

# PROPOSED CRADLE-VIEW MIXED USE HOUSING DEVELOPMENT MUNSIEVILLE

## DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

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Prepared by



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Environmental Management Programme for the Proposed Cradle-View Mixed Use Housing Development Munsieville.

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## EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Tholoana Consulting brings together a team of dedicated professional scientists, environmental managers and practitioners who have many years of combined experience in environmental services, including services not limited to housing, landfill site and bio-plant related environmental applications for authorisation. Tholoana Consulting provides comprehensive Integrated Environmental Management (IEM) services to a broad range of clients throughout the African continent and other international countries.

Tholoana Consulting has no interest in the aforementioned project or any component that may emerge from the processes of the development.

Details of the Environmental Assessment Practitioner (EAP) who compiled the Environmental Management Programme (EMPr) for the proposed Cradle-View Mixed Use Housing Development Munsieville:

**Mr Vusmuzi Hlatshwayo:** Mr Vusmuzi Hlatshwayo has a National Diploma in Environmental Sciences obtained from Tshwane University of Technology (TUT) at Pretoria. He is also a full member of the International Association for Impact Assessment (South Africa) (IAIASa) and is an EAP within Tholoana Consulting. Mr Vusmuzi Hlatshwayo was involved in the following projects: Evaton Estate (Housing Development), Krugersdorp Station Upgrade and Intermodal Facilities, Madiba Heights (mixed-use development), Msibi Bio-Plant (waste management application, and a Basic Environmental Assessment), Maluti-A-Phofung Landfill Site (waste management license application), Ventersdorp Mixed-Land Use Housing Development (Scoping/EIA application), Blydeville Mixed Land Use Housing Development (Scoping/EIA application) and Refliwe Hostel Development (EMPr).

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## ABBREVIATIONS

CA	Competent Authority (GDARD)
CLO	Community Liaison Office
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ELO	Environmental Liaison Officer
EMPr	Environmental Management Programme as per the EIA Regulations, Appendix 4, 2017
GDARD	Gauteng Department of Agriculture and Rural Development
I&AP	Interested and Affected Party
MCLM:DIEM	Mogale City Local Municipality : Department Integrated Environmental Management
OHSO	Occupational Health and Safety Officer
PHRAG	Provincial Heritage Resource Agency Gauteng
RDP	Reconstruction and Development Programme
RE	Resident Engineer
SABS	South African Bureau of Standards
SANS	South African National Standard
SHE	Safety, Health and Environment Officer.

## DEFINITIONS

TERM	EXPLANATION
Collection	means accumulation of wastes from intermediate storage sites for movement to a primary waste holding area or from several primary waste holding areas to the treatment or final disposal site or both;
Contractor	<p>The principal person or company undertaking the construction of the development.</p> <ul style="list-style-type: none"><li>• Appointed by the developer, including subcontractors appointed by the contractor.</li></ul>
Disposal	means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto land;
Engineer	A person representing the Developer on site and who is responsible for the technical and contractual implementation of the works to be undertaken. This is usually the engineer, but may be any other person, such as an architect or project manager, authorized by the Developer to fulfil this role
Environment	<p>The surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth:</p> <ul style="list-style-type: none"><li>• micro-organisms, plant and animal life;</li><li>• any part or combination of the above and the inter-relationships among and between them; and</li><li>• the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.</li></ul>
Environmental Control Officer	The individual or company appointed by the Developer to ensure the implementation of the EMPr and suitable environmental management practices on site for the duration of the construction phase of the Project.
General Waste	means waste that does not pose an immediate hazard or threat to health or to the environment, and includes - domestic waste; building and demolition waste; business waste; and inert waste.
Ground Water	subsurface water that fills voids between highly permeable ground strata comprised of sand, gravel, broken rocks, porous rocks, etc. and move under the influence of gravitation.
Hazardous Waste	means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or



TERM	EXPLANATION
	toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Heritage Resources	means any place or object of cultural significance, including all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.
Impact	Refers to a description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
Incident	An undesired event which may result in a significant environmental impact but can be managed through an internal response.
Mitigation	Measures designed to avoid, reduce or remedy adverse impacts.
Pollution	any change in the environment caused by – substances; radioactive or other waves; or noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.
Recycle	A process where waste is reclaimed for further use, this involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.
Rehabilitation	Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) which it was before disruption.
Safety, Health and Environmental Officer	The SHE officer is a Contractor representative, responsible for the safety, health and environmental aspects on the construction site. The SHE officer will be responsible for the day-to-day monitoring of the EMP and Health and Safety Plan as per the OHSA.
Segregation	means systematic separation of health care waste into designated categories;
Waste	means any substance, whether or not that substance can be reduced,

TERM	EXPLANATION
	<p>re-used, recycled and recovered –</p> <ul style="list-style-type: none"> <li>- that is surplus, unwanted, rejected, discarded, abandoned or disposed of;</li> <li>- which the generator has no further use of for the purposes of production;</li> <li>- that must be treated or disposed of; or</li> <li>- that is identified as a waste by the relevant Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but— <ul style="list-style-type: none"> <li>• a by-product is not considered waste; and</li> <li>• any portion of waste, once re-used, recycled and recovered, ceases to be waste</li> </ul> </li> </ul>
Waste Disposal Facility	means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premises.
Water Pollution	<p>As defined in the National Water Act, 36 of 1998, water pollution refers to the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it – less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful</p> <ul style="list-style-type: none"> <li>a. to the welfare, health or safety of human beings;</li> <li>b. to any aquatic or non-aquatic organisms;</li> <li>c. to the resource quality; or</li> <li>d. to property.</li> </ul>

**IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)-  
UDERTAKING BY THE PROJECT MANAGER-**

Uvuko Civils Maintenance and Construction (Pty) Ltd: Project Manager  
\_\_\_\_\_ is responsible for the following issues during the Planning  
Design, Pre Construction and Construction, **of the Cradle-View Mixed Use Housing  
Development:**

- Ensuring that the Uvuko Civils and its contractors are aware of all the specifications, legal constraints pertaining to the project specifically with regard to environmental management.
- Any damage to property or the environment must immediately be reported to Uvuko Civils as the developer and the landowner. The damage must be repaired immediately to the owner's written satisfaction.
- No wandering around adjacent properties. Access is limited to the stand tracks area and the site only.
- The public and all property are to be treated with respect at all times.
- To ensure that all stipulations within the attached EMPr are communicated to and adhered to by Uvuko Civils and it's contractors.
- To appoint an Environmental Control Officer (ECO) for monitoring of the EMPr throughout the project by means of site visits and meetings. This should be documented as part of the site meetings minutes.
- To ensure that all clean up and rehabilitation or any remedial actions that are required are completed prior to the issuing of a project completion certificate.

**UNDERTAKING:**

I, \_\_\_\_\_, the undersigned and duly authorized thereto by Uvuko Civils hereby undertake to give effect to all aspects as contained in the attached EMP and accept all responsibility therefore.

Signed at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_ 2017.

\_\_\_\_\_  
SIGNATURE

Witnesses:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **IMPLEMENTATION OF THE EMPr-UNDERTAKING -BY THE CONTRACTOR-**

The Uvuko Civils appointed contractor \_\_\_\_\_ for the Construction of the **proposed Cradle-View Mixed Use Housing Development** is responsible for the following:

- Ensure that the affected landowners are informed about your (the contractors) presence on their property.
- Ensure that Uvuko Civils and Engineers and its contractors are aware of all the specifications, legal constraints and the department's standards and procedures pertaining to the project specifically with regard to the environment.
- Immediately report any damage to property or the environment to Uvuko Civils and the landowner. The damage must be repaired immediately to the owner's written satisfaction.
- No wandering around adjacent properties. Access is limited to the farm tracks area and the site only.
- The public and all property are to be treated with respect at all times.
- Ensure that all stipulations within the attached EMPr are communicated to and adhered to by Uvuko Civils and Engineers and its contractors.
- Monitor the EMPr throughout the project by means of site visits and meetings. This should be documented as part of the site meetings minutes.
- Ensure that all clean up and rehabilitation or any remedial actions that are required are completed prior to the issuing of a completion certificate.

### **UNDERTAKING:**

I, \_\_\_\_\_, the undersigned and duly authorized thereto by Uvuko Civils Construction and Maintenance hereby undertake to give effect to all aspects as contained in the attached Environmental Management Plan and accept all responsibility therefore.

Signed at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_ 2017.

\_\_\_\_\_  
SIGNATURE

Witnesses:

\_\_\_\_\_

\_\_\_\_\_

# 1. INTRODUCTION

## 1.1. PROJECT DESCRIPTION

The proposed development is located on the following farms:

- Farm Paardeplaats 177 - PTN 26, 41, 37 and 40, at Munsieville Extension 10, under the Mogale City Local Municipality.

These properties are bordered to the north by Helena street and the Sterkfontein Psychiatric Hospital, to the south by Munsieville Extension 5 (RDP Houses), to the east by R563 (Van Riebeeck Road) and to the west by Munsieville Extension 4 (RDP Houses). The total size of the properties is measured to be approximately 28.73Ha.

The proposed development entails the establishment of the following:

- Bonded Housing Units

The bonded housing units are divided into complexes/estates and it proposed that each unit of 65m<sup>2</sup> will have two bedrooms, a bathroom, a kitchen, dining area with a balcony. All the complexes will be built in a four storeys. The numbers of units per complex are as follows:

- ✓ Complex/Estate A; 220 units.
- ✓ Complex/Estate B; 260 units.
- ✓ Complex/Estate C; 500 units.
- ✓ Complex/Estate D; 320 units.
- ✓ Complex/Estate E; 200 units.

The total number of bonded housing units is 1500.

- Flisp Housing Units

The flisp units of 48m<sup>2</sup> each will have an open kitchen and lounge area, a bathroom and two bedrooms. The height of the complexes/estates for the flisp will be four storeys. The numbers of units per complex/estate are as follows:

- ✓ Complex/Estate F; 320 units.

- ✓ Complex/Estate G; 544 units.

The total number of flisp housing units is 864.

In addition to the above the proposed development includes the following associated facilities:

- A crèche: the proposed crèche will be located at the heritage building on site along Helena Street. As a result the building will not be demolished, but converted into a crèche.
- Complex/Estate G; this estate has an area of approximately 1022m<sup>2</sup> allocated for building two office blocks.
- An area of approximately 17 918m<sup>2</sup> has been allocated for a shopping centre which house two anchor stores can i.e. pick n pay and Woolworths, restaurants and fast-food outlets, with spaces other applicable shops.
- A medium sized, pre-primary and primary school of 14 blocks with a sports field on an allocated area of approximately 3 669m<sup>2</sup> is proposed within the development. The school is located along the R 563 as per the SDP.
- The SDP shows the proposed Taxi Rank at the area zoned for business within the proposed development. This area is approximately 1234 m<sup>2</sup> in size.
- In total all the parks within the proposed development take make up to 11 503m<sup>2</sup> in size.

