as stipulated in R543 (56)(6). Their comments will be submitted to the competent authority and the EAP or applicant will be copied;
- The final EIR and draft EMP will be submitted to the competent authority for consideration. The competent authority will have 14 days to acknowledge receipt of the final EIR. Thereafter, the competent authority has 60 days to consider the report and in writing accept the report, reject the report, or ask for additional information or amendments to the document [R.543(34)(2)]. Once the report has been accepted, the competent authority has 45 days to grant or refuse authorisation [R.543(35)(1)];



- Continued consultation with the relevant authority until issuing of the decision.

## 8.2 Stages at which the competent authority will be consulted

The stages at which the competent authority will be consulted in the process of compiling the EIR and draft EMP as per the EIA Regulations R.543 (2010), will include amongst others, the following:

- During the Public Participation Process in accordance to EIA Regulations R.543 (2010), the draft EIR will be submitted to the competent authority for a period of 40 days (unless agreed otherwise) to obtain their comments [R543 (56)];
- The final EIR will be submitted to the competent authority. They will have 60 days, after acknowledging receipt of the final EIR, to consider the report and in writing accept the report, reject the report or request additional information or amendments to the document [Regulation 543(34)(2)]; and
- Continued consultation with the competent authority until the decision is issued.

## 8.3 Methodology of assessing the environmental impacts

It is required by Regulation 28 (g) of R.543 of the EIA Regulations, 2010, that major potential impacts on the surrounding environment, as a result of the proposed activity, are identified during the Scoping Phase.

Regulation 31 of R.543 of the EIA Regulations (2010), under the NEMA (1998), requires that an EIR includes an assessment of the status, extent, duration, probability, reversibility, replaceability of resources and mitigatory potential of the major potential environmental impacts of the proposed activity.

A baseline identification of the major potential impacts has therefore only been included in this Scoping Report. The prediction of the nature of each impact, the evaluation of each impact by rating its significance and the management and mitigation measures adopted to address each impact, will be assessed during the EIR.

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication and evaluation;
- Specification of the impact identification techniques;
- Criteria to evaluate the significance of impacts;
- Design of mitigation measures to lessen impacts;
- Definition of the different types of impacts (indirect, direct or cumulative); and
- Specification of uncertainties.

In broad terms, the impact assessment for this project will include the following:

- All potential impacts of the proposed activity will be identified and assessed;
- The nature, extent, magnitude and duration of all potentially significant impacts will be predicted;



- A range of mitigation measures that could diminish the impacts will be identified; and
- The significance of residual impacts that remain, after the proposed mitigation measures are implemented, will be evaluated.

The construction, operational and decommissioning phases of the project will be considered whilst identifying impacts. A detailed understanding of the proposed activity will be obtained to ensure that all the potential impacts are identified. The following process will be followed to identify and assess the potential impacts of the proposed activity:

- The current environmental conditions will be determined in detail. This will act as a baseline against which impacts can be identified and measured;
- The changes that will occur in future, should the proposed activity not occur, will be identified;
- A detailed understanding of the activity will be obtained in order to fully understand its consequences; and
- The significant impacts that will occur as a result of the proposed activity will be identified (should the activity be authorised).

After all impacts have been identified, the nature of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined and appropriate mitigation measures can be developed.

The risk assessment methodology is based on defining and understanding the three basic components of the risk, i.e. the source of the risk, the pathway and the target that experiences the risk (receptor). Refer to the figure below for a model representing the above principle (as contained in the DWA's Best Practice Guideline: G4 – Impact Prediction).

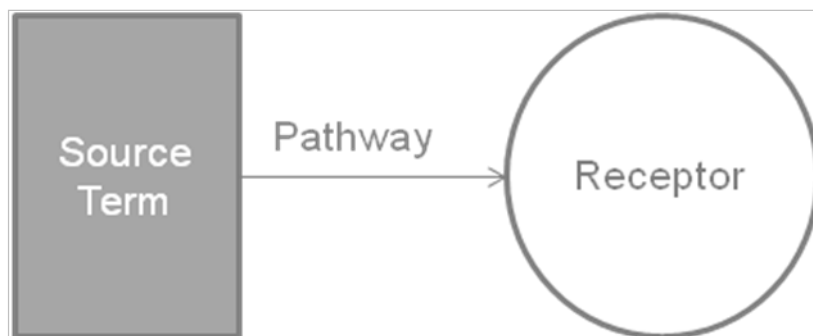


Figure 29: DWA's model for impact prediction (risk assessments)

Tables 26 and 27 below indicate the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and Table 28 provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.



