



**Client** | P J J van Vuuren Beleggings (Pty) Ltd

**Project** | Draft Environmental Management Programme

**Date** | April 2019

**Labesh**

ability to sustain

P J J van Vuuren Beleggings

Draft Environmental Management Programme (EMPr)

EIA Ref No. Gaut: 002/18-19/E0123

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## DEFINITIONS

### **Alternatives**

In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the-

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

### **Application**

An application for an Environmental Authorisation (EA).

### **Basic Assessment Report**

A report contemplated in regulation 21 of the EIA Regulations, 2014.

### **Buffer Area**

Unless specifically defined, means an area extending 10 kilometres from the proclaimed boundary of a world heritage site or national park and 5 kilometres from the proclaimed boundary of a nature reserve, respectively, or that defined as such for a biosphere.

### **Cumulative Impact**

In relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

### **Dangerous Good**

Goods containing any of the substances as contemplated in South African National Standard No. 10234, supplement 2008 1.00: designated "List of classification and labelling of chemicals in accordance with the Globally Harmonized Systems (GHS)" published by Standards South Africa, and where the presence of such goods, regardless of quantity, in a blend or mixture, causes such blend or mixture to have one or more of the characteristics listed in the Hazard Statements in section 4.2.3, namely physical hazards, health hazards or environmental hazards.

### **Development**

The building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.

### **Development footprint**

Any evidence of physical alteration as a result of the undertaking of any activity.

### **EAP**

An environmental assessment practitioner as defined in section 1 of NEMA.

## **EMPr**

An environmental management programme contemplated in regulations 19 and 23 of the EIA Regulations, 2014.

## **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 Impact Assessment**

A systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes Basic Assessment and Scoping and Environmental Impact Reporting.

## **Independent**

In relation to an EAP, a specialist or the person responsible for the preparation of an environmental audit report, means-

- a) that such EAP, specialist or person has no business, financial, personal or other interest in the activity or application in respect of which that EAP, specialist or person is appointed in terms of the EIA Regulations; or
- b) that there are no circumstances that may compromise the objectivity of that EAP, specialist or person in performing such work;

excluding -

- (i) normal remuneration for a specialist permanently employed by the EAP; or
- (ii) fair remuneration for work performed in connection with that activity, application or environmental audit.

## **Indigenous Vegetation**

Vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

## **Industrial Complex**

An area used or zoned for industrial purposes, including bulk storage, manufacturing, processing or packaging purposes.

## **Mitigation**

To anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

## **Phased Activities**

An activity that is developed in phases over time on the same or adjacent properties to create a single or linked entity.

## **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 in terms of regulation 42 of the EIA Regulations, 2014.

## **Significant Impact**

An impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.

### **Specialist**

A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies.

### **Systematic Biodiversity Plan**

A plan that identifies important areas for biodiversity conservation, taking into account biodiversity patterns (i.e. the principle of representation) and the ecological and evolutionary processes that sustain them (i.e. the principle of persistence). A systematic biodiversity plan must set quantitative targets/thresholds for aquatic and terrestrial biodiversity features in order to conserve a representative sample of biodiversity pattern and ecological processes.

### **Watercourse**

- (a) a river or spring;
  - (b) a natural channel in which water flows regularly or intermittently;
  - (c) a wetland, pan, lake or dam into which, or from which, water flows; and
- any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998); and
- a reference to a watercourse includes, where relevant, its bed and banks.

### **Wetland**

Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.



## ABBREVIATIONS

<b>BAR</b>	-	Basic Assessment Report
<b>BID</b>	-	Background Information Document
<b>CBA</b>		Critical Biodiversity Area
<b>DWS</b>	-	Department of Water and Sanitation
<b>EA</b>	-	Environmental Authorisation
<b>EAP</b>	-	Environmental Assessment Practitioner
<b>EIA</b>	-	Environmental Impact Assessment
<b>EMF</b>	-	Environmental Management Framework
<b>EMPr</b>	-	Environmental Management Programme
<b>ESA</b>		Ecological Support Area
<b>Ha</b>		Hectare
<b>PA</b>		Protected Area
<b>GDARD</b>	-	Gauteng Department of Agriculture and Rural Development
<b>GN</b>	-	Government Notice
<b>I&amp;AP</b>	-	Interested and Affected Party
<b>IWULA</b>	-	Integrated Water Use Licence Application
<b>NEMA</b>	-	National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended
<b>NEM:WA</b>	-	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), as amended
<b>NWA</b>		National Water Act, 1998 (Act No. 36 of 1998)
<b>NHRA</b>	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999), as amended
<b>R</b>	-	Regulation
<b>SANS</b>		South African National Standards
<b>SAHRA</b>	-	South African Heritage Resources Agency

## 1. PROJECT TITLE

Residential development for P J J van Vuuren Beleggings on Erf 1211, Pierre van Ryneveld

## 2. APPLICANT DETAILS

<b>Applicant Name</b>	P J J Van Vuuren Beleggings (Pty) Ltd
<b>Contact Person</b>	Piet Janse van Vuuren
<b>Postal Address</b>	PO Box 555, Wapadrand, 0050
<b>Telephone Number</b>	012 807 0760
<b>Email Address</b>	012 807 0767

## 3. ENVIRONMENTAL ASSESSMENT PRACTITIONER DETAILS

<b>Environmental Assessment Practitioner Company</b>	Labesh (Pty) Ltd
<b>Contact Person</b>	Lourens de Villiers
<b>Postal Address</b>	Postnet Box 469, Private Bag X504, Sinoville, 0129
<b>Telephone Number</b>	082 789 6525
<b>Fax Number</b>	086 552 6837
<b>Email Address</b>	admin@labesh.co.za
<b>Qualifications</b>	B.Sc Earth Science (North West University) Hons B.Sc Geography and Environmental Studies (North West University) M.Sc Water Resource Management (University of Pretoria)
<b>Relevant experience</b>	17 years' experience conducting Environmental Impact Assessment processes

The EAP's full Curriculum Vitae is attached to the Basic Assessment Report under Appendix E.

## 4. LOCATION OF THE PROPOSED DEVELOPMENT AND ACTIVITIES

The property for the proposed development and its associated activities is as follows:

Property/Land Parcel	21 digit Surveyor General Code	Property size
Erf 1211, Pierre van Ryneveld Extension 2	T0JR01970000121100000	34 109m <sup>2</sup> .

The project location is situated north-east of Centurion, in the City of Tshwane Metropolitan Municipality, Gauteng Province. The sites physical address is: Klopper Road, Pierre van Ryneveld, Centurion, 0045, Gauteng (on the western side of Van Ryneveld Road, between Dan Pienaar Road and Klopper Road). The GPS coordinates for the project site are as follows: 25°50'53.71", 28°14'42.06".

A locality map, provided on the next page, shows the location of the project property, at an appropriate scale.