The following has been considered for the preferred/proposed option as above:

- The Heritage Building along Helena Street will be retained and converted into a crèche
- Ridges along Helena Street are incorporated into the park at the northern side of the site. The ridge identified on the Southern Side has been marked as a not buildable area on the layout.

The following associated infrastructure developments are applicable to the proposed development:

- Bulk Water Supply

The estimated Annual Average Daily Demand for the proposed development has been calculated to be 2,297.10 kl/day (as per the outline scheme report). According to the Outline Scheme Report for the proposed development there is an existing 160 mm diameter bulk water pipeline along Van Riebeeck road; however its capacity will not be able to cater for the proposed development. An additional 255 mm diameter bulk water supply pipeline would be required to source water from the Dan Pienaar Water Reservoir and Elevated tower approximately 1km to the site.

- Bulk Sewer

Currently on site there is an existing 160mm diameter sewer collection pipeline running across the site from Munsieville Extension 5 which discharges to a point within the road servitude along Van Riebeeck road. As per the Outline Scheme report a 300 mm diameter sewage outfall sewer pipeline will be installed from the lowest point of the property for discharge by gravity to the nearest Sewage pumping station located at Mayibuye Township which is approximately 1.4 km from site.

- Storm Water Management

As per the outline scheme report, the storm-water network will be designed to accommodate the minor storm event of 1 in 2 years in pipes or open channels and the major storm (1 in 50 years) will be managed through controlled overland flows and aboveground attenuation storage, where possible.

## **1.2. PROJECT LOCATION**

The proposed Cradle-View Mixed Use Housing Development is located at the following properties at Munsieville, under the Mogale City Local Municipality: PTN 26, 41, 37 and 40 of the Farm Paardeplaats 177 IQ.

The centre coordinates of are as follows: 26° 3'48.19" S; 27°45'26.12"E

Furthermore the site can be accessed via van Riebeeck RD (R563) and Helena Street.



Figure 1 : LOCALITY MAP (GOOGLE IMAGE)



### 1.3. ENVIRONMENTAL SETTING

#### 1.3.1. Geology and Soil

According to the geotechnical investigation conducted by Nomfundo Exploration and Consulting (Pty) Ltd, the site is underlain by shale, quartzite, conglomerate, diamictite of the Government Sub-group (Rg), West Rand Group, of the Witwatersrand Supergroup. The site has been classified as C2-S2, thus possible collapsible soils and compressible soils. The investigation further highlights that according to SANS633;2012; soil horizons, the soil derived from the weathering of shale, and quartzitic sandstones have been indurated.



### **1.3.2. Climate**

The project site at Munsieville Ext 10 falls within the Mogale City Local Municipality, which receives an annual average rainfall of about 614 mm, most of it occurring during mid-summer. The area receives the highest rainfall in January (117mm) and the lowest in June. The temperatures range from 16.6<sup>0</sup> C in June to 26.4<sup>0</sup> C in January. Furthermore the area becomes cold in July when the mercury drops to 0.6<sup>0</sup> C on average at night.

### **1.3.3. Surface and Ground Water**

There are no surface water resources in close proximity to the site for the proposed development. According to the Geotechnical investigation “no free standing water was encountered within all the excavated the test pits number. However across the site, slightly moist conditions have been encountered in more than 90% of the excavated trenches. For period on which the trenches where open, there was no groundwater seepage observed”.

### **1.3.4. Ecological Characteristics**

#### **1.3.4.1. Fauna**

No red data listed Fauna is expected to frequent or occur on the sites due to the limited habitat diversity and a place for shelter. The other factor that limits the sites from any Faunal activities is the frequent pedestrian and vehicular movements in close proximity to the sites.

#### **1.3.4.2. Flora**

Tholoana Consulting appointed Eco Assessments to conduct an ecological scan for the proposed development. As per the assessment the vegetation on the sites is described as the Gold Reef Mountain Bushveld and the Soweto Highveld Grassland. The two vegetation types are categorised under the Least Threatened vegetation. According to the assessment no scarce flora has been recorded on the site or within the vicinity of the site according to GDARD records. In order to verify this info the site inspection done indicated that there is a low likelihood of scarce species occurring on the sites. One other key feature to mention from the report is the rocky outcrop areas along Helena Street which have been altered where from the herbaceous layer scarcer species would more likely occur.

