

# Appendix H

**EMPR**



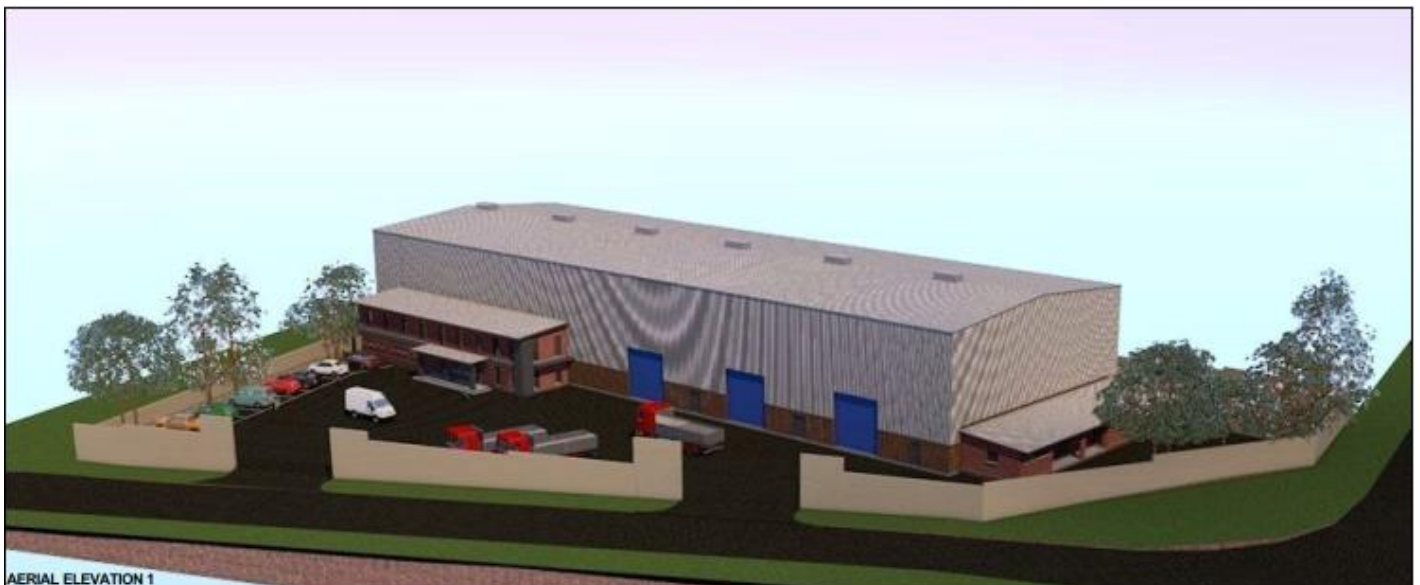


R-BAY PROPERTIES (PTY) LTD

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# PROPOSED CHEMICAL WAREHOUSE

Draft Environmental Management Programme





**R-BAY PROPERTIES (PTY) LTD**

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**Draft Environmental Management Programme**

**TYPE OF DOCUMENT (VERSION) PUBLIC**

**PROJECT NO. 41103633**

**OUR REF. NO. KZN EDTEA REFERENCE NUMBER: DC22/0002/2023**

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EAP CV

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CONCEPTUAL STORM WATER MANAGEMENT PLAN



# 1 INTRODUCTION

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WSP Group Africa (Pty) Ltd (WSP) was appointed by R-Bay Properties (Pty) Ltd (R-Bay), a subsidiary of the Richbay Group of Companies (Richbay) to undertake a Scoping and Environmental Impact Reporting (S&EIR) process for the proposed development of a chemical storage warehouse in Pietermaritzburg, KwaZulu Natal (**Figure 1-1**).

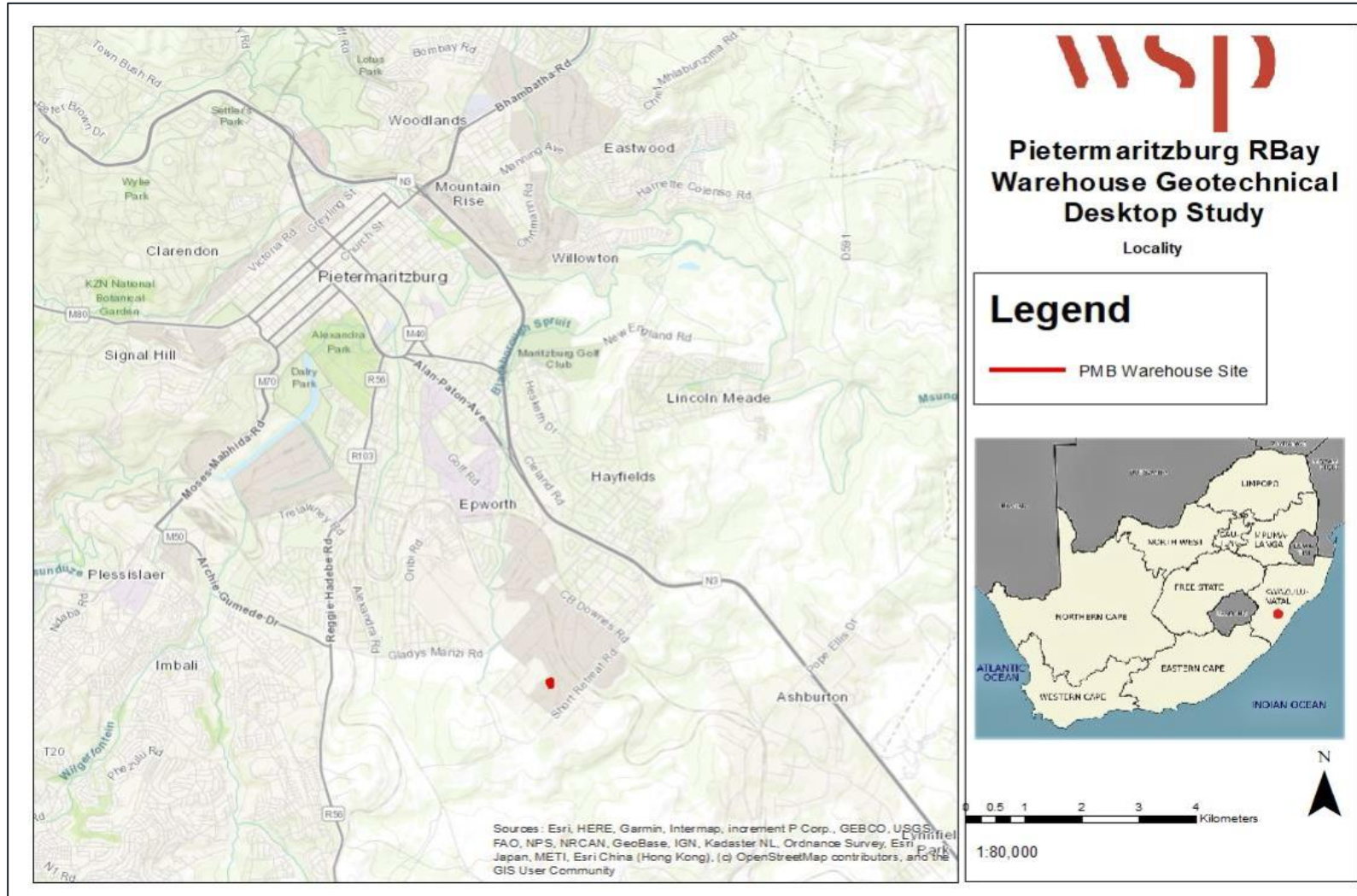
## 1.1 BACKGROUND INFORMATION

R-Bay proposes to construct a chemical warehouse for the storage of dangerous goods with a maximum capacity of 2 000 m<sup>3</sup>. The warehouse will be designed as a purpose-built chemical warehousing structure.

The project will entail the clearance of (potentially indigenous) vegetation on a site of 9 955 m<sup>2</sup>, in Shortts Retreat (Mkondeni), Pietermaritzburg. The warehouse will be used as an importation hub where chemicals (already packed and palletized) will be offloaded from shipping containers, and stored, prior to dispatch to Richbay facilities throughout Southern Africa. The proposed site is adjacent to one of the existing Richbay production facilities and is required in the immediate vicinity to alleviate space constraints at the existing Richbay Pietermaritzburg site. The space constraints have been negatively affected by the increase in shipping challenges through the Durban Port. In addition, processed chemicals (already packed and palletized) will be stored prior to dispatch for international distribution. No processing or decanting will take place in the warehouse/s.

The chemicals that will be stored at the warehouse/s will include:

- Hydrochloric Acid.
- Acetic Acid.
- Sodium Hypochlorite.
- Sulphuric Acid.
- Caustic Soda (Solid).
- Caustic Soda Liquid.
- Phosphoric Acid.
- Nitric Acid.
- Sodium Metabisulphite (Solid).
- Formaldehyde.
- Ammonium 25%.
- Sodium Chlorite 25-31%



**Figure 1-1 – Locality Map of the Proposed Warehouse**



**Figure 1-2 – Layout of the proposed warehouse**

## 1.2 PURPOSE OF THE EMPR

An EMPr is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced.”

This EMPr has been compiled in accordance with Appendix 4 of the EIA Regulations, in compliance with section 24N of NEMA, with the purpose of ensuring that negative impacts are reduced, and positive effects are enhanced through a process of continual improvement, during the construction, operational and decommissioning phases of the proposed project.

To facilitate compliance to the EMPr by appointed contractors and sub-contractors, it is required that all onsite personnel are aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the construction, operation and decommissioning activities.

Further to the above, appointed contractors and sub-contractors will also be required to comply with all relevant legislation and standards.

A hard copy of the EMPr must always be in the site office and made available to officials on request.

### 1.2.1 EMPR OBJECTIVES

The EMPr has the following objectives:

- Identify mitigation measures and environmental specifications which are required to be implemented for the planning, construction, operation, rehabilitation and decommissioning phases of the Project in order to manage and minimise the extent of potential environmental impacts associated with the facility;
- Ensure that all the phases of the proposed Project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced;
- Identify entities responsible for the implementation of the measures and outline functions and responsibilities;
- Create management structures that address the concerns and complaints of interested and affected parties (I&APs) with regards to the proposed project;
- Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation; Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Train onsite personnel with regard to their environmental obligations; and
- Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the BA process.

### 1.2.2 ENVIRONMENTAL OBJECTIVES AND TARGETS

To facilitate compliance to the EMPr, the project proponent must comply with all relevant legislation and standards and make all personnel aware of the requirements of the EMPr, as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed Project.

It is recommended that environmental objectives (as outlined in this document) be emphasised as minimum requirements. Objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and provide rational and practical environmental guidelines to:
  - Minimise disturbance of the natural environment;
  - Minimise fugitive emissions;
  - Minimise impact of added traffic into the area;
  - Ensure surface and groundwater resource protection;
  - Prevent or minimise all forms of pollution;
  - Protect indigenous flora and fauna;
  - Prevent soil erosion;
  - Promote sustainable use of resources;
  - Adopt the best practical means available to prevent or minimise adverse environmental impacts;
  - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
  - Promote the reduction, reuse, recycling and recovery of waste;
  - Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Describe all monitoring procedures required to identify impacts on the environment;
- Define how the management of the environment is reported and performance evaluated; and
- Train onsite personnel on their environmental obligations.

### 1.3 STRUCTURE OF THE EMPR

For the purposes of demonstrating legal compliance, **Table 1-1** cross-references the sections within the EMPr with the requirements as per Appendix 4 of the EIA Regulations.

**Table 1-1 – Legislation Requirements as detailed in Appendix 4 of the EIA Regulations**

Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
(a)	details of-	
	(i) the EAP who prepared the EMPr; and	<b>Section 2.2</b>
	(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	<b>Section 2.2 Appendix A</b>
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	<b>Section 3</b>
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	<b>Section 3 Appendix C</b>
(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the	<b>Section 3.2 and Section 7</b>

Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
	environmental impact assessment process for all phases of the development including- (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to - (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	Section 7
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6 / Section 7
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 6
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 6 / Section 7
(m)	an environmental awareness plan describing the manner in which-	Section 6.2
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	



Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	N/A

## 2 KEY ROLE PLAYERS

### 2.1 PROJECT PROPONENT

R-Bay Properties (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the chemical warehouse within the Msunduzi Local Municipality. **Table 2-1** provides the relevant details of the project proponent.

**Table 2-1 – Details of Project Proponent**

<b>Proponent:</b>	<b>R-Bay Properties (Pty) Ltd</b>
<b>Contact Person:</b>	Mr MF Klopper
<b>Postal Address</b>	PO Box 368 Richards Bay 3900
<b>Telephone:</b>	035 751 1702
<b>Email:</b>	martink@richbay.co.za

### 2.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP was appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the BA process for the proposed project. The Curriculum Vitae (CV) of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 2-2** details the relevant contact details of the EAP.

**Table 2-2 – Details of the EAP**

<b>EAP:</b>	<b>WSP Group Africa (Pty) Ltd</b>
<b>Contact Person:</b>	Patricia Nathaniel
<b>Physical Address:</b>	1st Floor, Pharos House, 70 Buckingham Terrace, Westville 3629 South Africa
<b>Telephone:</b>	+27 11 361 1398
<b>Email:</b>	Patricia.nathaniel@wsp.co.za
<b>EAP Qualifications:</b>	BSc (Hons) Geography and Environmental Management
<b>EAPASA Registration Number:</b>	EAPASA (2020/1120)

### STATEMENT OF INDEPENDENCE

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest





that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

### 3 PROJECT DESCRIPTION

This section provides a description of the location of the project area and the details associated with each phase of the proposed project. The description encompasses the activities to be undertaken during the construction and operational phases as well as the consideration for site accessibility, water demand, supply, storage, and site waste management. This section also considers the need and desirability of the project in accordance with Appendix 1 of GNR 326.

#### 3.1 LOCATION OF THE PROPOSED PROJECT

The proposed chemical warehouse will be located on Erf 2306 and 2307, Shortts Retreat (Mkondeni), Pietermaritzburg, KwaZulu Natal Province, which is designated as an industrial zone as per the Msunduzi IDP (2021/22). The proposed site is accessed via the R103 (Regional Road) or the N3 (National Road), with R103 approximately 1,3 km southwest of the facility and the N3 approximately 2,3 km southwest of the facility and covers an area of approximately 9 955 m<sup>2</sup> of which approximately 2 500 m<sup>2</sup> will be used for the development of the proposed chemical warehouse. Various urban roads are required to access the warehouse which lies on Balhambra Crescent, accessed from Yarborough Road to the east of the warehouse.

The regional locality of the site is depicted in **Figure 3-1** and a zoomed locality is provided in **Figure 3-2**.

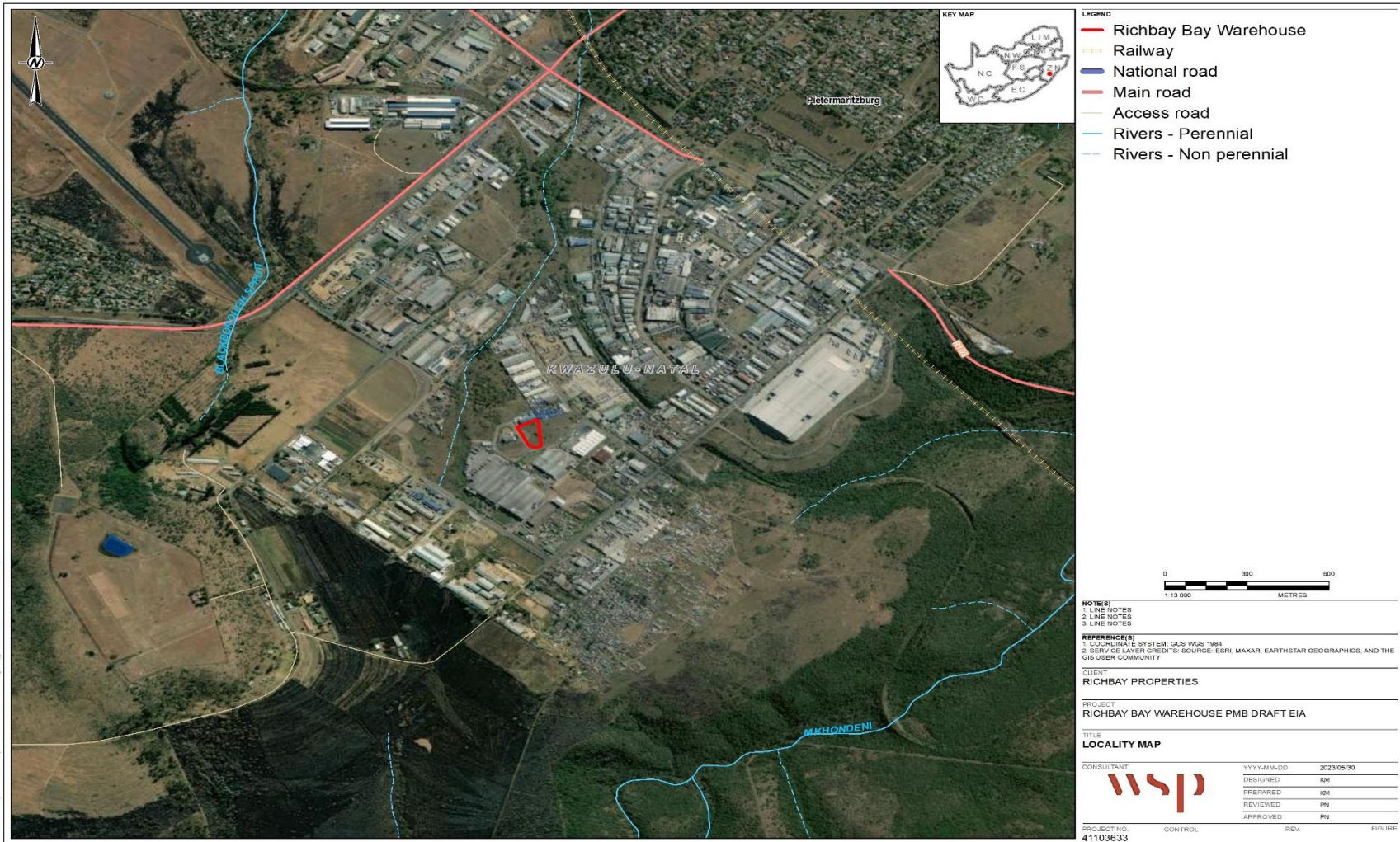
**Table 3-1** below indicates the cadastral information of the site and **Table 3-2** includes the co-ordinates of the site.

**Table 3-1 –Cadastral Information of the Site**

Details required as per GNR 326 ANNEX 1 (3)	DETAIL
21 Digit Surveyor General Code of each Cadastral Land Parcel	N0FT0211000023060000 N0FT0211000022910000
Physical Address and Farm Name	Erf 2306 and 2307, Shortts Retreat ( <u>Mkondeni</u> )
Land use Zoning	Industrial
Municipality	Msunduzi Metropolitan Municipality
Ward	36

**Table 3-2 – Coordinate Points of the Cadastral Land Parcel**

Point	Latitude	Longitude
Corner 1	29°39'39.14"S	30°24'49.56"E
Corner 2	29°39'38.14"S	30°24'51.84"E
Corner 3	29°39'38.40"S	30°24'52.04"E
Corner 4	29°39'41.76"S	30°24'52.33"E
Corner 5	29°39'41.98"S	30°24'51.63"E
Corner 6	29°39'41.74"S	30°24'50.93"E
Centre Point	29°39'39.93"S	30°24'51.24"E



**Figure 3-1 - Locality map of the proposed warehouse**



**Figure 3-2 - Location of the proposed chemical warehouse sited within Erf 2306 and 2307, Shortts Retreat, Pietermaritzburg**

### 3.2 PROPOSED PROJECT COMPONENTS AND PROCESSES

The chemicals will be stored inside a warehouse/s covering an area of approximately 2 500 m<sup>2</sup>(as per the layout plan attached in **Appendix I**). **Table 3-3** below provides a description of the chemicals that are proposed to be stored at the warehouse.

**Table 3-3 - Description of chemicals to be stored at the proposed warehouse**

Mixture Name	Container Type	Container Volume (m <sup>3</sup> )	Quantity Containers (Maximum)	Total Maximum Capacity (m <sup>3</sup> )
Hydrochloric Acid	HDPE	0.25	6000	1500
Acetic Acid	HDPE	0.25	200	50
Sodium Hypochlorite	HDPE	0.25	200	50
Sulphuric Acid	HDPE	0.25	200	50
Caustic Soda (Solid)	PP	0.025	8000	200
Caustic Soda Liquid	HDPE	0.25	200	50
Phosphoric Acid	HDPE	0.25	80	20
Nitric Acid	HDPE	0.25	100	25
Sodium Metabisulphite (Solid)	PP	0.025	100	2.5

In addition to the warehouse, there will be ancillary services, including:

- An administration building;
- A structure housing a canteen and changing rooms;
- Loading/off-loading bays;
- Security controlled entrance and exit; and
- Parking bays.

The proposed layout is indicated in **Figure 3-4** and an architectural rendering of the proposed warehouse is provided in **Figure 3-3** below.



**Figure 3-3 - Architectural Rendering of the Proposed Chemical Warehouse**

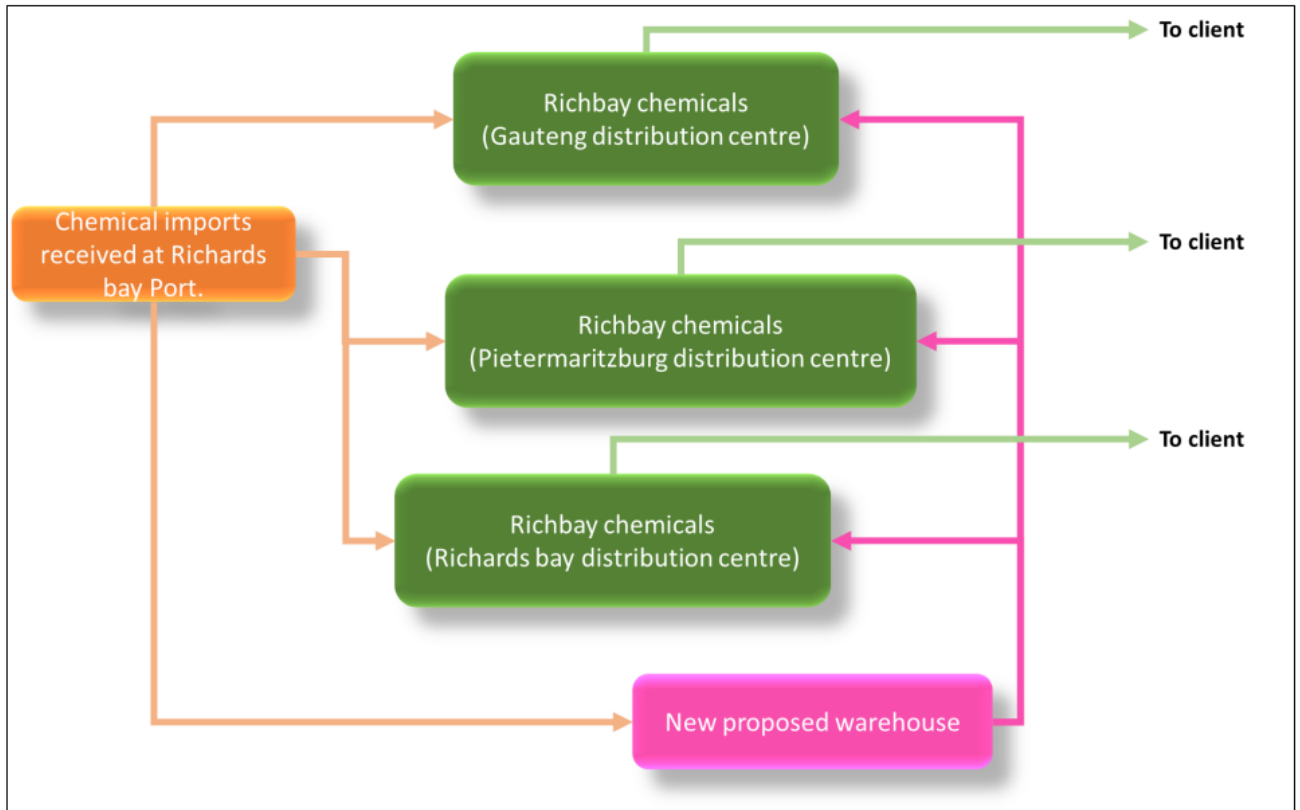


**Figure 3-4 - Proposed layout of the Chemical Warehouse**



### 3.3 PLANT AND PROCESS DESCRIPTION

The new proposed warehousing will be used as an importation hub where the chemicals in drums and IBCs, will be offloaded from shipping containers, and stored, prior to dispatch to the Richbay Chemical Plants throughout Southern Africa. No decanting will take place in the warehouse. The diagram in **Figure 3-5** shows a basic overview of the proposed operations.



**Figure 3-5 - Basic Overview of Proposed Operations**

### 3.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

#### 3.4.1 CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 3-4**.

**Table 3-4 – Construction Activities**

Activity	Description
Establishment of an access road	Access to the proposed warehouse site will be via the existing road network therefore no additional access roads are required.
Site preparation and establishment	Site establishment will include clearing of vegetation and any bulk earthworks that may be required.

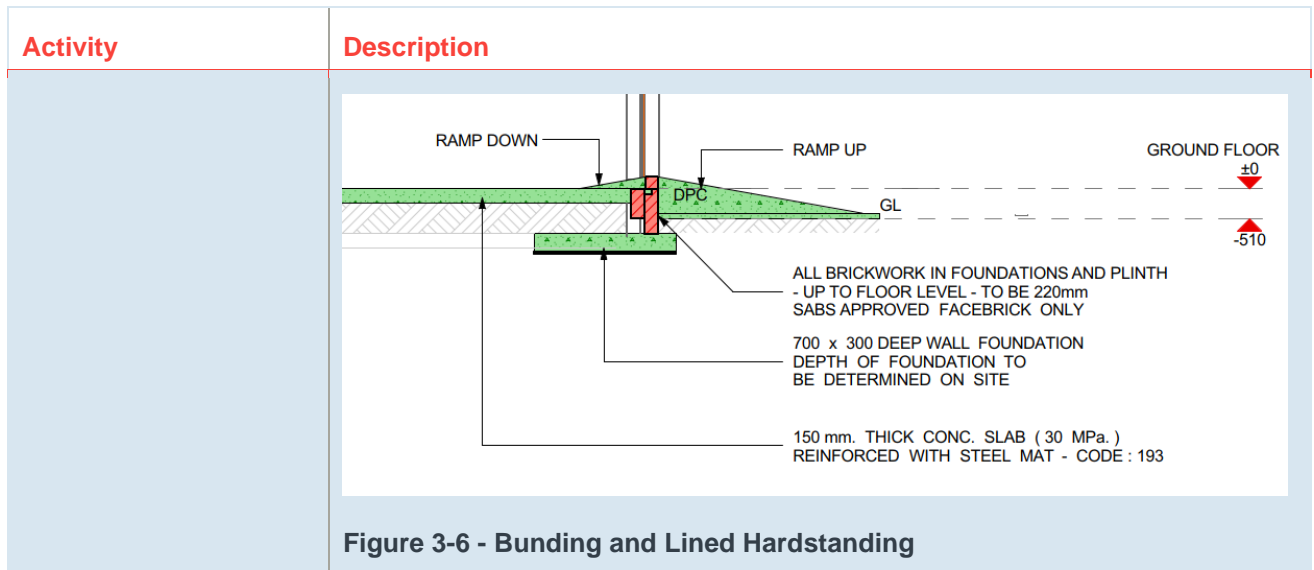
Activity	Description
Transport of components and equipment to site	All construction material, machinery and equipment (i.e. graders, excavators, trucks, cement mixers etc.) will be transported to site utilising the national, regional and local road network. Larger components (may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989). In such cases a permit may be required for the transportation of these loads on public roads.  The project will require approximately 1 or 2 trucks per day during the construction phase.
Establishment of a laydown area on site	Construction materials, machinery and equipment will be kept at relevant laydown and/or storage areas. Laydown areas (site camps) of approximately up to 0.25 ha have been proposed. The laydown area will limit potential environmental impacts associated with the construction phase by limiting the extent of the activities to one designated area.
Construction of the warehouse	The construction of the warehouse will consist of the following material: <ul style="list-style-type: none"> <li>■ Steel strusses</li> <li>■ Roof Sheeting</li> <li>■ Sheeting for side cladding</li> <li>■ Cement</li> <li>■ Reinforced mat</li> </ul>
Establishment of ancillary infrastructure	Ancillary infrastructure will include a workshop, storage areas, office, and a temporary laydown area for contractor's equipment.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated.

### 3.4.2 OPERATIONAL PHASE

During operation the key activities will include the storage of chemicals inside the warehouse. Key activities associated with the construction phase are described in Table 6-5.

**Table 3-5 - Operational Phase Activities**

Activity	Description
Transport of chemicals	Access to the proposed warehouse site will be via the existing road network therefore no additional access roads are required.  It is anticipated that there will be approximately 10 additional trucks required per week during the operational phase to deliver the chemicals to the warehouse.
Loading and offloading of material	The material will be offloaded / loaded from trucks inside the warehouse and no chemicals will be handled outside the warehouse.
Storage of material	The chemicals will be stored inside a warehouse/s. All chemicals will be handled in sealed containers. In addition, the inside of the warehouse will be bunded with a lined hardstanding (as per <b>Figure 3-6</b> ).



### 3.4.3 DECOMMISSIONING PHASE

The decommissioning phase will include activities similar to that of the construction phase as indicated in **Table 3-4**.

## 3.5 NEED AND DESIRABILITY OF THE PROJECT

The DEA&DP Guideline (2013) states that the essential aim of need and desirability is to determine the suitability (i.e., is the activity proposed in the right location for the suggested land-use/activity) and timing (i.e. is it the right time to develop a given activity) of the development. Therefore, need and desirability addresses whether the development is being proposed at the right time and in the right place. Similarly, the 'Best Practicable Environmental Option' (BPEO) as defined in NEMA is *“the option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.”*

Richbay have various chemical manufacturing plants situated across Southern Africa and produce a variety of commercial and industrial chemical products for the South Africa and international market.

Due to the Port of Durban becoming progressively unstable and unreliable, as well as international shipping schedules being hampered by various geopolitical matters, the receiving of imported chemicals required by the various processing plants have become erratic and therefore place a bottleneck on delivering the final product to the South African market. In addition, exporting to international markets has become backlogged and Richbay no longer has sufficient capacity to store the raw products or manufactures product. As such the warehouse is required to cater for additional storage in order for backlogs in shipping not hamper the ongoing operation of the Richbay facilities or supply to markets.

The proposed warehouse will therefore act as a buffer to receive the imported chemicals, ensure packaging is adequate, quality checks conducted, and a small volume of stock will be available at the warehouse. The products will therefore be readily available for their chemical manufacturing facilities.

Richbay has also grown in volume throughput (has been in existence since 1978) and it has now become necessary to construct a warehouse that can store and distribute their products between the branches and specifically near the Pietermaritzburg branch. This need combined with the

export/import product buffering as a direct result of the global shipping constraints are elevating the necessity of such a warehouse.

Based on the above the activity required to be undertaken is a warehouse for the storage of dangerous goods near the existing Richbay facility in Pietermaritzburg. The proposed site is adjacent to the existing facility and situated within an industrial area. There are some biophysical constraints, and these will be assessed by specialists in the EIA Phase. The site is less than 1 hectare, and two layout alternatives are being considered, however the impacts will remain the same as this is within the same assessed footprint.

The Needs and Desirability Guidelines, in terms of the Environmental Impact Assessment Regulations, Government Notice 792 of 2012, as amended, highlights the need to consider how the proposed project may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. It should also consider how the development may affect or promote justifiable economic and social development. The Need and Desirability is assessed in the table below.

**Table 3-6 – Need and Desirability Assessment**

<b>PART 1 - NEED</b>	
<p>Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?</p> <p>Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?</p>	<p>Based on the SDF, the site is located within the Mkondeni area which is earmarked for industrial activities in addition the site is situated in a developable area.</p> <p>The site is situated within a SEDi Lap Industrial Development Zone.</p>
<p>Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.</p>	<p>The Municipality's strategic location has supported the establishment of a very strong industrial base. Mkondeni is the primary industrial node in the Msunduzi Municipality. With the emergence of industrial nodes along the N3 at Camperdown (the Mkhambathini Municipality), Cato Ridge and Hammersdale (eThekweni), the locational importance and the role the Msunduzi Municipality could play in the regional context has become more pronounced. The N3 Corridor Development Plan locates the city as part of the KZN Industrial and Logistics Hub highlighting the significance of manufacturing and industrial sectors located along the N3 between Pinetown / New Germany and Pietermaritzburg for the regional economy. The plan proposes that existing industrial nodes within Pietermaritzburg be further developed and enhanced i.e., industrial areas Mason's Mill &amp; Pentrich be explored, and Mkondeni expanded to the south and east. The proposed site is located within the Mkondeni area which is earmarked for industrial activities, in addition the site is situated in a developable area.</p>

<p>Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?</p> <p>Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?</p>	<p>The site is situated in an area that has existing service delivery by the municipality. Minimal additional electricity and water will be required.</p> <p>R-Bay will also investigate sustainable construction alternatives to reduce reliance on electricity and water.</p>
<p>Is the project part of a national programme to address an issue of national concern or importance?</p>	<p>The proposed project does not form part of a national programme. However, it does form part of the supply of chemicals needed for the purification of drinking water.</p>
<p><b>PART 2 - DESIRABILITY</b></p>	
<p>Is the development the best practicable environmental option for this land/site?</p>	<p>The site is currently not formally used and is occupied by grasses, small trees and termite mounds. Google Earth imagery shows that the site has not been formally used in the past 40 years. Over the past 40 years, informal paths have been created by people traversing the site, assumedly using the open plot of land as a shortcut. In 2016, an informal driving path was created in the western section of the site. There was no evidence of planned future activities at the site, nor was there evidence of any current, planned or previous agricultural use being made of the site.</p> <p>The site is situated in an industrial area and will fit with the characteristics of the surrounding area.</p>
<p>Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?</p>	<p>No, the project is aligned with the SDF and IDP of the Msunduzi Municipality.</p>
<p>Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?</p>	<p>The Msunduzi Municipality assessed the proposed development against the EMF and the below was noted:</p> <ul style="list-style-type: none"> <li>■ High Water Quality Constraints: Appropriate and adequate stormwater management measures must be put in place to address excess runoff from increased hardened surface and its potential cumulative impact on the wetland system near the project site.</li> <li>■ High Air Quality Constraints: Adequate dust suppression measures must be put into place and emissions licences must be sought where applicable.</li> <li>■ The site does not have any environmental constraints within the project site.</li> </ul>

	<p>The specialist studies to be undertaken during the EIA Phase will assess the potential impacts and provide recommendations to be included in the EMPr.</p>
<p>Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).</p>	<p>The preferred location was chosen based on the following factors:</p> <ul style="list-style-type: none"> <li>■ The property is owned by R-Bay and therefore no further landowner consent is required.</li> <li>■ The proposed location is within an industrial area and the Erf is zoned as industrial therefore is a compatible land use for the site.</li> <li>■ The proposed location is approximately 2.5 km from the N3, allowing for a favourable transport route between major cities.</li> <li>■ The site is adjacent to one of the existing Richbay production facilities, and is required in the immediate vicinity in order to alleviate space constraints at the existing Richbay Pietermaritzburg site.</li> </ul> <p>Based on the SDF and Msunduzi Single Land Use Scheme the site is situated in a developable area and an industrial zone.</p>
<p>How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?</p>	<ul style="list-style-type: none"> <li>■ The Msunduzi Municipality assessed the proposed development against the EMF and the below was noted:</li> <li>■ High Water Quality Constraints: Appropriate and adequate stormwater management measures must be put in place to address excess runoff from increased hardened surface and its potential cumulative impact on the wetland system near the project site.</li> <li>■ High Air Quality Constraints: Adequate dust suppression measures must be put into place and emissions licences must be sought where applicable.</li> <li>■ The site does not have any environmental constraints within the project site.</li> </ul> <p>The specialist studies undertaken during the EIA Phase assessed the potential impacts and provided recommendations to be included in the EMPr.</p>
<p>How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?</p>	<p>Based on the impact significant screening, the impacts will range from very low to high without mitigation measures.</p> <p>The specialist studies undertaken during the EIA Phase assessed the potential impacts and provided recommendations to be included in the EMPr</p>
<p>Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?</p>	<p>No.</p>



Will the proposed land use result in unacceptable cumulative impacts?