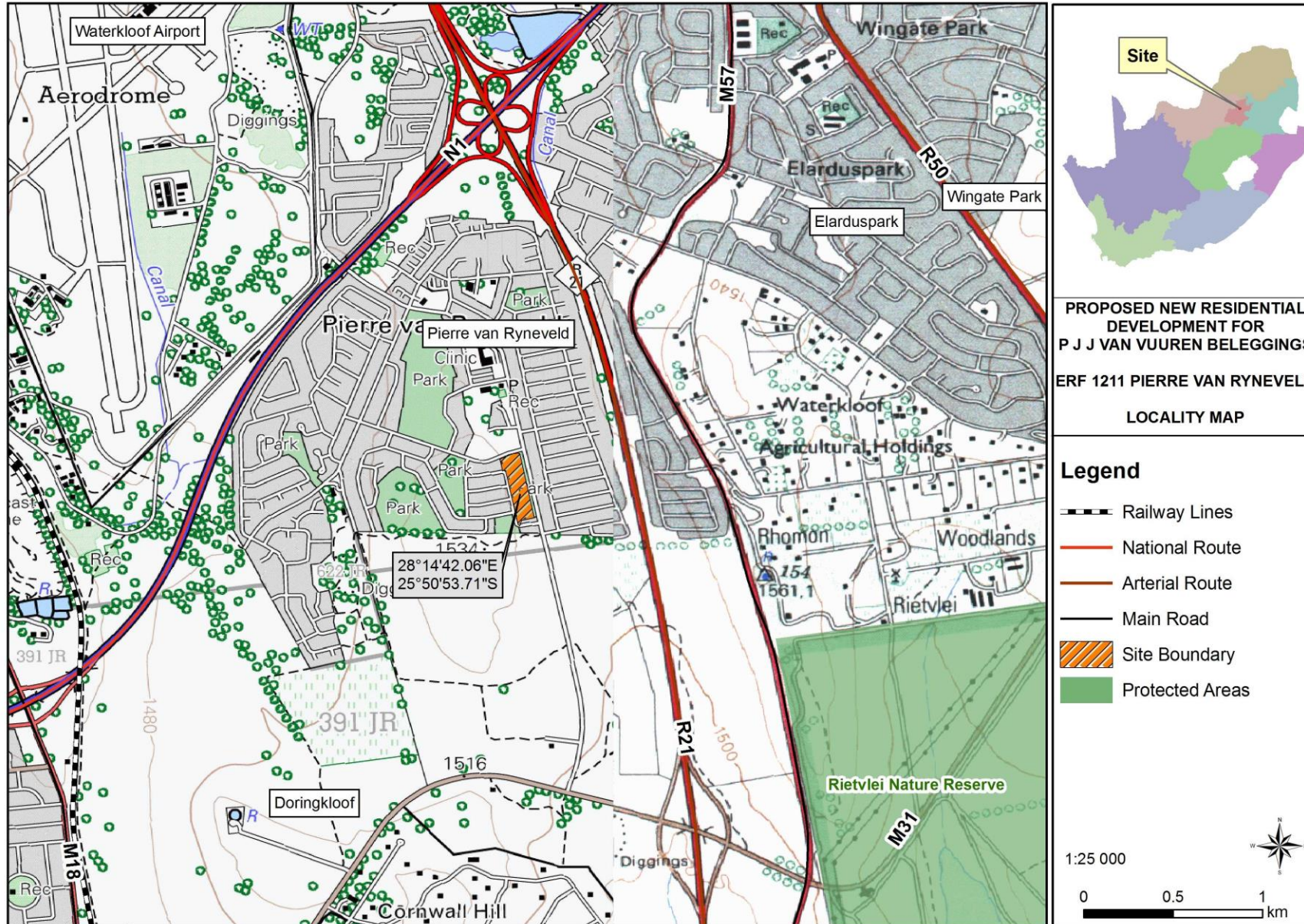


Figure 1: Site locality map.



The following photographs give an indication of the of the project property.















## 5. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY THAT ARE COVERED BY THE EMPr AS IDENTIFIED BY THE PROJECT DESCRIPTION

### 5.1 Description of the activities to be undertaken

The project site is currently a vacant property. The proposed residential development will comprise a total of 165 dwelling units (in three (3) storey building). This equates to a density of 48.4 dwellings per hectare (165 dwelling units ÷ 3.4109 hectares = 48.4 dwelling units/hectare). The unit types will include 2 and 3 bedroom dwelling units/duplex dwellings. There will be 57 two (2) – bedroom dwelling units and 108 three (3) – bedroom dwelling units. Adequate parking facilities for residents and visitors will be provided. Three (3) open spaces (with a combined area of 8 500m<sup>2</sup>) will be provided on the site. A part of this area will be developed as a play area. Access to the development will be from the west, in Kloppe Road, where it intersects with Grobbelaar Road.

### 5.2 Listed Activities triggered by the proposed development

The following listed activities are triggered by the proposed development and therefore require Environmental Authorisation, in terms of the Environmental Impact Assessment Regulations of 4 December 2014, as amended:

Table 1: Listed activity/activities triggered by the proposed development

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
GN. R 983 of 8 December 2014, as amended by GN. R 327 of 7 April 2017 (Listed activity no. 27)	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—  (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	An area of 3.4109 ha will be cleared for the construction of the proposed new development.
GN. R 985 of 8 December 2014, as amended by GN. R 324 of 7 April 2017 (Listed activity no. 4)	The development of a road wider than 4 metres with a reserve less than 13,5 metres.  <b>c. Gauteng</b>  xii. Sites zoned for conservation use or public open space or equivalent zoning.	Roads within the residential development will be wider than 4 m.
GN. R 985 of 8 December 2014, as amended by GN. R 324 of 7 April 2017 (Listed activity no. 12)	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.  <b>c. Gauteng</b>  iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was	An area of 34 109m <sup>2</sup> will be cleared, on land currently zoned as Public open space, for the construction of the proposed new development.



Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
GN. R 985 of 8 December 2014, as amended by GN. R 324 of 7 April 2017 (Listed activity no. 15)	<p>zoned open space, conservation or had an equivalent zoning.</p> <p>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.</p> <p><b>b. Gauteng</b></p> <p>i. All areas.</p>	An area of 34 109m <sup>2</sup> will be cleared, on land currently zoned as Public open space, for the construction of the proposed new residential development.

### 5.3 Water Use Licence Activities

No water use activities are anticipated that will require Water Use Registration and/or Licence applications in terms of Chapter 4 of the National Water Act, 1998 (Act No. 36 of 1998).

**5.4 Environmental sensitivity maps – Map at an appropriate scale that superimposes the proposed development footprint on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.**

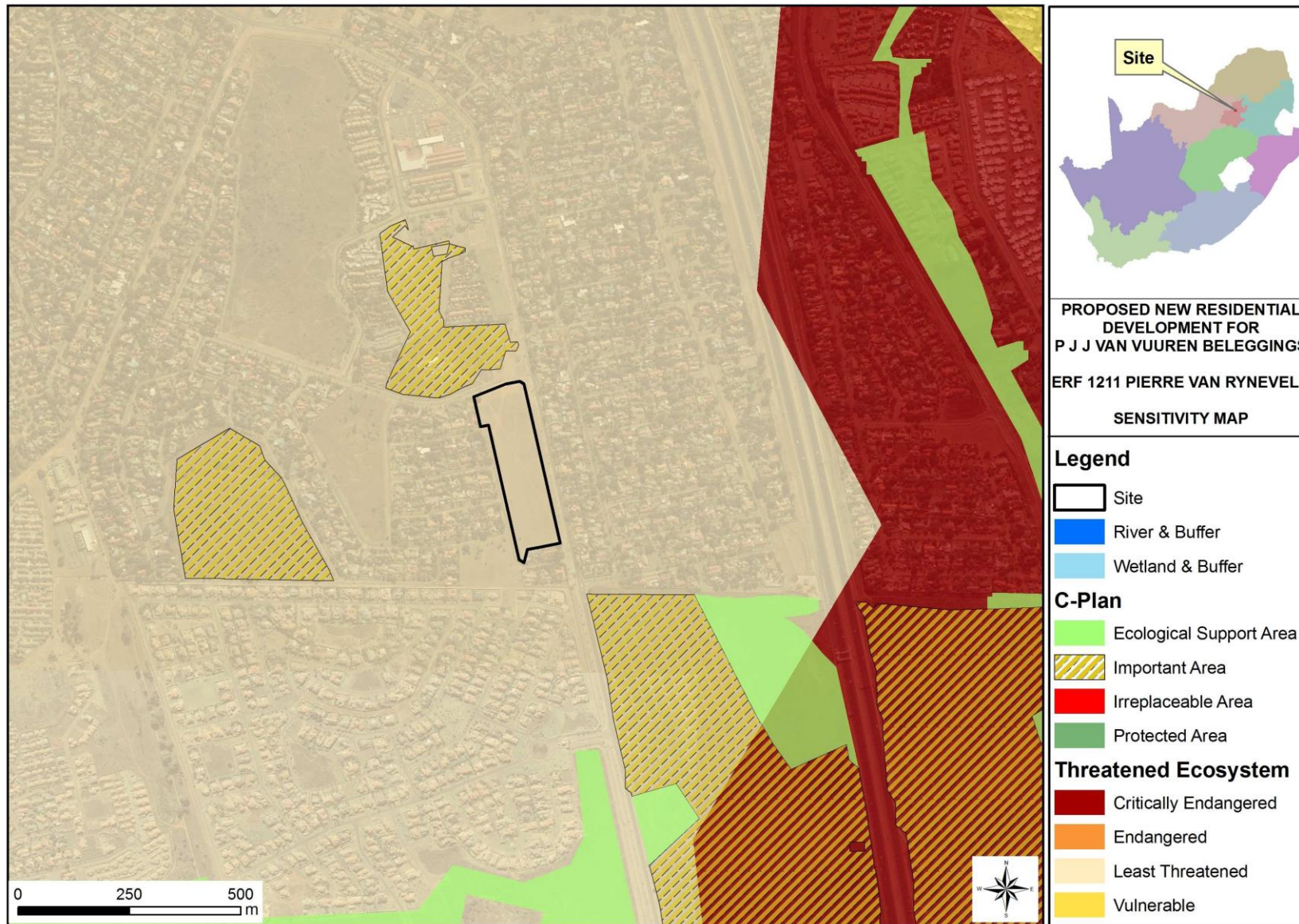


Figure 2: Environmental sensitivity overlay map

## 6. POLICY AND LEGISLATIVE CONTEXT OF THE APPLICATION

The following legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments are applicable to the proposed development and have been considered in this Basic Environmental Impact Assessment process. The mitigation measures proposed in this Environmental Management Programme are also aligned with the provisions of the relevant sections of legislation.