### **1.3.5. Cultural & Heritage Resources**

There is a Heritage building along Helena Street. According to the Heritage Impact Assessment conducted by Vhufa Hashu heritage consultancy, the structure constitutes the cultural landscape of the study area. Though there are no available written documents on

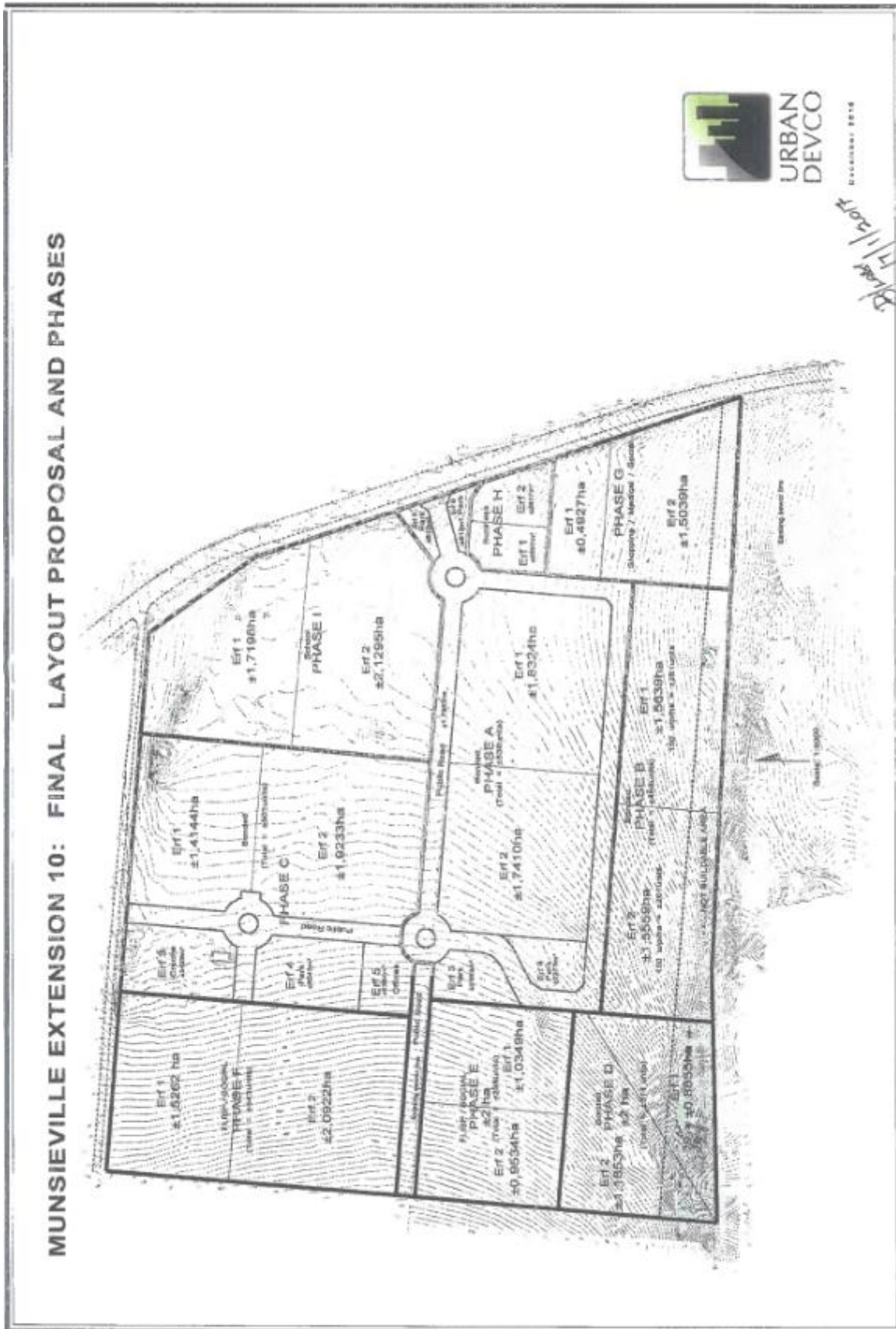
the building synthesis, architectural style and design show some elements associated with the early 1930-1940s and could be associated with the birth of Sterkfontein hospital in the early 1940s or early period (this time period is referred to as remains of the 19th Century). These remains are older than sixty years and therefore qualify as historical remains.

Historical buildings and associated infrastructures are significant for their “object” value, design and building style and they relate to a certain period associated with group or sub cultural group of the community and environment in which they occur. Historical remains are protected by section 35 of the National Heritage Resources Act (No. 25 of 1999). These buildings may not be affected (demolished, altered, renovated or removed) before the Provincial Heritage Resources Authority-Gauteng or South African Heritage Resources Agency (SAHRA) has approved such alterations.

#### **1.3.6. Zoning**

The properties for the proposed development are currently zoned agricultural. A rezoning application will be done by Urban Devco Town Planners. Refer to the approved layout for the rezoning. The properties will be rezoned to residential, educational and business areas.

Figure 2: FINAL APPROVED LAYOUT



### **1.3.7. Surrounding Land Uses**

These properties are bordered to the north by Helena street and the Sterkfontein Psychiatric Hospital, to the south by Munsieville Extension 5 (RDP Houses), to the east by R563 (Van Riebeeck Road) and to the west by Munsieville Extension 4 (RDP Houses).

### **1.3.8. Agricultural Potential**

The properties fall within an area zoned 1-Urban Development zone as per the Gauteng Provincial Environmental Framework. The intention of these zones is to streamline urban development activities, promote development infill, densification and concentration of urban development. In turn this minimizes urban sprawl into rural areas. It is unlikely that the properties have any agricultural potential.

### **1.3.9. Socio-Economic Environment**

The Demographic profile as per the Market Study conducted by Demacon Studies was based on the surrounding Munsieville area and part of the Sterkfontein

The Munsieville area comprises of approximately 26 314 people with household numbers that could be around 9 147. In terms of the household size, it can be expected that about 2.9 people live in one household.