Cumulative impacts have been assessed during the EIA Phase.

## 4 ENVIRONMENTAL SENSITIVITY

Table 4-1 and Figure 4-1 illustrate the overall sensitivity of the site in relation to the proposed project, there were no no-go areas identified on the proposed site.

**Table 4-1 - Environmental Sensitivities identified by specialists**

Specialist study	Sensitivity Rating/Fatal Flaw Analysis
Soil and Agriculture	<p>The soils identified at the site were Clovellys and Witbanks and the capability of the site was deemed to be Class III; Arable, and, despite Clovelly soils typically being considered good arable soils, is suitable only for Wildlife, Forestry, Light Grazing, Moderate Grazing, Intensive Grazing, Light Cultivation and Moderate Cultivation owing to its hardness and consequent lack of depth, and lack of topsoil.</p> <p>No fatal flaws are evident for the proposed project.</p>
Aquatic Ecology	<p>The study area is considered to be of low sensitivity for aquatic biodiversity, and the proposed development is cut off from downslope wetlands via the existing tarred road, and no significant impacts on aquatic biodiversity as a result of the proposed development are therefore anticipated.</p>
Terrestrial Ecology	<p>Most of the study area consists of degraded grassland, and the site ecological importance of this habitat unit is rated low. Nevertheless, the National Web-based Environmental Screening Tool categorises the Terrestrial Biodiversity Theme for the study area as Very High Sensitivity. This is based on the stated presence of land designated as CBA1 and the presence of proposed priority areas for protected area expansion. It is noted however, that the study area itself was characterised as degraded grassland when baseline surveys took place in December 2021, and has since been completely transformed through dumping of spoil by developers involved in earthworks on a site adjacent to the LSA.</p> <p>Provided that the mitigation measures and monitoring requirements are adhered to, the Project may be authorised from a terrestrial ecosystems and biodiversity perspective.</p>
Heritage	<p>The site is very low in sensitivity and the specialist recommended the site be exempt from a HIA.</p>
Palaeontology	<p>The site is very low in sensitivity and the specialist recommended that a Chance Find Protocol be implemented.</p>



Specialist study	Sensitivity Rating/Fatal Flaw Analysis
MHI	Due to the presence of certain hazardous materials, their associated offsite effects and the fact that some may be stored in IBCs (not drums) thereby exceeding the 2022 MHI Regulation Threshold, the R-Bay Properties Pietermaritzburg site should as a precaution be classified as a Low Level Major Hazard Establishment.
Geotechnical	Based on the desktop study, the proposed site is suitable for the development of a warehouse.

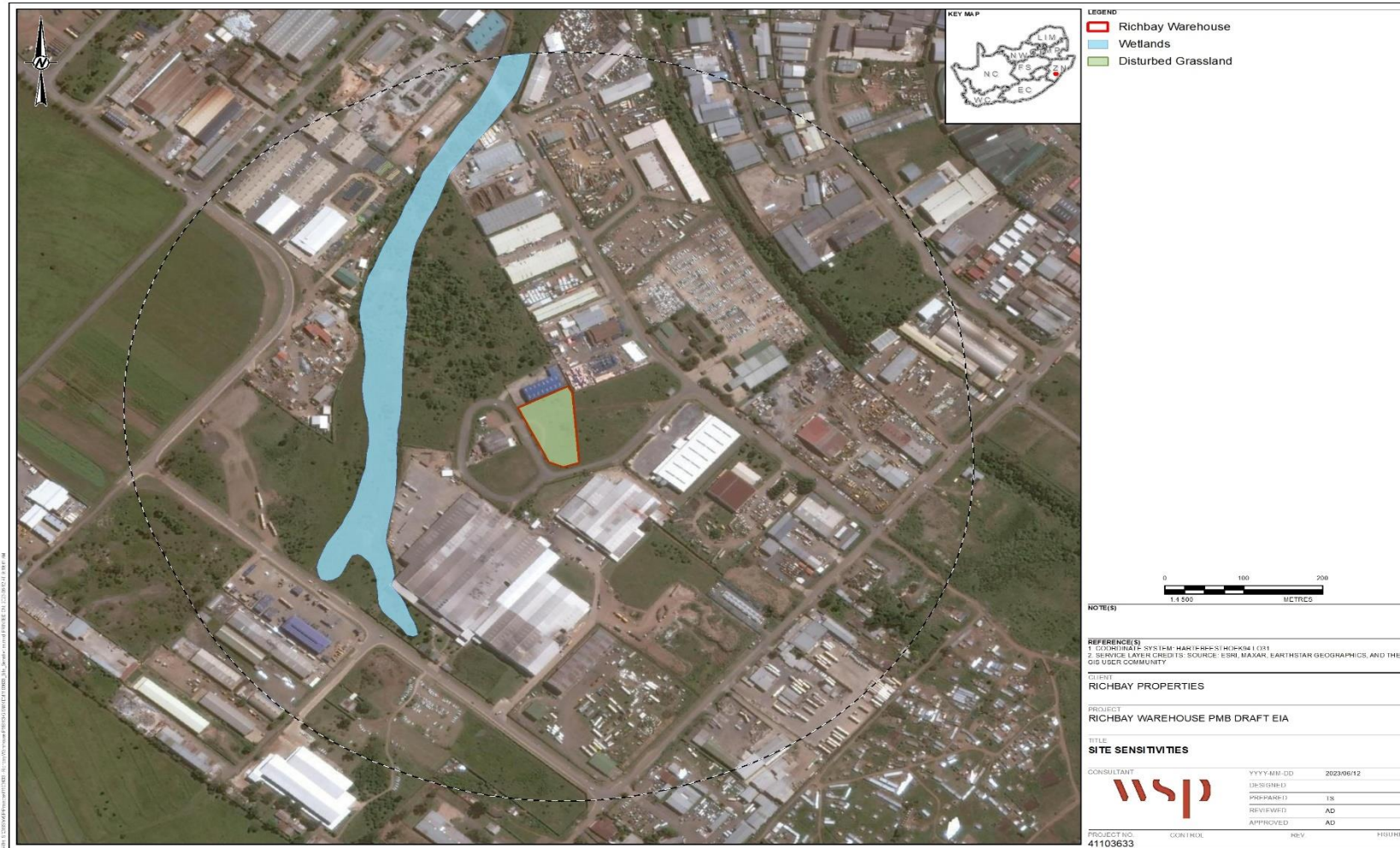


Figure 4-1 – Combined Sensitivity Map for the proposed project

## 4.1 IMPACT ASSESSMENT OUTCOMES

All impacts associated with the proposed project can be reduced to a medium to low significance with the implementation of recommended mitigation measures as presented within this EMP and the associated specialist studies.

A summary of the identified impacts and corresponding significance ratings for the proposed Project is provided in **Table 4-2** below.

**Table 4-2 – Impact Assessment Summary**

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
<b>Construction Phase</b>				
Air Quality	Impact on air quality during construction	Negative	Moderate	Low
Noise and Vibration	Impact on ambient sound levels during construction	Negative	Low	Low
Soil and Agriculture	Increased erosion and sedimentation	Negative	High	Low
	Change in surface profile (alternative system)	Negative	Moderate	Moderate
	Change in land use (alternative system)	Negative	Moderate	Moderate
	Change in land capability	Negative	High	Low
	Soil Contamination	Negative	High	Low
Terrestrial Biodiversity	Direct loss and disturbance of degraded grassland habitat	Negative	Moderate	Low
	Establishment and spread of alien and invasive plant species	Negative	Moderate	Low
	Injury and mortality of faunal species	Negative	Low	Very Low
Aquatic Biodiversity	Changes in sediment entering and exiting the system	Negative	Very Low	Very Low
	Changes in water quality due to pollution	Negative	Very Low	Very Low
Palaeontology	Impacts to palaeontology	Negative	Very Low	Very Low
Traffic	Road degradation	Negative	Very Low	Very Low
	Dust	Negative	Low	Very Low
	Intersection safety	Negative	Low	Very Low
Social Impacts	Regional employment and household income	Positive	Low	Moderate

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
	Influx of people	Negative	Low	Low
	Surrounding landowners	Negative	Low	Low
Hazardous Substances and Pollutants	Impacts of contaminants on soil, groundwater and surface water	Negative	Low	Low
Waste Management	Improper waste management during construction	Negative	Moderate	Low
	Improper disposal of sanitation waste	Negative	Moderate	Low
<b>Operational Phase</b>				
Soil and Agriculture	Soil erosion and sedimentation	Negative	High	Low
	Soil contamination	Negative	High	Low
Terrestrial Biodiversity	Spread of alien and invasive plant species	Negative	Moderate	Low
	Loss and fragmentation of fauna habitat	Negative	Low	Low
Aquatic Biodiversity	Changes in water quality due to pollution	Negative	Very Low	Very Low
Social Impacts	Regional employment and household income	Positive	Low	Low
	Surrounding landowners	Negative	Low	Low
Hazardous Substances and Pollutants	Impacts of contaminants on soil, groundwater and surface water	Negative	Low	Low
	Toxic releases	Negative	Low	Low
	Worst Case Incident	Negative	High	Low
Waste Management	Improper waste management during construction	Negative	Moderate	Low
<b>Decommissioning Phase</b>				
Soil and Agriculture	Soil erosion and sedimentation	Negative	High	Low
	Soil contamination	Negative	High	Low
Terrestrial Biodiversity	Spread of alien and invasive plant species	Negative	Moderate	Low
Social Impacts	Regional employment and household income	Positive	Low	Low



Considering the findings of the respective studies, no fatal flaws were identified for the proposed project. Should the avoidance and mitigation measures prescribed be implemented, the post-mitigation significance of the considered impacts for the negative aspects pertaining to the environmental aspects is expected to be medium to low.

## 4.2 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMP:

- EIA for the proposed chemical warehouse;
- EA issued by the KZN EDTEA in terms of the NEMA (once issued).

## 5 GOVERNANCE FRAMEWORK

### 5.1 NATIONAL LEGAL AND REGULATORY FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 5-1**.

**Table 5-1 – Applicable National Legislation<sup>1</sup>**

Legislation	Description of Legislation and Applicability
<b>The Constitution of South Africa (No. 108 of 1996)</b>	<p>The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.</p>
<b>National Environmental Management Act (No. 107 of 1998)</b>	<p>In terms of Section 24(2) of the NEMA, the Minister may identify activities which may not commence without prior authorisation. The Minister thus published GNR 327 (Listing Notice 1), 325 (Listing Notice 2) and 324 (Listing Notice 3), as amended, listing activities that may not commence prior to authorisation.</p> <p>The regulations outlining the procedures required for authorisation are published in GNR 326 [2014 Environmental Impact Assessment Regulations (EIA)] (as amended). Listing Notice 1 identifies activities that require a Basic Assessment (BA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&amp;EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity.</p> <p>WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in this section are considered applicable to the development: A S&amp;EIR process must be followed. An EA is required and has been applied for with the KZN EDTEA.</p>
<b>Listing Notice 2: GNR 325</b>  The KwaZulu Natal EDTEA is the competent authority	<p><b>Activity 4 – The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</b></p> <p><b>Description:</b></p>

<sup>1</sup> It should be noted that all dimensions outlined in relation to Listing Notice 1, 2 and 3 are provisional and are subject to final design.

Legislation	Description of Legislation and Applicability
	<p>The proposed project involves the erection of a chemical warehouse with a maximum storage capacity of 2000 m<sup>3</sup> of chemicals.</p> <p>Proposed chemicals to be stored:</p> <ul style="list-style-type: none"> <li>■ Hydrochloric Acid</li> <li>■ Acetic Acid</li> <li>■ Sodium Hypochlorite</li> <li>■ Sulphuric Acid</li> <li>■ Caustic Soda (Solid)</li> <li>■ Caustic Soda Liquid</li> <li>■ Phosphoric Acid</li> <li>■ Nitric Acid</li> <li>■ Sodium Metabisulphite (Solid)</li> <li>■ Formaldehyde</li> <li>■ Ammonium 25%</li> <li>■ Sodium Chlorite 25-31%</li> </ul>
<p><b>Listing Notice 3: GNR 324</b></p> <p>The KwaZulu Natal EDTEA is the competent authority</p>	<p><b>Activity – 12(d)(v)</b> - <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><i>d. KwaZulu-Natal</i></p> <p><i>v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p> <p><b>Description:</b></p> <p>The project will entail the clearance of (potentially indigenous) vegetation on a site of 9 955 m<sup>2</sup> within a critical biodiversity area, in Shortts Retreat (Mkondeni), Pietermaritzburg.</p>
<p><b>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)</b></p>	<p>The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) was promulgated in June 2004 within the framework of the NEMA to provide for the management and conservation of national biodiversity. The NEM:BA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEM:BA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI).</p> <p>SANBI was established by the NEM:BA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems.</p> <p>Critical biodiversity areas (CBAs) are areas of high biodiversity value which are usually at risk of being lost and usually identified as important in meeting biodiversity targets, except for Critically Endangered Ecosystems or Critical Linkages. CBAs in the Province can be divided into two sub-categories:</p> <ul style="list-style-type: none"> <li>■ Irreplaceable (parts of the site are within this sub-category), and</li> <li>■ Optimal (northern parts of the site are within this sub-category).</li> </ul> <p>Based on the Ezemvelo KZN Wildlife 2014, uMgungundlovu District Municipality Biodiversity Sector Plan, the development falls within an irreplaceable CBA. This is defined as areas that are considered critical for meeting biodiversity targets and thresholds, and which requires to ensue persistence of viable populations of</p>

Legislation	Description of Legislation and Applicability
	<p>species and functional ecosystems. There are also some Ecological Support Area (ESA) Local and Landscape corridors demarcated adjacent to the site.</p> <p>Terrestrial ecology studies will be undertaken during the EIA phase to inform the assessment of impacts and will include flora surveys of the project footprint to determine the presence of flora species of concern (SoC).</p> <p>The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the Environmental Management Programme (EMPr).</p>
<p><b>The National Heritage Resources Act (No. 25 Of 1999)</b></p>	<p>The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development.</p> <p>Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally:</p> <p>Section– 35 (4) - No person may, without a permit issued by the responsible heritage resources authority-</p> <ul style="list-style-type: none"> <li>■ destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;</li> <li>■ destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite.</li> <li>■ Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-</li> <li>■ any development or other activity which will change the character of a site— (i) exceeding 5 000 m<sup>2</sup> in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.</li> </ul> <p>In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed project, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668).</p> <p>The heritage specialist recommended that a HIA not be undertaken for the project area due to the existing conditions on the site.</p> <p>The EIA for the project will be loaded onto the SAHRIS portal for comment by SAHRA.</p>



Legislation	Description of Legislation and Applicability
<b>Occupational Health and Safety Act (No. 85 –f 1993) - Major Hazard Installation Regulations, GNR 692</b>	<p>Definitions in the regulations state that a Major Hazard Installation (MHI) is an installation where a substance is stored that is listed in Schedule A of the General Machinery regulations of the Occupational Health and Safety Act and the quantity exceeds those stipulated.</p> <p>It is an installation where a substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident. A Major Incident is an event or occurrence of catastrophic proportions resulting from the use of plant and machinery, or from activities at a workplace.</p>
<b>SANS 1–61:2018 - Major Hazard Installation - Risk Assessments</b>	<p>The regulation requires that a risk assessment be carried out by a Department of Labour Approved Inspection Authority (AIA).</p> <p>For this installation a Quantitative Risk Assessment is required and is aligned with the standards for Major Hazard Installation Risk Assessments.</p> <p>Risk is made up of two components:</p> <ul style="list-style-type: none"> <li>■ The probability of a certain magnitude of hazardous event occurring.</li> <li>■ The severity of the consequences of the hazardous event.</li> </ul> <p>A risk assessment is, therefore, typically comprised of the following aspects:</p> <ul style="list-style-type: none"> <li>■ Identification of the likely hazards expected to be associated with the operation of the installation;</li> <li>■ Quantification of the hazards in terms of their likely frequency and magnitude;</li> <li>■ Determination of the consequences of the hazards and their severity, should these occur;</li> <li>■ Estimating the risk and comparing this with certain acceptability criteria.</li> </ul>
<b>SANS 10–28:2012 - The identification and classification of dangerous goods for transport by road and rail modes</b>	<p>SANS 10228 covers the identification of dangerous goods that are capable of posing a significant risk to health and safety or to property and the environment. Dangerous goods are classified in nine classes and three packing groups in accordance with the United Nation.</p> <p>This code forms part of the requirements for assessing the dangerous goods aspect under the MHI regulations.</p>
<b>SANS 10–34:2019 - Globally Harmonized System of classification and labelling of chemicals (GHS)</b>	<p>SANS 10234 covers the harmonized criteria for the classification of hazardous substances and mixtures, including waste, for their safe transport, use at the workplace or in the home according to their health, environmental and physical hazards.</p> <p>This code forms part of the requirements for assessing the dangerous goods aspect under the MHI regulations.</p>
<b>SANS 10263-0:2010 – The warehousing of dangerous goods</b>	<p>SANS 10263-0 covers the warehousing of dangerous goods and covers aspects relating to storage considerations, key responsibilities, warehouse construction, fire protection measures, firefighting, warehouse organization and technology, safe operating procedures, housekeeping, Health Safety and Environmental requirements, Security and emergency planning.</p>

## 5.2 POLICIES AND PLANS

**Table 5-2** summarised key policies and plans as an outline of the governance framework for the project.

**Table 5-2 – Applicable Regional Policies and Plans**

Applicable Policy	Description of Policy
National Development Plan	<p>The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies a number of enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development.</p> <p>Chapter 3, Economy and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green low-carbon economy, is one of these challenges.</p> <p>In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place.</p> <p>Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes:</p> <ul style="list-style-type: none"> <li>▪ Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.</li> <li>▪ Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted.</li> </ul> <p>The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.</p>

Applicable Policy	Description of Policy
New Growth Path	<p>Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.</p>
National Protected Area Expansion Strategy, 2010	<p>The National Protected Area Expansion Strategy 2010 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2010).</p> <p>According to the NPAES (2016) dataset, the project area falls within a Priority Focus Area, which is of high importance for biodiversity because it is considered a high priority for protected area expansion.</p>

## 5.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

**Table 5-3 – Provincial Plans**

Applicable Plan	Description of Plan
<p><b>Msunduzi Integrated Development Plan (2021/22)</b></p>	<p>The main purpose of the Integrated Development Plan (IDP) is to foster more appropriate service delivery by providing the framework for economic and social development within the municipality. In doing so it contributes towards eradicating the development legacy of the past, operationalises the notion of developmental local government and foster a culture of co-operative governance amongst the three spheres.</p> <p>Integrated development planning is a process whereby municipalities prepare strategic development plans for a five-year period. IDPs are the main platform through which sustainable provision of service delivery could be achieved. They intend to promote co-ordination between local, provincial and national government. Once adopted by Council, these plans should inform planning, decision making, budgeting, land management, promotion of local economic development, and institutional transformation in a consultative systematic and strategic manner.</p> <p>Msunduzi's municipal visions is "A safe, vibrant city in which to live, learn, raise a family, work, play and do business", with its mission "To ensure that</p>

Applicable Plan	Description of Plan
	<p>the Municipality functions effectively and in a sustainable manner in order to deliver services of excellence to the community”</p> <p>This will be achieved by meeting the goals of the six strategic city-wide outcomes, together with their related objectives as defined below:</p> <ul style="list-style-type: none"> <li>■ A well-serviced city; <ul style="list-style-type: none"> <li>• Water and sanitation delivery;</li> <li>• Energy supply provision;</li> <li>• Implementation of waste management;</li> </ul> </li> <li>■ An accessible, connected city; <ul style="list-style-type: none"> <li>• Roads construction and maintenance;</li> <li>• Transport management;</li> <li>• Human settlement development</li> <li>• Telecommunications connectivity;</li> <li>• Social infrastructure distribution;</li> </ul> </li> <li>■ A clean, green city; <ul style="list-style-type: none"> <li>• Renewable energy supplies;</li> <li>• Public open space creation;</li> <li>• Urban renewal and greening promotion;</li> </ul> </li> <li>■ A friendly, safe city; <ul style="list-style-type: none"> <li>• Social cohesion;</li> <li>• Safety and security;</li> </ul> </li> <li>■ An economically prosperous city; <ul style="list-style-type: none"> <li>• Job creation;</li> </ul> </li> <li>■ A financially viable and well-governed city; <ul style="list-style-type: none"> <li>• Financial viability and good governance.</li> </ul> </li> </ul>
<p><b>Msunduzi Spatial Development Framework (2022)</b></p>	<p>The main purpose of the Spatial Development Framework (SDF) to influence the overall spatial distribution of current and future land use in a municipality in order to restructure and transform the city to be more compact, productive, inclusive and sustainable. It assists the municipality in realising its vision by spatially articulating the vision and informing the municipality’s IDP as well as the Land Use Planning By-Law. An SDF “must include the provision of basic guidelines for a land use management system for the Municipality.”</p> <p>The Municipality’s strategic location has supported the establishment of a very strong industrial base. Mkondeni is the primary industrial node in the Msunduzi Municipality. With the emergence of industrial nodes along the N3 at Camperdown (the Mkhambathini Municipality), Cato Ridge and Hammersdale (eThekweni), the locational importance and the role the Msunduzi Municipality could play in the regional context has become more pronounced. The N3 Corridor Development Plan locates the city as part of the KZN Industrial and Logistics Hub highlighting the significance of manufacturing and industrial sectors located along the N3 between Pinetown / New Germany and Pietermaritzburg for the regional economy. The plan proposes that existing industrial nodes within Pietermaritzburg be further developed and enhanced i.e., industrial areas Mason’s Mill &amp; Pentrich be explored, and Mkondeni expanded to the south and east. The proposed site is located within the Mkondeni area which is earmarked for industrial activities. In addition, the site is situated in a developable area.</p> <p>A desirable location for industries and industrial development is where a concentration exists. It should be close to and accessible to labour markets, sources of materials (in terms of type, quantity and delivery costs) and product markets. The sites must be accessible from main transport routes</p>

Applicable Plan	Description of Plan
	<p>(savings on transport, increased labour market, accessibility of product and visibility), while a location near rail facilities or an airport, would be an asset. In particular, the N3 corridor that runs through the municipality and is near the CBD is ideal to provide opportunities for industrial development. These opportunities could then be located in proximity to a national transportation route, along the SIP 2 corridor connecting the Durban Harbour and major markets within Gauteng and offer high visibility to industries.</p> <p>Spatial planning and land use management systems must promote the principles of socio-economic and environmental sustainability. Biodiversity areas and other environmental sensitive areas near Ncwadi in Ward 39 and along the Msunduzi River (between Pietermaritzburg and Scottsville) and Mkhondeni Spruit (between Ashburton and Mkhondeni) must be considered.</p> <p>The SDF notes that the site is within an area that is earmarked for industrial expansion, however, the sustainability of projects must also be considered. The S&amp;EIR process are thus aligned to this requirement and the socio-economic and environmental sustainability are considered.</p>
<p><b>Msunduzi Single Land Use Scheme (2022)</b></p>	<p>The scheme applies to all the areas within the jurisdiction of the Msunduzi Municipality as reflected in the associated Scheme map (MSU/SLUS/01/21).</p> <p>The purpose of this Scheme is to guide and manage development within the Municipality in accordance with the vision, strategies and policies of the IDP and associated SDF in order to promote sustainable development. Furthermore, the scheme is used to determine development rights and parameters in the Municipality.</p> <p>The extent and location of the various land use zones shall be as set out on the adopted Single Land Use Scheme Map. Within each zone, there are restrictions with regard to the use of land and the erection and use of buildings. The site is situated within a SEDi Lap Industrial Development Zone.</p> <p>The proposed development will likely be classified as a General Industry and will either be Permissible (A) or Consent (B). Town Planning approvals will form a separate application (if required) from the S&amp;EIR process.</p>
<p><b>Msunduzi Integrated Environmental Management Plan (IEMP) (2017)</b></p>	<p>The Msunduzi Municipality acknowledges that, development must be economically and socially sustainable, however it is also imperative that the development challenges facing Msunduzi be addressed in an environmentally sustainable manner.</p> <p>To overcome the imbalance of providing much needed service delivery, adequate housing, promoting commercial and industrial development, reducing unemployment while simultaneously protecting and conserving the environment. The Msunduzi Municipality has a responsibility towards the well being of the City which includes the protection of its residents and its ecological infrastructure with associated ecosystem goods and services.</p> <p>The Msunduzi Municipalities 2030 Vision lists a ‘clean, green city’ as one of its 6 strategic priority city-wide outcomes. The main outcome of this priority is: <i>“By 2030 Msunduzi is a city protecting our natural environment, our native plants and animal habitats, limiting pollution, greening the city and using our natural resources such as water, wisely. The clean, green city, harnesses our renewable energy supply, public open space creation project and urban renewal and greening programme to those ends. Msunduzi conserves its natural assets while still meeting the demand for more housing, more roads and more services to</i></p>

Applicable Plan	Description of Plan
	<i>accommodate our increasing population.” Further to this strategic priority is “Communities benefit from a linked public open space network providing for a range of sporting, cultural and recreational uses with a 2030 target of facilities within the public, open and green space network being within a 15 minute (walking or cycling) to 100% of residents.”</i>
<b>Environmental Management Framework (EMF)</b>	<p>The purpose of the greater Msunduzi EMF project is to provide for informed decision making and a framework against which plans, programs and policies can be assessed in the future.</p> <p>Based on the EMF the following characteristics are applicable to the site:</p> <ul style="list-style-type: none"> <li>▪ Agriculturally the site is suitable for development.</li> <li>▪ Air quality the site is sensitive.</li> <li>▪ Biodiversity there are developmental constraints.</li> <li>▪ The site is situated outside a flood zone.</li> <li>▪ The site is situated outside heritage zones.</li> <li>▪ The water quality is seriously modified.</li> <li>▪ There is a very high level of service provision.</li> </ul> <p>The characteristics of the site have been confirmed by the specialist studies.</p>
<b>By-Laws</b>	<p>There are numerous by-laws in the Msunduzi Municipality that may be applicable to the project, including but not limited to:</p> <ul style="list-style-type: none"> <li>▪ Electricity Supply Bylaws.</li> <li>▪ Fire Brigade Bylaws.</li> <li>▪ Fire Prevention and Flammable Liquids &amp; Substances Bylaws.</li> <li>▪ Spatial Planning and Land Use Management Bylaws.</li> <li>▪ Waste Management Bylaws.</li> </ul>

Additional permits and Authorisations **Table 5-4** outlines the additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

### 5.3.1 ADDITIONAL PERMITS AND AUTHORISATIONS

**Table 5-4 – Additional Permits and Authorisations required for the proposed development**

Permits / Authorisation	Legislation	Relevant Authority	Status
Section 38 (8) for the review of environmental documents	Section 38 (1) & (8) of the NHRA	SAHRA	Submitted (CaseID: 20361)
Permits for removal or destruction of nationally protected plant species	NEM:BA	DFFE	If required, permits will be obtained prior to the commencement of construction.

## 6 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

### 6.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. R-Bay (the Project Company) (via the appointed Engineering, Procurement, and Construction contractor/contractor/principal contractor), will be responsible for the overall control of the project site during the pre-construction, construction, operation, decommissioning and rehabilitation phases of the project. R-Bay responsibilities (via the appointed contractor/contractor/principal contractor) will include the following:

- Appointing an independent Environmental Control Officer (ECO) for the duration of the Contract during construction and as specified by EDTEA during operation;
- Being fully familiar with the EIA, EA conditions and the EMPr;
- Applying for an amendment of the EA from the EDTEA as and when required in line with the prevailing legislation;
- The overall implementation of the EMPr;
- Ensuring compliance, by all parties, and the imposition of penalties for non-compliance;
- Implementing corrective and preventive actions, where required;
- Ensuring that any other necessary permits or licences are obtained and complied with;
- Preventing pollution and actions that will harm or may cause harm to the environment;
- Notifying EDTEA 30 days prior that construction activity will commence;
- Notifying EDTEA in writing within 24 hours if any condition in the EA cannot be or is not adhered to; and
- Notifying the EDTEA 14 days prior to commencement of the operational phase.

**Table 6-1** provides a high-level outline of the various roles and responsibilities of the project.

**Table 6-1 – Roles and Responsibilities**

Designation	Roles and Responsibilities
EDTEA	<ul style="list-style-type: none"> <li>■ Is the designated authority responsible for authorising this EMPr and has overall responsibility for ensuring that the proposed Project complies with this EMPr, and any conditions listed in the Environmental Authorisation.</li> <li>■ Shall also be responsible for approving any significant amendments that may be required to the EMPr.</li> <li>■ May further perform random site inspections to check compliance with the EMPr.</li> </ul>
Project Manager/Engineer/Site Engineer	<ul style="list-style-type: none"> <li>■ Ensure that R-Bay and the relevant contractor/s are aware of all specifications, legal constraints pertaining to the project during construction, specifically with regards to the environment.</li> <li>■ Ensure that all stipulations within the EMPr and conditions of the environmental authorisation are communicated and adhered to by R-Bay and its contractor(s).</li> <li>■ Monitor the implementation of the EMPr and conditions of the environmental authorisation throughout the project by means of site</li> </ul>

Designation	Roles and Responsibilities
	<p>inspections and meetings. This will be documented as part of the site meeting minutes.</p> <ul style="list-style-type: none"> <li>■ Be fully conversant with the EIA for the project, the conditions of environmental authorisation and all relevant environmental legislation.</li> </ul>
Site Manager (Contractor)	<ul style="list-style-type: none"> <li>■ Be fully conversant with the EIA, the conditions of the EA and the EMPr.</li> <li>■ Approve method statements.</li> <li>■ Provide support to the ECO.</li> <li>■ Be fully conversant with all relevant environmental legislation and ensure compliance thereof.</li> <li>■ Have overall responsibility for the implementation of the EMPr and conditions of the environmental authorisation</li> <li>■ Ensure that audits are conducted to ensure compliance to the EMPr and conditions of the environmental authorisation.</li> <li>■ Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment</li> <li>■ Prevent actions that will harm or may cause harm to the environment and take steps to prevent pollution and unnecessary degradation onsite.</li> <li>■ Confine construction activities to demarcated areas.</li> </ul>
Environmental Officer (EO) (Contractor)	<p>The EO must be appointed by the Contractor and is responsible for managing the day-to-day onsite implementation of the EMPr, and for the compilation of weekly environmental monitoring reports during construction. During the operational phase environmental monitoring reports may be as specified by EDTEA (such as annually) by the external EO or ECO. In addition, the EO must act as liaison and advisor on all environmental and related issues, seek advice from the ECO when necessary, and ensure that any complaints received from I&amp;APs are duly processed and addressed and that conflicts are resolved in an acceptable and timely manner. The EO shall be a full-time dedicated member of the Contractor's team and must be approved by R-Bay (Project Company).</p> <p>The following qualifications, qualities and experience are recommended for the individual appointed as the EO:</p> <ul style="list-style-type: none"> <li>■ A relevant environmental diploma or degree in natural sciences, as well as a minimum of three years' experience in construction site monitoring, excluding health and safety;</li> <li>■ A level-headed and firm person with above-average communication and negotiating skills. The ability to handle and address conflict management situations will be an advantage; and</li> <li>■ Relevant experience in environmental site management and EMPr compliance monitoring.</li> </ul> <p>The EO's responsibilities include, but not limited to:</p> <ul style="list-style-type: none"> <li>■ Monitoring, on a daily basis, environmental specifications on site and compliance with the conditions of the EA, environmental legislation and EMPr;</li> <li>■ Keeping a register of compliance / non-compliance with the environmental specifications;</li> <li>■ Identifying and assessing previously unforeseen, actual or potential impacts on the environment;</li> <li>■ Ensuring that a brief weekly environmental monitoring report is submitted to the ECO;</li> </ul>



Designation	Roles and Responsibilities
	<ul style="list-style-type: none"> <li>■ Conducting site inspections during the defects liability period, and bringing any environmental concerns to the attention of the ECO and Contractor;</li> <li>■ Advising the Contractor on the rectification of any pollution, contamination or damage to the construction site, rights of way and adjacent land;</li> <li>■ Attending site meetings (scheduled and ad hoc);</li> <li>■ Presenting the environmental awareness training course to all staff, Contractors and Sub contractors, and monitoring the environmental awareness training for all new personnel on-site, as undertaken by the Contractor;</li> <li>■ Ensuring that a copy of the EA and the latest version of the EMPr are available on site at all times, and maintaining a records-keeping system of all compliance and environmental documentation;</li> <li>■ Ensuring that the Contractor is made aware of all applicable changes to the EMPr that are approved by the DEA;</li> <li>■ Assisting the Contractor in drafting environmental method statements and/or the Environmental Policy where such knowledge/expertise is lacking;</li> <li>■ Undertaking daily environmental monitoring to ensure the Contractor's activities do not impact upon the receiving environment. Such monitoring shall include dust, noise and water monitoring; and</li> <li>■ Maintaining the following on site:               <ul style="list-style-type: none"> <li>● A weekly site diary.</li> <li>● A non-conformance register (NCR).</li> <li>● An I&amp;AP communications register, and</li> <li>● A register of audits.</li> <li>● Records of all communication received in relation to compliance actions.</li> </ul> </li> </ul> <p>The EO will remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to the Operator.</p>
Independent ECO	<p>A suitably qualified independent ECO must be appointed by R-Bay to monitor the project compliance with the EMPr and conditions of the environmental authorisation on a monthly basis during construction. During the operational phase environmental monitoring may be undertaken as specified by EDTEA (such as annually) by this external ECO. Proof of external ECO appointment must be maintained onsite.</p> <p>Responsibilities of the ECO include:</p> <ul style="list-style-type: none"> <li>■ Be fully conversant with the EIA, the conditions of environmental authorisation and the EMPr;</li> <li>■ Be fully conversant with all relevant environmental legislation and ensure compliance thereof;</li> <li>■ Approve method statements;</li> <li>■ Remain employed until the completion of the construction activities; and</li> <li>■ Report to the Project Manager, including all findings identified onsite.</li> </ul> <p>In addition, the ECO will:</p> <ul style="list-style-type: none"> <li>■ Undertake independent monthly inspections of the site and surrounding areas in order to audit compliance with the EMPr and conditions of the environmental authorisation;</li> <li>■ Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed;</li> <li>■ Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and</li> </ul>

Designation	Roles and Responsibilities
	<ul style="list-style-type: none"> <li>■ Ensure that activities onsite comply with all relevant environmental legislation.</li> </ul>
Contractors, Staff and Service Providers	<ul style="list-style-type: none"> <li>■ Prepare Method Statements as per the EMPr, and ensure all activities are conducted as per the approved Method Statements.</li> <li>■ Regular on-site auditing to assess performance against the requirements of this EMPr.</li> <li>■ Completion of the appropriate training requirements as specified in the training program.</li> <li>■ Implementation and maintenance of environmental management controls as set out in the project's environmental management documentation.</li> </ul>

## 6.2 ENVIRONMENTAL AWARENESS PLAN

Legislation requires that R-Bay (via the appointed contractor/contractor/principal contractor) must develop an environmental awareness plan that describes the manner in which R-Bay intends to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental degradation and harm.