Table 26: Determination of Probability of the Impact

Frequency of Aspect / Unwanted Event	Score	Availability of pathway from the source to the receptor	Score	Availability of receptor	Score
Never known to have happened, but may happen	1	A pathway to allow for the impact to occur is never available	1	The receptor is never available	1
Known to happen in industry	2	A pathway to allow for the impact to occur is almost never available	2	The receptor is almost never available	2
< once a year	3	A pathway to allow for the impact to occur is sometimes available	3	The receptor is sometimes available	3
Once per year to up to once per month	4	A pathway to allow for the impact to occur is almost always available	4	The receptor is almost always available	4
Once a month - Continuous	5	A pathway to allow for the impact to occur is always available	5	The receptor is always available	5

**Step 1:** Determine the **PROBABILITY** of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor.





Table 27: Determination of Magnitude of impact

Source				Receptor							
Duration of impact	Score	Extent	Score	Volume/ Quantity/ Intensity	Score	Toxicity / Destruction Effect	Score	Reversibility	Score	Sensitivity of environmental component	Score
Lasting days to a month	1	Effect limited to the site (metres)	1	Very small quantities/ volumes/ intensity (e.g. <50L or <1hHa)	1	Non-toxic (e.g. water)/ Very low potential to create damage or destruction to the environment	1	Bio-physical and/or social functions and/or processes will remain unaltered.	1	Current environmental component(s) are largely disturbed from the natural state. Receptor of low significance/ sensitivity	1
Lasting 1 month to 1 year	2	Effect limited to the activity and its immediate surroundings. (tens of metres)	2	Small quantities/ volumes/ intensity (e.g. 50L to 210L or 1Ha to 5Ha)	2	Slightly toxic/ Harmful (e.g. diluted brine)/ Low potential to create damage or destruction to the environment	2	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	2	Current environmental component(s) are moderately disturbed from the natural state. No environmentally sensitive components.	2
Lasting 1 – 5 years	3	Impacts on extended area beyond site boundary (hundreds of metres)	3	Moderate quantities / volumes / intensity (e.g. > 210 L < 5000L or 5 – 8Ha)	3	Moderately toxic (e.g. slimes)Potential to create damage or destruction to the environment	3	Bio-physical and/or social functions and/or processes might be notably altered or enhanced/ Partially reversible	3	Current environmental component(s) are a mix of disturbed and undisturbed areas. Area with some environmental sensitivity (scarce / valuable environment etc.).	3
Lasting 5 years to Life of Organisation	4	Impact on local scale / adjacent sites (km's)	4	Very large quantities / volumes / intensity (e.g. 5000 L – 10 000L or 8Ha– 12Ha)	4	Toxic (e.g. diesel & Sodium Hydroxide)	4	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced /	4	Current environmental component(s) are in a natural state. Environmentally sensitive environment / receptor	4



Source						Receptor					
Duration of impact	Score	Extent	Score	Volume/ Quantity/ Intensity	Score	Toxicity / Destruction Effect	Score	Reversibility	Score	Sensitivity of environmental component	Score
								potentially irreversible		(endangered species / habitats etc.).	
Beyond life of Organisation / Permanent impacts	5	Extends widely (nationally or globally)	5	Very large quantities / volumes / intensity (e.g. > 10 000 L or > 12Ha)	5	Highly toxic (e.g. arsenic or TCE)	5	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	5	Current environmental component(s) are in a pristine natural state. Highly Sensitive area (endangered species, wetlands, protected habitats etc.)	5

**Step 2:** Determine the **MAGNITUDE** of the impact by calculating the average of the factors above.

Table 28: Determination of Severity of impact

ENVIRONMENTAL IMPACT RATING / PRIORITY					
	MAGNITUDE				
PROBABILITY	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

**Step 3:** Determine the **SEVERITY** of the impact by plotting the averages that were obtained above for Probability and Magnitude in the table below.