#### **➤ Age profile:**

- ✓ 33.1% of males, 34.0% of females - between 0 and 19 years
- ✓ 43.8% of males, 39.1% of females - between 20 and 39 years
- ✓ 20.7% of males, 23.3% of females – between 40 and 60 years
- ✓ 2.3% of males, 3.6% of females - 60 years +

#### **➤ Educational profile:**

- ✓ No schooling: 5.7%
- ✓ Some primary: 13.3%
- ✓ Complete primary: 5.6%
- ✓ Some secondary: 42.3%
- ✓ Std 10/Grade 12: 28.8%

- ✓ Higher education: 4.2%
- **Employment Profile:**
  - ✓ 64.4% economically active of which 72.4% are employed and 27.6% are unemployed.
- **Types of Houses**
  - ✓ 43.2% - house or brick structure on separate stand or yard
  - ✓ 39.9% - informal dwelling (shack in backyard)
  - ✓ 11.0% - informal dwelling (shack not in backyard)
- **Tenure status**
  - ✓ 45.3% - owned and fully paid off
  - ✓ 20.9% - occupied rent-free
  - ✓ 18.1% - rented
  - ✓ 15.6% - owned but not yet paid off
- **Average household income (2016)**
  - ✓ R54 909 per annum, R4 576 per month (All LSM)
  - ✓ R117 804 per annum, R9 817 per month (LSM 4 to 10+)
- **LSM Profile**
  - ✓ 61.5% - LSM 1 to
  - ✓ 3 38.5% - LSM 4 to 10+

For more detailed analyses of the above refer to the Market Study done by Demacon studies as attached in this report under Appendix G.

## ➤ Health

Munsieville has two clinics (Munsieville clinic A and Munsieville clinic B) which plays a key role on providing community needs to not travel long distances for health services. This two clinics helps community manage Primary Health Care Services such as operations Child Health Care Program, Maternal health, family planning and HIV and Aids and disease. The main purpose for this two clinics is to provide access to health care to Munsieville community of Mogale City through provision of health care facilities in close proximity to residences

### **1.4. PURPOSE OF THE EMPr**

This EMPr is compiled as per the requirements detailed in Appendix 4 of the EIA regulations 2017 promulgated in terms of the NEMA Act No 107 of 1998 (as amended). The developer must ensure that the conditions set out in this document are carried out to ensure sound management of the environmental impacts during the lifecycle of the proposed Cradle-View Mixed Use Housing Development. In terms of the provisions of the EIA Regulations 2017; this document must also be read as a living document that must be amended or updated periodically as and when required.

The EMPr aims to prevent, reduce or mitigate the negative occupational and safety hazards and environmental impacts, while enhancing the beneficial aspects of the development activities of the proposed Cradle-View Mixed Use Housing Development on the local environment. Some of these activities include: site clearing and establishment, earthworks, installation of bulk services and internal water and sewer reticulation.

The EMPr also outlines measures to be followed in order to reduce the social impacts of the project on local residents and adjacent properties. This document specifies environmental management activities for the different parties responsible for various mitigation tasks during all phases of the project. It therefore forms a key component of the construction contracts, and the specifications laid down in this EMPr will be enforceable under the general conditions of the contracts

The GDARD and MCLM:DIEM may require the developer to provide environmental audit reports on implementation of conditions set out in this EMPr at specified times or intervals. This means that in order to comply with the conditions from the CA and municipal by-laws

and any applicable legislation the Developer must make financial provision for environmental monitoring and compliance audits as a key component of the EMPr.

The purpose of this document is to outline a programme of action to mitigate and manage the impacts of the development on the existing and surrounding environment and to ensure that such impacts do not compromise the environment and people working on or around the site.

The EMPr aims to assist the responsible parties to comply with various legislative provisions pertaining to environmental management for the planning and design, pre-construction activities, construction activities and rehabilitation of the environment post construction.

It is a requirement that this EMPr must be viewed as an extension to the Contractual Documentation issued to the Applicant's agents – Contractors, subcontractors, Consulting Engineers for implementation and compliance during various phases of the development.

In summary, the purpose of this EMPr is to:

- Sketch the background for the development;
- Introduce the structure of the EMPr, particularly in terms of the contractual application of the environmental specifications;
- Highlight the salient features of the EMPr.
- Detail the roles of the various parties with respect to the implementation and monitoring of the EMPr;
- Clarify and streamline the implementation of the EMPr; and
- Outline procedures for proactive environmental management and environmental control, in the event of pollution or similar incidents.

This EMPr considers mitigation measures and recommendations contained in the following documents, commissioned and/or developed during the conceptual stage of the project.