To achieve effective environmental management, it is important that employees, contractors (including subcontractors) are aware of the responsibilities in terms of the relevant environmental legislation and the contents of the EMPr, conditions of the environmental authorisation.

R-Bay will provide appropriate resources to facilitate social and environmental awareness training during the construction, operational and decommissioning phases of the project. R-Bay will require that all managers associated with the project adhere to the mitigation/management measures detailed in the EMPr and identify, evaluate, and minimise risks to the social, physical and biophysical environments. This will be implemented by educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will be entrusted to maintain the necessary level of environmental performance for their activities. Contractors, and their associated sub-contractors, will also need to demonstrate compliance to mitigation/ management measures included in the EMPr.

The following methodology described must be used to implement and ensure environmental and social awareness and competence:

### 6.2.1 INTERNAL COMMUNICATION

Internal Communication of environmental issues to ensure environmental awareness will be achieved by using any combination of the following means:

- Meetings;
- Memos;
- Notice boards;

- Briefs;
- Reports;
- Monthly themes;
- Daily operational bulletins;
- Newsletter;
- E-mail;
- Telephone; and
- Induction training.

## 6.2.2 STANDARD MEETINGS

The following standard meetings will be held at specific times to ensure that environmental and social awareness; potential problems; complaints etc. are heard and addressed proactively:

- Safety, Health and Environmental Meetings will be held monthly by the Senior Management;
- Safety, Health and Environmental Meetings will be held weekly (during construction) and monthly (during operation) by the relevant personnel, environmental and social issues will form part of the agenda;
- Communication between all personnel and Senior Management will be facilitated through the appropriate reporting lines, or by using complaint and incident forms.

## 6.2.3 ENVIRONMENTAL AND SOCIAL TALK TOPICS

Quarterly environmental and social talk topics must be compiled and distributed/shared to relevant personnel and must be displayed on appropriate notice boards or shared by whatever means established on site. As a minimum, the following topics must be considered during the course of the construction phase:

- Water Quality;
- Water Use and Consumption;
- Air Quality i.e. dust;
- Waste Management;
- Fauna and Flora;
- Emergency Procedures;
- Incidents Reporting;
- Systems;
- Noise;
- Heritage Impacts;
- Landowner Etiquette;
- Speed Limits;
- Health Risks (such as HIV/ Aids); and
- General Awareness (e.g. World Environment Day, National Labour Day).

## 6.2.4 GENERAL COMMUNICATIONS

Communication to the community, government, landowners, environmental groups, non-government organisations and other stakeholders will be communicated to ensure environmental and social awareness by means of the following:

- Fax or E-mail;
- Telephone; or

- Formal meetings.

## 6.2.5 TRAINING

It is important to ensure that all personnel, contractors and their sub-contractors have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. As a minimum environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment.
- Employees will be thoroughly familiar with the requirements of the EMPr and the environmental specifications as they apply to the project.
- Employees must undergo training for the operation and maintenance activities associated with project and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.
- Awareness of any other environmental matters, which are deemed to be necessary by the Environmental Officer.
- Training must include the environment, health and safety as well as basic HIV/AIDS education.

The following facets to training form part of this Environmental and Social Awareness Plan:

- **Induction:** Environmental and social awareness training will be given at induction when personnel join the company and/or return from leave. Induction training will also be given to visitors entering the site. Induction training will include, inter alia:
  - A discussion on the environment concept, what does it comprise of and how do we interact with it;
  - A description on the components and phases of the specific renewable power generation facility;
  - A general account of how the facility and its associated activities can affect the environment, giving rise to what are called environmental impacts;
  - A discussion on what staff can do in order to help prevent the negative environmental impacts from degrading the environment i.e. environmental impact management.
- **Job Specific Training:** Job specific training programmes will be developed as and when required. The programs will be based on the significant environmental and social aspects/ impacts that are identified during regular audits and site inspections. Supervisory staff will be equipped with the necessary knowledge and information to guide their employees on environmental and social aspects applicable to performing a specific task.
- **Competency Training:** The Environmental Officer will be responsible for the environmental and social competency and awareness training of Middle Management and supervisors. This training will be performed both on a one-on-one basis and through workshops and presentations. Competence and the effectiveness of training and development initiatives will be determined through the following methods:
  - Trend analysis of incidents reported; and
  - Analysis of work areas during visits and audits.

The process to declare competency of personnel is documented in the ISO9001:2000 procedure. This plan will be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

- **Training Records:** Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr. The attendance registers must be kept on file.

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place.

## 6.3 MONITORING

The contractor's EO will monitor the day-to-day site activities on an ongoing basis and will produce weekly monitoring reports during construction. The independent, external ECO will undertake monthly audits (during construction) to ensure compliance with the EMPr and conditions of the environmental authorisation during the construction activities and will report to the Site Manager should any non-compliance be identified, or corrective action deemed necessary.

During the operational phase, R-Bay (via the appointed contractor/contractor/principal contractor) will establish, implement and maintain a procedure to monitor and measure, on a regular basis, the key characteristics of the operations that may have a significant environmental impact. The procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the operation's environmental objectives and targets.

R-Bay will ensure that all instruments and devices used for the measurement or monitoring are calibrated and appropriately operated and maintained. Calibration records must be kept on site or in close proximity to the equipment for ease of availability.

All the conditions outlined in the EMPr will be subject to required internal day-to-day monitoring and external compliance monitoring.

In order to determine implementation of the EMPr the following audits need to be undertaken:

- Annual internal audits.
- External compliance audits every two years.

## 6.4 NON-CONFORMANCE AND CORRECTIVE ACTION

The auditing of the construction and operational activities may identify non-conformances to the EMPr and conditions of the EA. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined, and corrective actions must be identified and implemented.

### 6.4.1 COMPLIANCE WITH THE EMPR AND CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

- A copy of the EMPr and conditions of the EA will be available onsite at all times for the duration of the construction and operational activities;
- All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the environmental authorisation;

- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the environmental authorisation may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the EA;
- Should a contractor be in breach of any of the specifications contained in the EMPr and conditions of the environmental authorisation, the Site Manager will, in writing, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
- Departmental officials will be given access to the property referred to in the EIA and EMPr for the purpose of assessing and/or monitoring compliance with the EMPr and conditions of the environmental authorisation, at all reasonable times.

#### **6.4.2 DUTY OF CARE**

All personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Failure to comply with the above conditions is a breach of the duty of care. If such harm is unavoidable, steps must be taken to minimise and rectify such pollution or degradation of the environment.

### **6.5 DOCUMENTATION AND REPORTING**

The following documentation must be kept onsite in order to record compliance with the EMPr and conditions of the environmental authorisation:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/ employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the EA, and will be made available for scrutiny if so requested by the Site Manager or his delegate and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Date of complaint/incident/emergency;
- Location of complaint/incident/emergency;
- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;

- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/emergency;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents/emergency.

## 6.6 PUBLIC COMPLAINTS

The Contractor shall keep a Complaints Register on site to allow the general public to document any comments on or complaints regarding the activities of the site.

The Complaints Register must:

- Have numbered pages – any missing pages must be accounted for by the Contractor;
- Be tabled during monthly site meetings;
- Be made available to the SE/Contract Manager, the ECO, the Project Company, and/or any authority at any time if requested; and
- Include a section for the documentation of the action taken to address the complaint.

All complaints must be investigated, responded to, and recorded in the Complaints Register within 28 calendar days.

## 7 SITE SPECIFIC ENVIRONMENTAL CONTROLS

The EMPr contains guidelines, operating procedures, rehabilitation and pollution control requirements which will be binding to the onsite personnel working for, or on behalf of the proposed project. It is essential that the EMPr be carefully studied, understood, implemented and adhered to at all times.

In instances where the method statements provided by the contractor conflict with the EMPr, such conflicts will be discussed between the Site Manager, ECO and contractor and if unresolved the EMPr will take precedent.

The EMPr identifies various actions which are undertaken throughout the construction and operational phases of the proposed project. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation. The columns in the structure of the EMPr have been described **Table 7-1** below.

**Table 7-1 – Structure of EMPr**

Column	Description
<b>Activity/Aspect</b>	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment.
<b>Impact Management Outcome</b>	The desired outcomes from effectively minimising negative impacts and/or enhancing positive impacts.
<b>Impact Management Actions/Measures</b>	Indicates the actions required to prevent and /or minimise the potential impacts on the environment that are associated with the project.
<b>Indicator and Compliance Management</b>	Items that will assist with determining compliance against management actions.
<b>Responsibility</b>	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the Site Manager will have authority to stop works if/as necessary.
<b>Priority Timeframe</b>	Indicates when the actions for the specific aspect must be implemented and/or monitored.





**Table 7-2 – General Environmental Management: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>GENERAL ENVIRONMENTAL MANAGEMENT</b>			
<b>Impact Management Outcome:</b> <ul style="list-style-type: none"> <li>■ To implement measures to minimise impacts on the environment from the initiation of construction through to decommissioning</li> </ul>			
<b>Indicator and Compliance Mechanism:</b> <ul style="list-style-type: none"> <li>■ Authority Reporting</li> <li>■ Close-out on incidents.</li> <li>■ Monitoring and audit reports.</li> <li>■ Inductions training and register.</li> </ul>			
Environmental Management and Monitoring	Compliance with the EMPr and conditions of the EA must be undertaken in terms of Section 6.4.1	<ul style="list-style-type: none"> <li>■ Project Manager</li> <li>■ EO</li> <li>■ Contractor (Site Manager)</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	The EDTEA must be notified 30 days prior that construction activities will commence.		
	The EDTEA must be 14 days prior to commencement of the operational phase.		
	A suitably qualified independent ECO must be appointed by R-Bay to monitor the project compliance with the EMPr and conditions of the environmental authorisation on a monthly basis during construction		
	A complaints register in terms of Section 6.6 must be maintained		
	An emergencies and incidents register must be maintained		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Implement the generic management plans outlined in Section 8: <ul style="list-style-type: none"> <li>■ Emergency Response Plan</li> <li>■ Hazardous Substances Management Plan</li> <li>■ Fire Management Plan</li> <li>■ Alien Invasive Plant Management Plan</li> <li>■ Erosion Management Plan</li> <li>■ Traffic and Transport Management Plan</li> <li>■ Heritage and Palaeontological Management Plan</li> </ul>		
	Annual internal audits must be undertaken.		
	External compliance audits must be undertaken every two years.		
Sustainability	Solar geysers and solar lighting must be used as far as practicable.	<ul style="list-style-type: none"> <li>■ Project Manager</li> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Construction</li> <li>■ Operation</li> </ul>
	Rainwater collection / harvesting tanks will be installed for grey water usage.		
	Low flush toilets and low flow taps and showers will be installed.		
	Recycling initiatives must be implemented.		
	Msunduzi Municipality's Green Building Guideline Toolkit must be taken into consideration to ensure the sustainability and improved efficiency of the proposed building.		
	A designated recycling area must be established and this area must be indicated on all future plans / layouts.		
	Waste storage areas must be suitably covered, banded and enclosed to ensure that waste materials are not impacted on by weather and / or any other factors.		



**Table 7-3 – Contractor laydown area and site access: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>CONTRACTOR LAYDOWN AREA AND SITE ACCESS</b>			
<p><b>Impact Management Outcome:</b></p> <ul style="list-style-type: none"> <li>■ To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures.</li> </ul>			
<p><b>Indicator and Compliance Mechanism:</b></p> <ul style="list-style-type: none"> <li>■ Health, safety, environmental and community incident and complaints management system register.</li> <li>■ Visual inspection of the signage indicating the 'no-go' areas.</li> <li>■ Close-out on incidents.</li> <li>■ Monitoring and audit reports.</li> <li>■ Inductions training and register.</li> <li>■ Environmental awareness programme/toolbox talks.</li> </ul>			
Project initiation of Construction Activities	Appoint an ECO to manage and verify compliance with the EA and EMPr. Monthly audits need to be undertaken.	<ul style="list-style-type: none"> <li>■ Project Manager</li> <li>■ EO</li> <li>■ Contractor (Site Manager)</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Development activities may take place only within the approved areas as indicated in <b>Figure 4-1</b> . This includes laydown, material storage, cement mixing, earth deposition and storage etc. that will result from the construction activities.		
	All personnel and contractors to undergo Environmental Awareness Training (as per Section 6.2 of this EMPr), including awareness of the surrounding area to inform importance of these areas and their conservation. A signed register of attendance must be kept for proof.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Implement the Environmental Awareness Plan outlined in Section 6.2.		<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Site clearing must be limited to the approved footprint only.		<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to the approved areas for these activities.		<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	Locate firefighting measures at laydown areas and vehicles, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures.		
	A fire management plan needs to be compiled and implemented to restrict the impact that fire would have on remaining natural and newly rehabilitated areas. Natural areas remaining adjacent to the development footprint should be left to naturally regenerate, fire and cutting control methods are not to be used to clear areas containing natural indigenous vegetation.		
	Firefighting equipment must be securely placed and inspected monthly.		
	Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials.		



**Table 7-4 – Vehicle, Equipment and Machinery Management: EMP Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT</b>			
<p><b>Impact Management Outcome:</b></p> <ul style="list-style-type: none"> <li>■ To implement measures to minimise impacts on the environment from poorly maintained equipment, machinery and vehicles onsite.</li> </ul>			
<p><b>Indicator and Compliance Mechanism:</b></p> <ul style="list-style-type: none"> <li>■ Health, safety, environmental and community incident and complaints management system register.</li> <li>■ Close-out on incidents.</li> <li>■ Monitoring and audit reports.</li> <li>■ Equipment, machinery and vehicle checklists.</li> <li>■ Incident classification and reporting procedure.</li> </ul>			
<p>Operation of Equipment, Machinery and Vehicles</p>	<p>Ensure that the equipment, machinery and vehicles are adequately maintained so as to:</p> <ul style="list-style-type: none"> <li>■ Reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid.</li> <li>■ Ensure road-worthiness.</li> <li>■ Reduce emissions.</li> </ul> <p>Evidence of such maintenance must be recorded and maintained onsite for verification.</p>	<ul style="list-style-type: none"> <li>■ EO</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	<p>The movement of vehicles into and out of the site must be managed to ensure that there is no impact on the surrounding landowners. The planned routes and designated vehicle and machinery storage areas must be located within the transformed areas on site.</p> <p>Management measures includes ensuring that abnormal loads are moved outside of peak traffic hours, and reasonable measures are taken to ensure that public and staff safety is managed adequately.</p>		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of life. Speed limits must be enforced to ensure that erosion is limited.		
	No storage of vehicles or equipment must be allowed outside of the designated laydown areas.		
	All vehicles and personnel must make use of the existing roads and walking paths, especially construction/operational vehicles.		
	No servicing of plant and equipment should take place on site unless an emergency. Drip trays must be utilized if emergency servicing/repairs are required.		

**Table 7-5 – Hazardous Substances and Pollutants: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>HAZARDOUS SUBSTANCES AND POLLUTANTS MANAGEMENT</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>To ensure the correct storage, handling and disposal of fuels and chemicals in order to prevent impacts to the surrounding environment.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>Maintenance records</li> <li>Safe disposal certificates (if applicable)</li> <li>Material safety data sheets (MSDS) (if applicable)</li> <li>Health, safety, environmental and community incident and complaints management system register.</li> <li>Chemicals management procedure (to be developed).</li> </ul>			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<ul style="list-style-type: none"> <li>■ Monitoring and audit reports.</li> <li>■ Training records.</li> </ul>			
Fuel and Chemical Management	Fuel, oil, chemicals and other hazardous materials that will be required for the duration of the construction process must be stored within an area designated for the storage of such hazardous materials.	<ul style="list-style-type: none"> <li>■ EO</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre - Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	Label all liquids (chemicals and hydrocarbons) stored onsite for easy identification. MSDS for onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. MSDS must include mitigation measures to ameliorate potential environmental impacts which may result from a spill, incorporating health and safety mitigation measures.		
	A spill management plan must be in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.		
	No servicing of equipment on site unless an emergency. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers for safe disposal.		
	In cases where a surface leak occurs during loading and off-loading of construction materials, the spill material will be cleaned using a spill kit.		
	Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair.		
	The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.	<ul style="list-style-type: none"> <li>■ EO</li> <li>■ Contractor</li> <li>■ Project Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	All machinery and equipment should be inspected regularly for faults and possible leaks; these should be serviced off-site or in appropriately banded areas.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe		
	Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.				
	All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.				
	Chemicals, hydrocarbon materials and hazardous substances maintained onsite must be managed in accordance with the Hazardous Substances Act (No. 15 of 1973) and its relevant regulations.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ EO</li> <li>■ Contractor</li> <li>■ Project Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>		
	Spill kits must be available at all locations where hazardous substances are stored, handled or used, and spills must be cleaned up immediately in accordance with an established protocol applicable to the material.				
	Provide secure storage for fuel, oil, chemicals and other waste materials to prevent contamination of stormwater runoff.				
	A spill management schedule must be in place to prevent any incompatible chemicals ending up in the same pit.			<ul style="list-style-type: none"> <li>■ Project Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>
	Compatibility charts will be developed and employees trained thereon.				
	Ensure product segregation as per SANS 10263.				
	Ensure secondary containment as per SANS 10263 and the National Buildings Regulations.				
	Ensure suitable ventilation through the warehouse.				
	All chemicals must be stored inside the warehouse within the bunded area.				
	No decanting of chemicals are allowed to take place on site.				





Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Health and Safety	Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store (if any).	<ul style="list-style-type: none"> <li>■ EO</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Strategically place the correct types of fire extinguishers onsite and near the hazardous material store. Train key personnel on basic firefighting skills		
	Ensure that operators are well informed of the impacts of toxic releases that have been included in the MHI.	<ul style="list-style-type: none"> <li>■ Project Manager</li> <li>■ Site Manager</li> <li>■ EO</li> </ul>	Operation
	Ensure that operators are well informed of the impacts of toxic releases that have been included in the MHI.		
	The training programmes should enable them to understand how to respond after an incident i.e. emergency planning and training.		
	Forklift drivers must be licenced and well trained to minimise the likelihood of forklift accidents when carrying toxic chemicals.		
	A copy of this risk assessment should be available on the site at all times for inspection by the authorities.		
	Consider having curbing with drain to sump/ collection pit in the chemical offloading area to reduce the impact of toxic release from spills after a drum / pallet with drums has ruptured while offloading.		
	A spill management schedule must be in place to prevent any incompatible chemicals ending up in the same pit.		
	Ensure product segregation as per SANS 10263.		
Ensure secondary containment as per SANS 10263 and the National Buildings Regulations.			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Ensure suitable ventilation through the warehouse.		
	There are Emergency Procedures for the R-Bay group, and the plan must be revised to include the proposed project.		
	Annual Emergency drills are required.		
	A person must be appointed as responsible for the MHI.		
	R-Bay properties should have segregation of incompatible materials for any accidental mixes and a natural ventilation system in place.		
	There will be no decanting at the warehouse, and this reduces the chances of having incompatible materials mixing.		
	Town Planning should be made aware of which areas could be affected, in order to manage the approval of new developments in the vicinity of this MHI.		
	The bunding and liner inside the warehouse must be inspected annually and maintained.		
	A person must be appointed as responsible for the MHI.		
	A copy of this risk assessment should be available on the site at all times for inspection by the authorities.		
	Prior to commencement of construction, the relevant authorities (i.e. local Fire and Emergency services, Provincial Department of Employment and Labour and National Department of Labour) should be notified as per the requirements of regulation 4 of the MHI Regulations of 2022. R-Bay Properties should retain proof of notifications. See section 5.3.2.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Prior to commencement of construction, public notifications should be undertaken as per the requirements of Regulation 4 of the MHI Regs of 2022. R-Bay Properties should retain proof of notifications. See section 5.3.2.		
	R-Bay Pietermaritzburg should confirm that the local emergency services have an off-site emergency plan in place.		
	This MHI facility should be reassessed 5-yearly, (i.e. due 2028), or earlier if major modifications are made, the installations are expanded, or a major incident occurs.		

**Table 7-6 – Waste Management: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>WASTE MANAGEMENT</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>■ To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>■ Induction training and records.</li> <li>■ Waste Management Protocol</li> <li>■ Relevant SANS Codes of Practice.</li> <li>■ Waste manifests and safety disposal certificates (all waste streams).</li> <li>■ Emergency preparedness and response procedure.</li> <li>■ Incident classification and reporting management procedure (to be developed).</li> <li>■ Health, safety, environmental and community incident and complaints management system register.</li> <li>■ Monitoring and audit reports.</li> </ul>			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
General Waste Management	General waste generated as a result of construction and operational activities must be managed in accordance with a waste management protocol for the Project.	<ul style="list-style-type: none"> <li>■ EO</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Train and inform all onsite personnel regarding general waste minimisation, management and disposal.		
	Place an adequate number of labelled or colour coded general waste bins around the laydown area and at the construction area in order to minimise littering. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.		
	Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site as and when required basis to prevent rodents and pests entering the site.		
	Any litter, spills, fuels, chemical and human waste in and around the project area must be removed and disposed of timeously and responsibly.		
	Refuse bins shall be emptied as required and secured.		
	Temporary storage of domestic waste shall be in covered waste skips.		
	Maximum domestic waste storage period shall be weekly.		
	Retain records such as waybills and waste manifests associated with waste removal, transportation and disposal (safe disposal certificates).		
	<p>Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it will be considered hazardous waste.</p> <p>There should be waste segregation implemented on site (e.g. chemicals, oil contaminated rags, paper, plastic) and management on the site.</p>		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Waste may never be stored in an open pit where it is susceptible to the elements such as wind and rain.		
	Recover, recycle and reuse general waste as far as possible.		
Hazardous Waste Management	Hazardous waste generated as a result of construction, operational and decommissioning activities must be disposed of to a registered landfill.	<ul style="list-style-type: none"> <li>■ ECO</li> <li>■ EO</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
Strict management of potential sources of pollution (e.g. litter, hydrocarbons from vehicles & machinery, cement during construction, etc.) within demarcated / banded areas			
Train and inform all onsite personnel regarding hazardous waste minimisation, management and disposal.			
Ensure that all hazardous wastes temporarily stored on site are stored in a covered sealed skip.			
Clean areas where hazardous waste spills have occurred and dispose of the hazardous material appropriately. Key personnel must be trained on handling spillages.			
Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal.			
Ensure that waste manifest documentation (as per the Waste Classification and Management Regulations – GNR 634) is prepared and maintained for the generation, transportation and disposal of waste.			
All spills should be reported to the authorities as per the emergency preparedness and response frequencies / specifications.			



**Table 7-7 – Health and Safety: EMP Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>HEALTH AND SAFETY</b>			
<p><b>Impact Management Outcome:</b></p> <ul style="list-style-type: none"> <li>▪ To ensure communication with members of the public and Contractor Personnel to promote safety awareness.</li> <li>▪ To prevent public access to construction sites and storage areas.</li> <li>▪ To ensure safety for all onsite personnel.</li> <li>▪ To ensure the health and safety of all site personnel, landowners and communities that may emanate from proposed Receiver Station</li> </ul>			
<p><b>Indicator and Compliance Mechanism:</b></p> <ul style="list-style-type: none"> <li>▪ Induction training and records.</li> <li>▪ Health, safety, environmental and community incident and complaints management system register.</li> <li>▪ Monitoring and audit reports.</li> <li>▪ Incident classification and reporting management procedure (to be developed).</li> <li>▪ PPE Register.</li> <li>▪ Occupational health and safety plan (to be developed).</li> <li>▪ Health and safety protocol (to be developed).</li> <li>▪ Competency certification.</li> <li>▪ Health and safety file for Developer and contractors.</li> <li>▪ SANS certification.</li> <li>▪ Compliance with OSHACT, Act 85 of 1993.</li> <li>▪ Legal Register.</li> <li>▪ Legal Appointments as per OSHACT.</li> </ul>			
Health and Safety	The construction phase will be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993 specifically the Construction Regulations.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ Contractor</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>
	All onsite personnel are required to undergo induction training and regular toolbox talks in order to raise awareness of health and safety requirements.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Development and implementation of an Occupational Health and Safety Plan and Safety Health Environment Risk & Quality (SHERQ) policy	<ul style="list-style-type: none"> <li>■ Contractor</li> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> </ul>
	The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to.	<ul style="list-style-type: none"> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Emergency response plan to be in place prior to beginning construction and to include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers.		
	Provide and wear appropriate PPE onsite.	<ul style="list-style-type: none"> <li>■ Contractor/Operator</li> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Compile detailed Risk Assessments for all aspects of construction and operational activities prior to work.		
	Ensure all contractor's safety files are in place and up to date prior to commencement of their work.		
	All necessary good hygiene practices to be in place, e.g., provision of toilets, eating areas, infectious disease controls.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
Facility emergencies	Emergency Response Plan for full operation and maintenance phase to be in place prior to beginning commissioning and to include aspects such as: <ul style="list-style-type: none"> <li>■ appointment of emergency controller,</li> </ul>	<ul style="list-style-type: none"> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	<ul style="list-style-type: none"> <li>▪ provision of PPE for hazardous materials response,</li> <li>▪ provision of first aid facilities,</li> <li>▪ first responder contact numbers</li> <li>▪ Anti-venom, snake bite treatment and facilities</li> </ul>		
	A detailed risk assessment of all normal operating and maintenance activities on site to be compiled, and form the basis of operating instructions, prior to commencing commissioning.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operation</li> </ul>
Fire risk	Suitable fire-fighting equipment on site near source of fuel.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ Contractor</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>
	Safety integrity level rating of equipment (failure probably) with suitable redundancy if required.		
	Ensure regular testing of emergency alarm systems are undertaken.		
	Emergency Response plan in compliance with SANS 1514 to be compiled, e.g. plan from transport and construction phase to be extended to operational phase to include the hazards of the systems containing large quantities of highly hazardous chemicals.		
	A fire management plan needs to be compiled and implemented to restrict the impact that fire would have on remaining natural and newly rehabilitated areas. Natural areas remaining adjacent to the development footprint should be left to naturally regenerate, fire and cutting control methods are not to be used to clear areas containing natural indigenous vegetation.		
Public Safety	Restrict public access to the site.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>





**Table 7-8 – Water Management: EMP Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>WATER MANAGEMENT</b>			
<b>Impact Management Outcome:</b> <ul style="list-style-type: none"> <li>■ To implement measures to prevent the contamination on surface and groundwater resources.</li> <li>■ To prevent erosion.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b> <ul style="list-style-type: none"> <li>■ Induction training and records.</li> <li>■ Incident classification and reporting management procedure (to be developed).</li> <li>■ Environmental awareness programme/toolbox talks.</li> <li>■</li> </ul>			
Water Management	Stormwater control measures must be implemented for the duration of the construction phase of the project.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> </ul>
	Containment of all contaminated water by means of careful run-off management on site.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Working protocols incorporating pollution control measures (including approved method statements by the contractor) should be clearly set out for the project and strictly enforced.		
	Acquire spill kits to clean up any hydrocarbon or chemical spills during construction, operation and closure to prevent seepage. All spillage incidents must be reported to the responsible site officer as soon as they occur.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe	
	Any cement mixing shall be completed on impervious hardstanding surfaces to prevent spillage to the environment.		<ul style="list-style-type: none"> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>	
	Onsite staff are to be provided with an appropriate potable water supply, safe and healthy sanitary facilities and protection against exposure to environmentally dangerous or unhealthy situations or conditions.		<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>	
	Appropriate ablution facilities should be provided for construction workers during construction.			
	Seepage of liquid material into the ground will be prevented and accidental spillage will be cleaned immediately.			
	Implement the Stormwater Management Plan outlined in <b>Appendix D</b> .	<ul style="list-style-type: none"> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>	
	Contaminated stormwater will not reach environment as water will pass sump, hydrocarbon trap or filter prior to being released into the environment or stormwater system			
	Rainwater collection / harvesting tanks will be installed for grey water usage.			
	Low flush toilets and low flow taps and showers will be installed.			



**Table 7-9 – Air Quality: EMP Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>AIR QUALITY</b>			
<b>Impact Management Outcome:</b> <ul style="list-style-type: none"> <li>▪ To ensure that impacts to air quality of the surrounding environment are minimised.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b> <ul style="list-style-type: none"> <li>▪ Complaints register.</li> <li>▪ Incident reporting system.</li> <li>▪ Health, safety, environmental and community incident and complaints management system register.</li> <li>▪ Incident classification and reporting management procedure (to be developed).</li> <li>▪ Equipment, machinery and vehicle maintenance.</li> </ul>			
Dust Management	Before the commencement of any site works and during the operation, as much vegetation as possible must be retained, including patches and strips to minimise dust.	<ul style="list-style-type: none"> <li>▪ EO</li> <li>▪ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>
	Activities with high dust-causing potential, such as excavating and moving of soil, must not be carried out close to the sensitive CBA areas during adverse wind conditions.		<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Decommissioning</li> </ul>
	All stockpiles (if any) must be restricted to designated areas and may not exceed a height of two (2) metres;		
	Excavation activities have the potential to generate large amounts of dust. Pre-planning of earth-moving works can reduce dust emissions by limiting the time the site is exposed. Options for dust control can include the following:		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	<ul style="list-style-type: none"> <li>■ Plan excavation activities so that they are completed just prior to the time they are needed;</li> <li>■ Observe weather conditions and do not commence or continue excavation activities if conditions are unsuitable e.g., under conditions of strong winds; and</li> <li>■ Pre-water areas to be disturbed.</li> </ul>		
	Cover trucks hauling any loose material that could produce dust when travelling. Minimise transfer points.		
	Re-vegetate disturbed areas as soon as possible to prevent excessive dust from occurring.		
	Dampen exposed soil to suppress dust if required. Use watering sprays on materials to be loaded and during loading. No non-environmentally friendly dust suppressants may be used.		
	Where possible, minimise speed limits and vehicle weights.		
	Limit the duration of the construction phase to as short a timeframe as possible.		
	Where possible, minimise the area under construction.		
	Make use of wet suppression techniques to minimise dust entrainment during periods of high wind speeds.		
	Where possible, minimise speed limits.		
	Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and soil/material stockpiles especially. This includes wetting of exposed soft soil surfaces and not conducting activities during high wind periods which will increase the likelihood of dust being generated.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Ensure that all vehicles, machines and equipment are adequately maintained to minimise emissions.		
	It is recommended that the clearing of vegetation from the site should be selective, be kept to the minimum feasible area, and be undertaken just before construction so as to minimise erosion and dust potential.		
	All materials transported to, or from, site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials.		
	Once construction is complete, initiate rehabilitation (e.g., re-vegetation) procedures to reduce wind speed across exposed surfaces.		

**Table 7-10 – Noise: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>NOISE</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>To ensure that noise impacts to the surrounding environment are minimal or mitigated.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>Complaints register.</li> <li>Incident reporting system.</li> <li>Health, safety, environmental and community incident and complaints management system register.</li> <li>Incident classification and reporting management procedure (to be developed).</li> <li>Equipment, machinery and vehicle maintenance.</li> </ul>			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Noise	Fit equipment, machinery and vehicles generating excessive noise with appropriate noise abatement measures and undergo regular maintenance to ensure optimum efficiency during operation.	<ul style="list-style-type: none"> <li>■ EO</li> <li>■ Contractor</li> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Provide complaints register to report any excessive noise incidents. Manage all complaints as per the Incident Classification and Reporting Management Procedure.		
	Regular maintenance of equipment to reduce the generation of additional unwanted noise.		
	Construction activities must be restricted to weekdays and daylight.		