### Legislation

- The Constitution of South Africa, 1996 (Act No. 108 of 1996), as amended
- The National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended
- The Environmental Impact Assessment Regulations of 4 December 2014, as amended
- The National Water Act, 1998 (Act No. 36 of 1998), as amended
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), as amended
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999), as amended
- The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

### Plans

- City of Tshwane, Integrated Development Plan, 2011-2016, April 2011.

### Spatial tools

- SANBI Biodiversity GIS Database

### Municipal development planning frameworks

- Gauteng Provincial Environmental Management Framework, November 2014.
- Gauteng Provincial Environmental Management Framework (Poster).
- Gauteng Spatial Development Framework, 2030.

### Municipal By-Laws

- All

## 7. DESCRIPTION OF IMPACT MANAGEMENT OUTCOMES, MANAGEMENT STATEMENTS AND IMPACTS AND RISKS THAT NEED TO BE AVOIDED, MANAGED AND/OR MITIGATED

### 7.1 Impact Management Outcomes

Please refer to *Table 3* under Section 8 below.

### 7.2 Impact Management Statements

The applicant, commits to implementing the mitigation actions contained in this Environmental Management Programme in order to ensure that the environmental impacts from their development are minimised.

### 7.3 Impacts and risks that need to be avoided, managed and/or mitigated

The following impacts and risks have been identified for the preferred alternative and need to be avoided, managed and/or mitigated:

*Table 2: Impacts and Risks Identified for the Preferred Alternative*

Impact	Phase	Risks
Environment in General	Planning and Design Phase	<ul style="list-style-type: none"> <li>Inadequate planning and design could result in traffic impacts.</li> </ul>
		<ul style="list-style-type: none"> <li>Inadequate planning and design could result in sinkholes, damage to infrastructure and safety of residents.</li> </ul>
		<ul style="list-style-type: none"> <li>Inadequate services and stormwater management.</li> </ul>
		<ul style="list-style-type: none"> <li>The transformation of land with a moderate agricultural sensitivity.</li> </ul>
Pre-Construction Phase	Pre-construction Phase	<ul style="list-style-type: none"> <li>Unsafe working conditions.</li> <li>Workers being unaware of the dangers of working at the construction site, resulting in a risk to their safety.</li> </ul>
Surface and Groundwater	Construction Phase	<ul style="list-style-type: none"> <li>Pollution of surface and/or groundwater resources due to the incorrect management of concrete mixing.</li> <li>Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.</li> <li>Pollution of surface and/or groundwater resources due to poor waste management.</li> <li>Pollution of surface and/or groundwater resources due to contaminated stormwater.</li> </ul>
	Post Construction/Rehabilitation Phase	<ul style="list-style-type: none"> <li>Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.</li> <li>Pollution of surface and/or groundwater resources due to poor waste management.</li> <li>Pollution of surface and/or groundwater resources due to contaminated stormwater.</li> </ul>

Impact	Phase	Risks
	Operational Phase	<ul style="list-style-type: none"> <li>• Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.</li> <li>• Pollution of surface and/or groundwater resources due to poor waste management.</li> <li>• Pollution of surface and/or groundwater resources due to the runoff of contaminated stormwater.</li> <li>• Pollution of surface and/or groundwater resources due to spillages from the sewerage network (pipelines) onsite.</li> <li>• Wastage of resources [municipal water supply and electricity] due to the irresponsible use.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>• No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>
Fauna	Construction Phase	<ul style="list-style-type: none"> <li>• Disturbance or death of fauna.</li> </ul>
	Post Construction/Rehabilitation Phase	<ul style="list-style-type: none"> <li>• Disturbance or death of fauna.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>• Cause of pain, suffering or distress to animals and the impact of poisonous chemicals on non-target species.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>• No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>
Flora	Construction Phase	<ul style="list-style-type: none"> <li>• Site clearance and subsequent loss of vulnerable Carletonville Dolomite Grassland vegetation onsite.</li> </ul>
	Post Construction/Rehabilitation Phase	<ul style="list-style-type: none"> <li>• Increase in alien invasive plant species on the site.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>• Increase in alien invasive plant species on the site.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>• No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>
Archaeological, Heritage and Cultural Resources	Construction Phase	<ul style="list-style-type: none"> <li>• Disturbance or destruction of archaeological, heritage or cultural resources.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>• None anticipated.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>• No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>



Impact	Phase	Risks
<b>Palaeontological Resources</b>	Construction Phase	<ul style="list-style-type: none"> <li>Disturbance or destruction of palaeontological resources.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>None anticipated.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>
<b>Air Quality and Noise</b>	Construction Phase	<ul style="list-style-type: none"> <li>Generation of dust by construction vehicles and wind erosion.</li> <li>Release of emissions from construction vehicles.</li> <li>Generation of nuisance and noise from construction vehicles and equipment/machinery.</li> </ul>
	Post Construction/Rehabilitation Phase	<ul style="list-style-type: none"> <li>Generation of dust by vehicles, trucks and mobile equipment.</li> <li>Release of emissions from vehicles, trucks and mobile equipment.</li> <li>Generation of nuisance and noise from vehicles, trucks and mobile equipment.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>Release of emissions from vehicles.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>
<b>Soil</b>	Construction Phase	<ul style="list-style-type: none"> <li>Soil erosion due to the clearance of vegetation.</li> <li>Soil compaction to create foundations for buildings and other associated infrastructure.</li> <li>Soil pollution during to concrete mixing.</li> <li>Soil pollution due to the incorrect management of chemical substances and dangerous goods.</li> <li>Soil pollution due to poor waste management (general and hazardous waste).</li> <li>Soil pollution due to runoff of contaminated stormwater.</li> </ul>
	Post Construction/Rehabilitation Phase	<ul style="list-style-type: none"> <li>Soil pollution due to the incorrect management of chemical substances and dangerous goods.</li> <li>Soil pollution due to poor waste management (general and hazardous waste).</li> <li>Soil pollution due to runoff from contaminated stormwater.</li> <li>Soil erosion due to inefficient rehabilitation of construction areas.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>Soil pollution due to the incorrect management of chemical substances and dangerous goods.</li> <li>Soil pollution due to poor waste management (general and hazardous waste).</li> <li>Soil pollution by contaminated stormwater.</li> </ul>

Impact	Phase	Risks
	Decommissioning Phase	<ul style="list-style-type: none"> <li>No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>
Socio-economic	Construction Phase	<ul style="list-style-type: none"> <li>Potential increase in crime in the area.</li> <li>Potential decrease in crime due to increased presence on currently vacant land.</li> <li>Generation of job opportunities.</li> <li>Stimulation of the local economy.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>Increased security due to presence of residents on formally vacant land.</li> <li>Generation of job opportunities for domestic workers, gardeners and other services.</li> <li>Stimulation of the local economy.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>
Traffic	Construction Phase	<ul style="list-style-type: none"> <li>Increase in traffic volumes to the site.</li> </ul>
	Post Construction/Rehabilitation Phase	<ul style="list-style-type: none"> <li>Increase in traffic volumes to the site.</li> </ul>
	Operational Phase	<ul style="list-style-type: none"> <li>Increase in traffic volumes in the area.</li> </ul>
	Decommissioning Phase	<ul style="list-style-type: none"> <li>No decommissioning activities are anticipated or planned for the development. Therefore, no impacts have been identified or assessed as part of this Environmental Impact Assessment process.</li> </ul>

## 8. DESCRIPTION OF PROPOSED IMPACT MANAGEMENT ACTIONS (ENVIRONMENTAL MANAGEMENT PROGRAMME ACTIONS)

### 8.1 Impact Management Outcome and Action Table

Please refer to *Table 3* below.