1. Demacon Market Study
2. Traffic Impact Assessment Report
3. Geotechnical Investigation Report



4. Ecological Scan
5. Heritage Impact Assessment Report Phase 1
6. Outline Scheme Report

**Table 1:** Legislation, policies or guidelines are applicable to the proposed project:

<b>Title of legislation, policy or guideline:</b>	<b>Section</b>	<b>Short Description</b>
The Constitution (No 108 of 1996)	Chapter 2 Section 24	Bill of rights Specifies environmental rights
National Environmental Management Act No. 107 of 1998 as amended (NEMA).	Section 2	This section sets out principles that apply throughout the republic to the actions of all organs of state that may significantly affect the environment.
	Section 28	Duty of care and remedial action for environmental damage.
National Heritage Resources Act (No 25 of 1999)	Section 38	Specifies list of activities that require the developer to notify the Heritage Resources Authority as part of the management of heritage resources.
National Environmental Biodiversity Act (No 10 of 2004)		The Act provides for the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.
Occupational Health and Safety Act (No 85 of 1993)		The act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.
National Water Act (No 36 of 1998)		The act serves as a fundamental law relating to the conservation and protection water resources.
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA)		The act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery, this includes the protection of persons against hazards from any work related activities.
National Health Act (Act No 61 of 2003)		The act provides a framework for a structured uniform health system within the Republic, taking into account the obligations imposed by the Constitution and other laws on the national, provincial and local governments with regard to health services; and to provide for matters connected therewith.
National Environmental Management: Air Quality Act (No 39 of 2004)		To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development.
National Environmental Management: Waste Act, 2008 (Act 59 of 2008, as amended)		To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.



Title of legislation, policy or guideline:	Section	Short Description
National Environmental Management Act (No 107 of 1998, as amended), Environmental Impact Assessment Regulations 2017		The purpose of these Regulations is to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.
Hazardous Substances Act (No 15 of 1973)		To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products; to provide for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and to provide for matters connected therewith.
SANS 1186-1		Symbolic safety signs Part 1: Standard signs and general requirements (2008)

All other conditions that may be further specified by the CA and local authority must be included in the EMPr. This EMPr is therefore a stand-alone document, which must be used on site during the life-cycle of the development.

## 1.5. OBJECTIVES OF THE EMPr

The stated objectives of the EMPr are to ensure that:

- a) All project activities are managed in a manner that reduces or avoids negative social and environmental impacts, while enhancing positive impacts;
- b) Timely precautions are taken to forestall damage and claims arising from damages;
- c) Communication between the developer, contractors and affected parties is optimised to ensure that all role-players are aware of their specific responsibilities;
- d) The known risk and hazards are actively managed and monitored according to guidelines laid down in this EMPr;

- e) The completion date of the contract is not delayed due to problems arising from neighbours' concerns with the project.
- f) Accurate records of environmental or social incidents, including accidents or objections and complaints are kept, so that the responsible parties are accountable in the event of claims against the Developer;
- g) Environmental Audit or Compliance Reports are submitted to the Competent Authority and Local Authority in terms of an agreed schedule or as and when required;
- h) Any improvements made in the mitigation of the EMPr due to on-going monitoring of its effectiveness are documented, and then made available for future reference.
- i) In order to meet the preceding objectives, an Occupational Health and Safety Officer as well as the Environmental Control Officer must be appointed by the Developer. The responsibilities of the two abovementioned officers are outlined below under the heading Roles and Responsibilities.

This EMPr also focuses on the key safety risk mitigation measures associated with the development. This EMPr addresses the following phases of the development:

#### **1.5.1. The Planning and Design Phase**

This EMPr provides an ideal opportunity to incorporate pro-active environmental management and occupation health and safety measures to ensure that development occurs in a sustainable manner.

Pro-active safety and environmental measures minimise the risks of major incidents. There is still a possibility of accidental incidents taking place; however, through the incorporation of contingency plans during the planning phase, the necessary corrective action can be taken to further limit detrimental impacts arising from unforeseen/foreseen incidents. An unforeseeable event could be the lack of commitment of key role players to implement mitigation measures as proposed in this EMPr, thus a practical solution to the problem has to be sought. This emphasises the need to see this EMPr as a dynamic working tool that needs to be modified as and when necessary.

### 1.5.2. The Pre-construction and Construction Phase

The majority of impacts identified during this phase will have immediate effect (i.e. noise-, dust-, traffic congestion and air pollution mainly due to vehicular traffic that may result). The other major impact could be visual impacts due to the location of the proposed Cradle View Development, thus this EMPr should suggest precautionary measures to be implemented in line with designs for the development. If the site is monitored on a continual basis during the construction phase, it is possible to identify and mitigate impacts to ensure proper safety and environmental management practices on behalf of the Developer and their Contractor(s). Possible impacts include:

- Removal and/or destruction of natural vegetation.
- Traffic disturbances due to movement of construction vehicles to and from the site.
- Groundwater impacts as a result of leakages from chemicals and surface water impacts caused by sediment loads or run-off of chemicals.
- Soil contamination from oil and/or other chemicals from construction vehicles and equipment.
- Visual disturbances due to lack of proper house-keeping.
- Topography disturbance as a result of earthworks and excavation activities.

The figure below explains briefly how incidents are identified and handled throughout the different phases of the project.

Activate and Communicate	Bring Incident Under Control	Audit	Recovery
			
Developer	Safety, Health & Environmental Committee	Safety, Health & Environmental Audit Team	Incident Recovery Team

	Emergency Operations Centre is located at disaster site
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**Figure 3: Four Phases of an Environmental Incident**

### 1.5.3. The Operational Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase may be minimised, and where possible, avoided.

Monitoring of certain critical aspects such as waste management will still be required. The Developer and/or estate manager will be instrumental in implementing the EMPr during the operational phase.

## 1.6. FINANCIAL PROVISION OR BUDGET FOR IMPLEMENTATION OF EMP

The developer will be required to provide means and resources to implement all aspects of the EMPr for the construction and operational phases. The proposed budget for the EMPr includes professional fees for the Environmental Control Officer and an Occupational Health and Safety (OHSO) Officer. The provisional budget items are estimated in Table 2, and will need to be verified by the Developer.