**Table 7-11 – Soil, Land Use and Agriculture: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>SOIL, LAND USE AND AGRICULTURE</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>■ To prevent any disturbance, erosion or contamination of soil resources.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>■ Induction training and records.</li> <li>■ Incident classification and reporting management procedure (to be developed).</li> <li>■ Health, safety, environmental and community incident and complaints management system register.</li> <li>■ Monitoring and audit reports.</li> <li>■ Stormwater Management Plan (SWMP) (to be developed).</li> </ul>			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Soil and Land Management	Land clearance must only be undertaken immediately prior to construction activities and only within the approved project footprint. Unnecessary land clearance must be avoided.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	Limit earthworks and vehicle movement to demarcated paths and areas.		
	Limit the duration of construction activities where possible, especially those involving earthwork / excavations.		
	Access roads associated with the development should have gradients or surface treatment to limit erosion, and road drainage systems should be accounted for.		
	On-site vehicles should be well-maintained.		
	Drip trays should be placed under stationary vehicles / plant.		
	On-site pollutants/hazardous materials should be contained in a bunded area and on an impermeable surface.		
	Ensure proper control of dangerous substances entering the site.		
	When the site is decommissioned, the surface profile thereof can be altered to more closely resemble its current profile through earthworks		
	Chemicals should be stored in fully enclosed areas and the car park area should be covered. Both should be on impermeable hardstanding.	<ul style="list-style-type: none"> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>
Hardstanding should be monitored for cracks.			
If chemicals are kept outside of the enclosed area temporarily, this area should be on hardstanding and bunded.			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Ensure proper control of substances entering the site.		
	Adequate disposal facilities should be provided.		
	A non-polluting environment should be enforced.		
Erosion Management	Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces and soil stockpiles should be re-vegetated or stabilised as soon as is practically possible.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	A storm water management plan should be designed for the site and adhered-to.	<ul style="list-style-type: none"> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>
	Surface stormwater channels must be fitted with screens to filter litter		
	The site should be monitored for signs of erosion continually.	<ul style="list-style-type: none"> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>
	Bare areas should be kept well vegetated.	<ul style="list-style-type: none"> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>

**Table 7-12 – Terrestrial Biodiversity: EMP Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>TERRESTRIAL BIODIVERSITY</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>■ Prevent the unnecessary destruction of, and fragmentation of the biodiversity of the area.</li> <li>■ No excess habitat loss within sensitive areas.</li> <li>■ Revegetation of cleared areas.</li> <li>■ Alien vegetation clearing &amp; control.</li> </ul>			





Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<ul style="list-style-type: none"> <li>Reduce erosion.</li> </ul>			
<p><b>Indicator and Compliance Mechanism:</b></p> <ul style="list-style-type: none"> <li>Induction training and records.</li> <li>Incident classification and reporting management procedure (to be developed).</li> <li>Environmental awareness programme/toolbox talks.</li> <li>Monitoring and audit reports.</li> <li>Alien Invasive Management Plan.</li> </ul>			
No-go areas	<p>The areas to be developed (or activity areas) must be specifically demarcated to prevent the movement of staff or equipment/vehicles into the surrounding High sensitivity environment i.e., wetland and forest areas. Signs must be erected enforce this.</p>	<ul style="list-style-type: none"> <li>Site Manager</li> <li>Contractor</li> <li>EO</li> </ul>	<ul style="list-style-type: none"> <li>Pre-Construction</li> <li>Construction</li> <li>Operation</li> <li>Decommissioning</li> </ul>
	<p>All laydown, chemical toilets etc. must be restricted to Very Low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the area once the construction phase has been concluded.</p>	<ul style="list-style-type: none"> <li>Site Manager</li> <li>Contractor</li> <li>EO</li> </ul>	<ul style="list-style-type: none"> <li>Pre-Construction</li> <li>Construction</li> <li>Operation</li> <li>Decommissioning</li> </ul>
Loss of degraded grassland	<p>Vegetation clearing should be restricted to the proposed Project infrastructure footprints only (i.e. warehouse, carparks, access roads only), with no clearing permitted outside of these areas.</p>	<ul style="list-style-type: none"> <li>Site Manager</li> <li>Contractor</li> <li>EO</li> </ul>	<ul style="list-style-type: none"> <li>Pre-Construction</li> <li>Construction</li> <li>Decommissioning</li> </ul>
	<p>The footprints to be cleared should be clearly demarcated prior to construction to prevent unnecessary clearing outside of this area.</p>		
	<p>Should invertebrate species of concern be indicated to be potentially present in the LSA once feedback from consultation with mollusc and millipede experts is received, specific surveys for these will be carried out prior to construction, to</p>		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	inform the need for the development of any additional mitigation measures for these species.		
	Prior to the commencement of construction works, a dedicated vegetation and flora survey will be carried out to identify any indigenous plant or tree species that can be preserved for use in rehabilitation activities, and map the locations of AIS so that these can be managed before they are inadvertently spread via earthworks during construction.		
	As appropriate, barrier/fences should be erected to prevent fauna gaining access to construction and operational areas where they have a high probability of being killed or injured.		
	A low-speed limit (recommended 20 km/h in areas of highest risk e.g. where roads are located near riparian/wetland habitat) should be enforced within the LSA to reduce the risk of potential wildlife collisions.		
	The handling, poisoning or killing of fauna by construction workers, warehouse staff and contractors must be strictly prohibited.		
	Following completion of construction, all litter, building rubble, etc. must be removed and disposed of at an appropriate site.		
	Any areas that were cleared of topsoil must be revegetated and the site left in a safe, stable and environmentally friendly condition.		
	Soils should be replaced around excavated/disturbed areas in the correct order, i.e. subsoils at the bottom, top soils on the top.		
	If any indigenous plant species were removed from the site prior to construction, these should be replanted, with locations for planting to be specified, and planting overseen by an ecologist or botanist.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Any remaining areas of bare soils must be overseeded with an appropriate grass seed mix including a binding creeping grass and a nurse species selected for its rapid growth properties to provide stability to the disturbed soils. If necessary, seeded areas should be further stabilised with a biodegradable (jute) mesh that is pegged in place. The seed mixture should be manually sown over the prepared soils.		
	Any imported plants used for revegetation purposes should consist of native grassland/thornveld species.		
	Deep watering immediately after installation of the sods/sowing seeds on bare soil areas will be required to promote the rooting of the sods back into the soils below, and/or the germination of the sown seeds. Manual watering should be done twice-weekly for at least four weeks, and every week thereafter for the duration of the dry season.		
Species of Conservation Concern (SCC)	Any individual protected plant that may be observed needs a relocation or destruction permit if it will be removed or destroyed as a result of the activities. Preferably, the plants should be relocated to an area that will not be impacted on by future activities.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> </ul>
Fauna	No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this. These actions are illegal in terms of provincial environmental legislation.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	A qualified ECO must be on site when clearing begins. The area must be walked though prior to construction to ensure that no faunal species remain in the habitat and get killed. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> </ul>
	Any holes/deep excavations must be dug in a progressive manner in order to allow burrowing animals time to move off and to prevent trapping. Should the	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> </ul>



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	holes remain open overnight they must be covered temporarily to ensure no fauna species fall in.	<ul style="list-style-type: none"> <li>▪ EO</li> </ul>	
	Should any SCC fauna be observed nesting within the proposed footprint area before or during construction, all activities must cease immediately. A relevant faunal specialist must be consulted in order to facilitate the capture or removal of any SCC animals	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ Contractor</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Decommissioning</li> </ul>
	Employees and contractors should be made aware of the presence of, and rules regarding fauna through suitable induction training and on-site signage.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ Contractor</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>
	Movement across the Project area should be facilitated by providing suitably sized gaps in fencing and/or culverts/passageways under roads for fauna.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ Contractor</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>
	Any significant heat generated from any source must be monitored to ensure that it does not negatively affect the local fauna.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ Contractor</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>
	Invertebrate monitoring of restored vegetation following construction should be done to determine whether the restored habitats support milliped or mollusc species understood to be present in the nearby Mkhondeni Local Corridor' ESA.	<ul style="list-style-type: none"> <li>▪ Site Manager</li> <li>▪ Contractor</li> <li>▪ EO</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pre-Construction</li> <li>▪ Construction</li> <li>▪ Operation</li> <li>▪ Decommissioning</li> </ul>
	The Proponent's progress with the implementation of the required mitigation measures should be audited annually, to confirm that the mitigation measures have been effectively implemented on site, and to ensure that the measures are effective. In the case that the mitigation measure audits find that additional measures are necessary to manage risks to terrestrial habitats and species, these will be included in the site-wide environmental monitoring programme.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	<p>The soils and vegetation at rehabilitated/revegetated areas should be inspected weekly for the first 2 months to ensure that germination and establishment are progressing as expected and that watering frequency is adequate. After that, inspections can be done monthly for the remainder of the year and then quarterly for a further 2 years.</p>		
Rehabilitation	<p>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds and to support the adjacent habitat. This will also reduce the likelihood of encroachment by more alien invasive plant species.</p> <p>All disturbed areas are to be rehabilitated and appropriately landscaped. Rehabilitation of the disturbed areas existing in the PAOI must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to the project area vegetation type. Progressive rehabilitation of cleared areas will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank.</p>	<ul style="list-style-type: none"> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Post Construction</li> </ul>
Alien Vegetation Management	<p>An alien invasive species control programme must be developed, or any existing AIS management programmes expanded, to include the active control of alien invasive species that may establish/spread as a result of proposed Project activities.</p> <p>The Alien and invasive species management to be prioritised for the following alien and invasive species control areas:</p> <ul style="list-style-type: none"> <li>■ Areas where vegetation cover is disturbed.</li> <li>■ Areas where soils imported from external sources are applied.</li> <li>■ All rehabilitated areas.</li> <li>■ Areas within the development area that are already invaded by alien species.</li> <li>■ Road fringes.</li> </ul>	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	The presence of alien and invasive flora species should be documented prior to the commencement of the development of the infrastructure and rehabilitation activities, and the baseline case used as a benchmark against which the spread of these species can be monitored. Annual monitoring inspections should identify target areas for clearing and additional rehabilitation.		
	All alien vegetation occurring within construction and operational areas must be removed and monitored for re-growth.		
	No plant species whether indigenous or exotic may be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.		
	Walked Surveys of the project perimeter, access roads and other areas adjacent to hard infrastructure to monitor for alien vegetation and re-growth.		

**Table 7-13 – Aquatic: EMP Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>AQUATIC BIODIVERSITY</b>			
<b>Impact Management Outcome:</b> <ul style="list-style-type: none"> <li>▪ Prevent the unnecessary destruction of, and fragmentation of the biodiversity of the area.</li> <li>▪ Revegetation of cleared areas.</li> <li>▪ Alien vegetation clearing &amp; control.</li> <li>▪ Reduce erosion.</li> <li>▪ Reduce sedimentation</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<ul style="list-style-type: none"> <li>■ Induction training and records.</li> <li>■ Incident classification and reporting management procedure (to be developed).</li> <li>■ Environmental awareness programme/toolbox talks.</li> <li>■ Monitoring and audit reports.</li> <li>■ Alien Invasive Management Plan.</li> </ul>			
Water Resource Management	Vehicles should make use of existing access roads and vehicles must avoid the drainage line.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	The wetland and forest areas surrounding the site must be treated as ‘no go’	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Any soil stockpiles within 100 m of the watercourse should be bunded using an appropriate structure (silt nets, sandbags, etc.).		
	All laydown, chemical toilets etc. must be restricted to ‘Very Low’ sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the area once the construction/closure phase has been concluded.		
	Where development activities are located upslope from wetlands, effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMP.		
	Construction should be done in the dry season and completed by the wet season, so that appropriate water management systems are in place for stormwater management.		
	A buffer of at least 24 m from the wetland edge must be retained for development (based on the Buffer Zone tool) – since the development boundary is approximately 150 m from the wetland edge, this will be easily achievable.		



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Erosion control and protection measures installed as part of the construction of the project will be adapted for the specific area and situation where signs of erosion appear.		
	Soil compacted in non-operational areas during construction activities should be ripped to break up the compacted soil surface and re-vegetated to aid infiltration and decrease run-off.		
	Topsoil stockpiles to be re-vegetated with non-invasive vegetation, in order to stabilise the soil, aid infiltration and decrease run-off.		
	The re-vegetation programme shall take cognisance of the climatic and seasonal conditions but should generally be undertaken annually starting in spring and early summer.		
	Develop an alien and invasive plant management program to pro-actively strive towards the eradication and control of alien invasive species within the warehouse site, so that any project-induced spread to nearby areas is limited.		

**Table 7-14 – Archaeological and Cultural Heritage: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>ARCHAEOLOGICAL AND CULTURAL HERITAGE</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>▪ To ensure that sites/artefacts of heritage value are identified and protected.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>▪ Health, safety, environmental and community incident and complaints management system register.</li> </ul>			





Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<ul style="list-style-type: none"> <li>Incident classification and reporting management procedure (to be developed).</li> <li>Monitoring and audit reports.</li> </ul>			
Chance Finds	If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments and charcoal/ash concentrations) are found during construction activities, the finds must be reported and the Chance Find Protocol must be implemented ( <b>Section 8.8.1</b> ).	<ul style="list-style-type: none"> <li>Site Manager</li> <li>Contractor</li> <li>EO</li> </ul>	<ul style="list-style-type: none"> <li>Pre-Construction</li> <li>Construction</li> <li>Decommissioning</li> </ul>
	If any graves are uncovered during construction activities, the archaeologist must be called in to inspect the finds and/or if the police find them to be heritage graves, mitigation may be necessary and AMFA / SAHRA must be contacted for processes to follow as per section 36(6) of the NHRA.	<ul style="list-style-type: none"> <li>Site Manager</li> <li>Contractor</li> <li>EO</li> </ul>	

**Table 7-15 – Palaeontology: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>PALAEONTOLOGY</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>To ensure that palaeontological material is identified and protected.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>Health, safety, environmental and community incident and complaints management system register.</li> <li>Incident classification and reporting management procedure (to be developed).</li> <li>Monitoring and audit reports.</li> </ul>			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Chance Finds	If any palaeontological material is exposed during digging, excavating, drilling or blasting Implement the finds must be reported and the Chance Find Protocol must be implemented ( <b>Section 8.8.1</b> ).	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>

**Table 7-16 – Traffic: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>TRAFFIC</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>■ To ensure that the traffic impacts of the project are mitigated and managed.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>■ Induction training and records.</li> <li>■ Health, safety, environmental and community incident and complaints management system register.</li> <li>■ Monitoring and audit reports.</li> <li>■ Incident classification and reporting management procedure (to be developed).</li> <li>■ PPE Register.</li> <li>■ Occupational health and safety plan (to be developed).</li> <li>■ Health and safety protocol (to be developed).</li> <li>■ Traffic and transportation management plan</li> </ul>			
Management Plan	<p>A Traffic Management Plan (TMP) is to be compiled once the contractor has been appointed and all the relevant details of the construction process are known. The TMP needs to address, inter alia:</p> <ul style="list-style-type: none"> <li>■ clearly defined route/s to the site for specific vehicles needed to transport equipment and materials.</li> <li>■ scheduled deliveries to avoid local congestion.</li> </ul>	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	R-Bay Chemicals will ensure that all transportation is undertaken in terms of the requirements of the National Road Traffic Act, 93 of 1996 (NRTA) and applicable South African National Standards (SANS).		
	R-Bay will develop procedures for the transportation of all dangerous goods.	<ul style="list-style-type: none"> <li>■ Site Manager</li> </ul>	<ul style="list-style-type: none"> <li>■ Operation</li> </ul>
Records	A photographic record of the road condition should be maintained throughout the various phases of the project development. This provides an objective assessment and mitigates any subjective views from road users.	<ul style="list-style-type: none"> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
Signage and Notifications	Post relevant road signage along affected routes.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> <li>■ Decommissioning</li> </ul>
	The developer shall ensure that the contractor erects temporary signs warning motorists of construction vehicles on the approaches to the access road.	<ul style="list-style-type: none"> <li>■ Contractor</li> <li>■ EO</li> </ul>	
Dust Emissions	Reduce travel speed for construction vehicles on the internal roads on the site during construction.	<ul style="list-style-type: none"> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Dust-reducing mitigation measures must be put in place and be strictly adhered to, particularly for all dirt roads and any earth dumps. This includes the wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated. Only environmentally friendly suppressants may be used to avoid the pollution of water sources. Speed limits must be put in place to reduce erosion, and speed bumps should also be constructed.		
Vehicle Management	Ensure all vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Ensure that the access roads are left in the same or better condition, post-construction.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	All remedial work or modifications to any of the public roads shall be done in consultation with and have the approval of the local road's authority (as is standard practice, this will be finalised during and be a requirement of the municipal planning approval process.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> </ul>	
	The developer shall ensure that the contractor provides the necessary driver training to key personnel to minimise the potential of incidents on the public road network.		
Permits	A permit must be obtained from the relevant authority for any abnormal loads transported.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>

**Table 7-17 – Socio-Economic: EMPr Mitigation and Management Measures**

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<b>SOCIO-ECONOMIC</b>			
<b>Impact Management Outcome:</b>			
<ul style="list-style-type: none"> <li>■ To ensure that the negative socio-economic impacts are mitigated and managed.</li> <li>■ To ensure that the positive socio-economic impacts are enhanced.</li> </ul>			
<b>Indicator and Compliance Mechanism:</b>			
<ul style="list-style-type: none"> <li>■ Induction training and records.</li> </ul>			



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
<ul style="list-style-type: none"> <li>■ Health, safety, environmental and community incident and complaints management system register.</li> <li>■ Monitoring and audit reports.</li> <li>■ Incident classification and reporting management procedure (to be developed).</li> <li>■ PPE Register.</li> <li>■ Occupational health and safety plan (to be developed).</li> <li>■ Health and safety protocol (to be developed).</li> <li>■ Employment records and community engagement local enterprise development records.</li> </ul>			
Employment	Opportunities for the training of unskilled and skilled workers from local communities should be maximized.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Exploring ways to enhance local community benefits with a focus on broad-based BEE and preferential procurement.		
	A 'locals first' policy with regard to construction and operational labour needs.		
	Using local sub-contractors where possible and requiring that contractors from outside the local area that tender also meet targets for how many locals are given employment.		
	The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.		
Employee Management	The applicant and the contractors should develop a Code of Conduct for the project. The code should identify what types of behaviour and activities by workers are not permitted in agreement with surrounding landowners and land managers.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>



Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	The applicant should implement measures to assist and, if needed, fairly compensate any surrounding businesses for damage to property as a result of construction activities		<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	No construction workers, with the exception of security personnel, should be allowed to stay on the site overnight.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Decommissioning</li> </ul>
	The movement of workers on and off the site should be closely managed and monitored by the contractors. In this regard the contractors should be responsible for making the necessary arrangements for transporting workers to and from site on a daily basis.		
Complaints	A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes.	<ul style="list-style-type: none"> <li>■ Site Manager</li> <li>■ Contractor</li> <li>■ EO</li> </ul>	<ul style="list-style-type: none"> <li>■ Pre-Construction</li> <li>■ Construction</li> <li>■ Operation</li> <li>■ Decommissioning</li> </ul>
	Surrounding businesses should be able to contact the site manager to report any issues which they may have. The site manager should be stationed within the area and should therefore be available on hand to deal with and address any concerns which may be raised.		

## 8 MANAGEMENT PLANS

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A number of generic management plans have been included in the EMPr. The plans included below provide an indication of the requirements that must be followed on the proposed construction and operation of the Proposed Project. It must be noted that many of these plans can be updated at any stage depending on any changes that may occur on the site.

The following specific plans have been compiled:

- Emergency Response Plan (ERP);
- Hazardous Substance Management Plan;
- Fire Management Plan;
- Alien Invasive Plant Management Plan;
- Traffic and Transport Management Plan;
- Heritage and Palaeontological Management Plan;

### 8.1 EMERGENCY RESPONSE PLAN

Appropriate resources must be provided to respond to accidental and emergency situations for operations and activities during construction and operation phases. The procedures will include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to emergencies associated with their respective hazards.

This ERP is intended as a practical working document for the proposed project. The purpose of this document is to provide the basic guidelines on how to respond to potential emergency situations that may arise during project activities. These potential emergency situations include medical emergencies and fires.

All activities associated with the project will require site-specific emergency response plans to mitigate impacts, which meet or exceed all applicable regulations.

The objectives of this plan are as follows:

- Protect the communities and the environment through the development of emergency response strategies and capabilities.
- Set out the framework for hazard identification in order to define procedures for response to the situations including the development of contingency measures.
- Structure a process for rapid and efficient response to and manage emergency situations during the construction and operational phases of the project.
- Assign responsibilities for responding to emergency situations.

The ERP must take the incident procedures referred to in Section 30 of the NEMA into account.

#### 8.1.1 ROLES AND RESPONSIBILITIES

With respect to this plan, R-Bay (via the appointed contractor/contractor/ principal contractor) has the responsibility to:

- Provide emergency response services (such as first aid and firefighting representative) and to structure and coordinate emergency response procedures for the project.
- Ensure that specific emergency responsibilities allocated to them are organised and undertaken.

- Ensure that employees and contractor third parties are trained and aware of all required emergency procedures.

### **8.1.2 EMERGENCY COMMUNICATIONS AND CO-ORDINATION PLAN**

In an emergency situation where there is an immediate threat to communities, personnel or the environment, the Project Manager will be notified immediately. The Project Manager will dispatch the Emergency Response Coordinator (or suitably tasked person) who will determine the appropriate plan of action depending on the severity of the emergency, the people affected, and the need to evacuate.

If there is a developing emergency or unusual situation, where an emergency is not imminent, but could occur if no action is taken, the Project Manager (or if the Project Manager is absent the Environmental Officer) is to be informed immediately. Once the emergency or unusual situation has been managed, the correct incident/near miss must be reported to the General Manager.

If an emergency situation poses a direct threat to surrounding businesses and/or land uses in the area, the Environmental Officer and/or Social Officer will advise persons in the vicinity of the emergency to evacuate due to the potential risk. The appropriate government authorities will immediately be notified of such an emergency evacuation. The Emergency Response Coordinator (or suitably tasked person) will be tasked with responding to the potential risk. Should the emergency situation be such that it can be managed by R-Bay, equipment and personnel will be deployed to the maximum extent necessary, so as to prevent/minimise potential risks.

### **8.1.3 RESPONSE TO INCIDENTS**

An incident is any occurrence that has caused, or has the potential to cause, a negative impact on people, the environment or property (or a combination thereof). It also includes any significant departure from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential or actual impacts because of all such incidents.

The actions resulting from any formal or informal investigations will be used to update the EMPr.

### **8.1.4 BUDGET FOR EMERGENCY RESPONSE**

Costs for emergency response and management will be included in the capital expenditure budget for the construction phase and operational budget for the operational and decommissioning phases of the project.

### **8.1.5 VERIFICATION**

An environmental emergency response system will be developed for the execution of emergency drills that will include the following, inter alia:

- Fire Drills
- Emergency Evacuation Drills
- Medical and Environmental Drills.

Reporting and monitoring requirements for the plan will include:

- Monthly inspections and audits
- Quarterly reporting of accidents/ incidents



- Reporting at the time of the incident and monthly spill reporting developed by the Environmental and Quality, Health and Safety departments
- Annual reporting on training

Emergency response drills and reporting will be maintained by the Project Manager and will provide information regarding required revisions to training or the emergency response actions. Each incident reported will be reviewed and investigated upon occurring. Actions will be identified where possible to improve the site's overall response to emergencies. Updates/revisions that are necessary to protect worker or community health and safety will be implemented immediately after approval by the General Manager. On a bi-annual basis, Key Performance Indicators (KPIs) will be compared against past-performance and analysed for trends to determine if there are areas for improvement. Changes because of the trend analysis and identified areas for improvement will be implemented following the project's change management system as required.

## 8.2 HAZARDOUS SUBSTANCES MANAGEMENT PLAN

Hazardous substances are chemicals or materials that can cause acute or chronic harm to health, be it humans or the environment. The key potential sources of impact related to the management of Hazardous Chemical Substances (HCS) and fuel during construction relate to the risk of accidental release of hydrocarbons to the environment, accidental exposure to workers, and fire and explosion risks.

Potential impacts associated with these risks, if poorly managed, include:

- Impact to soil and/or groundwater, which may result in degradation of the resource and requirement for remedial action;
- Impacts on pastoralist livelihoods due to contamination of pasture or water resources and consequent impacts to their, health, livelihood and animals;
- Impacts on human health & safety due to either direct exposure or through fire/explosion;
- Gas emissions associated with the combustion of fuel, are mainly compounds of nitrogen, carbon including very small traces of sulphur and particulate matter; and
- Fugitive emissions from HCS & fuel storage.

The purpose of a Hazardous Substances Management Plan (HSMP) is to provide a framework for the management of hazardous substances onsite during the construction and operation of the Proposed project:

- Ensure the handling and storage of hazardous substances are in accordance with relevant standards;
- To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons;
- To ensure that the storage and maintenance of machinery onsite does not cause pollution of the environment or harm to persons.

### 8.2.1 HAZARDOUS SUBSTANCES MANAGEMENT PROCEDURE

A plan for managing the transportation, delivery, storage and handling of hazardous substances onsite is detailed below. A method statement detailing the specific storage and handling practices during construction must be prepared by the Contractor prior to the commencement of construction.



## REGISTER OF HAZARDOUS SUBSTANCES

Contractors shall establish inventories or registers of hazardous substances on site. The inventory is to be updated when new hazardous substances are introduced to the workplace or the use of existing hazardous substances is discontinued. Both the chemicals' register and the Material Safety Data Sheets (MSDSs) must be readily available at a central location or near where the chemicals are being stored or used.

## MSDS

It is standard practice that an MSDS is provided by the manufacturer or supplier of all hazardous substances. An MSDS is required for all chemicals and substances on site. These MSDSs are to be made available to all parties affected by the use or storage of the chemical. MSDSs are the key to communicating hazards and safe handling practices for chemicals. In addition, MSDS information is to be made available to all employees.

## DELIVERIES

Transport of all hazardous substances must be in accordance with the relevant legislation and regulations. Contractors are responsible for identifying and securing any necessary permits for any proposed bulk fuel storage arrangements. The supplier will fill contractors fuel tanks; fuelling is the responsibility of the licensed contractor who will be supervised by the storage/work area supervisor. No 'black-market' or 'grey-import' fuels shall be used. All fuels purchased must be legitimate and subject to required duties and taxes.

Prior to fuel transfer the operator will verify that: all fuel transfer hoses have been connected properly and couplings are tight; transfer hoses are not obviously damaged; fuel transfer personnel are familiar with procedures; for fuelling stations, personnel are located at both the fuel truck and fuel transfer tank(s) and have the ability to shut off fuel flow manually; a means of communication has been established between the two people transferring fuel; and a high liquid level shutoff device can be substituted for the person at the delivery tank, in which case operation of the shutoff will be verified each time it is used; The fuel contractor will clean up and report any accidents or spills immediately to the project ESHS team.

## ENVIRONMENT AND OCCUPATIONAL HEALTH AND SAFETY

The following requirements are additional to any applicable requirements established in other management plans such as the Occupational Health & Safety Management Plan:

- Storage facilities will have the applicable MSDS available;
- Smoking will be strictly prohibited from any areas where fuel loading operations take place;
- Appropriate signage will be used to identify potential spill risks;
- Any accidental damage to containment structures will be inspected immediately and appropriate repairs undertaken. The extent of damage will be reported in writing to WP as well as remedial repairs effected together with the date of repairs and any follow up inspection. Any release of fuels or other substance will be cleaned up;
- All used fuel / oil products will be collected in tanks marked "Waste Oil"; and
- All hydrocarbon associated wastes will be managed in line with the Waste Management Plan.

## **MATERIALS STORAGE**

- All temporary hydrocarbon storage will be situated above ground. There will be no buried storage tanks permitted.
- All chemicals, fuels and other hazardous materials are to be stored in designated and bunded areas, where the bunded area is impermeable and is impervious to the stored substance as per the requirements of SABS 089:1999 Part 1. The bunded area will contain 110% volume of the largest container stored.
- Bunds and service area platforms to be cleaned and maintained regularly.
- SABS approved Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. The relevant construction crew members must be trained in their use.
- Keep a record of all hazardous substances stored on site. Clearly label all the containers storing hazardous waste.
- The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with Material Safety Data Sheets (MSDS) files and applicable regulations and safety instructions.
- Chemical and hydrocarbon storage facilities shall be covered to prevent rainfall ingress into secondary containment units and well-ventilated
- Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with.
- An effective monitoring system must be put in place to detect any leakage or spillage of all hazardous substances during their transportation, handling, installation and storage.

## **SPILL AND LEAK MANAGEMENT AND PREVENTION**

- In the event of a major spill or leak of contaminants, the relevant authorities must be informed. The relevant construction crew members must be trained in their use.
- Spilled cement must be cleaned up immediately and, stored as hazardous waste and disposed of at a suitably licensed hazardous waste disposal facility.
- Routine servicing and maintenance of vehicles must not be undertaken onsite (except for emergencies). If repairs of vehicles must take place, an appropriate drip tray must be used to contain any fuel or oils.
- Any water that collects in bunds must not be allowed to stand. Should the water be contaminated, it is to be removed and treated prior to discharge, or disposed of as hazardous waste. Clean stormwater contained within the bunds may be reused.
- No chemicals must be stored, or vehicle maintenance undertaken within 100m of wetlands or drainage lines.
- Construction machinery must be stored in an appropriately sealed area. If machinery cannot be stored in a sealed area, then a drip tray must be used to prevent spillage from any leaks.
- As far as practicable, all equipment servicing / maintenance shall be undertaken within designated workshop areas.
- All generators on site, including generators that are not in use must be located in a bunded area or on a drip tray.
- Bunded areas and drip trays must be maintained on a regular basis.
- Diesel generators and water pumps shall be located in secondary containment areas or shall be self-contained to prevent loss of fuels and oils;
- Precautions must be in place to limit the possibility of oil and other toxic liquids from entering the soil or clean stormwater system.

- Upon completion of construction, the area must be cleared of potentially polluting materials.
- Emergency response planning will be managed via the Emergency Preparedness and Response Plan.

### 8.2.2 OPERATIONAL PHASE

During the operational phase of the project the recommendations as contained within the MHI Risk Assessment must be adhered to and included in the Hazardous Substances Management Plan.

### 8.2.3 INSPECTION, MONITORING AND TRAINING

Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function.

The contents of the Hazardous Substances Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. All training must be undertaken as outlined in the relevant Training Procedure.

Examples of Toolbox Talks include:

- Storage of hazardous substances
- Working with hazardous substances
- Management of hazardous waste
- Spill Prevention

## 8.3 FIRE MANAGEMENT PLAN

The purpose of this plan is to address firefighting requirements throughout the construction of the project and to preserve and protect human life as well as tangible goods and equipment in the event of a fire.

Mitigation and management measures include, but are not limited to the following:

- All construction camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.
- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures must include appropriate instruction of employees about fire risks and designated smoking areas.
- Fire prevention facilities must be present at all storage facilities. No open fires shall be allowed on site under any circumstance. No cooking on open fires shall be done onsite to prevent runaway fires.
- The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.
- Emergency numbers for local police and fire department etc. must be placed in a prominent area.
- Firefighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.
- All construction staff must be trained in fire hazard control and firefighting techniques. Translators are to be used where necessary.
- All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.
- Smoking must only be conducted in demarcated areas.

- Firefighting equipment must be regularly maintained by a suitable service provider.

## 8.4 ALIEN INVASIVE PLANT MANAGEMENT PLAN

The purpose of this Plan is to provide a framework for the management of alien and invasive plant species during the construction and operation of the project, which in turn serves to manage open spaces, as required. The broad objectives of the plan include the following:

- Ensure alien plants do not become dominant in parts or the whole site through the control and management of alien and invasive species presence, dispersal and encroachment.
- Managing and maintaining the ecosystem in a near-natural state and restoring and/or rehabilitating the ecosystems to such a state.
- Develop and implement a monitoring and eradication programme for alien and invasive species.
- Promote the natural re-establishment and planting of indigenous species in order to retard erosion and alien plant invasion.

Mitigation and management measures include, but are not limited to the following:

- Monitor for early detection, to find species when they first appear on site. This should be as per the frequency specified in the management plan, and should be conducted by an experienced botanist. Early detection should provide a list of species and locations where they have been detected. Summer (vegetation maximum growth period) is usually the most appropriate time, but monitoring can be adaptable, depending on local conditions.
- Monitor for the effect of management actions on target species, which provides information on the effectiveness of management actions. Such monitoring depends on the management actions taking place. It should take place after each management action.
- Monitor for the effect of management actions on non-target species and habitats.
- Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.
- Alien vegetation and the spread of exotic species on the site will need to be controlled.
- The contractor must be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.
- Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only suitable herbicides shall be used.
- The use of pesticides and herbicides on the site must be discouraged as these can impact on important pollinator species of indigenous vegetation. Use of these should only be permitted where absolutely necessary.
- Correct rehabilitation with locally indigenous species.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.
- Constant maintenance of the area to ensure re-colonisation of floral species.
- Ensure regular removal of alien species, which may otherwise jeopardise the proliferation of indigenous species.

## 8.5 RE-VEGETATION AND HABITAT REHABILITATION PLAN

The purpose of the rehabilitation plan is to ensure that areas cleared or impacted during construction activities are rehabilitated with a plant cover that reduces the risk of erosion from these areas as well as restores some ecosystem function. The purpose of the rehabilitation plan for the site can be summarised as follows:

- Achieve long-term stabilisation of all disturbed areas to minimise erosion potential.
- Re-vegetate all disturbed areas with suitable local/indigenous plant species or grass/crop.
- Minimise visual impact of disturbed areas.
- Ensure that disturbed areas are safe for future uses.
- Re-vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.
- Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with suitable crop or locally indigenous species typical of the representative botanical unit.
- Re-vegetation of the disturbed site is aimed at approximating as near as possible the existing vegetative conditions prevailing prior to construction.
- Seeds from surrounding seed banks can be used for re-seeding.
- Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.
- Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.
- Habitat destruction must be limited to what is absolutely necessary for the construction of the infrastructure, including the construction of new roads. In this respect, the recommendations from the Biodiversity Assessment must be applied strictly. Personnel must be adequately briefed on the need to restrict habitat destruction, and must be restricted to the actual construction area.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.

## 8.6 EROSION MANAGEMENT PLAN

Exposed and unprotected soils are the main cause of erosion in most situations. Therefore, this erosion management plan and the revegetation and rehabilitation plan are closely linked to one another and should not operate independently but should rather be seen as complementary activities within the broader environmental management of the site and should therefore be managed together. This Erosion Management Plan addresses the management and mitigation of potential impacts relating to soil erosion, including:

- Material stockpiled for long periods (2 weeks) must be retained in a bermed area.
- Stockpiles not used in three (3) months after stripping must be covered with hessian or a similar material to prevent dust and erosion.
- Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented.
- Any vegetation clearance must be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.
- Areas to be cleared must be clearly demarcated and this footprint strictly maintained.
- Silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.

- Wind screening and stormwater control must be undertaken to prevent soil loss from the site.
- Other erosion control measures that can be implemented are as follows:
  - Brush packing with cleared vegetation
  - Mulch or chip packing
  - Planting of vegetation
  - Hydroseeding / hand sowing
- All erosion control mechanisms need to be regularly maintained.
- Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.
- Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with indigenous grasses.
- No impediment to the natural water flow other than approved erosion control works is permitted.
- To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be estimated and the drainage system assessed accordingly.