## 8.4 Public Participation during the EIA process

The compilation of the EIR and draft EMP, as per R.543 will include, but is not limited to, the following public participation processes:

- The draft EIR and draft EMP will be provided to the client for review prior to public and competent authority comment;
- The Public Participation Process will be conducted in accordance with the EIA Regulations R.543 (2010). This will include submitting the draft EIR to the competent authority and public for a review period of 40 days [Regulation 543(56)];
- All comments, objections and/or representations received during the Public Participation Process will be included and addressed in the final EIR and this document will be finalised;
- The final EIR and draft EMP will be submitted to the client to obtain their inputs; and
- Registered Interested and Affected Parties (I&APs) will be given an opportunity to comment on the final EIR as stipulated in R.543(56)(6). Their comments will be submitted to the competent authority and the EAP or applicant will be copied.

## 8.5 Alternatives

Alternatives have and will continue to be investigated and the “No-Go Option” will be included in the alternatives assessment. The EIA document will discuss the alternatives identified and investigated for the proposed project as well as the advantages and disadvantages of each.

## 8.6 Knowledge gaps and specialist studies

The following knowledge gaps and uncertainties have been identified during the scoping process of the proposed project and require further investigations that will be comprehensively carried out as part of the EIA process for the proposed project:

- All relevant specialist studies need to be conducted for the area associated with the proposed project. The studies identified during the Scoping Phase include an Air Quality Impact Report;
- While impacts have been identified as part of the scoping process, it is required as part of the EIA Phase to fully quantify impacts to all aspects of the environment; and
- Detailed designs for the pyrolysis plant and its pollution control measures are being developed. These designs will be presented as part of the final EIR.



## 9. CONCLUSION

This scoping process has been carried out in accordance with the NEMA, 1998, and the Regulations there under.

The following main potential environmental impacts have been identified as part of this Scoping phase:

- Soil, surface water and ground water pollution due to incorrect management and disposal of cement and concrete;
- Soil, surface water and ground water pollution due to the run-off of contaminated wash water;
- Soil pollution and degradation due to incorrect management, storage and disposal of construction, general and hazardous waste;
- Generation of noise pollution and nuisance;
- Soil, surface water and ground water pollution due to unsanitary conditions onsite;
- Soil, surface water and ground water pollution due to inadequate storage of shredded tyres;
- Pollution of the atmosphere due to release of atmospheric emissions, such as dioxins, furans, particulate matter (PM), oxides of nitrogen (NO<sub>x</sub>), oxides of sulphur (SO<sub>x</sub>), Carbon Dioxide (CO<sub>2</sub>) and Carbon Monoxide (CO), from the pyrolysis process;
- Generation of odourous emissions from the pyrolysis process;
- Generation of emissions from the storage of products of the pyrolysis process;
- Health and safety risks to workers at the facility;
- Soil, surface water and ground water pollution due to the incorrect management, storage and disposal of chemicals, such as catalysts, and oil;
- Soil, surface water and ground water pollution due to incorrect management and disposal of ash generated during the pyrolysis process under abnormal conditions;
- Soil, surface water and ground water pollution due to affected stormwater runoff;
- Increased traffic flow to the site and potential strain on existing road infrastructures as well as creating a higher risk of vehicular accidents on the access roads;
- Fire establishment or explosion as a result of the storage of Liquefied Petroleum Gas (LPG); and
- Fire establishment as a result of the storage of feedstock, namely waste tyres.

Appropriate mitigation measures will assist in minimising the potential impacts on the surrounding environment during the construction and operational phases of the development. These will be identified during the Environmental Impact Assessment Phase of this project.

Knowledge gaps identified as part of this scoping phase include a specialist study (Atmospheric Impact Report) as well as the finalisation of designs for pyrolysis plant and its associated infrastructures, such as abatement measures for atmospheric emissions.



Based on the above-mentioned information and the identification of the potential environmental impacts as a result of the proposed Waste Tyre Pyrolysis plant, it is concluded that a full Environmental Impact Assessment may commence.