**Table 2: Financial Provision and Budget : EMPr Implementation**

*Budget per implementation/construction phase*

<u>Cost Items</u>	<u>Monthly (R)</u>	<u>Annually (R)</u>	<u>Remarks</u>
1. Appointment of Environmental Health and Safety Officer	12,000	120,000	
2. Training of HSE Officer	5,000	5,000	Once-off
3. Provision of Environmental, Health & Safety Training and Awareness for Contractors' personnel	6,000	6,000	once-off
4. Travel Costs of HSE Officer	1,000	11,000	
5. Telecommunication, Stationery, etc.	300	3,300	
6. Specialists & ad hoc input	1,000	11,000	only as required
7. Attendance of HSE Officer at HSE committee meetings	1,200	13,200	monthly

8. External HSE Audits	12,000	12,000
<b>Total Estimated Budget</b>	<b>R 38 500</b>	<b>R 181 500</b>

The manner in which the EMP is financed will depend upon the extent to which resources are used for these tasks in-house. The estimated cost of the EMP is therefore conservative, and it will vary depending on the scale and duration of each phase of the project. As a minimum, it is suggested that R 181,500 exl. Vat is set aside for environmental, health and safety monitoring and compliance measures over a 12-month period.

## 2. GENERAL ENVIRONMENTAL GUIDELINES

This document serves as a guideline for the management of environmental impacts during construction by the Environmental Control Officer and site manager, in order to minimize adverse environmental impacts and effects and enhance positive impacts. The EMP provides specifications and regulations that must in all instances be adhered to. It is however the responsibility of all people involved, in committing themselves with the implementation of the EMP in all phases of the project. The developer will be responsible for ensuring compliance of the contractors with the EMP and will rely on the Environmental Control Officer to monitor compliance. The Contractor must monitor his/her employees to ensure the adherence of the provisions of the EMP.

The contractor shall receive a copy of the EMP from the developer on which he/she will be given an opportunity to clear any misconceptions and uncertainties. The EMP will form part of the contract and will therefore be a legally binding document. In the event of discrepancy with regard to environmental matters or environmental specifications this document shall take precedence.

### ➤ Environmental Control Officer (ECO)

The ECO must be appointed before commencement of any land clearing or construction activities by the applicant to assist the contractor/s on site regarding environmental matters on planned monthly basis. Relevant stakeholders must be notified of such an appointment for communication purposes. The contractor shall direct all his/her queries or uncertainties regarding any environmental issues or aspects to the ECO. The ECO will discuss the matter with the project manager, who reports to the Client. In turn the project manager will resolve issues raised by the ECO with the contractor. The ECO shall be

responsible for evaluating compliance of all aspects of the EMPr. Monthly site audits must be undertaken by the ECO and detailed report submitted to the client for review prior to the following audit. If queries arise for issues that cannot be adequately addressed by the ECO, the ECO must seek advice from a person or persons that are specialists and experienced in the relevant field. The ECO shall remain employed until all rehabilitation measures, as required by the EMPr are completed and the site is ready for operation.

➤ **Failure to comply with Environmental Considerations**

All rules and regulations pertaining to the site and municipal bylaws must be adhered to. All outdoor advertising must be below the thresholds stipulated in the EIA Regulations, 2017. The ECO may order the contractor to suspend part of or all operations if the contractor causes damage to the environment by not adhering to the specifications set below. Any environmental degradation/damage must be mitigated/managed within a timeframe stipulated by the ECO, failing which the ECO will have the right to suspend operations or part thereof.

➤ **Environmental Training Programme**

It is the responsibility of the contractor to communicate all aspects of the EMPr to the site staff (i.e. sites agents and labourers) prior to commencement of the project. Basic environmental awareness training should be included with the safety training, tool box tools talks and induction programs. A copy of the EMPr must always be made available on site.

➤ **Progress/Site Meetings**

Environmental management shall be a standing Agenda Point during site meetings. The ECO or a designated person involved with environmental management on the project shall attend the progress and on site meetings on a regular basis to provide feedback on any outstanding or continuous environmental matters, including any lessons learned with a focus on any negative and positive outputs.

## **3. ROLES AND RESPONSIBILITIES**

### **3.1. The Developer**

The developer/applicant is required to adhere to the following:

- All relevant approvals and permits are attained prior to the start of construction activities on site.
- Ensure that the contractor is aware of the specific conditions to be adhered to in line with activities to be undertaken during the construction phase.
- Ensure that any recommendations emanating from the concept design, design, through construction to the operation phase are implemented.
- Ensure that a suitably qualified ECO is appointed before construction activities and for the duration of the construction phase.

### **3.2. The Engineer**

The engineer appointed for the proposed development has the following responsibilities:

- Play a role in the decision making process with the ECO in order to address any environmental problems that may occur during the construction phase.
- Ensure that the requirements as set out in this EMPr and any other conditions stipulated by the relevant Authorities are implemented;
- Monitor compliance with consultation with the ECO on the contractor's obligations on construction activities.
- Consult the ECO on the review of the construction method statements.
- Exercise and take actions on compliance of specifications by the ECO on site.
- Play a role on internal reviews ECO EMPr review.