### 8.6.1 MONITORING

The site must be monitored continuously during construction and operation in order to determine any indications of erosion. If any erosion features are recorded as a result of the activities on-site the Environmental Officer (during construction) or Site Manager (during operation) must:

- Assess the significance of the situation.
- Take photographs of the soil degradation.
- Determine the cause of the soil erosion.
- Inform the contractor/operator that rehabilitation must take place and that the contractor/operator is to implement a rehabilitation method statement and management plan.
- Monitor that the contractor/operator is taking action to stop the erosion and assist them where needed.
- Report and monitor the progress of the rehabilitation weekly and record all the findings in a site register.
- All actions with regards to the incidents must be reported on a monthly compliance report which will be submitted to the Competent Authority (during construction) and kept on file for consideration during the annual audits (during construction and operation).

The Contractor (in consultation with an appropriate specialist) must:

- Select a system/mechanism to treat the erosion.
- Design and implement the appropriate system/mechanism.
- Monitor the area to ensure that the system functions like it should. If the system fails, the method must be adapted or adjusted to ensure the accelerated erosion is controlled.
- Continue monitoring until the area has been stabilised.

## 8.7 TRAFFIC AND TRANSPORT MANAGEMENT PLAN

The purpose of a Traffic and Transportation Management Plan is to address regulatory compliance, traffic management practices, and protection measures to help reduce impacts related to transportation and the construction of temporary and long-term access within the vicinity of the project site. The objectives of this plan include the following:

- To ensure compliance with all legislation regulating traffic and transportation within South Africa National, Provincial, Local and associated guidelines.
- To avoid incidents and accidents while vehicles are being driven and while transporting personnel, materials, and equipment to and from the project site.
- To raise greater safety awareness in each driver and to ensure the compliance of all safe driving provisions for all the vehicles.
- To raise awareness to ensure drivers respect and follow traffic regulations.
- To avoid the deterioration of access roads and the pollution that can be created due to noise and emissions produced by equipment, machinery, and vehicles.

Mitigation and management measures include, but are not limited to the following:

- All vehicles used during the transport of materials and in the construction, activities are required to be roadworthy per the National Road Traffic Act (NRTA) and display all pertinent certificates as required.
- All vehicles travelling to and from the site shall adhere to all laws imposed by the law enforcement agencies and shall comply with any requests made by the law enforcement officials.
- For each convoy of abnormal vehicles/loads a designated safety officer shall be nominated. All abnormal vehicles and loads to be transported are required to have a valid permit before any trip is begun.
- The route must be assessed to determine if any structures or vegetation need to be temporarily or permanently relocated so as to avoid damage to the load as well as public and private property during the trips.
- A designated transport coordination manager must be appointed to oversee and manage the traffic safety officers. Additionally, the designated transport coordination manager must inform and keep up-to-date the interested and affected parties of all the activities taking place that may have a direct impact on them.
- A traffic safety officer shall be nominated to make all the necessary arrangements to maintain the required traffic measures for the duration of the project as outlined in the “Standard Specifications for Road and Bridge Works for State Road Authorities,” 1998 edition. The safety officer shall liaise daily with the transportation coordination manager to keep them apprised of the state of all the traffic arrangements.
- All construction vehicles that are entering the site shall also be available via radio or telephone communication to the transport coordination manager. So that in the event of an emergency, all vehicles can be accounted for.
- All vehicles shall comply with the posted speed limits on public roads as well as the speed limits within the development. For additional speed limits that are imposed on the construction traffic, refer to the South African Road Traffic Signs Manual (SARTSM), Volume 2, June 1999 for the restrictions.
- All construction traffic shall comply with the legal load requirements as outlined in the National Road Traffic Act and National Road Traffic Regulations.
- Construction traffic entering the site along public roads must be limited to times when peak hour traffic can be avoided. The peak traffic occurs during 7h00 to 8h30, and 16h00 to 17h30.
- The South African Road Traffic Signs Manual (SARTSM), Volume 2, June 1999 is to be used for all traffic during the construction activities of the proposed project.



- During periods of high construction traffic entering and exiting the site, it is recommended that flagmen help direct the traffic. This will enable the safe movement of construction and public traffic at the entrance and reduce the number of potential conflicts.

## 8.8 HERITAGE AND PALAEOLOGICAL MANAGEMENT PLAN

The purpose of this document is to provide a response guideline should archaeological sites, palaeontological sites or graves become exposed during ground altering activities within the area of the Proposed Project. Heritage resources are protected in terms of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

### 8.8.1 CHANCE FIND PROCEDURE

The following procedural guidelines must be considered in the event that previously unknown heritage resources are exposed or found during the construction of the Proposed Project. This chance find procedure (CFP) must be read in conjunction with the Environmental Authorisation, the Environmental Management Programme, Final BAR and the final layout archaeological ground-truthing report.

The Contractor or other person discovering a potentially significant site or artefact will initiate the following actions:

- Once alerted to heritage resource/fossil occurrence(s): alert site foreman, stop work in area immediately, safeguard site with security tape / fence / sand bags if necessary.
- Record key data while fossil remains are still in situ:
  - Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo
  - Context – describe position of fossils within stratigraphy (rock layering), depth below surface
  - Photograph fossil(s) in situ with scale, from different angles, including images showing context (e.g. rock layering)
- If feasible to leave fossils in situ:
  - Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
  - Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume
- If not feasible to leave fossils in situ (emergency procedure only):
  - Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock)
  - Photograph fossils against a plain, level background, with scale
  - Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags
  - Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist
  - Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
- If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.

- Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency;
- The Specialist Palaeontologist must undertake the following:
  - Apply for Fossil Collection Permit Record / submit Work Plan to relevant Heritage Resources Agency.
  - Describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy).
  - Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data.
  - Submit Palaeontological Mitigation report to Heritage Resources Agency.
  - Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.

## 8.8.2 TRAINING, INSPECTION AND MONITORING

Since it is not practical to have a regular monitoring presence over the construction period by either an archaeologist or palaeontologist, environmental awareness training must be conducted by the EO for all contractors and subcontractors. The training must include, as a minimum, the following:

- Identifying potential features of heritage significance;
- Procedures for dealing with heritage resources discovered on site;
- Applicable Legislation pertaining to the protection of heritage resources; and
- The importance of protecting heritage resources.
- The contents of the Heritage Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks.

## 8.9 GRIEVANCE MECHANISM

### 8.9.1 GRIEVANCE MECHANISM - EXTERNAL

A grievance mechanism is a tool used to address affected communities' concerns and complaints and is an important pillar of the stakeholder engagement process, since it creates opportunities for companies and communities to identify problems and discover solutions together. The Project proponent can benefit from understanding community concerns and complaints and addressing them through all stages of project development.

Where it is anticipated that a new project will involve ongoing risk and adverse impacts on surrounding communities, the project proponent is required to establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the proponent's environmental and social performance. The grievance mechanism should be scaled to risks and adverse impacts of the project, address concerns promptly, use an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and do so at no cost to communities and without retribution. The mechanism should not impede access to judicial and administrative remedies.

This Grievance Mechanism has been developed to receive and facilitate grievances and provide a solution to these concerns and grievances. The aim of the grievance mechanism is to ensure that

grievances or concerns raised by local landowners, staff and or communities are addressed in a manner that:

- Provides accessible avenues for all internal and external stakeholders to contact management of the facility;
- Provides a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, lasting and dealt with in a timely manner;
- Builds trust as an integral component of staff and broader community relations activities; and
- Enables more systematic identification of issues and trends affecting a project, facilitating corrective action and pre-emptive engagement.

The aim of this Grievance Mechanism is to address grievances in a manner that does not require a potentially costly and time-consuming legal process. This grievance mechanism also ensures alignment with local and international best practices in human resources development and stakeholder engagement.

## 8.9.2 OBJECTIVES

The objectives of the grievance mechanism include:

- To be respectful of complainant culture, values, traditions and views;
- To resolve grievances at the local level and in a timely manner;
- To identify the root causes of grievances and address systemic issues;
- To provide a process that is dialogue based, with the complainant and the Proponent cooperating in the investigation, discussion, resolution and announcement of the grievance and result;
- To ensure fair, equitable and consistent outcomes to resolve grievances;
- To enhance and continuously improve the ability of the Proponent to fairly address community concerns.

## 8.9.3 SCOPE AND RESPONSIBLE PARTIES

A grievance mechanism is primarily for the community to raise relevant concerns about the Project / Proponent's activities and is to be implemented throughout the life cycle of the Project (i.e. throughout assessment, construction, and implementation phases).

WSP will only be involved in the stakeholder engagement and grievance management process for the assessment phase. The Project proponent and the Contractor will be responsible for implementation of the grievance mechanism throughout the construction phase.

## 8.9.4 GRIEVANCE REDRESS PROCEDURE

This grievance mechanism sets out the following steps to be taken to resolve grievances.

- **Register grievance**
  - A grievance can be submitted in a written letter, e-mail, fax, or raised verbally in person or via telephone.
  - Grievances raised during the assessment process are to be submitted to the EAP via the details provided as per the stakeholder engagement notifications. The EAP will notify the Proponent of the grievance.

- Grievances raised during the implementation process are to be submitted to the Proponent / Contractor via the relevant details, which are to be made available to registered stakeholders prior to commencement of onsite activities, as well as via site notice boards.
  - In the event that a complaint is raised verbally, the responsible person must obtain the approval of the complainant as to the documented complaint (by way of signature of the Receipt of Grievance Form). Should the complainant have literacy issues, the responsible person may request that a third party (friend / relative of complainant) is available to verify / approve the contents of the documented complaint to the satisfaction of the complainant.
  - The submission should include the nature of the grievance, the date when it occurred and the name and contact details of the complainant.
  - Grievances will be accepted anonymously or through a third party (e.g. unions, NGOs, local authorities, community representatives, etc.).
  - Individuals have the right to request that their name be kept confidential throughout the grievance process.
  - As men and women may communicate their grievances differently, and also have different types of grievances, the complainant may request that their grievance is processed by a female / male representative. In the event that such a request is made, the Proponent, as far as reasonably practicable, will accommodate this request.
- **Within a Week (7 days) of receiving the grievance the Proponent will:**
- Enter the grievance into the Proponent's records that track grievances;
  - Assess the grievance according to specific criteria and if necessary, develop an appropriate approach for the particular grievance;
  - Provide a written acknowledgement of the grievance including the name of the responsible person to contact about progress, an explanation of the steps that will be taken to investigate, discuss and resolve the grievance, and an anticipated timetable for processing the grievance.
- **Processing the Grievance:**

The responsible person will:

- Identify the parties involved;
- Clarify issues and concerns raised by the grievance through direct dialogue;
- Classify the grievance in terms of seriousness according to the gravity of the allegation, the potential impact on an individual's or a group's welfare and safety, or the public profile of the issue;
- Convene a staff group with expertise relative to the grievance;
- Determine the method for resolving the grievance – the most common approaches, not excluding others, will be:
  - The Proponent proposes a solution;
  - The Proponent and aggrieved party decide together the solution;
  - The Proponent and aggrieved party defer to a third party for mediation / arbitration.
- Gather views of other stakeholders, including those of the Proponent and if necessary, an agreed neutral technical opinion;
- Determine initial options that parties have considered and explore various approaches for settlement;

- Conduct the process as agreed;
  - Close the grievances by signing the Complaint Close-Out Form (i.e. that the grievance has been resolved satisfactory to both parties).
  - The Proponent may “close” the grievance even if the complainant is not satisfied with the outcome. This option can be pursued by the Proponent in the case that the complainant is unable to substantiate a grievance, or if there is an obvious speculative or fraudulent attempt. In such situations, the Proponent’s efforts to investigate the grievance and to arrive at a conclusion will be well documented and the complainant advised of the situation. The Proponent (or contractors working for the Proponent) will not dismiss grievances based on a cursory review and close them in their grievance record unless the complainant has been notified and had the opportunity to provide supplementary information / evidence;
  - Keep a record that tracks the progress and communications for each grievance.
- **Processing Timeline**
    - The Proponent will aim to bring the grievance to a resolution within 30 days of receiving the grievance. The grievance shall be acknowledged within 7 days by the responsible person, and responded to within 30 days. If the matter takes longer than 30 days to resolve, the complainant will be informed through dialogue and in writing, of the reason for the delay, any advances or difficulties encountered and the anticipated new resolution date.

### 8.9.5 RECOURSE

If the complainant is not satisfied with the outcome of the grievance process the aggrieved party has the right to address the grievance via the judicial system.

## 9 CONCLUSION

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The EIA process for the proposed project considered the biophysical location of the proposed project, as well as the nature of the activity which was assessed by the relevant specialists and the EAP.

It is therefore the opinion of the EAP that provided this project is mitigated, as per the mitigation and management measures outlined in this EMPr, the project will result in impacts that should not significantly impact the receiving environment. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor must thoroughly familiarise himself with the requirements of the EMPr and appoint an EO to oversee the implementation of the EMPr on a day-to-day basis. In addition, the applicant must appoint an external independent ECO to undertake monthly compliance audits during construction against the requirements of the EMPr as well as the EA.

Parties responsible for transgression of this EMPr must be held responsible for any corrective actions that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence must receive penalties.

WSP is of the opinion that the project can proceed, provided that the outlined mitigation measures of the EIA process and this EMPr are implemented effectively.

In terms of NEMA, everyone (i.e., all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

R-Bay also recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. Should the above-mentioned environmental guidelines and mitigation measures be adopted, it is anticipated that the negative environmental impacts of the Proposed Project will be mitigated adequately. The selected Contractor shall appoint relevant personnel, as well as an independent ECO, to monitor the site periodically throughout construction to ensure that the required environmental controls are in place and working effectively.



If you have any further enquiries, please feel free to contact:

WSP Group Africa (Pty) Ltd

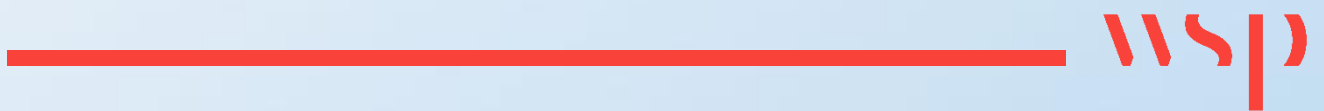
Attention: Anri Scheepers

Tel: +27 11 300 6089

E-mail: [Anri.Scheepers@wsp.com](mailto:Anri.Scheepers@wsp.com)

# Appendix A

**EAP CV**





## APPENDIX

*Patricia Nathaniel*



## Patricia Nathaniel

Principal Consultant, Earth & Environment

### CAREER SUMMARY

Patricia is a dedicated, focused and experienced individual with a post-graduate degree in Environmental Management and twelve years of work experience in the environmental field. Patricia is a Principal Consultant for WSP's Earth & Environment Team.

Patricia has an Honours degree in Environmental Management and is a registered Environmental Assessment Practitioner with EAPASA. She is also SACNASP registered.

Patricia was a Technical Manager at KSEMS Environmental Consulting before taking up a position at GIBB Environmental. Patricia has broad experience with a range of aspects within the environmental management space, including environmental reporting, reviewing, compiling tender documents, submission of tenders, business development, marketing, client liaison, training of the junior staff and overall project management of all active projects.

Patricia's most recent position prior to joining WSP as a Principal Consultant, was Senior Environmental Consultant at GIBB Environmental. She was the Environmental Scientist on the MCWAP-2A Project which is one of the largest projects of its kind in Africa involving the abstraction of water from the Crocodile (River) West and the transfer of this water to the end users i.e., predominantly the power stations in the Limpopo Province. She was also the Lead Consultant on the KZN Automotive Supply Park Project, DTPC is the Applicant. This is also a pioneer project as it would be the first of its kind in KZN. She is the EAP on the Lower Mkomazi Bulk Water Scheme Project, renewable energy projects and hospital conditional assessments as well as Environmental Project Manager for the Transnet Port of Durban Masterplan Project.

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*<1 years with WSP*

*12 years of experience*

#### *Area of expertise*

Environmental auditing and reporting  
Environmental Impact Assessments  
Basic Assessment Reports  
Water Use License Applications  
Due Diligence Reports  
Project Management

#### *Language*

English

### EDUCATION

Bachelor of Science (Honours), Environmental Management, University of KwaZulu-Natal, South Africa 2013  
Bachelor of Science, Geography, University of KwaZulu-Natal, South Africa 2009

### ADDITIONAL TRAINING

WULA Training Course: KSEMS 2016  
Public Participation in EIA Course: IAIAAsa 2015



## Patricia Nathaniel

Principal Consultant, Earth & Environment

2014 EIA Regulations in Context: Shepstone and Wiley

2015

### PROFESSIONAL MEMBERSHIPS

Registered Environmental Assessment Practitioner: Number 2020/1120

EAPASA

SACNASP Registered Scientist: 123478

SACNASP

### PROFESSIONAL HISTORY

Gibb Environmental, Consultant, Environmental

April 2020 - February 2023

KSEMS Environmental Consultant, Principal Consultant, Technical Manager  
Senior Environmental Consultant, Environmental Consultant

February 2014 – March 2020

ERM Southern Africa, Consultant/subconsultant, Researcher/Environmental

December 2020 – August 2013

Tiger Brands, Quality Analyst

September – December 2010

BSN Medical, Microbiologist Intern

January – December 2009

### PROFESSIONAL EXPERIENCE

#### Environmental Reporting and Project Management

**Umgeni Water, uMkhomazi Bulk Water Scheme, South Africa**

**2022 – 2023**

**EAP**

Compilation of the BAR for the project.

**Eskom, Ferrum Upington 400kV Solar Powerline, South Africa**

**2022 – 2023**

**EAP**

Brief project description

**Client, Project title, Country**

**Year from/to**

**Role**

Compilation of the BAR for the project.

**DTPC, KZN Automotive Supply Park, South Africa**

**2022 - 2023**

**EAP**

BAR and WULA. Compilation of the BAR and WULA for the project.

**Transnet Durban, Transnet Durban Logistics Hub Expansion, South Africa**

**2022 - 2023**

**EAP / Project Manager**

Fatal Flaw Analysis on various components of the POD expansion. Project manager, environmental assessments.

**TCTA, MCWAP2 Bulk Water Scheme and Borrow Pits, Limpopo**

**2020 - 2023**

**EAP.**

BAR and WULA. Compilation of the BAR for the Borrow Pits and WULA for the entire project.



## **Patricia Nathaniel**

Principal Consultant, Earth & Environment

**THD and Dube TradePort (eThekweni Metropolitan Municipality), N3 Material Sources (Quarries and Borrow Pits), South Africa  
2019 -2020**

**Technical Manager/Project Manager**  
Compilation of the BAR and WULA.

**HHO Consulting Engineers (Free State), R34 Upgrade and Borrow Pits, South Africa  
2019 - 2020**

**Technical Manager/Project Manager**  
Compilation of the BAR and WULA.

**Manaba Investments, Ugu District Municipality, Uvongo Car Park, South Africa  
2019 - 2020**

**Technical Manager/Project Manager**  
Compilation of the BAR and WULA.

**DDRA/Grindrod, Mkambathini Municipality, Grindrod Autoport, South Africa  
2019 - 2020**

**Technical Manager/Project Manager**  
EA Amendment and ECO Audit Reports. Compilation of the EA Amendment and Review of the ECO Audit Reports.

**WSP, Umgungundlovu District Municipality, N3 Upgrade from Murray Road to New England Interchange, South Africa  
2019 - 2020**

**Technical Manager/Project Manager**  
Review of the BAR and WULA.

**Aurecon Eastern Cape, New and Upgrade of Access Roads along the N2 including Borrow Pits, Eastern Cape, South Africa  
2018 - 2020**

**Technical Manager/Project Manager**  
Compilation of the BAR and WULA.

**Umgeni Water, Umgungundlovu District Municipality, Vulindlela Pipeline Bulk Water Supply Scheme Phase 1 and 2, South Africa  
2017 - 2020**

**Technical Manager/Project Manager**  
Compilation of the BAR and WULA.

**KSIA, eThekweni Metropolitan Municipality, King Shaka Amendment to the EA, South Africa  
2017 - 2019**

**Technical Manager/Project Manager**  
Review of the EA Amendment.

**THD and Dube TradePort, eThekweni Metropolitan Municipality, Ushukela Mixed Used Development, South Africa  
2017 - 2019**

**Technical Manager/Project Manager**  
Compilation of the BAR and WULA.

**Keystone Investments, eThekweni Metropolitan Municipality, Umbogintwini Petrol Filling Station, South Africa  
2017 - 2018**

**Technical Manager/Project Manager**  
Compilation of the BAR and WULA.



## **Patricia Nathaniel**

Principal Consultant, Earth & Environment

**RHDHV, Mangaung Metropolitan Municipality, SANRAL N8 Rehabilitation and Borrow Pits, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Compilation of the BAR and WULA.

**RHDHV, Port Edward, SANRAL Port Edward Borrow Pit, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Review of BAR and WULA.

**RHDHV, Port Edward, SANRAL R61 Borrow Pit, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Review of BAR and WULA.

**Renishaw, Scottburgh, Renishaw Property Development, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Project Direction and Review of the WULA.

**Nyeleti Consulting, Ubumbulu, Mbumbulu MR30 Town Upgrade, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Compilation of the EIA Enquiry.

**Umgeni Water, Umgungundlovu District Municipality, Umbumbulu Pump Station, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Project Direction and Review of the BAR and WULA.

**Transnet, uMhlatuze Municipality, Diesel Locomotive Facility in the Port of Richards Bay, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Project Direction and Review of the EA amendment and WULA.

**Cubical Investments, Ugu District Municipality, Scottsburgh Mall Fuel Station, South Africa**

**2017 - 2018**

**Technical Manager/Project Manager**

Compilation of the BAR, WULA and Appeal.

**TPA Consulting, iLembe District Municipality, Mona Bridge, South Africa**

**2017**

**Technical Manager/Project Manager**

Review of BAR and WULA.

**TPA Consulting, iLembe District Municipality, Mahadeni Bridge, South Africa**

**2017**

**Technical Manager/Project Manager**

Review of BAR and WULA.

**NME Consulting, eThekweni Municipality, N2 Upgrade (Lovu River to Umlaas Canal), South Africa**

**2017**

**Technical Manager/Project Manager**

Compilation of the BAR and WULA.

**Ibhongo Consulting, D1252 Triple Celled Culvert and Borrow Pit, South Africa**

**2016 - 2019**



## **Patricia Nathaniel**

Principal Consultant, Earth & Environment

**Technical Manager/Project Manager**

Project Guidance and Technical Review of BAR and WULA.

**Ecovate, eThekweni Metropolitan Municipality, South Africa  
2016**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of BAR and WULA.

**TPA Consulting, Ugu District Municipality, Harding Informal Traders Market, South Africa  
2016**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of ECO Audit Reports and WULA.

**Arcus Gibb, Eden District Municipality, Gwaing Bridge, South Africa  
2016**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of BAR and WULA.

**FFS Visserhok Plant, Western Cape Scoping and EIR, South Africa  
2016**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of EA amendment.

**Tongaat Hulett Development, eThekweni Metropolitan Municipality, Shongweni Mixed Use  
Development Phase 2 & 3, South Africa  
2016 - 2019**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of the Scoping and EIR.

**Henwood and Nxumalo, Umgungundlovu District Municipality, Water Use License Application for  
Sinkwazi and Sikhumbuzo Roads, South Africa  
2016 - 2017**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of the WULA.

**Henwood and Nxumalo, Umgungundlovu District Municipality, Upgrading of Harewood Phase 1-6  
Roads within Edenvale, South Africa  
2016 - 2020**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of the BAR and WULA.

**Naidu Consulting, Umgungundlovu District Municipality WULA, The Upgrade of New Barker's Bridge,  
South Africa  
2016 - 2017**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of the BAR WULA.

**Naidu Consulting, Umgungundlovu District Municipality BAR and WULA, The Upgrade of the Meshlyn  
Bridge, South Africa  
2016 - 2017**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of the BAR and WULA.

**uBuhlebezwe Municipality, Ogle Farm Mixed Use Development, South Africa  
2016 - 2019**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of the BAR and WULA.



## **Patricia Nathaniel**

Principal Consultant, Earth & Environment

**Samani Consulting, Ugu District Municipality, Basic Assessment Report and WULA, Upgrade of Provincial Road D985, South Africa  
2016 - 2017**

**Environmental Consultant/Project Manager**

Project Guidance and Technical Review of BAR and WULA.

**Samani Consulting, Ugu District Municipality, Basic Assessment Report and WULA, Upgrade of Provincial Road P740, South Africa  
2016 – 2017**

**Environmental Consultant/Project Manager**

Project Guidance and Technical Review of BAR and WULA.

**TPA Consulting, Ugu District Municipality, Madakana and Kwaluhlaza Pedestrian Bridge, South Africa  
2016**

**Technical Manager/Project Manager**

Project Guidance and Technical Review of BAR and compilation of the WULA.

**Nyeleti Consulting, Mangaung Metropolitan Municipality, Bloemfontein Ring Road N8, South Africa  
2015 - 2020**

**Environmental Consultant/Project Manager**

Compilation of the Scoping and EIR and WULA.

**SANRAL, Mangaung Municipality, Upgrading of the Sanral N6 National Route from Rouxville to Smithfield including Borrow Pits, South Africa  
2015 - 2020**

**Environmental Consultant/Project Manager**

Basic Assessment Report and WULA. BARs for Borrow Pits, WULA, Technical Review of the ECO Audit Reports.

**David Rowles Development, eThekweni Metropolitan Municipality Basic, Chicken Farm Residential Development, South Africa  
2015 - 2019**

**Environmental Consultant/Project Manager**

Assessment Report, WULA, EIA Enquiries. Compilation of BAR, WULA and EIA Enquiries and Technical Review of Reports once project was handed over to another consultant.

**True Blue Group, eThekweni Metropolitan Municipality, KFC Tongaat, South Africa  
2015 - 2019**

**Environmental Consultant, Reviewer/Project Manager**

Basic Assessment Report, EIA Enquiry and WULA. Compilation of the EIA Enquiry and Reviewer of the WULA

**Samani Consulting, Ugu District Municipality, P73 Borrow Pit, South Africa  
2015 - 2016**

**Technical Manager/Project Manager**

Basic Assessment Report and WULA. Project Guidance and Technical Review of BAR and WULA.

**Transnet, uMhlatuze Municipality, Transnet Locomotive Turntable, South Africa  
2015 -2016**

**Environmental Consultant/Project Manager**

Basic Assessment Report and WULA.

**Samani Consulting, Ugu District Municipality, N2 Borrow Pit, South Africa  
2015 - 2016**

**Environmental Consultant/Project Manager**

Basic Assessment Report and WULA. Compilation of EMPr and WULA/Project Manager.



## **Patricia Nathaniel**

Principal Consultant, Earth & Environment

**Samani Consulting, eThekweni Metropolitan Municipality, P400 WULA, South Africa  
2015 - 2016**

**Environmental Consultant/Project Manager**

WULA and ECO Audit Reports. Compilation of WULA and ECO Audit Reports.

**Aecom, Umgungundlovu District Municipality, DUT Pietermartizburg Upgrade – ECO, South Africa  
2015 - 2016**

**Environmental Consultant/Project Manager**

EMPr and ECO Reports. Compilation of the EMPr and ECO Reports.

**Springville Investments, eThekweni Metropolitan Municipality, 117 Wiltshire Road Upgrade, South Africa  
2015 - 2016**

**Environmental Consultant/Project Manager**

Compilation of WULA.

**Enprocon, Gert Sibande District Municipality, Goedehoop Stene Brickmaking Facility, South Africa  
2015 - 2016**

**Environmental Consultant/Project Manager**

Compilation of the WULA.

**Samani Consulting, Ugu District Municipality, P73 Borrow Pit, South Africa  
2015 - 2016**

**Environmental Consultant/Project Manager**

Compilation of the EMPr.

**Henwood and Nxumalo, Umgungundlovu District Municipality, Harewoods Roads, South Africa  
2015**

**Environmental Consultant**

Basic Assessment Report and WULA. Project Guidance and Technical Review of BAR and WULA.

**Madan Singh and Associates, Ugu Municipality, P77 Road Upgrade, South Africa  
2014 - 2015**

**Environmental Consultant**

Compilation of BAR and WULA.

**Samani Consulting, Ugu Municipality, Upgrade of Provincial Road R75.3, South Africa  
2014 - 2015**

**Environmental Consultant**

Compilation of BAR and WULA.

**Madan Singh and Associates, Umgungundlovu District Municipality, Dambuza Road Upgrade, South Africa  
2014 - 2015**

**2014 - 2015**

**Environmental Consultant**

Compilation of BAR and WULA.

**Boston Ink Consulting, Zululand District Municipality, Upgrade of Phenyane to Obhazweni Road, South Africa  
2014 - 2015**

**2014 - 2015**

**Environmental Consultant**

Compilation of WULA.

**Hatch Goba, Ndwedwe Municipality, Umdlotti River Bridge and Realignment of P713, South Africa  
2014 - 2015**

**Environmental Consultant**

Compilation of BAR and WULA.





## **Patricia Nathaniel**

Principal Consultant, Earth & Environment

**TPA Consulting Engineers, Okahlamba Municipality, Ohombe Vehicle Bridge, South Africa  
2014 - 2015**

**Environmental Consulting**

Compilation of BAR and WULA.

**Mott Macdonald, eThekwini, Umlazi K & L Sanitation Project  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**Client Mott Macdonald, eThekwini, Umlazi P & Q Sanitation Project, South Africa  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**Mott Macdonald, eThekwini, Umlazi G Sanitation Project, South Africa  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**Mott Macdonald, eThekwini, Umlazi A, B, C, E, S, and Malaba Hills Sanitation Project, South Africa  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**Mott Macdonald, eThekwini, Unity Avenue Sanitation Project, South Africa  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**Mott Macdonald, eThekwini, N4 Informal Settlement Sanitation Project, South Africa  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**Mott Macdonald, eThekwini, Happy City Informal Settlement Sanitation Project, South Africa  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**Samani Consulting, Umdoni Municipality, GJ Crookes Pedestrian Bridge, South Africa  
2014**

**Environmental Consultant**

Screening, Basic Assessment Report and WULA. Compilation of BAR and WULA.

**NamPower, Namibia, Baynes Hydropower Project, South Africa  
2010 - 2013**

**Junior Environmental Consultant**

Environmental, Social and Health Impact Assessment.



*We certify that*

**PATRICIA PEARL NATHANIEL**

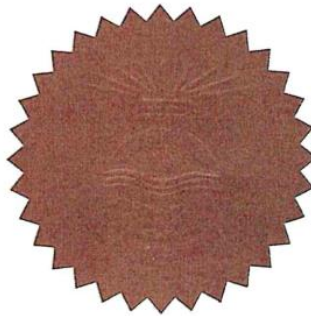
*having complied with the requirements of the Higher Education Act  
and the Institutional Statute, was admitted to the degree of*

**HONOURS BACHELOR OF SCIENCE**  
*in Environmental Management*

*at a congregation of the University  
on 24 May 2013*

*M. Malherbe*

Vice-Chancellor



*M. Lijt*

Executive Dean

*J. J. J. J.*

University Registrar





Registration No. 2020/1120

***Herewith certifies that***

**Patricia Nathaniel**

***is registered as an***

**Environmental Assessment Practitioner**

***Registered in accordance with the prescribed criteria of Regulation 15. (1)  
of the Section 24H Registration Authority Regulations  
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the  
National Environmental Management Act (NEMA), Act No. 107 of 1998, as  
amended).***

Effective: 01 March 2023

Expires: 29 February 2024

Chairperson

Registrar



**APPENDIX**

*ANRI SCHEEPERS*



## ANRI SCHEEPERS, BA

*Principal Consultant (Environmental Services), Environment & Energy*



### CAREER SUMMARY

Anri graduated from the University of Johannesburg with a BA honours in Geography in 2007, and has thirteen years work experience. Anri is a principal environmental consultant and team coordinator for the Planning and Advisory Services unit.

Anri has been involved in numerous mining and industrial projects in South Africa. Anri has experience with diamond, gold, platinum, chrome, coal and manganese mining and processing operations. The projects include Environmental and Social Impact Assessments, Amendment processes and Environmental Management Programme consolidation and alignment processes. She has project managed numerous multi disciplinary projects in various sectors in South Africa and has experience with the International Finance Corporation Performance Standards and African Development Bank Guidelines.

### Years with the firm

8

### Years of experience

13

### Areas of expertise

*Stakeholder Engagement*

*Water Use License Applications*

*Environmental Authorisation Processes*

*Environmental Management Plans*

*Waste Management*

*Legal Compliance Assessments*

*Environmental Due Diligence and Liability Assessments*

*Environmental Management Systems*

### Languages

*English*

*Afrikaans*

Anri is qualified as a Lead Auditor and has undertaken legal compliance auditing, including environmental authorisations, waste management licences, water use licences and environmental performance assessments. In addition, she has undertaken general site assessments to determine compliance against, local, provincial and national environmental legislation. Anri has also been involved in environmental due diligence and liability assessments.

Anri's roles and responsibilities include the management of Environmental Authorisation and Waste Management Licence Processes (Basic Assessments and Scoping and Environmental Impact Assessment Reporting), Water Use Licence Application Processes and Auditing.