Table 3: Environmental Management Programme – Impact Management Outcome and Action Table

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
<b>Planning and Design Phase</b>				
<b>Planning and Design Phase</b>				
Planning and design related to traffic.	Inadequate planning and design of the could result in traffic impacts.	To effectively plan and design the residential development to minimise traffic impacts.	<ul style="list-style-type: none"> <li>• The City of Tshwane to confirm whether any road reserve widening is required:               <ul style="list-style-type: none"> <li>➢ Along Van Ryneveld Avenue.</li> <li>➢ Along Dan Pienaar Road.</li> </ul> </li> <li>• Construct the following access arrangements (also refer to Mariteng Plan No.: 185-86-01):               <ul style="list-style-type: none"> <li>➢ Access from Klopper Park, directly opposite Grobbelaar Road.</li> <li>➢ Provide two inbound lanes, one with a paved width of 3.0m and the second lane with a paved width of 3.5m.</li> <li>➢ One outbound lane with a paved width of 3.5m and a clearance of 4.5m.</li> <li>➢ A throat length of 24m - distance measured from edge of road to centre of access control boom/gate.</li> <li>➢ 3.0m x 3.0m splays at access on Klopper Road.</li> <li>➢ Bellmouth radius on Klopper Road to be a minimum of 5.0m.</li> <li>➢ No vertical structures are currently proposed at the site access. However, should the need arise later in the design phase provision should be made for a minimum vertical clearance of 5.2m.</li> </ul> </li> <li>• All parking provided on site, with a 5.0m x 2.5m dimension.</li> <li>• The internal layout and access arrangements are supported from a traffic engineering view point, but will also require the approval from the Fire Department.</li> <li>• Refuse collection area to be provided on Klopper Road, at the entrance to the development.</li> <li>• Road upgrades/changes, or bulk contribution for upgrades/changes, as required by the City of Tshwane must be implemented/paid.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Engineer</li> <li>• City of Tshwane</li> </ul>
Planning and design related to dolomite areas.	Inadequate planning and design of the could result in sinkholes, damage to infrastructure and safety of residents.	To effectively plan and design the residential development to avoid sinkholes, damage to infrastructure and safety of residents.	<ul style="list-style-type: none"> <li>• No residential development is allowed in Zone D1 and if commercial developments are planned on this zone, FPI, must be conducted as per the SANS 1936:2012 requirements.</li> <li>• A certified site development plan (SDP) should be submitted to the Council for Geoscience for co-signing.</li> <li>• The development as such should be enrolled with the NHBRC and must be designed and constructed in accordance with their requirements for residential buildings on dolomite as prescribed in the NHBRC Home Building Manual of 2015.</li> <li>• All foundations should be suitable designed to span at least 5 m loss of support due to sinkhole or subsidence formation and these must be according to SANS 10400-H requirements.</li> <li>• A site-specific Dolomite Risk Management Plan in accordance with SANS 1936-4:2012 must be compiled and implemented for the site. The owners/responsible persons must be made aware of the risks involved in building on dolomite and be informed about how to be vigilant and act pro-actively by applying sound water management principles.</li> <li>• General precautionary measures as set out in SANS 1935 Part 3: Design and construction of buildings, structures and infrastructure, must be studied and implemented for a D3 portion of the site. Some precautions are listed below:               <ul style="list-style-type: none"> <li>➢ All stormwater from downpipes and gutters from buildings and structures shall discharge onto concrete-lined channels which, in turn, shall discharge the water at least 1.5 m away from structures onto areas permitting surface drainage away from buildings and structures. Joints between any open channel drains and buildings shall be suitable sealed.</li> <li>➢ Where guttering is not provided, impervious paved areas or apron slabs shall be provided within 3 m (or greater if deemed appropriate by the competent person (engineer) of buildings or structures, runoff from which shall drain into lined channels feeding into a designed stormwater system or shall be spread as sheet flow. The paved areas or apron slabs shall include areas located below the drip line or the periphery of the building or structure that is subject to draining rainwater.</li> <li>➢ Wet engineering services should, where ever possible, not be placed parallel to buildings unless they are least 5 m away (if stand size allows) from the structure. Should this be unavoidable, a rational design shall be performed by the competent person (engineer).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Engineer</li> <li>• City of Tshwane</li> </ul>



Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
			<ul style="list-style-type: none"> <li>➤ The preferred pipe type for all wet engineering services, and the sleeve systems for such services, on dolomite are designation D3 sites are polyethylene (PE) pipes and fittings that comply with the material manufacturing requirements of the relevant of parts 1,2,3 and 5 of SANS 4427.</li> <li>➤ Liquid-retaining structures shall be watertight (zero leakage), constructed without any joints and shall not be placed closer than 5 m from a building.</li> <li>➤ The water supply to a building shall be via a single water supply connection unless otherwise approved by the competent person (engineer). This also applies to other pressurized liquid bearing services.</li> <li>➤ Wet engineering services, excluding stormwater systems, shall be capable of spanning the projected notional sinkhole diameter (5 m), which has a high likelihood of formation in accordance with the requirements of SANS 1936-2, without the service rupturing or any joint leaking or separating from the pipeline.</li> <li>➤ Gardens within 15 m of buildings and structures shall not include: <ul style="list-style-type: none"> <li>a. Water features, such as fish ponds, except where an impermeable lining is provided in accordance with a design prepared by a competent person (engineer); or</li> <li>b. Water features with automatic replenishment systems. No automated irrigation systems shall be installed within a distance of 5 m from any structure or building on sites designated as D3 dolomite land.</li> </ul> </li> <li>➤ The Builder must inform the professional team when the service/foundation trenches are open for inspection to take place. The results of these inspections and quality control must be recorded in a construction report (copy to the Local Authority, NHBRC and the Council of Geoscience).</li> <li>➤ The professional team involved, including HMA, shall carefully consider the appropriate water precautionary measures and then ensure and finally certify that these have been implemented.</li> <li>➤ Wet services should be laid exactly where indicated on the drawings presented to the Local Authority, and to the Council of Geoscience). Wet service may not be laid below structures. The Builder or his appointed professional team should certify that they have been placed as indicated. The Home Owner must also have a copy of the exact plan presented to the Council of Geoscience).</li> <li>➤ The Local Authority must implement a risk management system. Commenting on the suitability of sites within its jurisdiction is based on the premise that this system will be implemented.</li> <li>• The Council for Geoscience should be informed of changes and the Competent Person responsible for the dolomite stability investigation should be given the opportunity to indicate the influence such changes could have on the overall stability.</li> </ul>	
Planning and design related to municipal services and stormwater.	Inadequate municipal services and stormwater infrastructure.	To ensure the necessary municipal services and infrastructure with adequate capacity are available for the residential development.	<ul style="list-style-type: none"> <li>• The City of Tshwane to confirm the availability of the following services (with adequate capacity): <ul style="list-style-type: none"> <li>➤ Licensed municipal landfill sites, with sufficient air space;</li> <li>➤ Municipal sewage system;</li> <li>➤ Stormwater infrastructure;</li> <li>➤ Water supply; and</li> <li>➤ Power/electricity supply.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Engineer</li> <li>• City of Tshwane</li> </ul>
Planning and design related to land use.	The transformation of land with a moderate agricultural sensitivity to land.	To ensure land is used appropriately and optimally.	<ul style="list-style-type: none"> <li>• The site must have the correct land use zoning to enable the infrastructure to be constructed and operated.</li> <li>• The land should be used in line with the areas spatial and management frameworks.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Engineer</li> <li>• City of Tshwane</li> </ul>
<b>Pre-Construction Phase</b>				
<b>Pre-Construction Phase</b>				
Construction site establishment.	Unsafe working conditions.	To ensure that the construction site is operated in a safe and responsible manner for	<ul style="list-style-type: none"> <li>• The construction site must be demarcated (fenced or delineated with danger tape).</li> <li>• A site plan must be drawn up by the construction contractor and kept on file. The site plan must show proposed stockpile areas, waste storage areas and ablution facilities.</li> <li>• Signage indicating that the site is a "Construction Site" and indicating the risks associated with the site must be displayed. Emergency numbers, "No-smoking" signs and "No Open Flame" signs must also be displayed at the construction site.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
		the duration of the construction phase.	<ul style="list-style-type: none"> <li>• Fire-fighting equipment must be placed at the construction site and must be easily accessible.</li> <li>• The fire-fighting equipment must be maintained on a yearly basis.</li> <li>• Where welding, hot-work and flame-cutting activities are undertaken, fire-fighting equipment must be at hand.</li> </ul>	
Appointment of workers (employees and contractors) to commence construction activities onsite.	Workers being unaware of the impact that their activities may have on the environment.	To adequately educate workers (employees and contractors) regarding environmental awareness.	<ul style="list-style-type: none"> <li>• Before any employees or contractors commence work at the development, each individual must undergo an Induction Training session that will cover the aspects as detailed in the Environmental Awareness Plan (contained in this EMP). Attendance registers must be completed and kept on file.</li> <li>• Employees and contract workers must be issued with suitable Personal Protective Equipment (PPE), as applicable to each persons' job onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Surface and Groundwater</b>				
<b>Construction Phase</b>				
Construction activities.	Pollution of surface and/or groundwater resources due to the incorrect management of concrete mixing.	To prevent the contamination of water during to concrete mixing.	<ul style="list-style-type: none"> <li>• Concrete should ideally be mixed on an impermeable surface such as a concrete slab.</li> <li>• Cement bags (new and used) must be stored under roof or in closed containers where they will not be exposed to rain.</li> <li>• Dry concrete must be removed and disposed of together with other building rubble.</li> <li>• Ready-mix concrete trucks may clean chutes into foundations, but not elsewhere onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction activities.	Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.	<ul style="list-style-type: none"> <li>• A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>• MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>• The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>• Chemicals must be used as prescribed by the product and MSDS guidelines.</li> <li>• Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> <li>• Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>• Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>• No wastewater or wash water may be released into the environment from construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction activities.	Pollution of surface and/or groundwater resources due to poor waste management.	To ensure that waste (construction waste, general waste and hazardous waste) is managed in an environmentally responsible manner.	<ul style="list-style-type: none"> <li>• Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>• Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>• Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• No waste may be stored on open soil or within wetlands and/or watercourses.</li> <li>• Sufficient ablution facilities must be provided.</li> <li>• Chemical toilets must be serviced regularly and must be provided with toilet paper at all times.</li> <li>• Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste.</li> <li>• Construction waste must be stored in a designated area.</li> <li>• Building rubble must be stored separately from domestic waste and may be stored on bare soil as it is inert in nature. It must, however, be ensured that other waste (general and/or hazardous waste) is not mixed together with the building rubble.</li> <li>• Refuse bins must be provided for domestic waste.</li> <li>• Large volumes of waste may not accumulate onsite.</li> <li>• No waste may be burnt or buried onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
Runoff of contaminated stormwater.	Pollution of surface and/or groundwater resources.	To prevent the contamination of storm water.	<ul style="list-style-type: none"> <li>• Building rubble must be kept clean of plastic and brick ties.</li> <li>• Storm water must be diverted around areas where there are pollution sources.</li> <li>• Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>• No contaminated storm water may be released into the environment from the construction activities.</li> <li>• Washing or cleaning of equipment and machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a leak-proof container or a plastic lined pit.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Post Construction/Rehabilitation Phase</b>				
Rehabilitation activities	Pollution of surface and/or groundwater resources due to the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.	<ul style="list-style-type: none"> <li>• A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>• MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>• The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>• Chemicals must be used as prescribed by the product and MSDS guidelines.</li> <li>• Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> <li>• Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>• Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>• No wastewater or wash water may be released into the environment from rehabilitation activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Rehabilitation activities	Pollution of surface and/or groundwater resources due to poor waste management.	To ensure that waste (general waste and hazardous waste) is managed in an environmentally responsible manner.	<ul style="list-style-type: none"> <li>• Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>• Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>• Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• No waste may be stored on open soil or within wetlands and/or watercourses.</li> <li>• Sufficient ablution facilities must be provided.</li> <li>• Chemical toilets must be serviced regularly and must be provided with toilet paper at all times.</li> <li>• Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste.</li> <li>• Waste must be stored in a designated area.</li> <li>• Building rubble must be stored separately from domestic waste and may be stored on bare soil as it is inert in nature. It must, however, be ensured that other waste (general and/or hazardous waste) is not mixed together with the building rubble.</li> <li>• Refuse bins must be provided for domestic waste.</li> <li>• Large volumes of waste may not accumulate onsite.</li> <li>• No waste may be burnt or buried onsite.</li> <li>• Building rubble must be kept clean of plastic and brick ties.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Runoff of contaminated stormwater.	Pollution of surface and/or groundwater resources.	To prevent the contamination of storm water.	<ul style="list-style-type: none"> <li>• Storm water must be diverted around areas where there are pollution sources.</li> <li>• Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>• No contaminated storm water may be released into the environment from the rehabilitation activities.</li> <li>• Washing or cleaning of equipment and machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a leak-proof container or a plastic lined pit.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Operational Phases</b>				
Maintenance and upkeep of	Pollution of surface and/or groundwater resources due to	To prevent the release of pollutants, chemical	<ul style="list-style-type: none"> <li>• A register must be compiled of all chemical substances and dangerous goods used onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
residential development.	the incorrect management and potential release of pollutants, such as chemical substances and dangerous goods.	substances and dangerous goods, such as fuels, into the environment.	<ul style="list-style-type: none"> <li>MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>Chemicals must be used as prescribed by the product and MSDS guidelines.</li> <li>Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon, paint or other chemical spillages.</li> <li>Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> </ul>	
Waste management activities.	Pollution of surface and/or groundwater resources due to poor waste management.	To ensure that waste (general waste and hazardous waste) is managed in an environmentally responsible manner.	<ul style="list-style-type: none"> <li>Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste).</li> <li>General and hazardous waste streams must not be mixed.</li> <li>Domestic waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>Domestic waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>Waste must be stored in a designated area.</li> <li>Large volumes of waste may not accumulate onsite.</li> <li>No waste may be burnt or buried onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Runoff of contaminated stormwater.	Pollution of surface and/or groundwater resources.	To prevent the contamination of storm water.	<ul style="list-style-type: none"> <li>A storm water management plan must be developed and implemented at the development. The Storm Water Management Plan must take cognisance of rainfall frequencies and the 1:100 year flood regime.</li> <li>Storm water must be diverted around areas where there are pollution sources.</li> <li>Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>No contaminated storm water may be released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Spillages from the sewerage network /pipelines) onsite.	Pollution of surface and/or groundwater resources due to spillages from the sewerage network (pipelines) onsite.	To prevent spillages of sewage onsite.	<ul style="list-style-type: none"> <li>Ablution facilities must regularly be cleaned.</li> <li>Should toilets run slowly or become blocked, this should be investigated to ensure that this is not due to a broken or blocked pipe underground.</li> <li>Any broken or blocked pipes must be repaired.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Irresponsible use of resources (municipal water and electricity).	Wastage of resources [municipal water supply and electricity] due to the irresponsible use.	To prevent resource (municipal water and electricity) wastage.	<ul style="list-style-type: none"> <li>Consumption of water and electricity must be monitored.</li> <li>Use energy efficient lighting, where possible.</li> <li>Switch off lights and appliances when not in use.</li> <li>Water pipes and hoses should be inspected on a regular basis and any leakages should immediately be repaired.</li> <li>Running water taps or hoses may not be left unattended.</li> <li>High pressure hoses should be used, where possible.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Fauna</b>				
<b>Construction Phase</b>				
Site clearance.	Disturbance or death of fauna.	To prevent the disturbance or death of fauna.	<ul style="list-style-type: none"> <li>Where possible fauna species are encountered or exposed during the construction phase (especially slow-moving species such as tortoises) these should be removed and relocated to natural areas in the vicinity. This remediation requires the employment of appropriate specialists to oversee the removal of any such species during the initial ground clearing phase of construction (i.e. initial ground-breaking by earthmoving equipment).</li> <li>Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.</li> <li>Alien and invasive plants must be removed.</li> <li>When holes or trenches are dug, construction must be completed as quickly as possible; otherwise such holes may act as death traps for animals.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
			<ul style="list-style-type: none"> <li>Holes and trenches must be inspected regularly to ensure that no animals are trapped.</li> <li>During the construction phase there will be increased surface water runoff and a decreased water quality (with increased silt load and pollution). Completing construction during the winter months would mitigate the environmental impact.</li> </ul>	
<b>Operational Phase</b>				
Pest control.	Cause of pain, suffering or distress to animals and the impact of poisonous chemicals on non-target species.	To prevent pain, suffering or distress to animals and the impact of poisonous chemicals on non-target species.	<ul style="list-style-type: none"> <li>Reference should be made to the National Council for SPCA's deterrents and pest control guidelines for humane pest deterrent and control methods.</li> <li>No snares, lethal trapping devices, substances or any form of animal control that cause or may cause suffering may be used in the control of pests.</li> <li>Poisonous chemicals may have impacts on non-target species, including humans. When pesticides/chemicals remain the only alternative control, employees and/or contractors should adhere to the safety, storage and disposal guidelines specific to the pesticide/chemical being used.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Flora</b>				
<b>Construction Phase</b>				
Site clearance.	Site clearance and subsequent loss of vulnerable Carleton Dolomite Grassland vegetation onsite.	To minimise the extent of vegetation removal and the impact of removal that cannot be prevented.	<ul style="list-style-type: none"> <li>Avoid any form of erosion and rehabilitate where needed.</li> <li>Use only indigenous plant species for gardens and rehabilitation.</li> <li>Remove all alien woody species.</li> <li>If applicable, rescue red data listed and protected species, and replant at suitable places (e.g. gardens) within the development.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>				
Invasion by alien invasive plant species.	Increase in alien invasive plant species and densities on the site.	To prevent the establishment and spread of alien invasive plant species.	<ul style="list-style-type: none"> <li>All alien seedlings and saplings must be removed as they become evident.</li> <li>Manual/mechanical removal is preferred to chemical control.</li> <li>Dispose of eradicated plant material at an approved solid waste disposal site.</li> <li>Poisonous chemicals may have impacts on non-target species, including humans. When herbicides/chemicals remain the only alternative control, employees and/or contractors should adhere to the safety, storage and disposal guidelines specific to the herbicide/chemical being used.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Archaeological, Heritage or Cultural Resources</b>				
<b>Construction Phase</b>				
Construction activities.	Disturbance or destruction of archaeological, heritage or cultural resources.	To prevent the disturbance or destruction of archaeological, heritage or cultural resources.	<ul style="list-style-type: none"> <li>If any archaeological, heritage or cultural resources, sites, features or objects are exposed during the construction activities, all construction activities in the area must be stopped and a relevant specialist must be contacted to investigate the site and recommend the way forward.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>				
Operational activities.	None anticipated.	Not Applicable.		Not Applicable.
<b>Palaeontological Resources</b>				
<b>Construction Phase</b>				
Construction activities.	Disturbance or destruction of palaeontological resources.	To prevent the disturbance or destruction of palaeontological resources.	<ul style="list-style-type: none"> <li>If any palaeontological resources, sites, features or objects are exposed during the construction activities, all construction activities in the area must be stopped and a relevant specialist must be contacted to investigate the site and recommend the way forward.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>				
Operational activities.	None anticipated.	Not Applicable.		Not Applicable.



Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
<b>Air Quality and Noise</b>				
<b>Construction Phase</b>				
Construction activities.	Generation of dust by vehicles, trucks and mobile equipment and wind erosion.	To prevent the generation of dust.	<ul style="list-style-type: none"> <li>• Implement dust suppression techniques.</li> <li>• Install a wind screen around the construction site.</li> <li>• Speed bumps and traffic signs should be erected to prevent speeding onsite.</li> <li>• Limit vegetation clearance until it is necessary for soil stripping.</li> <li>• A complaints register must be kept onsite and be easily accessible to any party who wishes to lodge a complaint. The complaints register must include the following fields:               <ul style="list-style-type: none"> <li>➢ The date of the complaint;</li> <li>➢ The name and surname of the person lodging the complaint;</li> <li>➢ Details of the complaint; and</li> <li>➢ How and when the complaint was addressed.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction activities.	Release of emissions from construction vehicles.	To minimise emissions from construction vehicles.	<ul style="list-style-type: none"> <li>• Regular maintenance of vehicles to minimise the release of emissions.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction activities.	Generation of nuisance and noise from construction vehicles and equipment/machinery.	To prevent the generation of excessive noise.	<ul style="list-style-type: none"> <li>• Noisy activities must be scheduled during times of the day that will result in the least disturbance to adjacent sensitive receptors.</li> <li>• Noisy work may not be undertaken on weekends and public holidays.</li> <li>• No amplified music is allowed onsite.</li> <li>• Sirens and/or hooters may only be used during emergencies and drills.</li> <li>• Vehicles must not be left idling unnecessarily.</li> <li>• All vehicles must be regularly maintained.</li> <li>• A complaints register must be kept onsite and be easily accessible to any party who wishes to lodge a complaint. The complaints register must include the following fields:               <ul style="list-style-type: none"> <li>➢ The date of the complaint;</li> <li>➢ The name and surname of the person lodging the complaint;</li> <li>➢ Details of the complaint; and</li> <li>➢ How and when the complaint was addressed.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Post Construction/Rehabilitation Phase</b>				
Rehabilitation activities	Generation of dust by vehicles, trucks and mobile equipment.	To prevent the generation of dust.	<ul style="list-style-type: none"> <li>• Implement dust suppression techniques.</li> <li>• Speed bumps and traffic signs should be erected to prevent speeding onsite.</li> <li>• A complaints register must be kept onsite and be easily accessible to any party who wishes to lodge a complaint. The complaints register must include the following fields:               <ul style="list-style-type: none"> <li>➢ The date of the complaint;</li> <li>➢ The name and surname of the person lodging the complaint;</li> <li>➢ Details of the complaint; and</li> <li>➢ How and when the complaint was addressed.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Rehabilitation activities	Release of emissions from vehicles, trucks and mobile equipment.	To minimise emissions from vehicles, trucks and mobile equipment.	Regular maintenance of vehicles to minimise the release of emissions.	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Rehabilitation activities	Generation of nuisance and noise from vehicles, trucks and mobile equipment.	To prevent the generation of excessive noise.	<ul style="list-style-type: none"> <li>• Noisy activities must be scheduled during times of the day that will result in the least disturbance to adjacent sensitive receptors.</li> <li>• Noisy work may not be undertaken on weekends and public holidays.</li> <li>• No amplified music is allowed onsite.</li> <li>• Sirens and/or hooters may only be used during emergencies and drills.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
			<ul style="list-style-type: none"> <li>• Vehicles must not be left idling unnecessarily.</li> <li>• All vehicles must be regularly maintained.</li> <li>• A complaints register must be kept onsite and be easily accessible to any party who wishes to lodge a complaint. The complaints register must include the following fields:               <ul style="list-style-type: none"> <li>➢ The date of the complaint;</li> <li>➢ The name and surname of the person lodging the complaint;</li> <li>➢ Details of the complaint; and</li> <li>➢ How and when the complaint was addressed.</li> </ul> </li> </ul>	
<b>Operational Phase</b>				
Operational activities.	Release of emissions from vehicles.	To minimise emissions from vehicles.	<ul style="list-style-type: none"> <li>• Speeds bumps and traffic signs should be erected to prevent speeding onsite.</li> <li>• Set up a notice board with the purpose of making residents aware of:               <ul style="list-style-type: none"> <li>➢ Public transport systems in the area; and</li> <li>➢ The benefits of carpooling and sharing.</li> </ul> </li> </ul>	Applicant
<b>Soil</b>				
<b>Construction Phase</b>				
Site clearance during the construction phase.	Soil erosion due to the clearance of vegetation.	To prevent erosion during site clearance.	<ul style="list-style-type: none"> <li>• Limiting vegetation clearance until it is necessary for soil stripping.</li> <li>• Implement adequate erosion prevention measures, such as measures to dissipate runoff water velocities.</li> <li>• Implement adequate storm water management measures.</li> <li>• Topsoil and subsoil must be stored on separate stockpiles.</li> <li>• Cover topsoil stockpiles to prevent the soil being washed away during rainfall events.</li> <li>• Topsoil must be replaced during rehabilitation and landscaping.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction activities.	Soil compaction to create foundations for buildings and other associated infrastructure.	To prevent soil compaction.	<ul style="list-style-type: none"> <li>• The development footprint must be optimised to minimise the area that will be compacted during the construction activities.</li> <li>• Soil should be moved when dry, as far as possible.</li> <li>• Excessively heavy vehicles should not be used for earthmoving activities. This will minimise compaction of the soil.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Spillages from chemical toilets.	Soil pollution from spillages from chemical toilets.	To prevent spillages from chemical toilets and ensure that any spillages are cleaned effectively.	<ul style="list-style-type: none"> <li>• Sufficient ablution facilities must be provided.</li> <li>• Chemical toilets must be serviced regularly and must be provided with toilet paper at all times.</li> <li>• Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• Chemical toilets must be screened from view from the outside of the construction site.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
The mixing of concrete.	Soil pollution during to concrete mixing.	To prevent the contamination of soil during to concrete mixing.	<ul style="list-style-type: none"> <li>• Concrete should ideally be mixed on an impermeable surface such as a concrete slab.</li> <li>• Cement bags (new and used) must be stored under roof or in closed containers where they will not be exposed to rain.</li> <li>• Dry concrete must be removed and disposed of together with other building rubble.</li> <li>• Ready-mix concrete trucks may clean chutes into foundations, but not elsewhere onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction activities.	Soil pollution due to the incorrect management of chemical substances and dangerous goods.	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.	<ul style="list-style-type: none"> <li>• Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> <li>• Vehicles should regularly be inspected. Immediately repair any leaking machinery or vehicles.</li> <li>• Place oil drums on impermeable surfaces or plastic liners.</li> <li>• Immediately clean any hydrocarbon spillages and dispose of as hazardous waste.</li> <li>• No wastewater or wash water may be released into the environment from construction activities.</li> <li>• Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>• A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>• MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
			<ul style="list-style-type: none"> <li>The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>Chemicals must be used as prescribed by the product and MSDS guidelines.</li> </ul>	
Construction activities.	Soil pollution due to poor waste management (general and hazardous waste).	To ensure that waste (construction waste, general waste and hazardous waste) is managed in an environmentally responsible manner.	<ul style="list-style-type: none"> <li>Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>No waste may be stored on open soil or within wetlands and/or watercourses.</li> <li>Construction waste must be stored in a designated area.</li> <li>Building rubble must be stored separately from domestic waste and may be stored on bare soil as it is inert in nature. It must, however, be ensured that other waste (general and/or hazardous waste) is not mixed together with the building rubble.</li> <li>Refuse bins must be provided for domestic waste.</li> <li>Large volumes of waste may not accumulate onsite.</li> <li>No waste may be burnt or buried onsite.</li> <li>Building rubble must be kept clean of plastic and brick ties.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Runoff of contaminated stormwater.	Soil pollution due to runoff of contaminated stormwater.	To prevent the contamination of storm water.	<ul style="list-style-type: none"> <li>Storm water must be diverted around areas where there are pollution sources.</li> <li>Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>No contaminated storm water may be released into the environment from the construction activities.</li> <li>Washing or cleaning of equipment or machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a container or a plastic lined pit.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Post Construction/Rehabilitation Phase</b>				
Rehabilitation activities.	Soil pollution from spillages from chemical toilets.	To prevent spillages from chemical toilets and ensure that any spillages are cleaned effectively.	<ul style="list-style-type: none"> <li>Sufficient ablution facilities must be provided.</li> <li>Chemical toilets must be serviced regularly and must be provided with toilet paper at all times.</li> <li>Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste. Safe Disposal Certificates must be obtained and kept on record.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Rehabilitation activities.	Soil pollution due to the incorrect management of chemical substances and dangerous goods.	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.	<ul style="list-style-type: none"> <li>Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> <li>Vehicles should regularly be inspected. Immediately repair any leaking machinery or vehicles.</li> <li>Place oil drums on impermeable surfaces or plastic liners.</li> <li>Immediately clean any hydrocarbon spillages and dispose of as hazardous waste.</li> <li>No wastewater or wash water may be released into the environment from construction activities.</li> <li>Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>Chemicals must be used as prescribed by the product and MSDS guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Rehabilitation activities.	Soil pollution due to poor waste management (general and hazardous waste).	To ensure that waste (general waste and hazardous waste) is	<ul style="list-style-type: none"> <li>Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>



Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
		managed in an environmentally responsible manner.	<ul style="list-style-type: none"> <li>• Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• No waste may be stored on open soil or within wetlands and/or watercourses.</li> <li>• Construction waste must be stored in a designated area.</li> <li>• Building rubble must be stored separately from domestic waste and may be stored on bare soil as it is inert in nature. It must, however, be ensured that other waste (general and/or hazardous waste) is not mixed together with the building rubble.</li> <li>• Refuse bins must be provided for domestic waste.</li> <li>• Large volumes of waste may not accumulate onsite.</li> <li>• No waste may be burnt or buried onsite.</li> <li>• Building rubble must be kept clean of plastic and brick ties.</li> </ul>	
Rehabilitation activities.	Soil pollution due to runoff from contaminated stormwater.	To prevent the contamination of storm water.	<ul style="list-style-type: none"> <li>• Storm water must be diverted around areas where there are pollution sources.</li> <li>• Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>• No contaminated storm water may be released into the environment from the construction activities.</li> <li>• Washing or cleaning of equipment or machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a container or a plastic lined pit.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Rehabilitation activities.	Soil erosion due to inefficient rehabilitation of construction areas.	To prevent soil erosion.	<ul style="list-style-type: none"> <li>• Rehabilitation must already be initiated during the construction phase, where possible.</li> <li>• Areas for rehabilitation must be cleared of any building rubble and/or debris before rehabilitation is commenced with.</li> <li>• Soil should be moved when dry, as far as possible.</li> <li>• Weeds must be removed prior to soil replacement.</li> <li>• Areas under rehabilitation must be cordoned off to prevent pedestrian and vehicular access.</li> <li>• Re-vegetation must be undertaken using indigenous species, as far as possible.</li> <li>• Areas under rehabilitation must be monitored to ensure successful vegetation establishment. Organic fertilizers and topsoil should be added to areas where vegetation establishment is not effective.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Operational phase</b>				
Maintenance and upkeep of residential development.	Soil pollution due to the incorrect management of chemical substances and dangerous goods.	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.	<ul style="list-style-type: none"> <li>• A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>• MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>• The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>• Chemicals must be used as prescribed by the product and MSDS guidelines.</li> <li>• Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>• Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Waste management activities.	Soil pollution due to poor waste management (general and hazardous waste).	To ensure that waste (general waste and hazardous waste) is managed in an environmentally responsible manner.	<ul style="list-style-type: none"> <li>• Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste).</li> <li>• General and hazardous waste streams must not be mixed.</li> <li>• Domestic waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>• Domestic waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• Waste must be stored in a designated area.</li> <li>• Large volumes of waste may not accumulate onsite.</li> <li>• No waste may be burnt or buried onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>