### EDUCATION

Bachelor of Arts (Honours), Geography, University of Johannesburg, Gauteng, South Africa 2007

Bachelor of Arts, Geography, University of Johannesburg, Gauteng, South Africa 2006

### ADDITIONAL TRAINING

Environmental-Law Mine Closure, Centre for Environmental Management, South Africa 2019

Snake Awareness, Scorpion Awareness and First Aid for Snakebite and Scorpion Sting, African Snakebite Institute 2016

Environmental Management Systems ISO 14001 Audit: Lead Auditor, Centre for Environmental Management, South Africa 2014

IWRM, Water Use Authorisations, and Water Use Licence Applications – Procedures, Guidelines, IWWMPs and Pitfalls, Carin Bosman Sustainable Solutions, South Africa 2012

ISO 14001 Environmental Management Systems (EMS), Implementation and Auditing, Centre for Environmental Management, South Africa 2011

IEMA Approved Foundation Course in Environmental Auditing, Aspects International, South Africa 2009

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**PROFESSIONAL EXPERIENCE***Environmental Authorisation Processes*

- Jet Park Warehouse Development, Gauteng (2020-2021). Project Manager. Basic Assessment Process for the development of a commercial park within a 30m from a wetland and within a critical biodiversity area. Client: Sable Place Properties
- Vosloorus Filling Plant, Vosloorus, Gauteng (2019-2020). Project Manager. Environmental authorisation process for the proposed dangerous goods filling plant. Client: Richbay Chemicals
- Mbabane – Manzini Corridor Dam (Nondvo Dam), Hhohho Region, Eswatini (2018-2019). Project Manager. An Environmental and Social Impact Assessment for the proposed Nondvo Dam in Eswatini (previously Swaziland). Client: Government of the Kingdom of Eswatini, Ministry of Natural Resources and Energy, Department of Water Affairs
- Sappi Ngodwana Reservoir, Mpumalanga (2020): Project Manager. Basic Assessment Process for the construction of a reservoir within a critical biodiversity area. Client: Sappi Southern Africa
- Demolition and Rehabilitation of Infrastructure at West Wits Business Operations, Carletonville, Gauteng (2019): Project Manager. A contaminated land assessment and environmental authorisation process for the decommissioning and rehabilitation of selected infrastructure West Wits Operations. Client: AngloGold Ashanti
- Kranspoort Cattle Feedlot Basic Assessment Process, Kranspoort, Mpumalanga, South Africa (2018): Project Director. A Basic Assessment Process and Waste Management Plan for the proposed development of a cattle feedlot. Client: Department of Rural Development and Land Reform
- Amandelbult Section Dangerous Goods and Railway Extension Final Basic Assessment Report, Thabazimbi, Limpopo (2017-2018): Project Director. The Basic Assessment Process for the proposed installation of diesel tanks and the extension of a railway line at the Amandelbult Section, Tumela Mine. Client: Anglo American Platinum Limited
- Anglo Platinum Water Separation Project, Rustenburg, North West, (2016-2017): Project Manager. The Basic Assessment process for the proposed refurbishment of an existing pipeline and installation of new pipelines as part of the Water Infrastructure Upgrade Project. Client: Anglo American Platinum Limited
- Sasol Energy Technology Blending Facility Upgrade Project, Sasolburg, Free State, South Africa (2017): Project Manager. Basic Assessment Process for the installation of dangerous goods tanks at the Sasol One Site. Client: Sasol Energy Technology, a Division of Sasol Oil (Pty) Ltd
- Sasol Energy Technology Blending Facility Upgrade Project, Sasolburg, Free State, South Africa (2017-2018): Project Manager. Basic Assessment process for the construction of a fuel drum storage warehouse adjacent to the existing underground fuel storage tanks at the Fuel Blending Facility on the Sasol One site. Client: Sasol Energy Technology, a Division of Sasol Oil (Pty) Ltd
- Section 24G Application Process for Rappa Holdings, Germiston, Gauteng (2017-2018): Project Manager. Undertaking the rectification process for six historic rectification applications. Client: Rappa Holdings (Pty) Ltd
- Environmental Authorisation Process for the SO<sub>2</sub> Abatement Plant at Mortimer Smelter, Swartklip, North West, South Africa (2016-2017): Project Manager. Undertaking a Scoping and Environmental Impact Reporting Process to ensure compliance with the National Environmental Management Air Quality Act (No. 39 of 2004). Client: Anglo American Platinum Limited

- Environmental Authorisation Process for the SO<sub>2</sub> Abatement Plant at Polokwane Smelter, Polokwane, Limpopo, South Africa (2016-2017): Project Manager. Undertaking a Scoping and Environmental Impact Reporting Process to ensure compliance with the National Environmental Management Air Quality Act (No. 39 of 2004). Client: Anglo American Platinum Limited
- Environmental Authorisation for a Private Vehicle Proving Ground Development, Northern Cape, South Africa (2016): Project Manager. A Scoping and Environmental Impact Reporting Process for a private vehicle proving ground. Client: Ingen | Aix GmbH
- Establishment of the Proposed Rietvlei Opencast Coal Mine, Mpumalanga, South Africa (2016-2018): Project Manager. This project involved repeating the environmental authorisation process with the DMR as the competent authority, for the establishment of an opencast coal mine north of Middelburg. Client: Rietvlei Mining Company
- Environmental Authorisation for Blue Sphere, Nigel, Gauteng, South Africa (2014): Consultant. This project includes an environmental impact assessment, environmental management programme report, water use license application, waste management license application and an atmospheric emissions licence application as well as the public participation process for the existing and proposed processes for Blue Sphere in Nigel. Client: Blue Sphere Investments and Trading 103 (Pty) Ltd
- Environmental Authorisation for the Proposed Construction and Operation of Two Furnaces and Associated Infrastructure at Transalloys, eMalahleni, Mpumalanga, South Africa (2014): Consultant. The project entailed undertaking an environmental authorisation (by way of a scoping and environmental impact reporting process), including an atmospheric emissions licence application and waste management licence application process for the construction of two new 75MVA submerged arc furnaces that will primarily produce silicomanganese. Client: Transalloys (Pty) Ltd
- Section 24G Rectification Process for the Storage of Dangerous Goods for Much Asphalt, Gauteng, South Africa (2014): Project Manager. Much Asphalt was required to undertake a Section 24G Rectification Process for the unlawful storage of dangerous goods on a number of their sites. Zaffar was involved in the compilation of the Section 24G application forms. Client: Much Asphalt (Pty Ltd
- M14 Furnace Environmental Authorisation, Meyerton, Gauteng, South Africa (2012): Consultant. The project entailed undertaking an environmental authorisation, including an atmospheric emissions licence application process, in terms of the National Environmental Management Act (No. 107 of 1998) for the construction of an 81MVA furnace that will produce Ferromanganese and Silicomanganese. Client: Samancor Manganese (Pty) Ltd
- Basic Assessment Process for the Proposed Expansion and Upgrading of the Raw Materials Stockyard at Metalloys, Meyerton, Gauteng, South Africa (2011): Consultant. The project included the undertaking of an environmental authorisation process, by way of a basic assessment process, and the amendment application of an atmospheric emissions licence. The project involved the expansion and The project entailed undertaking an environmental authorisation, including an atmospheric emissions licence application process, in terms of the National Environmental Management Act (No. 107 of 1998) for the construction of an 81MVA furnace that will produce Ferromanganese and Silicomanganese upgrading of the existing Raw Materials Stockyard at the Samancor Meyerton Works (Metalloys site). Client: Samancor Manganese (Pty) Ltd
- Proposed new Sinter Plant: Mamatwan Mine, Hotazel, Northern Cape, South Africa (2010): Consultant. This project included an environmental impact assessment, environmental management programme report addendum and water

use license application as well as the public participation process for a proposed sinter plant at the Mamatwan Mine in the Northern Cape. Client: Hotazel Manganese

#### *Environmental Management Plans*

- Refurbishment (Fit-Out) of the 8<sup>th</sup> Floor in 140 West Building, South Africa (2020): Project Manager. Compilation of the Environmental Management Plan for the refurbishment of an office space in order to acquire a Green Star SA – Office v1 certification by the Green Building Council of South Africa. Client: Goldman Sachs
- Environmental Management Plan for the South Sudan Feeder Roads, South Sudan (2019): Project Director. Compilation of an Environmental Management Plan for the construction of the Kayango Market to A43 Road in South Sudan. Client: United Nations Office for Project Services (UNOPS)
- Environmental Programme for the Proposed Knightsbridge Development, Bryanston, Gauteng, South Africa (2015): Project Manager. Compilation of a Green Star Rating Environmental Programme for the Proposed Knightsbridge Development. Client: Emira Property Fund
- J.P Morgan Chase & Company, 1 Fricker Road EMP ECO, Illovo, Gauteng, South Africa (2017): Project Manager. An EMP was compiled for the proposed refurbishment of the office building to attain a Green Star rating and is also responsible for conducting the first EMP compliance audit and training of the DEO to carry out subsequent audits. Client: J.P Morgan Chase & Company
- Compilation of Environmental Management Plans - West Plant Metalloys, Meyerton, Gauteng, South Africa (2011): Consultant. The project included the undertaking of an environmental risk assessment for all facilities and activities at West Plant. Environmental management plans were compiled from the results of the risk assessments. Client: Samancor Manganese (Pty) Ltd Metalloys

#### *Environmental Management Programme Reports*

- Separation of the Union Section Operational Environmental Management Programme (and Addendums) into ‘Carved Out’ versus ‘Retained’ categories, Swartklip, North West Province, South Africa (2017): Project Manager. The Section is in possession of an approved Environmental Management Programme as well as numerous addendums for mining, concentrating and smelting operations. The Section is in a restructuring process which involves the selling and/or disenfranchising of certain of the operations. WSP/PB restructured the Sections’s consolidated Environmental Management Programme to align with the future goals/strategies of the Mine. Client: Anglo Platinum Limited - Rustenburg Platinum Mines Limited
- EMPR Updates – Vaal River and West Wits Operations, Gauteng and North West, South Africa (2014-2016): Project Manager. The alignment of the West Wits (WW) and Vaal River (VR) Operations Environmental Management Programme Reports (EMPR) in accordance with the requirements of the Mineral and Petroleum Resources Development Act (No. 28 Of 2002) (MPRDA). Client: AngloGold Ashanti (Pty) Ltd
- Environmental Management Programme Report Consolidation and Alignment of Union Mine: Rustenburg Platinum Mines, North-West, South Africa (2014): Project Manager. The EMPR consolidation and alignment process combined the original EMPR and authorised EMPR amendments into a complete and comprehensive document, which will become the overarching EMPR for the mine lease area and will be used as a concise management tool for all employees operating within mine lease area. Client: Anglo American Platinum Ltd



*Waste Management*

- Construction and Operation of a Waste Treatment Facility, Middelburg, Mpumalanga (2016-2018): Project Manager. The Scoping and Environmental Impact Reporting process for the construction and operation of a Health Care Risk Waste treatment facility in Middelburg. Client: Vikela Afrika Waste Care CC
- Applications for Samancor Manganese (Pty) Ltd Metalloys in terms of section 20 of the Environment Conservation Act 73 of 1989, Meyerton, Gauteng, South Africa (2014): Consultant. The project entailed applications, by way of risk assessments, in terms of section 20 of the Environmental Conservation Act, for the North Plant Sludge Dam, West Plant Sludge Dam, Bag Filter Material storage Facilities and Slag Stockpiles at Metalloys. Subsequent to the receipt of the waste management licences in terms of the National Environmental management: Waste Act (No. 59 of 2009) an amendment process was also undertaken. Client: Samancor Manganese (Pty) Ltd
- Applications for Afrisam, Vanderbijlpark, in terms of section 20 of the Environment Conservation Act 73 of 1989. Vanderbijlpark, Gauteng, South Africa (2014): Consultant. The project entailed applications in terms of section 20 of the Environmental Conservation Act, for the slag stockpiles at Afrisam, Vanderbijlpark. Subsequent to the receipt of the waste management licences in terms of the National Environmental management: Waste Act (No. 59 of 2009) an amendment process was also undertaken. Client: AfriSam South Africa (Pty) Ltd
- Waste Management Licence Application for The Existing And New Waste Management Facilities At Columbus Stainless Complex In Middleburg, Mpumalanga Province, South Africa (2014): Project Manager. Columbus Stainless (Pty) Ltd (Columbus) proposes to license existing waste management facilities and a new hazardous waste store within the footprint of the Columbus Complex. The Environmental Authorisation process by way of Scoping and Environmental Impact Reporting is required in order to license the said facilities. The facilities requiring licensing involve, but is not limited to: storage, recovery, bailing and treatment. WSP is responsible for obtaining a Waste Management License for the said activities via the Department of Environmental Affairs in line with relevant legislation. Client: Columbus Stainless (Pty) Ltd
- Establishment of a Waste Monitoring Committee, Meyerton, Gauteng, South Africa (2011): Consultant. The project included the identification of potential members for the monitoring committee and the establishment of the committee. The establishment of the committee included the compilation of the constitution and committee meetings. Client: Samancor Manganese (Pty) Ltd

*Water Use Licence Applications*

- Water Use Licence Application Process for the SO<sub>2</sub> Abatement Plant at Anglo American Platinum Limited: Polokwane Smelter, Polokwane, Limpopo, South Africa (2017-2018): Project Manager. The project involved the management of specialist along with the compilation and submission of the technical documentation. Client: Anglo American Platinum Ltd: Polokwane Metallurgical Complex
- Rietvlei Coal Mine Water Use Licence Application and Integrated Water and Waste Management Plan, Middelburg, Mpumalanga, South Africa (2016 – 2017): Project Manager. The project involved the compilation of the Integrated Water and Waste Management plan for all water uses proposed at the Greenfileds Rietvlei Opencast Coal Mining Operation. Client: Rietvlei Mining Company (Pty) Ltd
- Metalloys Water Use Licence Application, Meyerton, Gauteng, South Africa (2009): Assistant. This project involved compiling and submitting water use licence applications for all water use licence activities being undertaken at Metalloys. Subsequently a water use licence amendment process was also undertaken. Client: Samancor Manganese (Pty) Ltd

### *Environmental Authorisation Amendments/Renewals*

- Amendment of the Vodacom Dangerous Good Environmental Authorisations, Midrand, Gauteng (2021): Project Manager. The amendment process of the environmental authorisations to amend auditing and monitoring conditions. Client: Vodacom South Africa
- Transfer of the West Wits Operations EMPR to Harmony Gold (2020): Project Manager. The amendment of the EMPR to transfer the West Wits Operations EMPR to Harmony Gold. Client: AngloGold Ashanti Limited
- Amandelbult Section Bus and Taxi Terminal Part 2 Amendment Process, Thabazimbi, Limpopo (2020-2021): Project Manager. The amendment process of the existing Environmental Management Programme Report to formalise the bus and taxi terminal. Client: Rustenburg Platinum Mines
- Sibanye Rustenburg Platinum Mine Part 2 Amendment Process, Rustenburg, North West (2018): Project Manager. The proposed amendment of the Environmental Management Programme Report to excluded activities which will not take place and to ensure alignment of the management measures. Client: Sibanye-Stillwater
- Zibulo Colliery Part 2 Amendment Process, Mpumalanga (2018-2019): Project Manager. The amendment of the Zibulo Colliery Environmental Management programmes for the inclusion of a new coal stockpile. Client: Anglo American Inyosi Coal
- Scaw Metal Waste Treatment and Disposal Facility Part 2 Amendment (2018-2019): Project Manager. The amendment of the Scaw Waste Management Licence to include different waste types. Client: Scaw South Africa
- The transfer of Authorisations for Union Mine (2018): Project Manager. The transfer a Waste Management Licence and ECA Permit in terms of the Part 1 Amendment Process. Client: Anglo American Platinum Limited
- The transfer of Authorisations for Anglo American Platinum Rustenburg Section (2018): Project Manager. The transfer a two Waste Management Licences in terms of the Part 1 Amendment Process. Client: Anglo American Platinum Limited
- Amendment of the Sibanye Rustenburg Platinum Mines Environmental Management Programme, Rustenburg, North West (2018): Project Manager. A Part 2 Amendment Process was undertaken to limit the EMPR to activities have commenced or will be undertaken. Client: Sibanye-Stillwater
- Amendment Process for the Copper Smelting and Casting Plant at Rappa Resources, Germiston, Gauteng (2017-2018): Project Manager. A Part 2 Amendment Process for the installed Copper Smelting and Casting Plant at Rappa Resources. Client: Rappa Resources (Pty) Ltd
- Renewal of the Technopack Eastern Cape Waste Management Licence, Springs, Gauteng (2017): Project Manager. The Waste Management Licence was renewed to ensure the continuation of the plant operations at Enstra. Client: Technopack Eastern Cape (Pty) Ltd
- The Impala Platinum Springs Waste Management Licence Amendment, Springs, Gauteng (2018): Project Manager. A Part 1 Amendment Process was undertaken in order to amend some of the conditions of the Waste Management Licence. Client: Impala Platinum Refineries
- Environmental Authorisation Amendment Process for the Ventilation Shaft at Siphumelele 1 Mine, Rustenburg, North-West, South Africa (2016): Project Manager. Part 2 Amendment Process for the proposed establishment of the Ventilation Shaft at Siphumelele 1 Mine. Client: Rustenburg Platinum Mines Limited

*Stakeholder Engagement*

- Minimum Emissions Standard Postponement Application for Nulandis Lilianton and Modderfontein (2018-2019): Project Manager. Undertaking the stakeholder engagement process in support of the Nulandis Lilianton and Modderfontein Minimum Emissions Standard Postponement Application. Client: Nulandis
- Minimum Emissions Standard Postponement Application for Sappi Ngodwana (2019): Project Manager. Undertaking the stakeholder engagement process in support of the Sappi Ngodwana Minimum Emissions Standard Postponement Application. Client: Sappi Southern Africa
- Minimum Emissions Standard Postponement Application for AEL Interlligent Blasting Modderfontein (2018-2019): Project Manager. Undertaking the stakeholder engagement process in support of the Modderfontein Site Minimum Emissions Standard Postponement Application. Client: AEL Intelligent Blasting
- Identification of Interested and Affected Parties for Omnia Sasolburg, Sasolburg, Free State, South Africa (2018): Project Manager. The identification of interested and affected parties in terms of Clause 4.1 and 4.2 of ISO 14001:2015. Client: Omnia Fertilizer a Division of Omnia Group (Pty) Ltd
- Re-establishment of a Monitoring Committee for Metalloys, Meyerton, Gauteng, South Africa (2015 – 2016): Project Manager. The re-establishment of a Monitoring Committee for four of the Waste Management Facilities at Samancor Manganese, Metalloys. Client: BHP Billiton Metalloys (Pty) Ltd
- Stakeholder Engagement for Mooi-Mgeni Transfer Scheme Phase 2, Rosetta Village, Kwazulu- Natal, South Africa (2009): Assistant. This project involved undertaking the public participation process for the Mooi-Mgeni Transfer Scheme Phase 2, which will primarily encompass the construction of the proposed Spring Grove Dam and an associated transfer pipeline from the proposed dam to the Mpofana River. Client: Department of Water Affairs and Forestry (DWAf)

*Legal Compliance*

- AfriSam Regulation 34 Audits (2020-2021): Lead Auditor. Undertaken the Regulation 34 Compliance Audits for various AfriSam Operations (Eikenhof, Roodekrans, Ladysmith, Umlaas, Pietermaritzburg, Rooikraal). Client: AfriSam
- EMPR Regulation 34 Audits at Mogalakwena Section, Limpopo, South Africa (2020): Lead Auditor. Undertaking nine compliance audits in accordance with Regulation 34 of the EIA Regulations and compilation of seven statements of confirmation that the activities have not yet commenced. Client: Rustenburg Platinum Mines.
- Desktop Review of the Impala EMPR 2019 Audit (2020): Lead Auditor. A desktop review was undertaken to determine whether any changes has been made to the operations at Impala that could influence compliance. Client: Impala Platinum
- External Waste Management Licence Audit at Impala Platinum, Gauteng, South Africa (2016, 2018 and 2020): Lead Auditor. External compliance audit of the WML for the Salvage Yard at Impala Springs. Client: Impala Platinum Refiners
- External Water Use Licence Audit of the Rustenburg Operations, North West, South Africa (2020): Lead Auditor. Undertaking the Water Use Licence for the Waterval Smelter and Anglo Converter Plant, Rustenburg Base Metal Refinery and Precious Metals Refinery. Client: Rustenburg Platinum Mines.
- Impala Platinum Regulation 34 and Waste Management Licence Audits, Rustenburg (2019): Lead Auditor. Undertaking seven compliance audits in accordance with Regulation 34 of the EIA Regulations. Client: Impala Platinum

- Surface Operations Regulation 34 Audits (2019): Lead Auditor. Undertaking the Regulation 34 audits for the Vaal River, Mine Waste Solution and West Wits Operations. Client: AngloGold Ashanti Limited
- Used Oil Industry Audits, Countrywide, South Africa (2014-2019): Lead Auditor. Country-wide environmental compliance auditing of the South African recycled oil industry, comprising sixteen oil refinery operations, and twenty nine drum re-conditioning plants. The audits are primarily focussed on compliance to legislation and ensuring that each site follows international best practice. The audits include a review of the refineries ISO14000 auditor's findings, and tracking of compliance in regards to corrective actions. Client: OSE Foundation
- Sasol Third Party Audits, Johannesburg, Gauteng, South Africa (2017): Project Manager. Undertaken compliance assessments of three environmental authorisations and two water use licence for Sasol Gas. Client: Sasol Gas
- External Environmental Compliance Audit - Tarlton Intermixture Fractionator Plant, Gauteng, South Africa (2014 and 2016): Lead Auditor. An external environmental compliance audit of the record of decision for the Transnet Pipelines Tarlton Intermixture Fractionator Plant was undertaken in order to establish whether Transnet Pipelines are compliant with the conditions specified therein. The audit was undertaken by means of site observations, interviews and verification of available information. Client: Transnet Pipelines (GOC) Ltd
- Waste Management Licence for the Remediation and Decommissioning of Tar Residue Pits, Rustenburg, North-West, South Africa (2015): Lead Auditor. A close-out audit was undertaken to compile compliance with the Waste Management Licence conditions during remediation and decommissioning. Client: Anglo Platinum Limited - Rustenburg Platinum Mines Limited
- Water Use Licence Audit for the Landau Colliery, Mpumalanga, South Africa (2014): Auditor. The audit of the Water Use Licence was conducted in accordance with the relevant requirements of the National Water Act and conditions stipulated therein. The audit report included a summary of findings and compliance criteria, as well as recommendations for future corrective and preventative actions if required. Client: Anglo American Thermal Coal
- Waste Management License Audit for the Slagment Operation, Vanderbijlpark, Gauteng, South Africa (2014): Lead Auditor. This project involved the annual environmental compliance auditing for AfriSam's Slagment Operation in Vanderbijlpark in Gauteng Province. The audit included AfriSam's compliance to the conditions of their waste management license. Client: AfriSam South Africa (Pty) Ltd
- Legal Compliance Audit, Olifantsfontein, Province, South Africa (2012): Lead Auditor. The project included undertaking a legal compliance audit of the atmospheric emissions licence and waste management licence at A-Thermal Retort Technologies (Pty) Ltd. A-Thermal, in Olifantsfontein. Client: A-Thermal retort Technologies (Pty) Ltd
- Metals Water Use Licence Audit, Meyerton, Gauteng, South Africa (2012): Auditor. The project entailed undertaking a compliance verification audit of the water use licence conditions of Metals. Recommendations were also provided in the audit report for non-compliance or potential concerns. Client: Samancor Manganese (Pty) Ltd
- M14 Furnace Legal Compliance Audit, Meyerton, Gauteng, South Africa (2010 & 2012): Auditor. The project included undertaking a legal compliance audit at Samancor Manganese (Pty) Ltd (Metals) to verify their compliance to the conditions of the record of decision issued for the M14 Furnace and the associated atmospheric emissions licence. Client: Samancor Manganese (Pty) Ltd
- Annual Audit of the Record of Decision and Environmental Management Plan for the Fouriespruit Stream diversion and Old Slag Area, Meyerton, Gauteng, South

Africa (2009 & 2010): Lead Auditor. A legal compliance audit on the record of decision and the associated environmental management plan was undertaken to establish whether the upgrading of the existing stream diversion and the closure and rehabilitation of the old slag disposal area comply with the conditions contained therein. Client: Samancor Manganese (Pty) Ltd

- Goedgevonden Mine Water Use Licence Audit, Ogies, Mpumalanga, South Africa (2009): Auditor. The project entailed undertaking a compliance verification audit of the water use licence conditions of Goedgevonden Mine. Recommendations were also provided in the audit report for non-compliance or potential concerns. Client: Xtrata Coal South Africa

*Environmental Due Diligence and Liability Assessments*

- Environmental Due Diligence for Rolfes Chemicals, Germiston, Gauteng, South Africa (2014): Auditor. Environmental Due Diligence for the acquisition of a Processing Plant and associated facilities. Client: Rolfes Chemicals Alberton
- Environmental and Social Due Diligence of 22 FMCG facilities, Country-wide, South Africa (2014): Lead Auditor. Transactional Environmental and Social Due Diligence for the acquisition of 22 FMCG facilities mainly in the food manufacturing and consumer formulated chemical sectors situated across South Africa for an international private equity and real estate investor. Client: Confidential
- Environmental and Social Due Diligence of Medrock, Johannesburg, South Africa (2014): Lead Auditor. Transactional Environmental and Social Due Diligence for the acquisition of three medical supplies facilities situated in Johannesburg. Client: Confidential

*Site Assessments*

- The development and expansion at Two Rives Platinum Mine (2021): Project Manager. Environmental Screening for the proposed expansions at the existing Two Rivers Platinum Mine. Client: Two Rivers Platinum Mine
- The Development of a Filling Plant, Vosloorus, Gauteng (2019): Project Manager. Environmental screening for the proposed chemical filling plant. Client: Richbay Chemicals
- Springfield Coal Mine, Meyerton, Gauteng (2019): Project Manager. Site and Legal Review for the Proposed Springfield Coal Mine. Client: Glubay Coal
- The Development of Thermal Power Plant and Solar PV Plant, Nacala, Mozambique (2018): Project Manager. Environmental and social screening for the alternative sites in terms of the International Finance Corporation Performance Standards on Environmental and Social Sustainability. Client: Confidential
- Gap Analysis for the Northern Pit Development at Zibulo Colliery, Mpumalanga (2018): Project Manager. Undertaking a gap analysis of the proposed development of an opencast pit in the northern section of the approved mining right area for Zibulo Colliery, Mpumalanga. Client: Anglo American Inyosi Coal (Pty) Ltd
- Screening Assessment of Proposed Waste Management Facility at Vodacom Campus, Midrand, Gauteng, South Africa (2017). Project Manager. Screening assessment to prepare a business case based on the facts so that the options for Vodacom's development vs. the potential requirement to identify an alternative site can be objectively evaluated by Vodacom. Client: Vodacom Group Limited
- Site Assessment of a culvert on Sappi Forest Property, plantation Nooitgedacht – Camelot South, Ngodwana, Mpumalanga, South Africa (2015): Project Manager. A site assessment of a recently completed culvert development on Sappi Forest property, plantation Nooitgedacht – Camelot South, Mpumalanga. The purpose of the site assessment is to evaluate the works undertaken on site in respect of the National Environmental Management Act (107 of 1998) as amended and National



## ANRI SCHEEPERS, BA

*Principal Consultant (Environmental Services), Environment & Energy*

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Water Act (36 of 1998) and relevant regulations promulgated under these acts.  
Client: Sappi Southern Africa Limited

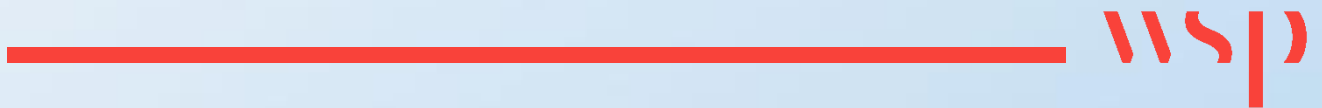
- Legal Assessment for the a Proposed Development of a barley Malting Process in Alrode, Germiston, Gauteng, South Africa (2013): Senior Consultant. Undertaking of legal assessment to identify and assess potential scenarios based on environmental assessment triggers for the proposed development at erven 283, 289 and 1607 in Alrode Extension 2. Client: South African Breweries (Pty) Ltd

### *Environmental Management Systems*

- Voorspoed Internal ISO 14001 Audit, Klerksdorp, Free State, South Africa (2010): Auditor. An internal audit was undertaken of the Voorspoed Mine, ISO 14001 System. During the audit conformance to ISO 14001 and the effective implementation of such was assessed. Client: De Beers Group Services (Pty) Ltd
- Venetia Internal ISO 14001 Audit, Musina, Limpopo, South Africa (2009): Auditor. An internal audit was undertaken of the Venetia Mine, ISO 14001 System. During the audit conformance to ISO 14001 and the effective implementation of such was assessed. Client: De Beers Group Services (Pty) Ltd

# Appendix B

## **EAP DECLARATION OF INTEREST AND OATH UNDERTAKING**



# APPLICATION FOR ENVIRONMENTAL AUTHORIZATION

(b) Declaration by the environmental assessment practitioner.

**Environmental assessment practitioner (EAP):**

Trading name (if any):	WSP Group Africa (Pty) Ltd		
Contact person:	Patricia Nathaniel		
Postal address:	1st Floor, Pharos House, 70 Buckingham Terrace, Westville		
Postal code:	3629	Cell:	+27 82 303 2346
Telephone:	011 361 1398		
E-mail:	Patricia.Nathaniel@wsp.com		
Education Qualifications <sup>4</sup> :	BSc (Hons) Environmental Management BSc (Geography)		
EAPASA Registration number:	EAPASA (2020/1120)		

I, PATRICIA NATHANIEL, declare that I

- am the independent environmental practitioner in this application;
- am registered with EAPASA as a Registered EAP and my registration is in good standing;
- will comply with the requirements for an EAP as stipulated in Regulation 13 of the EIA Regulations, 2014;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- have expertise in conducting environmental impact assessments, including knowledge of the National Environmental Management Act, 1998 (Act 107 of 1998), regulations and any guidelines that have relevance to the proposed activity;
- will comply with the National Environmental Management Act, 1998 (Act 107 of 1998), regulations and all other applicable legislation;
- 2014 undertake to disclose to the applicant and the KZN Department of Economic Development, Tourism & Environmental Affairs all material information in my possession that reasonably has or may have the potential of influencing its decision with respect to this application;
- will ensure that information containing all reports in respect of this application is distributed or made available to interested and affected parties and that their participation is facilitated in such a manner that they will be provided with a reasonable opportunity to participate and provide comments on the reports;
- will provide the competent authority with access to all information at my disposal regarding this application, whether such information is favourable to the applicant or not;
- declare that all the particulars furnished by me in this form are true and correct;
- I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998); and
- I will comply with all the requirements as indicated in the National Environmental Management Act, 1998 (Act 107 of 1998) and Environmental Impact Assessment Regulations, 2014.



Signature of the environmental assessment practitioner

WSP

Trading name

12 June 2023

Date

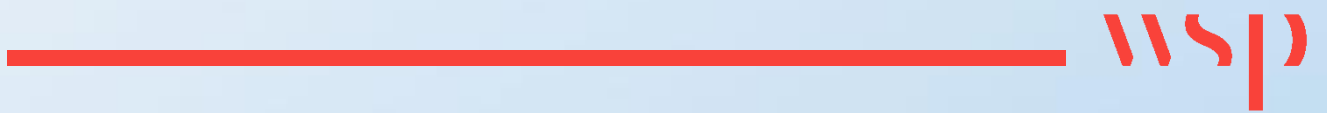
<sup>4</sup>Please include details of names, education qualifications and professional affiliations of the EAP and each representative of the EAP appointed to manage this application.

Department of Economic Development, Tourism & Environmental Affairs, KwaZulu-Natal	Application for Environmental Authorization	Oct 2022 V1
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# Appendix C



**MAPS**



# Proposed Chemical Warehouse

Project Site Coordinates

## Legend

-  Coordinate Placemarkers
-  Site Boundary

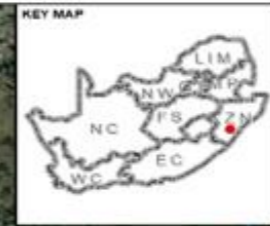


Google Earth

Image © 2022 Maxar Technologies

100 m





- LEGEND**
- Richbay Bay Warehouse
  - Railway
  - National road
  - Main road
  - Access road
  - Rivers - Perennial
  - - - Rivers - Non perennial



**NOTE(S)**  
 1. LINE NOTES  
 2. LINE NOTES  
 3. LINE NOTES

**REFERENCE(S)**  
 1. COORDINATE SYSTEM: GCS WGS 1984  
 2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

**CLIENT**  
 RICHBAY PROPERTIES

**PROJECT**  
 RICHBAY BAY WAREHOUSE PMB DRAFT EIA

**TITLE**  
 LOCALITY MAP


CONSULTANT	YYYY-MM-DD	2023/06/30
	DESIGNED	JM
	PREPARED	JM
	REVIEWED	PN
	APPROVED	PN

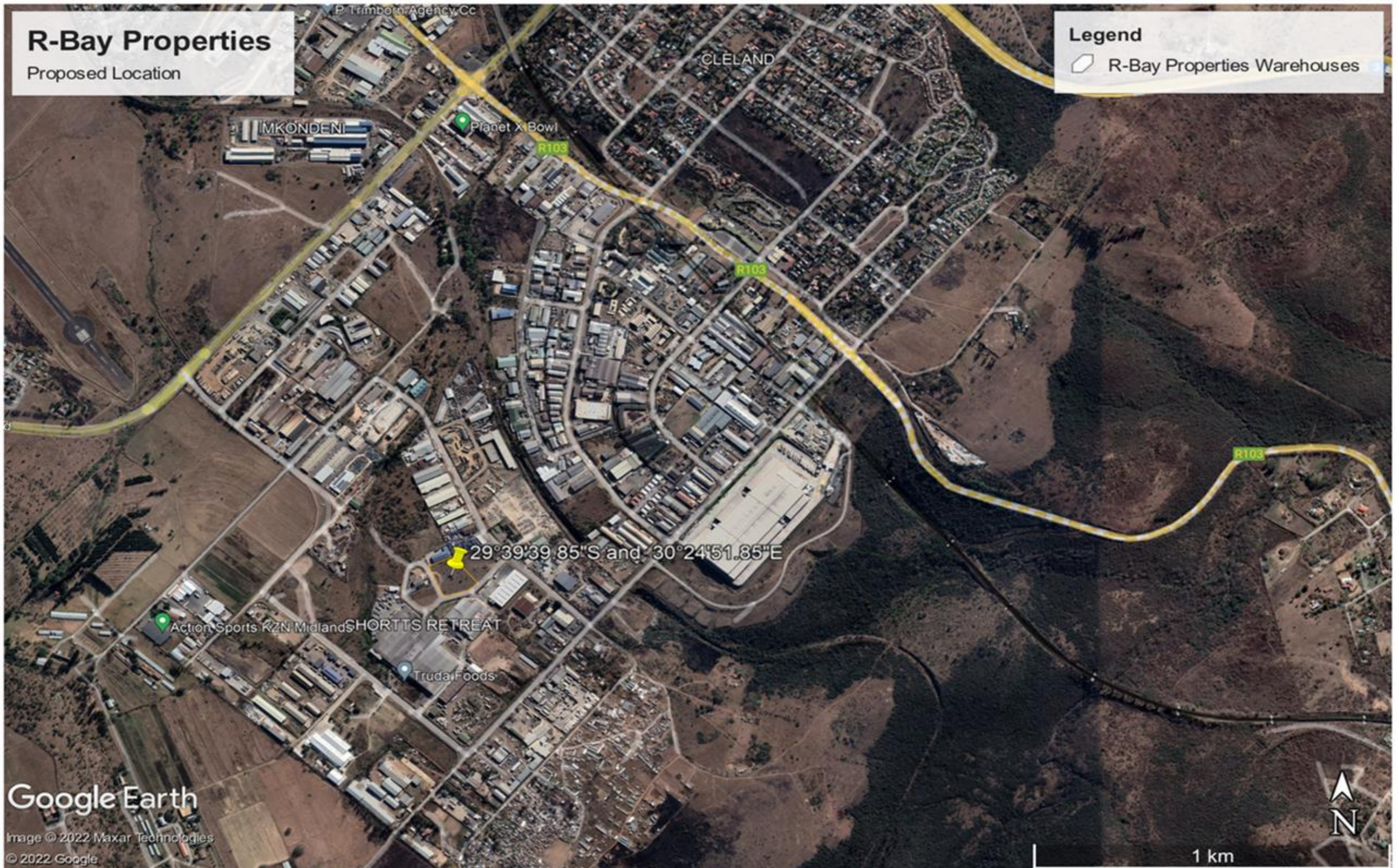
PROJECT NO. 41103633      CONTROL      REV.      FIGURE

# R-Bay Properties

Proposed Location

## Legend

 R-Bay Properties Warehouses



Google Earth

Image © 2022 Maxar Technologies  
© 2022 Google



**R-BAY PROPERTIES**  
**LAYOUT MAP**

**Legend**

-  Chemical Warehouse
-  Administration Building and Staff Rooms
-  Entrance / Exit
-  Parking Bays (Cars and Trucks)
-  Facility Boundary



DATA SOURCE:  
ARC GIS 10.2

PROJECTION: UTM Zone 25S (WGS1984)

PROJECT TITLE: R-Bay Properties (Chemical Warehouse)

PROJECT NO: 41133023

SCALE: 1:800 AT A4      DATE: 2022/06/28

DRAWN BY: JARED PADJUNTAN

REVIEWED BY: ANDR SCHIEPERS

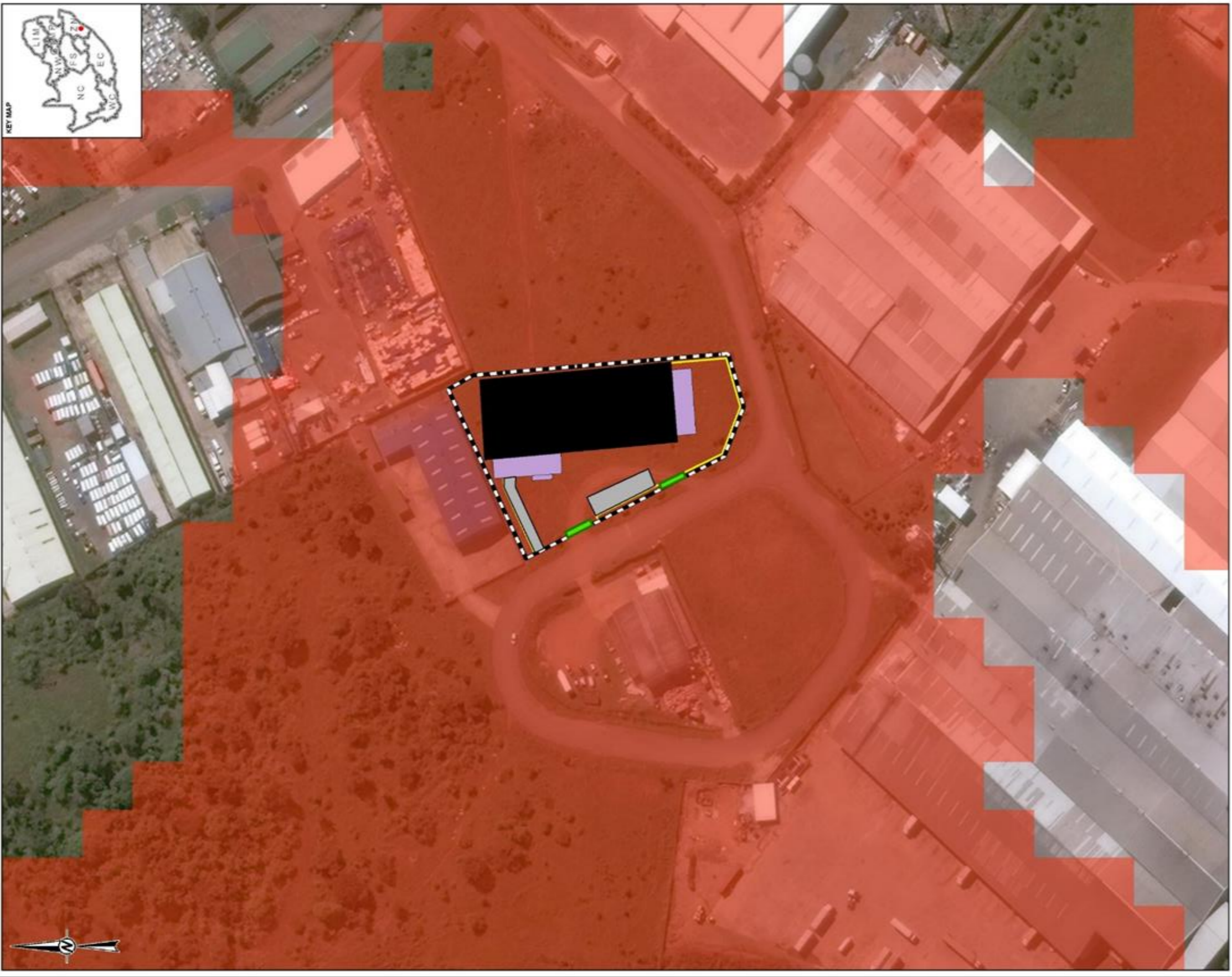


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**DISCLAIMER**  
The information on this figure was derived from various digital databases available to WSP Environmental Pty Ltd. All information is provided 'as is' and it must be acknowledged that data information and maps are dynamic and to a constant state of maintenance, correction and update. WSP Environmental Pty Ltd cannot accept any responsibility for errors, omissions, or positional accuracy where it has not been already ascertained or implied as to the use of this information, including the warranty of non-negligence or fitness for a particular purpose. Publication of any errors will be appreciated.

ESRI, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, DeLorme, Earthstar Geographics, and the GIS User Community

FILE: S:\41103633\Richbay Warehouse\41103633\_Richbay Warehouse\_PMB Draft EIA\_20230630.mxd, 2023/06/30 11:02:22 pm



**LEGEND**

- Path
- Fence
- Warehouse
- Buildings
- Entry Points
- Parking

**KZN Biodiversity Sector Plan (2016)**

CBA: Irreplaceable



**NOTES:**  
1. LINE NOTES  
2. LINE NOTES  
3. LINE NOTES

**REFERENCE(S):**  
1. COORDINATE SYSTEM: GCS WGS 1984  
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EarthStar Geographics, AND THE GIS USER COMMUNITY

**CLIENT**  
RICHBAY PROPERTIES

**PROJECT**  
RICHBAY BAY WAREHOUSE PMB DRAFT EIA

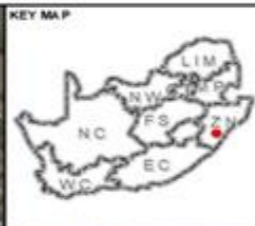
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SENSITIVITY MAP

**CONSULTANT**  
YYYY-MM-DD 2023/06/30  
DESIGNED JM  
PREPARED JM  
REVIEWED PN  
APPROVED PN



**PROJECT NO** 41103633  
**CONTROL**  
REV





**LEGEND**  
 Richbay Warehouse  
 Red List of Ecosystems, remaining extent (SANBI, 2021)  
 Least Concern



NOTE(S)

**REFERENCE(S)**  
 1 COORDINATE SYSTEM: HARTENBEESTHOEKH LO31  
 2 SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

CLIENT  
 RICHBAY PROPERTIES

PROJECT  
 RICHBAY WAREHOUSE PMB DRAFT EIA

TITLE  
 RED LIST OF ECOSYSTEMS



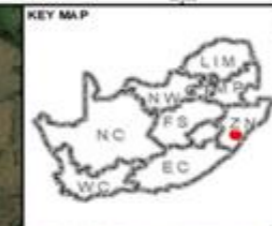
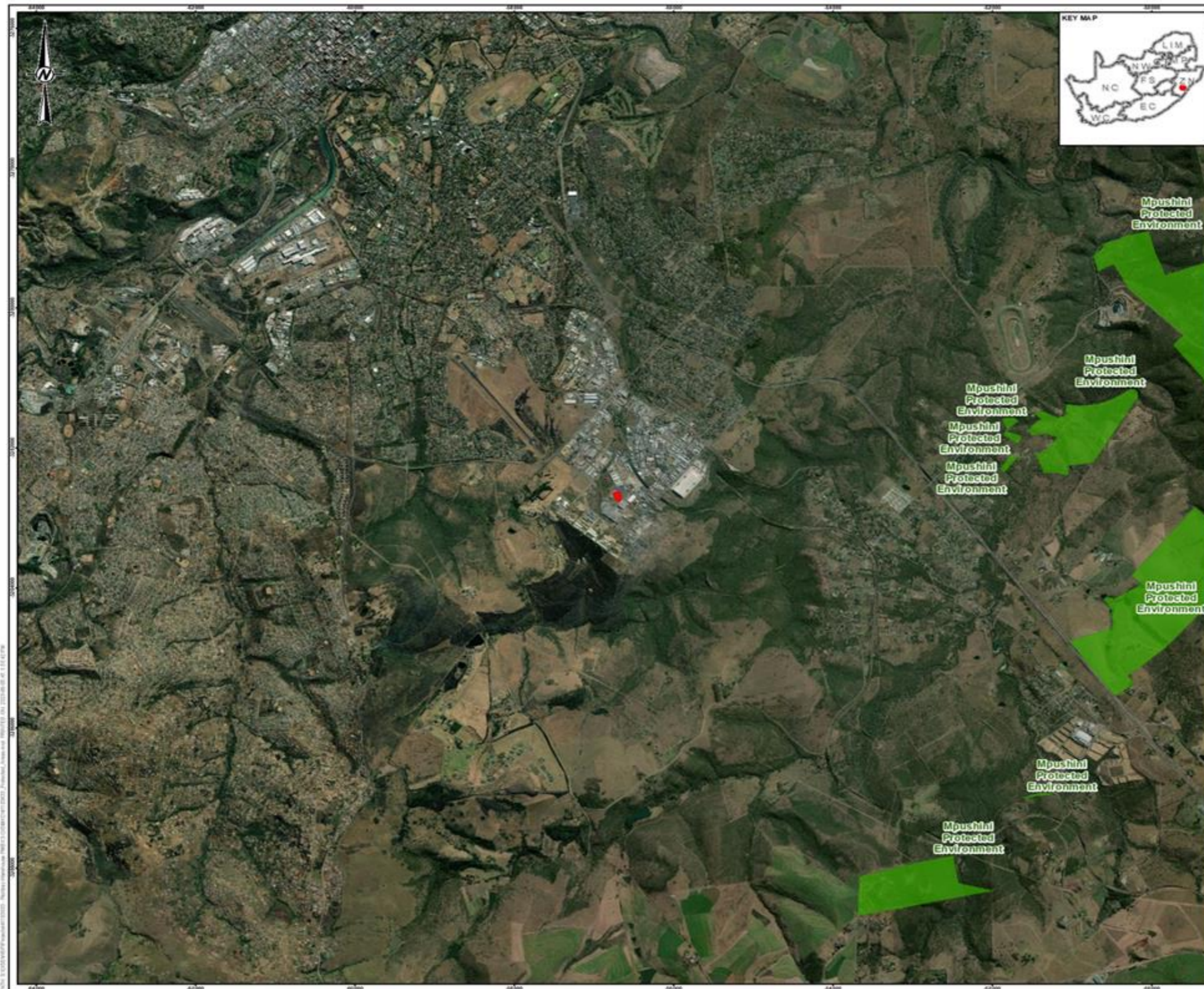
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DESIGNED		
PREPARED	TS	
REVIEWED	AD	
APPROVED	AD	

PROJECT NO: 41103633 CONTROL REV FIGURE

Richbay Warehouse PMB Draft EIA - Red List of Ecosystems (SANBI, 2021) - Figure 1: Red List of Ecosystems, remaining extent (SANBI, 2021)

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- LEGEND**
- Richbay Warehouse
  - Protected Areas (SAPAD, 2022 Q3)



NOTE(S)

REFERENCE(S)  
 1. COORDINATE SYSTEM: HARTEBEESTHOEK94 LQ31  
 2. SERVICE LAYER CREDITS: SOURCE: ESR, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

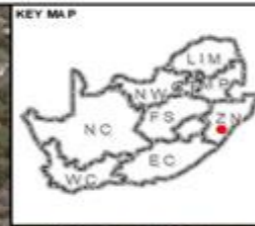
CLIENT  
 RICHBAY PROPERTIES

PROJECT  
 RICHBAY WAREHOUSE PMB DRAFT EIA

TITLE  
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		DESIGNED	
		PREPARED	TS
		REVIEWED	AD
		APPROVED	AD

PROJECT NO. 41103633      CONTROL      REV      FIGURE



**LEGEND**  
 Richbay Warehouse  
 NPAES Negotiated Focus Areas (DFFE, 2018)  
 Priority Focus Areas



NOTE(S)

REFERENCE(S)  
 1. COORDINATE SYSTEM: HARTEBEESTHOEK94 L031  
 2. SERVICE LAYER CREDITS: SOURCE: ESR, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

CLIENT  
 RICHBAY PROPERTIES

PROJECT  
 RICHBAY WAREHOUSE PMB DRAFT EIA

TITLE  
**PRIORITY AREAS FOR PROTECTED AREA EXPANSION**

CONSULTANT	WSP	YYYY-MM-DD	2023-06-05
DESIGNED			
PREPARED	TS		
REVIEWED	AD		
APPROVED	AD		

PROJECT NO: 41103633      CONTROL      REV      FIGURE

DATA SOURCES: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY. PRINTED ON 2023-06-05 AT 1:52:34 PM.

IF THE DOCUMENT IS USED FOR ANY OTHER PURPOSE, THE USER SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION.



- LEGEND
- Disturbed Grassland
  - Richbay Warehouse



NOTE(S)

REFERENCE(S)  
1. COORDINATE SYSTEM: HARTBEESTHOEKH L001  
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

CLIENT  
**RICHBAY PROPERTIES**

PROJECT  
**RICHBAY WAREHOUSE PMB DRAFT EIA**

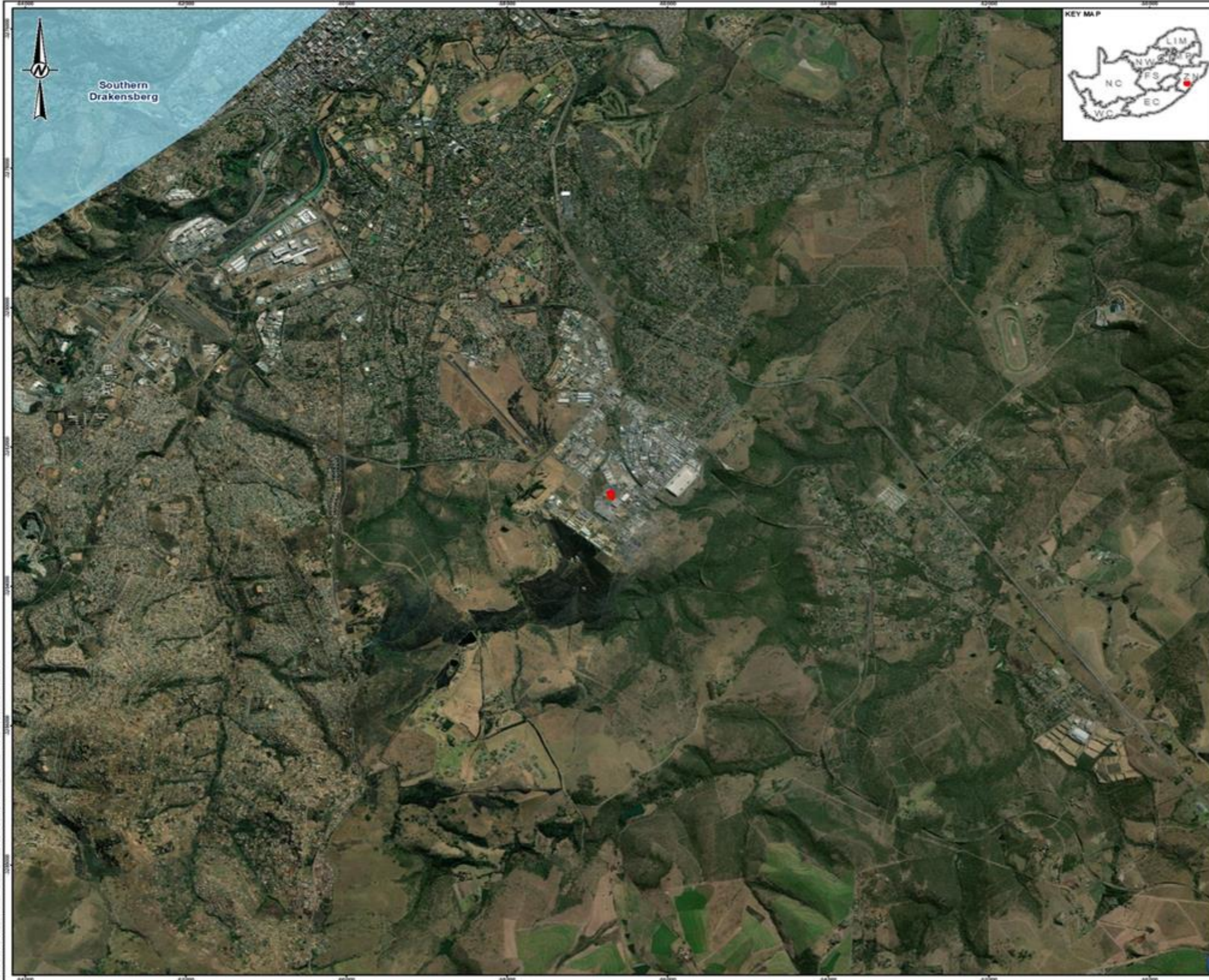
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	DESIGNED	
	PREPARED	TS
	REVIEWED	AD
	APPROVED	AD

PROJECT NO. 41103633      CONTROL      REV.      FIGURE

WSP-1103633-01-VEGETATION COMMUNITIES - RICHBAY WAREHOUSE PMB DRAFT EIA - 2023-06-06

WSP-1103633-01-VEGETATION COMMUNITIES - RICHBAY WAREHOUSE PMB DRAFT EIA - 2023-06-06



**LEGEND**

- Richbay Warehouse
- SWSA (2017)



**NOTE(S)**

**REFERENCE(S)**  
 1. COORDINATE SYSTEM: HARTEBEESTHOEK94 LQ31  
 2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

**CLIENT**  
 RICHBAY PROPERTIES

**PROJECT**  
 RICHBAY WAREHOUSE PMB DRAFT EIA

**TITLE**  
 STRATEGIC WATER SOURCE AREAS

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	DESIGNED		
	PREPARED		TS
	REVIEWED		AD
	APPROVED		AD

PROJECT NO: 41103633      CONTROL:      REV:      FIGURE:



- LEGEND**
- Richbay Warehouse
  - National Wetland Map 5 (SANBI, 2018)
  - Estuarine functional zone
  - Estuarine microsystems
  - Channelled valley-bottom wetland
  - Depression wetland
  - Floodplain wetland
  - River
  - Seep wetland
  - Unchannelled valley-bottom wetland
  - Wetland flat



**NOTE(S)**  
 1. LINE NOTES  
 2. LINE NOTES  
 3. LINE NOTES

**REFERENCE(S)**  
 1. COORDINATE SYSTEM: HARTBEESTHOEK94 LO31  
 2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

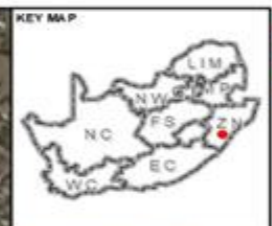
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**PROJECT**  
 RICHBAY WAREHOUSE PMB DRAFT EIA

**TITLE**  
 NATIONAL WETLAND MAP 5

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	PREPARED	TS
	REVIEWED	AD
	APPROVED	AD

PROJECT NO. 41103633      CONTROL      REV.      FIGURE



**LEGEND**  
 Richbay Warehouse  
 Wetlands



NOTE(S)

REFERENCE(S)  
 1. COORDINATE SYSTEM: HARTEBEESTHOEKM LO31  
 2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

CLIENT  
**RICHBAY PROPERTIES**

PROJECT  
**RICHBAY WAREHOUSE PMB DRAFT EIA**

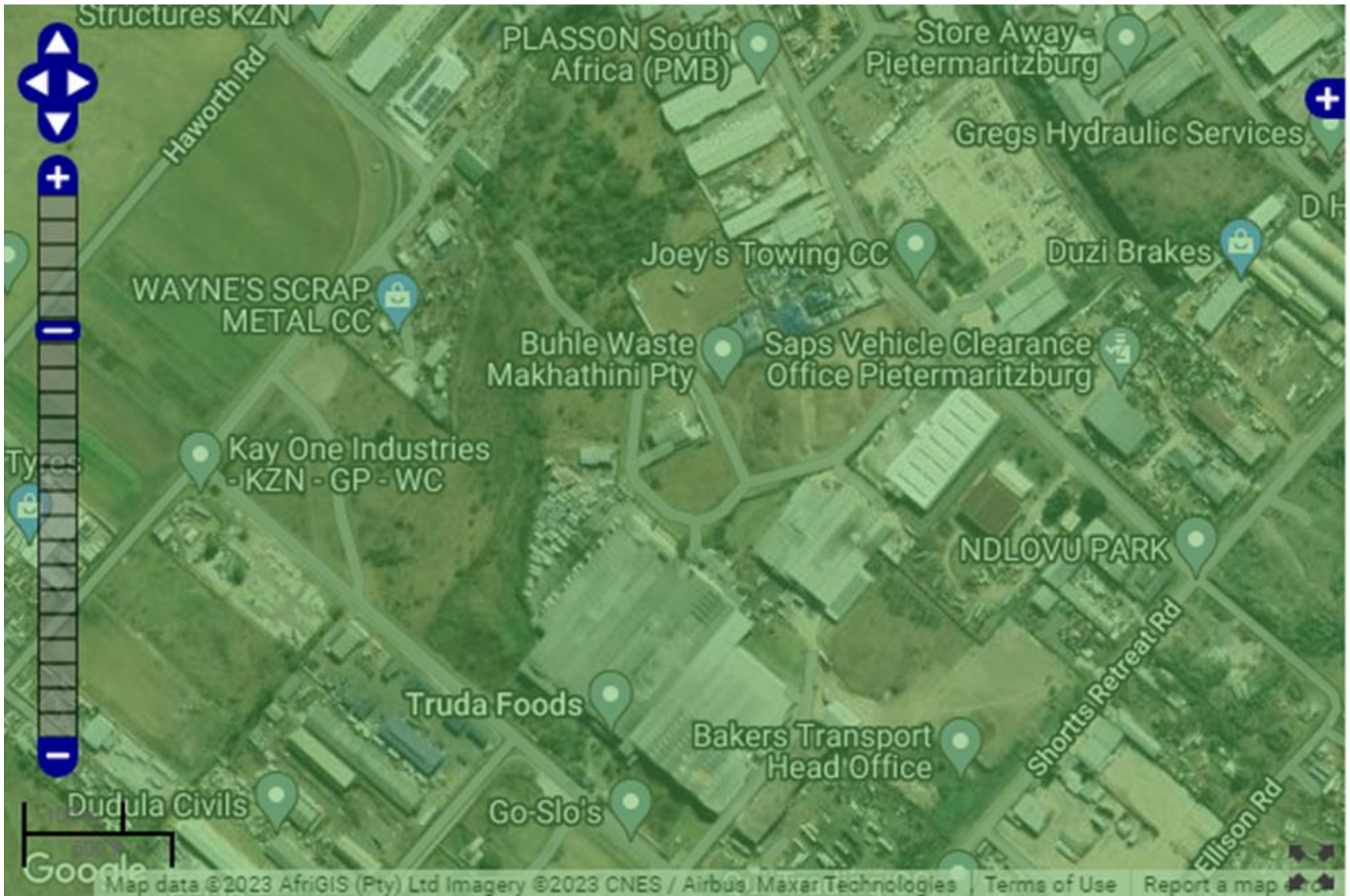
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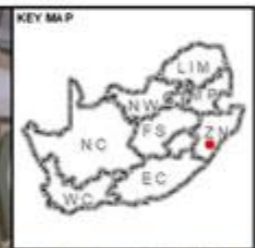
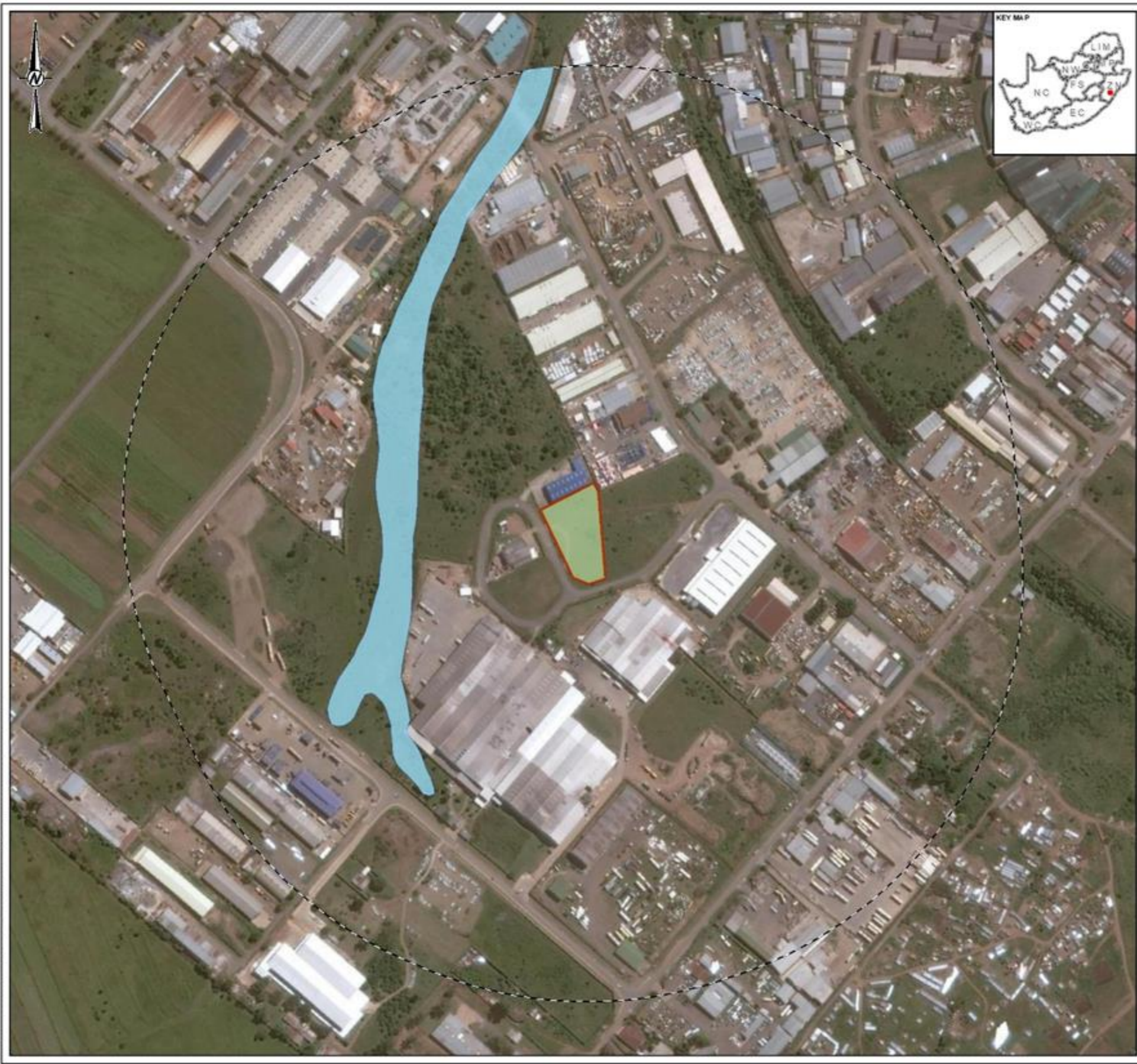
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PROJECT NO: **41103633** CONTROL REV. FIGURE

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 2023/06/05

1:10 000  
 2023/06/05  
 1:10 000  
 2023/06/05





- LEGEND**
- Richbay Warehouse
  - Wetlands
  - Disturbed Grassland



**NOTE(S)**

- REFERENCE(S)**
1. COORDINATE SYSTEM: HARTSBEESTHOKKOP LO01
  2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

**CLIENT**  
RICHBAY PROPERTIES

**PROJECT**  
RICHBAY WAREHOUSE PMB DRAFT EIA

**TITLE**  
SITE SENSITIVITIES

	CONSULTANT	YYYYMM-DD	2023/06/12
	DESIGNED		
	PREPARED	TS	
	REVIEWED	AD	
	APPROVED	AD	

PROJECT NO.	CONTROL	REV	FIGURE
41103633			

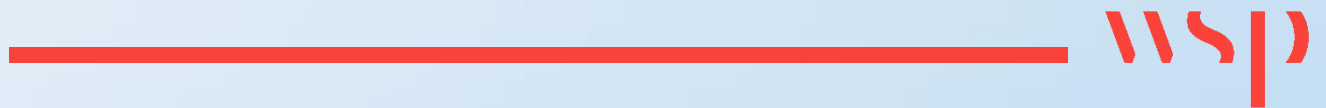
\GIS\PROJECTS\41103633\41103633\_001\_Site\_Sensitivities\_PMB\_Draft\_EIA\FIGURE 12 SITE SENSITIVITIES (DRAFT)

\GIS\PROJECTS\41103633\41103633\_001\_Site\_Sensitivities\_PMB\_Draft\_EIA\FIGURE 12 SITE SENSITIVITIES (DRAFT)



# Appendix D

## **CONCEPTUAL STORM WATER MANAGEMENT PLAN**





# TECHNICAL MEMO

<b>TO</b>	R-Bay Properties	<b>FROM</b>	M Baloyi
<b>DATE</b>	06 June 2023	<b>CONFIDENTIALITY</b>	<b>Confidential</b>
<b>SUBJECT</b>	Richards Bay Warehousing Complex Conceptual Stormwater Management Plan		

## INTRODUCTION

WSP Group (Ltd) Pty (WSP) has been Requested by R-Bay Properties to develop a Conceptual Stormwater Management Plan (SWMP) for their new Warehousing Complex in Pietermaritzburg, KwaZulu-Natal. The purpose of this study is to manage stormwater runoff from the site catchment area by diverting it away from key infrastructure and sizing diversion channels to fulfil the requirements of the National Water Act (Act 36 of 1998), particularly, the Government Notice 704 (GN704).

This technical memorandum summarises the model inputs and assumptions used to develop the SWMP as well as the results.

## MODEL INPUTS

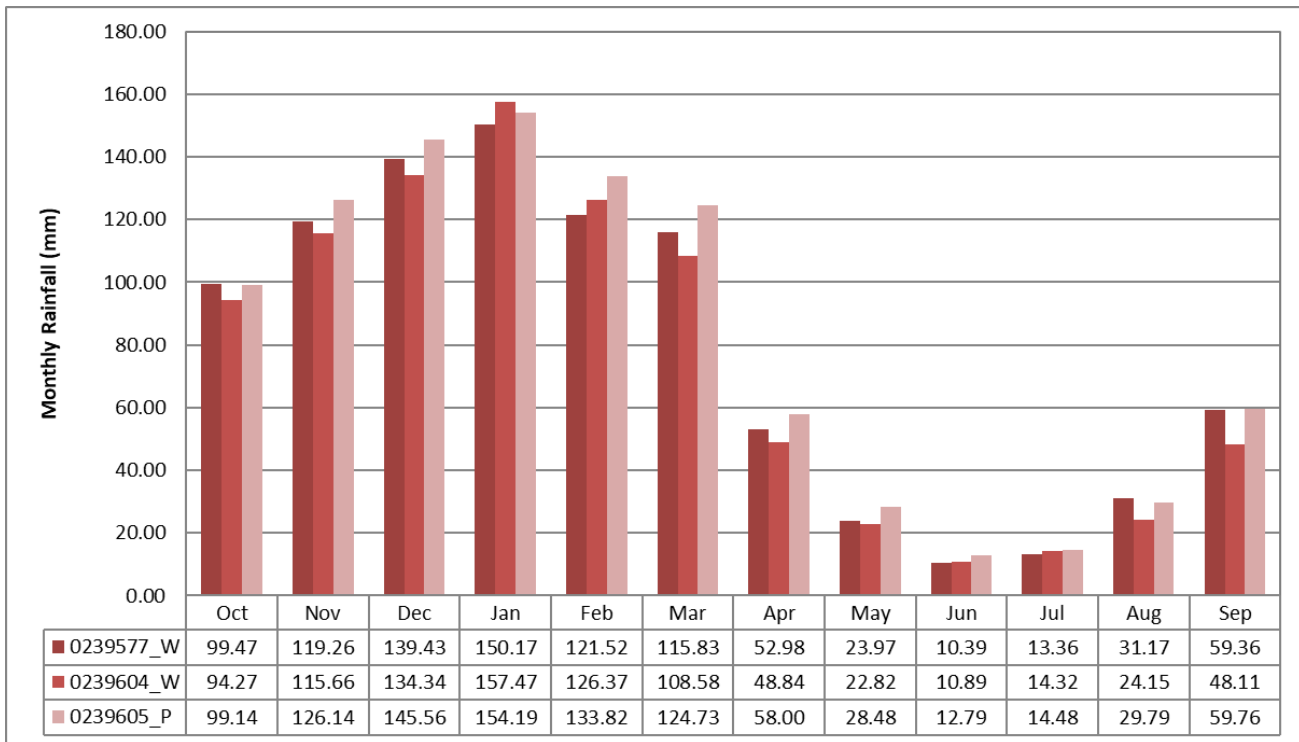
The following information was used to develop the SWMP for the new R-Bay Warehousing Complex.