Aspect	Impact and Nature	Impact Management Outcomes	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
Runoff of contaminated stormwater.	Soil pollution.	To prevent the contamination of storm water.	<ul style="list-style-type: none"> <li>• A storm water management plan must be developed and implemented at the development. The Storm Water Management Plan must take cognisance of rainfall frequencies and the 1:100 year flood regime.</li> <li>• Storm water must be diverted around areas where there are pollution sources.</li> <li>• Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>• No contaminated storm water may be released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
<b>Socio-economic</b>				
<b>Construction Phase</b>				
Construction activities.	Potential increase in crime in the area.	To prevent an increase in incidents of crime in the area.	<ul style="list-style-type: none"> <li>• Reference checks should be conducted on all workers before they are appointed.</li> <li>• Workers should not be allowed to leave the construction site during the day and should be transported to and from the site on a daily basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction activities	Decrease in crime due to increased presence on currently vacant land.	This is a positive impact and no mitigation measures are therefore required.		Not applicable.
Construction activities	Generation of job opportunities.	This is a positive impact and no mitigation measures are therefore required.		Not applicable.
Construction activities.	Stimulation of the local economy.	This is a positive impact and no mitigation measures are therefore required.		Not applicable.
<b>Operational Phase</b>				
New residences in the area.	Increased security due to presence of residents on formally vacant land.	This is a positive impact and no mitigation measures are therefore required.		Not applicable.
New residences in the area.	Generation of job opportunities for domestic workers, gardeners and other services.	This is a positive impact and no mitigation measures are therefore required.		Not applicable.
New residences in the area.	Stimulation of the local economy.	This is a positive impact and no mitigation measures are therefore required.		Not applicable.
<b>Traffic</b>				
<b>Construction Phase</b>				
Construction activities.	Increase in traffic volumes to the site.	To minimise the effect of an increase in traffic volumes.	<ul style="list-style-type: none"> <li>• Avoid using access roads during peak times, as far as possible.</li> <li>• Ensure that construction vehicles are roadworthy and that drivers comply with road rules.</li> <li>• Loads must be securely fastened and may not exceed the tonnage limitations for each vehicle.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Post Construction/Rehabilitation Phase</b>				
Rehabilitation activities	Increase in traffic volumes to the site.	To minimise the effect of an increase in traffic volumes.	<ul style="list-style-type: none"> <li>• Avoid using access roads during peak times, as far as possible.</li> <li>• Ensure that construction vehicles are roadworthy and that drivers comply with road rules.</li> <li>• Loads must be securely fastened and may not exceed the tonnage limitations for each vehicle.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Operational Phase</b>				
Operational activities.	Increase in traffic volumes to the site.	Increase in traffic volumes in the area.	<ul style="list-style-type: none"> <li>• Ensure optimal operation of access gates where applicable to ensure minimal impact on traffic flow.</li> <li>• Set up a notice board with the purpose of making residents aware of: <ul style="list-style-type: none"> <li>➢ Public transport systems in the area; and</li> <li>➢ The benefits of carpooling and sharing.</li> </ul> </li> </ul>	Applicant

## 8.2 Applicable Environmental Management Standards and Practices

- Norms and Standards for the Storage of Waste (GN 926 of 29 November 2013).

## 8.3 Applicable provisions of the NEMA, 1998, as amended, regarding closure

The provisions of NEMA, 1998, pertaining to closure are not applicable to this proposed development as the development does not include the prospecting, exploration or extraction of a mineral or petroleum resource.

## 8.4 Applicable provisions of the NEMA, 1998, as amended, regarding financial provision for rehabilitation

The provisions of NEMA, 1998, pertaining to financial provision for rehabilitation are not applicable to this proposed development as the development does not include the prospecting, exploration or extraction of a mineral or petroleum resource.

## 8.5 Method of monitoring the implementation of the impact management actions

### Construction Phase

An independent Environmental Control Officer (ECO) must be appointed to conduct monthly compliance audits during the construction phase of the proposed development. The audits must verify compliance with the Environmental Authorisation and this Environmental Management Programme and a formal report must be compiled after each audit. The reports must be submitted to the Competent Authority. Once the construction phase has been completed, a post-construction audit must be conducted by the independent ECO and the report also submitted to the Competent Authority.

### Operational Phase

An internal ECO must be appointed to conduct monthly compliance audits during the operational phase of the proposed development and to ensure that corrective actions are implemented where required. Reports resulting from these audits do not need to be submitted to the Competent Authority.

An independent ECO must be appointed to conduct annual compliance audits during the operational phase of the proposed development. The audits must verify compliance with the Environmental Authorisation and this Environmental Management Programme and must comply with the requirements of Appendix 7 of the Environmental Impact Assessment Regulations of 2014, as amended. A formal report must be compiled after each audit and the reports must be submitted to the Competent Authority.

## 8.6 The frequency of monitoring the implementation of the impact management actions

### Construction Phase

Monthly independent ECO compliance audits.

### Operational Phase

Monthly internal ECO compliance audits and annual external ECO compliance audits.

## 8.7 Persons who will be responsible for the implementation of the impact management actions

The applicant is ultimately responsible for the implementation of the impact management actions, during all phases of the development, even where the implementation of the actions may be contracted out to a third party. During the construction phase, sub-contractors will for the most part be carrying out the required impact management actions and these actions

should therefore be adequately communicated to the contractors. During the operational phase, the applicant will be mostly responsible for carrying out the required impact management actions along with the site manager.

The applicant must appoint a designated person for the function of internal/in-house ECO and an external, suitably qualified Environmental Assessment Practitioner for the function of external, independent ECO.

## **8.8 Time periods within which the impact management actions must be implemented**

### **Planning and Design Phase**

The management actions for the Planning and Design Phase must be completed before the Pre-construction Phase is commenced with.

### **Pre-construction Phase**

The management actions for the Pre-construction Phase must be completed before the Construction Phase is commenced with.

### **Construction Phase**

The management actions for the Construction Phase must be completed prior to the completion of the Construction Phase (i.e. before the Operational Phase is commenced with). Rehabilitation should be conducted concurrent with construction as far as possible. Any additional rehabilitation should be conducted within one year from the completion of construction.

### **Operational Phase**

The management actions for the Operational Phase must be implemented during the Operational Phase, on a continual basis.

## **8.9 Mechanism for monitoring compliance with the impact management actions**

Please refer to Sections 8.5 and 8.6 of this EMP.

## 8.10 Program for reporting on compliance, taking into account the requirements as prescribed by the EIA Regulations, 2014, as amended

Table 4: Reporting program

Type of reporting	Reporting Frequency	Authority to report to
<b>Construction Phase</b>		
Monthly independent ECO compliance audits	Monthly, for the duration of the construction phase	Competent Authority (GDARD)
Post-construction phase independent ECO compliance audit	Once-off, upon completion of the construction phase	Competent Authority (GDARD)
<b>Operational Phase</b>		
Monthly independent ECO compliance audits	N/A – Internal reporting	N/A – Internal reporting
Annual external ECO compliance audits	Yearly	Competent Authority (GDARD)

## 9. ENVIRONMENTAL AWARENESS PLAN

The applicant will ensure that its employees are adequately informed of the environmental risks that may result from work that they conducted onsite and how these risks must be dealt with in order to avoid pollution or the degradation of the environment, through the implementation of this Environmental Awareness Plan.

The Environmental Awareness Plan for the development consists of two parts, namely, initial Induction Training and ongoing job-specific, Toolbox-talk Training. The same training material will be utilised during both the Induction Training and Toolbox-talk Training.

### Induction Training

Before any employees or contactors commence work at the development, each individual must undergo an Induction Training session. This is required during the following phases of the proposed project:

- Pre-Construction phase;
- Construction phase (including rehabilitation); and
- Operational phase.

An attendance register must be kept by the Applicant and each individual who has completed the Induction Training must complete the attendance register. This will also function as an acknowledgement that each individual has understood the training received.

### Toolbox-talk Training

Toolbox-talk Training must be conducted biannually during the operational phase of the proposed development and all operational employees must attend these sessions.

An attendance register must be kept by the Applicant and each individual who has completed the Toolbox-talk Training must complete the attendance register. This will also function as an acknowledgement that each individual has understood the training received.

### Training Material

The same material will be used for both the Induction Training and Toolbox-talk Training sessions and will cover the following topics:

- What is meant by the term “environment”;
- Why the environment requires protection;
- The environmental risks that may result from work that is performed at the development, during the above-mentioned phases of the project;
- How the identified risks may impact upon the environment;
- How the identified risks can be mitigated;
- The protection of workers who refuse to do environmentally hazardous work, as provided for in the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended;
- Environmental Management Programme conditions that are specifically applicable to employee’s work onsite;
- Fire-fighting procedures; and
- Hydrocarbon spill response procedure, including spill kit usage training.

The training can be presented in a verbal format if required.

## **10. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

No specific information has been required by the Competent Authority at this stage of the application process.