### Climate Data

Historic climate data around the project site were sourced from the Daily Rainfall Extraction Utility. Three climate stations were selected and analysed to determine the most suitable station to be used in this study. These stations were selected based on their reliability, rainfall record length as well as proximity to the study site. The station properties are presented in Table 1 below. The monthly rainfall distribution for these stations is shown in Figure 1

**Table 1: Rainfall Station Properties**

Station Number	Station Name	Distance From Site	Record	Recorded Period	Reliability	MAP	Coordinates	
		km	Years	From – To	%	mm	Lat	Long
0239577 W	Pietermaritzburg (PUR)	6.4	48	1 Dec 1949 – 28 Feb 1997	100	936.9	29.36	30.26
0239604 W	Allerton (VET)	8.8	89	31 May 2001 – 1 July 1917	58	905.8	29.35	30.21
0239605 P	Botanic Gardens - PMB	8.8	82	1 Jan 1907 - 30 Nov 1989	94	986.9	29.35	30.21

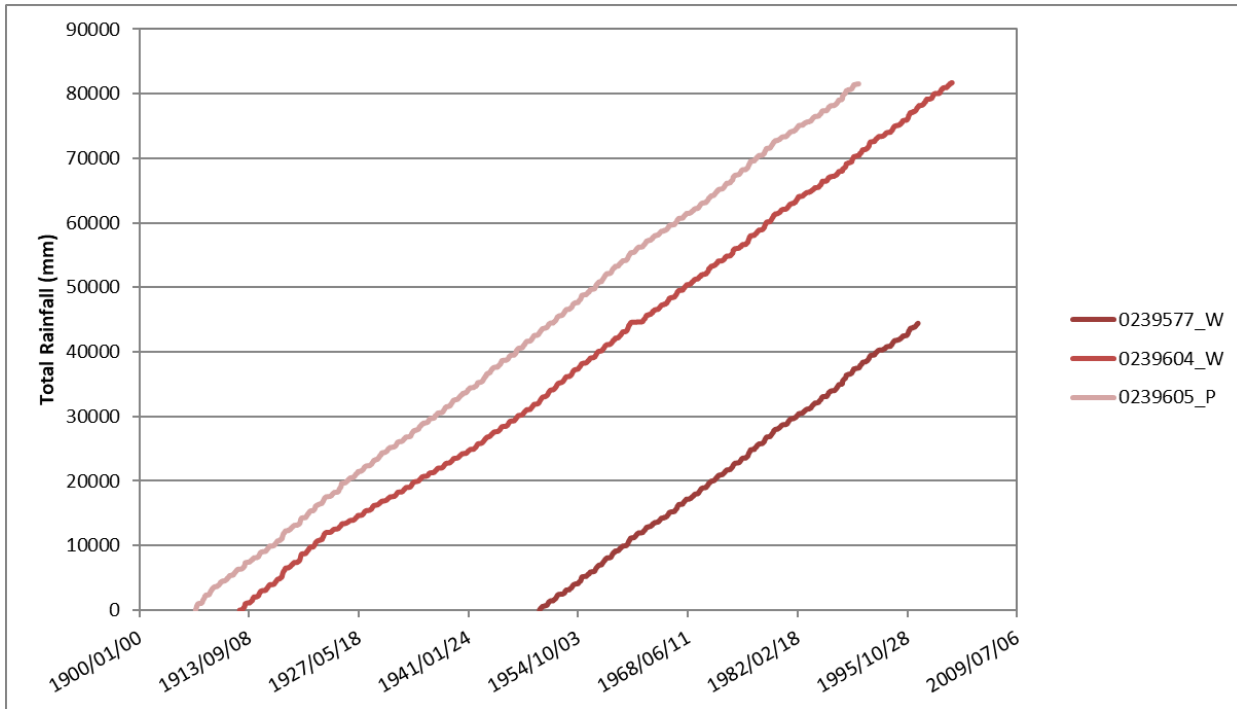


**Figure 1: Average monthly rainfall for the R-Bay new Warehousing complex**

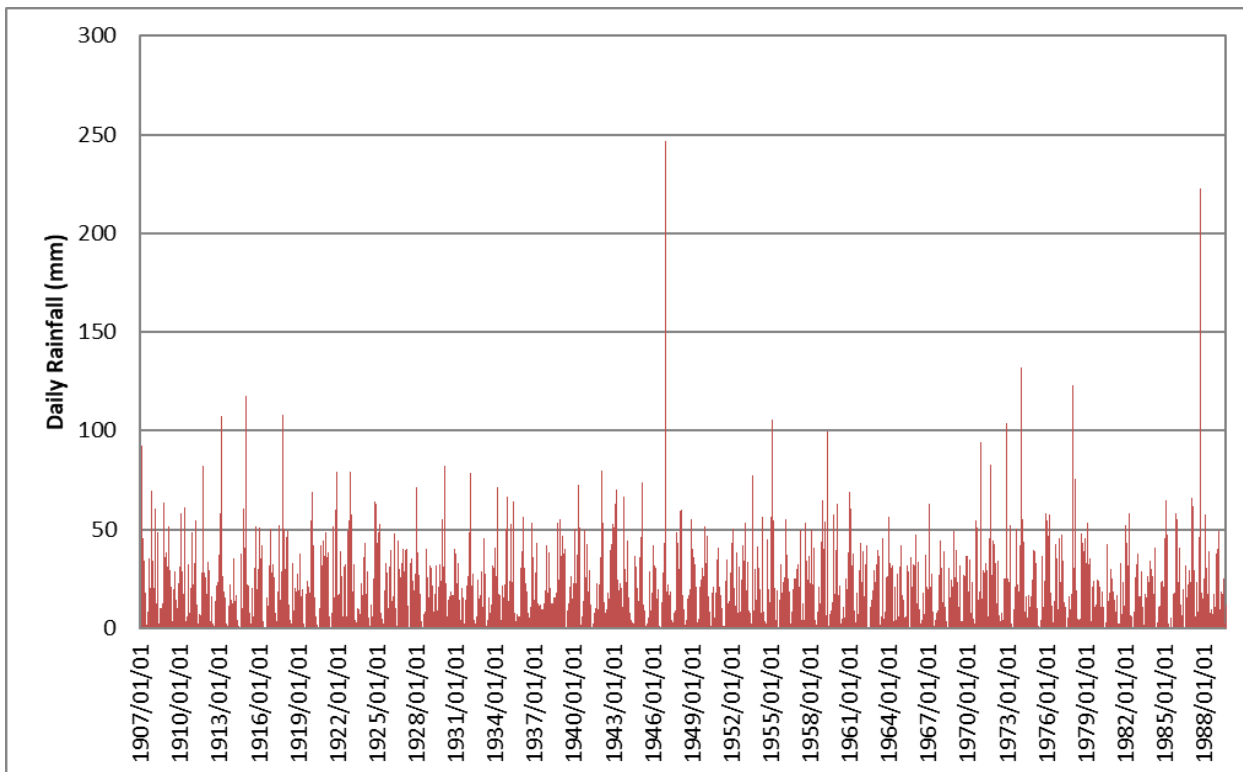
Figure 2 illustrates the cumulative plots of rainfall for the three stations analysed. This is done to check for irregularities and anomalies that may have occurred during the recorded rainfall period. All three stations seem to follow a similar trend with only a slight change in trend noted at the 0239604\_W (Allerton (VET)) station.

The 0239605\_P (Botanic Gardens – PMB) rainfall station was selected for use in this study due to its high data reliability and long record period.

Figure 3 shows the daily rainfall for the 0239605\_P (Botanic Gardens – PMB) rainfall station. It is noted that the station experienced a large storm in January of 1947 and September of 1987 with rainfall depths of 247 mm and 222 mm, respectively.

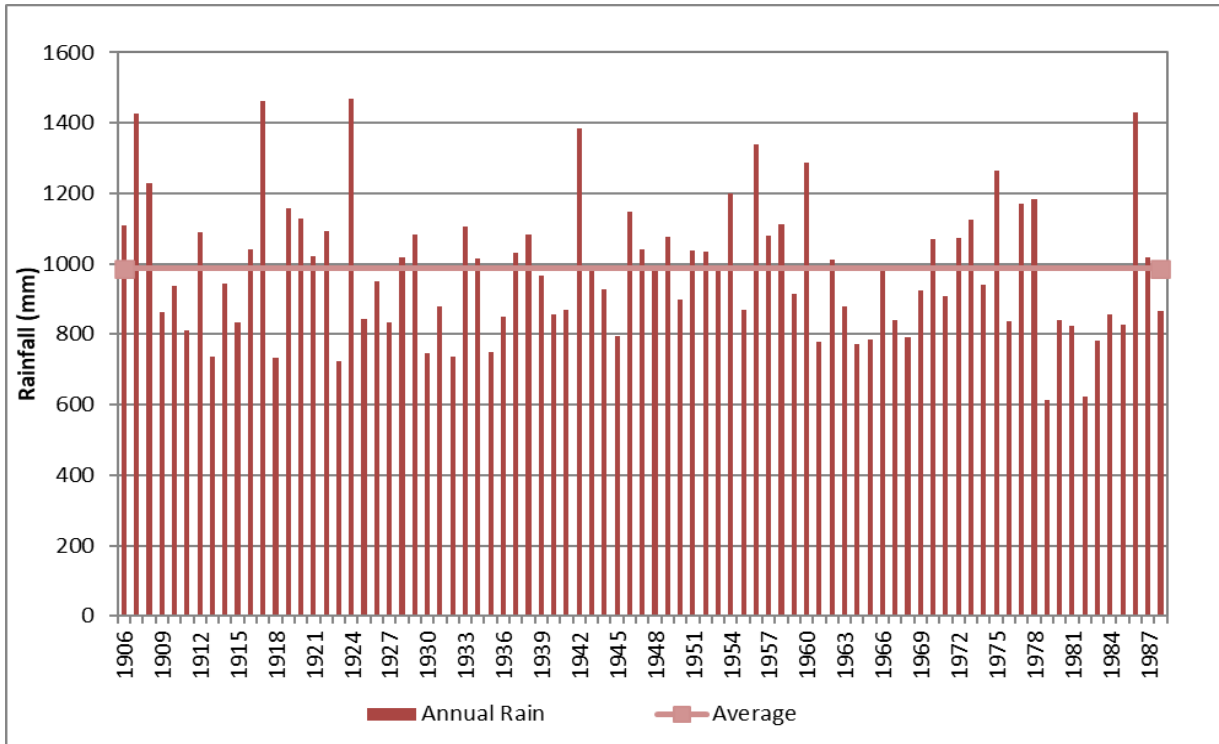


**Figure 2: Cumulative rainfall for the rainfall stations near the R-Bay New Warehousing complex**



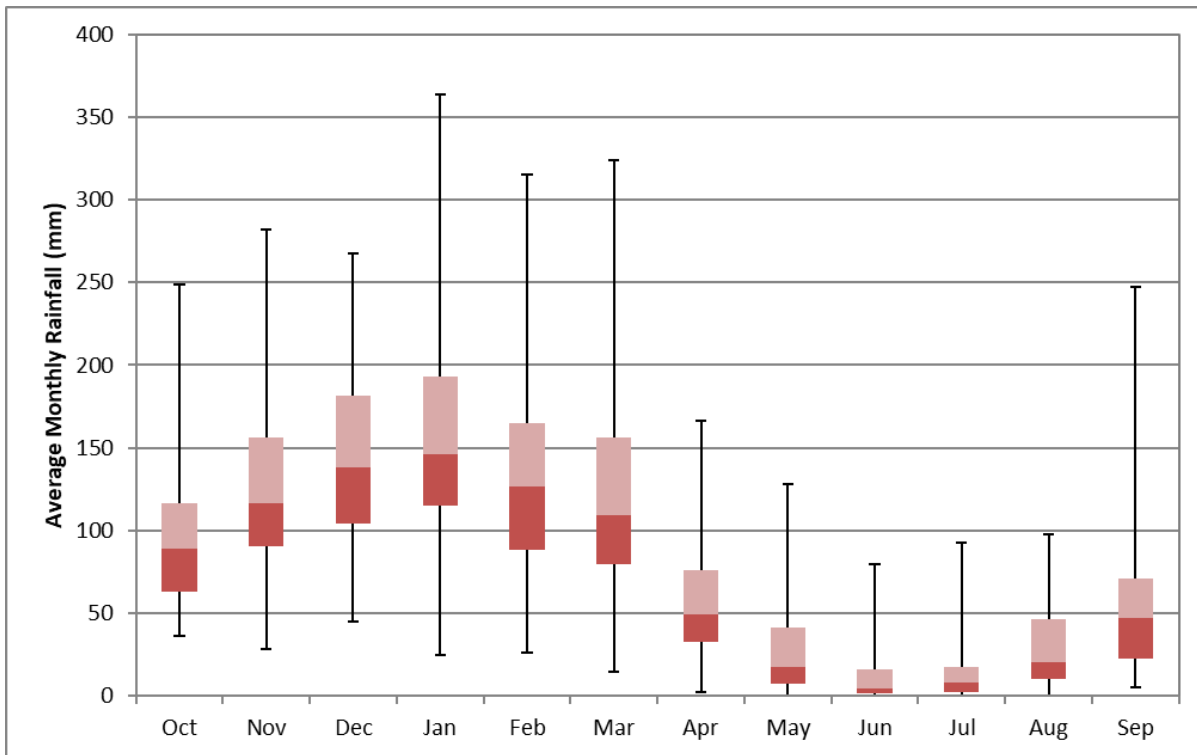
**Figure 3: Daily rainfall for the Botanic Gardens – PMB rainfall station**

Figure 4 shows the annual rainfall for each year compared to the Mean Annual Precipitation (MAP) of the combined rainfall record. The MAP appears to be in a similar range as the other two stations.



**Figure 4: Annual rainfall depth for the Botanic Gardens – PMB rainfall station**

Figure 5 shows the monthly rainfall boxplot for station 0239605\_P (Botanic Gardens – PMB). A boxplot shows the variations of observed monthly rainfall totals in a five-number summary. This includes the 1<sup>st</sup> percentile, 25<sup>th</sup> percentile, 50<sup>th</sup> percentile, 75<sup>th</sup> percentile and 99<sup>th</sup> percentile, of the observed monthly rainfall records. The higher rainfall occurs between September and March while very little rain falls between April and August.



**Figure 5: Monthly rainfall depth box plot for the Botanic Gardens – PMB rainfall station**

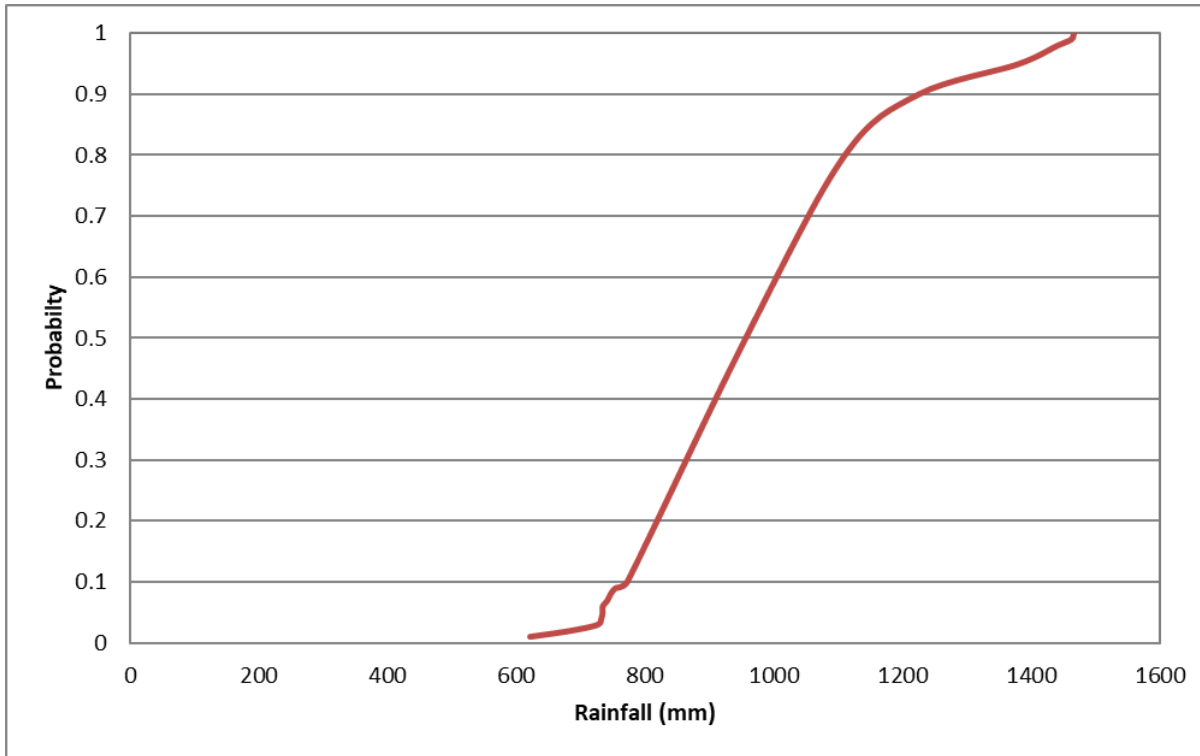
The 5<sup>th</sup>, 50<sup>th</sup> and 95<sup>th</sup> percentiles of the annual rainfall totals for the rainfall station are presented in Table 2. Figure 6 shows the cumulative distribution function of the annual rainfall totals measured at the Botanic Gardens – PMB station.

**Table 2: 5<sup>th</sup>, 50<sup>th</sup> and 95<sup>th</sup> percentile on the annual rainfall totals**

Station Name	5 <sup>th</sup> Percentile	50 <sup>th</sup> Percentile	95 <sup>th</sup> Percentile
Botanic Gardens – PMB	735	957	1382

Figure 6 shows the following occurrences in the area based on the rainfall data collected at the Botanic Gardens – PMB rainfall station.

- 95% of sample observations indicate that the area will experience an annual rainfall of 735 mm or more.
- 50% of sample observations indicate that the area will experience an annual rainfall of 957 mm or more.
- 5% of sample observations indicate that the area will experience an annual rainfall of 1382 mm or more.



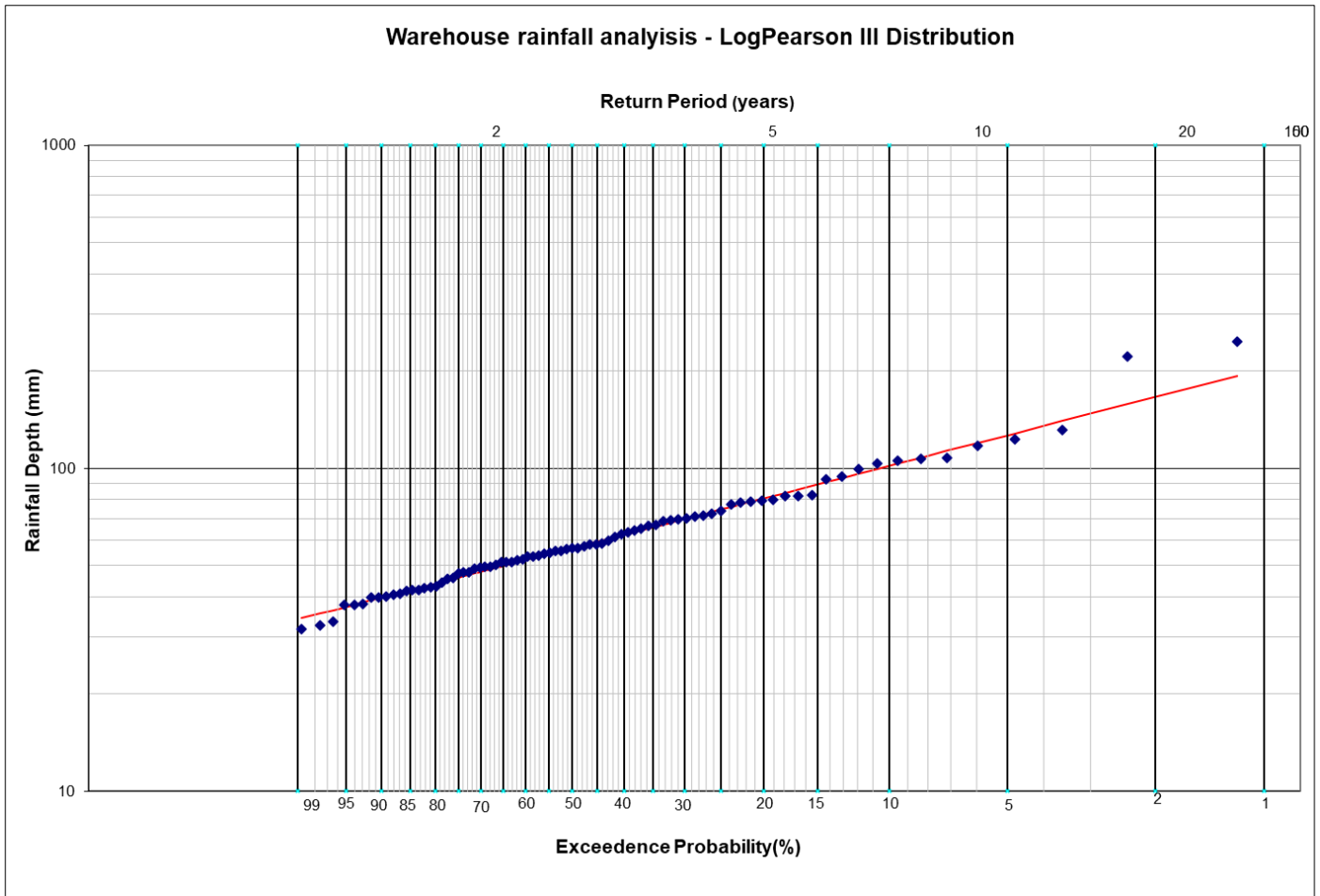
**Figure 6: Exceedance probability distribution for the Botanic Gardens – PMB rainfall station**

### Storm Depth Recurrence Periods

Probability distributions were fitted to the annual maximum rainfall depths measured at the Botanic Gardens - PMB station in order to determine the likely magnitude of storm events for various recurrence intervals. The Log Pearson Type III distribution was found to fit the data best. The daily rainfall depths for the wet season were then converted to 24-hour rainfall depths using the 1981 ratio of 1.11 (Adamson, 1981). Table 3 and Figure 7 presents the storm depths for the different Annual Exceedance Probability (AEP) based on this fitted distribution.

**Table 3: 24-Hour rainfall depths for the different AEP in mm/day**

Annual Exceedance Probability (AEP)	1:2	1:5	1:10	1:20	1:25	1:50	1:100	1:200
Daily rainfall Depth (mm)	57	81	102	126	135	166	204	248
24 Hour Rainfall Depth (mm)	63	90	113	140	150	185	226	276



**Figure 7: Log Pearson III distribution for the Botanic Gardens – PMB rainfall station**

## Modelling

The PCSWMM® (refer [www.chiwater.com](http://www.chiwater.com)) commercial software package, developed by Computational Hydraulics International (CHI) was used as the analysis model. PCSWMM® is a dynamic rainfall-runoff simulation model used for single event or long-term simulation of runoff quantity. The runoff component of SWMM operates on a collection of sub-catchment areas that receive precipitation and simulate runoff overland and underground through a system of pipes, channels, storage and treatment devices, pumps, and regulators.

PCSWMM tracks the quantity of runoff generated within each sub-catchment, and the flow rate, flow depth and quality of water in each pipe and channel during a simulation period comprised of multiple time steps.

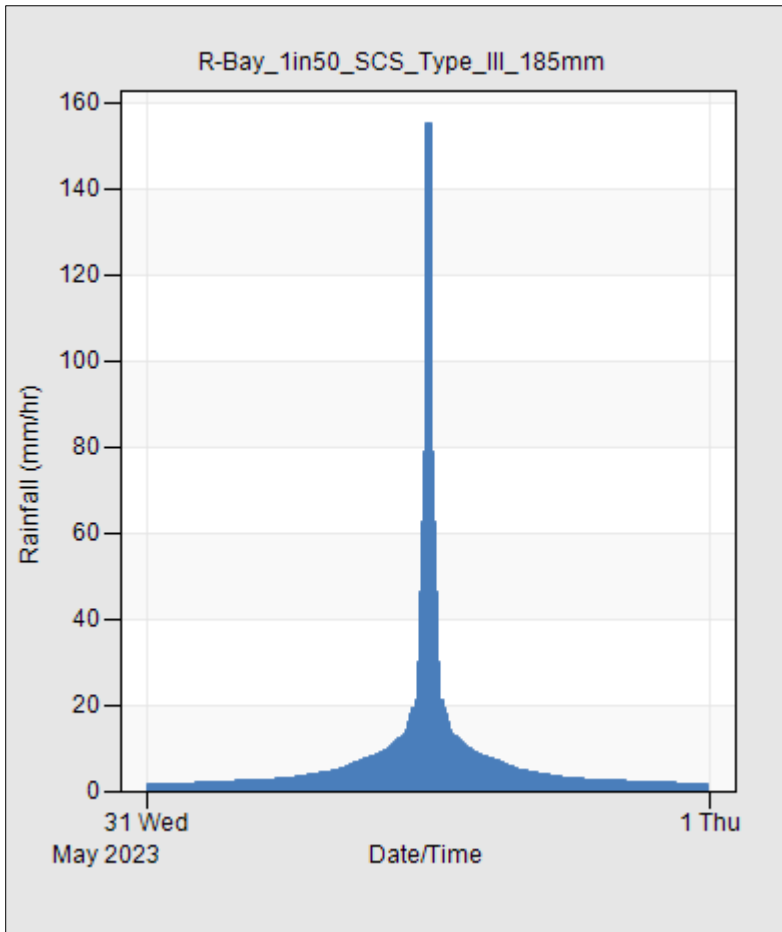
### RAINFALL-RUNOFF MODEL INPUT PARAMETERS

The following assumptions were made for the hydrologic and hydraulic input parameters:



**Table 4: Model Input Parameters**

Parameter	Input used in model	Comment
Pervious/Impervious Surface	Paved catchments and roofs assumed 100 % impervious and vegetated areas assumed 95 % pervious	
Manning's N roughness coefficients for catchments	Asphalt paved areas: 0.011 Grass cover: 0.15 Corrugated iron roof: 0.024	
Soil Type and Infiltration Method	Sandy Loam, the Modified Green Ampt infiltration method was used as the infiltration method in the model with the following properties: Avg. Capillary Suction Head: 110.1 mm Hydraulic Conductivity: 21.8 mm/hr Initial Moisture content deficit: 0.358	The Green-Ampt method is a function of the soil suction head, porosity, hydraulic conductivity, and time used to estimate infiltration into the soil
Cross-sectional profile of channels evaluated	Trapezoidal	
Manning's roughness coefficients for diversion channels	Asphalt: 0.013 Concrete: 0.015	
Flood type used in Model	South African SCS 24-hour Type 3	Based on the location of the site. Figure 8 below shows the hyetograph for the 1:50 year 24-hour storm event
Design rainfall depth	185 mm	Refer to Table 3 above



**Figure 8: 1 in 50-year storm event**

## RAINFALL-RUNOFF MODEL RESULTS

### Stormwater Management Plan Description

R-Bay Properties requires a storm water management plan to divert storm water runoff from the New Warehouse Development catchment. The design criteria adopted for the analysis and design of the storm water management system will follow the guiding principles of Regulation No.704 dated 4 June 1999, gazetted by (then) Department of Water Affairs and Forestry under the National Water Act, Act No.36 of 1998 (GN704) as this regulation applies to mining activities.

The guideline principles state the following:

- Separate clean and dirty water systems:
- Demarcation of dirty water footprint areas
- Delineation of upstream catchment areas that would naturally drain into dirty water areas.
- Estimation of peak flood runoff from relevant catchments
- Design of drains, diversion channels and berms to prevent clean water from entering dirty water areas.
- Control and contain dirty water runoff:
- Design of drains and berms to prevent dirty water from leaving dirty water areas.
- Design appropriately sized SWDs that will not spill into a clean water system more than once in 50-years.



Figure 9 shows the conceptual SWMP for the New Warehouse. The catchments areas were delineated into sub-catchments based on the site topography. Survey data of 5-meter interval contours was sourced from the National Geo-spatial Information (NGI) Mapping and Aerial Imagery site and used for the study site. The runoff from the entire site catchment is assumed to be clean with no contaminants in the water. The paved catchment is assumed to have an Asphalt lining. The clean runoff from the paved catchment area is diverted into channels along the perimeter on the south-western boundary wall of the site, as well as behind the northern parking bay into the nearest municipal stormwater system.

The new warehouse roof is assumed to be corrugated iron with its runoff being collected in a gutter system reporting to the nearest perimeter channel. The runoff from the grassed catchment will report to a second northern perimeter channel that connects to a channel reporting to the municipal stormwater system.

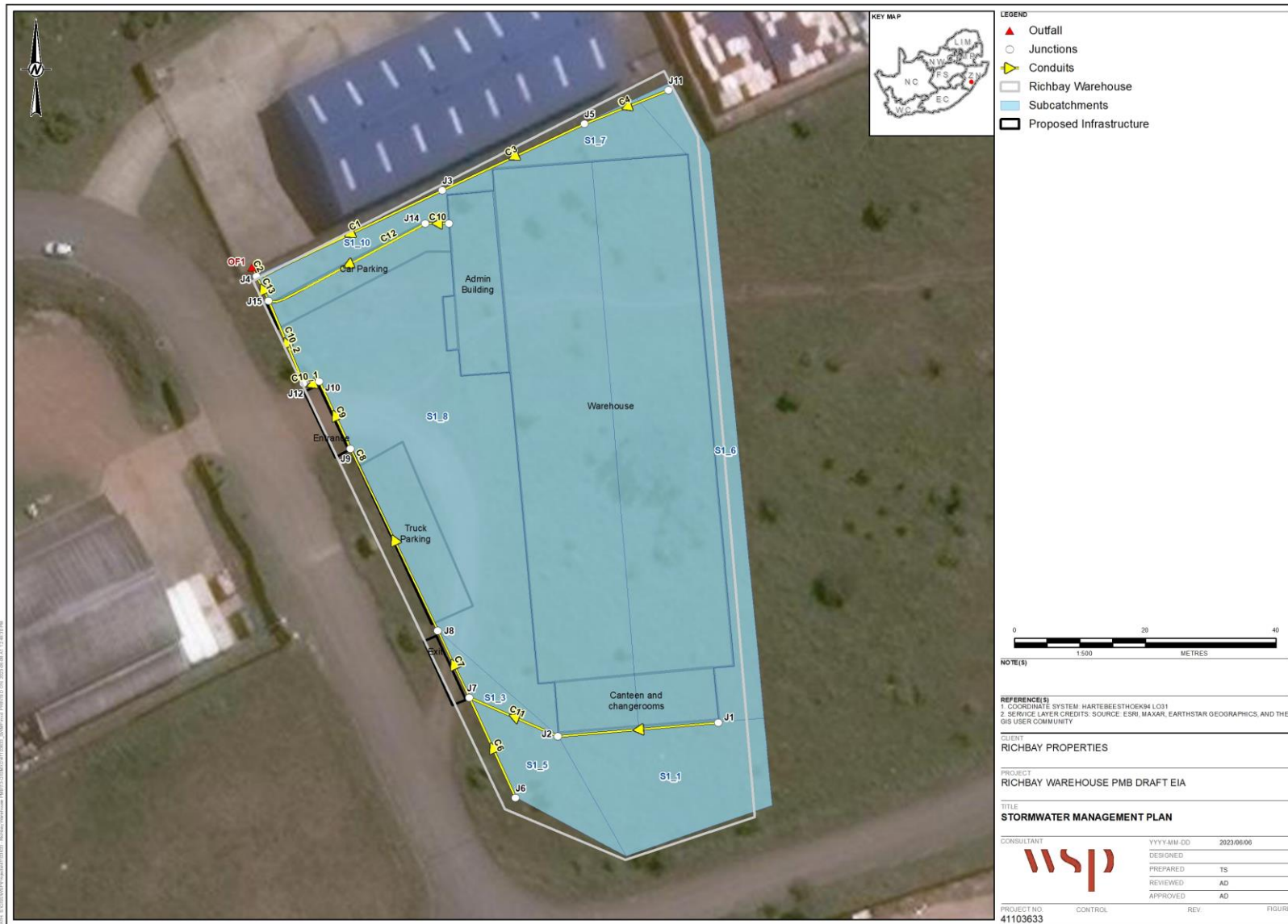


Figure 9: R-Bay Properties New Warehouse SWMP



## Sub-catchment Parameters

The sub-catchment characteristics used in the model are shown in Table 5 below.

**Table 5: Sub-catchment characteristics**

Name	Area (m <sup>2</sup> )	Slope (%)	Impervious (%)
S1_1	456	4.5	100
S1_10	138	3.8	2
S1_3	55	5.6	100
S1_5	190	5.3	100
S1_6	393	4.0	100
S1_7	163	3.2	2
S1_8	1 444	4.4	100
S1_2	1 279	1.0	100
S1_4	1 291	1.0	100
S1_11	215	1.0	100

## Sub-catchment Model Outputs

The computed flood peaks and runoff volumes for the sub-catchments on site are presented below in Table 6

**Table 6: Computed Flood Peaks**

Name	Runoff Volume (ML)	Peak Runoff (m <sup>3</sup> /s)	Runoff Coefficient
S1_1	0.08	0.02	0.999
S1_10	0.01	0.01	0.24
S1_3	0.01	0.01	0.999
S1_5	0.04	0.01	0.999
S1_6	0.31	0.07	0.999



S1_7	0.01	0.01	0.24
S1_8	0.27	0.06	0.999
S1_2	0.24	0.06	0.999
S1_4	0.24	0.06	0.999
S1_11	0.04	0.01	0.999

## Channel Sizing

Table 7 shows the channel dimensions and computed velocities for each channel for a 1 in 50-year recurrence interval 24-hour storm event.

**Table 7: Channel Sizes**

Name	Length (m)	Roughness	Depth (m)	Bottom Width (m)	Side Slope (V:H)	Max. Flow (m <sup>3</sup> /s)	Max. Velocity (m/s)	Max Full depth (m)	Min Freeboard (m)
C1	31.4	0.014	0.5	0.5	1:2	0.15	0.84	0.20	0.31
C10	3.6	0.015	0.3	0.3	1:3	0.06	1.18	0.10	0.21
C10_1	2.7	0.015	0.3	0.3	1:5	0.03	1.38	0.05	0.26
C10_2	13.7	0.015	0.3	0.3	1:5	0.03	0.82	0.07	0.24
C11	14.8	0.015	0.3	0.3	1:3	0.02	1.29	0.04	0.46
C12	26.9	0.015	0.3	0.3	1:3	0.06	1.17	0.10	0.21
C13	4.2	0.015	0.3	0.3	1:5	0.09	0.64	0.15	0.15
C2	1.5	0.014	0.5	0.5	1:2	0.24	1.18	0.22	0.29
C3	24.0	0.014	0.5	0.5	1:2	0.08	0.75	0.27	0.23
C5	24.6	0.015	0.3	0.3	1:3	0.02	1.05	0.05	0.45
C6	16.9	0.015	0.3	0.3	1:5	0.01	0.58	0.03	0.27
C7	11.3	0.015	0.3	0.3	1:5	0.03	1.37	0.04	0.26



C8	30.8	0.015	0.3	0.3	1:5	0.03	1.33	0.04	0.26
C9	11.3	0.015	0.3	0.3	1:5	0.03	1.41	0.04	0.26
C4	13.8	0.014	0.5	0.5	1:2	0.07	1.26	0.09	0.42

## RECOMMENDATIONS

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- Frequent maintenance is recommended on the diversion channels at least once before the wet season and once during the wet season.

## REFERENCES

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Adamson, P. (1981). *South African Storm Rainfall*. October 1981: Department of Environment Affairs .



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