### **3.3. The Contractor**

In line with the implementation of this EMP, the contractor refers to the organisation or individual that has been appointed to carry out the work as required by the Developer. The contractor is required to adhere to the following in terms of this EMP:

- Ensure that the affected landowners are informed about your (the contractors) presence on their property.

- Immediately report any damage to property or the environment to the Applicant. The damage must be repaired immediately to the owner's written satisfaction.
- No wandering around adjacent properties. Access is limited to the farm tracks area and the site only.
- The public and all property are to be treated with respect at all times.
- Ensure that all stipulations within the attached EMPr are communicated to and adhered to by the Applicant and Engineers and its contractors.
- Monitor the EMPr throughout the project by means of site visits and meetings. This should be documented as part of the site meetings minutes.
- Ensure that all clean up and rehabilitation or any remedial actions that are required are completed prior to the issuing of a closure certificate.

### **3.4. Environmental Control Officer (ECO)**

The Environmental Control Officer will oversee all the environmental aspects relating to the development. The ECO must be a suitably qualified Environment Scientist with experience in managing environmental impacts. The ECO must be appointed during the planning phase and must form part of the project management team. She/he must attend monthly project meetings, compile periodic Environmental Compliance Reports (ECRs) to evaluate compliance with the EMPr and be responsible for providing feedback on potential environmental issues associated with the facility. The ECR must contain information on the implementation and compliance of the EMP with the conditions of the Local authority (MCLM: DIEM) and with the directives of the Competent Authority. In addition, the ECO must be responsible for:

- Liaison with relevant authorities, i.e. the South African Heritage Agency, MCLM:DIEM and GDARD.
- Liaison with contractors regarding environmental issues : and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, whenever necessary.

The ECO will be responsible for monitoring compliance. The onus is on the Developer to ensure that the Contractor(s) complies with the conditions set out in this EMP.



### **3.5. OCCUPATIONAL HEALTH AND SAFETY OFFICER (OHSO)**

The OHSO must be suitably qualified in occupational health and safety with experience in managing occupational health and safety incidents. The OHSO must be appointed during the planning phase and must form part of the project management team. She/he must attend monthly project meetings; audit the site for compliance with the Occupational Health and Safety Regulations; compile periodic health and safety compliance reports to evaluate compliance with the EMPr and be responsible for providing feedback on potential health and safety problems associated with the site. Such reports must contain information on the implementation and compliance of the OHSA Regulations.

In addition, the OHSO must be responsible for:

- Liaison with relevant authorities, i.e. Department of Labour on occupational health and safety issues.
- Liaison with contractors regarding health and safety compliance.

The OHSO will be responsible for monitoring compliance, rather than enforcing it.

## **4. KEY ENVIRONMENTAL ISSUES**

### **Key issue 1: Biophysical impacts**

There are a number of potential impacts on the biophysical environment that may result from the project life stages. Such impacts must be mitigated by following the guidelines set forth in this EMPr. The ECO is responsible for monitoring compliance on the mitigation measures set out in this EMPr and must compile regular compliance reports. The key issues to be considered are as follows:

- Poorly managed storm water
- Vegetation clearing and topsoil management
- Poor stock piling of soil

## **Key issue 2: The social environment**

It must be emphasised that whilst there are a number of impacts relating to the occupational health and safety, fire risk and groundwater/surface water contamination, this development will be of major significance on the lives and means of livelihood of a fairly large group of people who make up the surrounding community. Therefore, a major focus of the EMPr is on reducing/mitigation the negative social impacts, while enhancing the expected positive benefits and spin-offs of the development. Two groups of people were identified as affected parties: employees of the construction company involved in the development and the community in close proximity to the site. In this regard the social issues raised in the public consultation process must be taken into account. Therefore, implementation of the project must take into account key impacts that affect people and their well-being. The following social issues can be linked to safety hazards.

- Change in air quality due to increased dust during construction activities.
- Increase in traffic congestion.
- Increased services.
- Temporary visual impacts due to construction activities.
- Increased noise as a result of construction activities.

## **Key issue 3: Safety Hazards and Risks**

The key issues and impacts that must be managed pertain to safety hazards and risks that could arise due to human error or negligence leading to a major or minor incident. If the incident is a major one, with a severe impact, it is considered as a Disaster. Key negative impacts that this EMPr addresses are:

- Uncontrolled fire risks.
- Operation of dangerous construction equipment by unqualified personnel.
- Safety and health risks due to potential hazards on site such as vehicles, equipment/machinery.

- Vehicle and pedestrian accidents due to an increase in traffic.

## 5. ENVIRONMENTAL MANAGEMENT PROGRAMME

The intention of this section of the EMPr is that it forms a stand-alone document, which can be used as an integrated environmental, health and safety management tool during the various phases of the project.

The following table forms the core of this EMPr for the planning, pre-construction and construction and operational phases of the development. This table must be used as a checklist on site during each phase of the development. Compliance with this EMPr must be audited monthly during the construction phase and once immediately following the completion of construction. This must be followed up with annual audits.

## PLANNING AND DESIGN PHASE EMP

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Planning &amp; Design</b>			
<b>General compliance reporting</b>	<p>This EMPr will be made binding on the developer, the design team, contractors and subcontractors working on the site.</p> <p>The special conditions of the contract must include provision for the strict adherence to and compliance with this EMPr as well as the general and specific conditions from the CA and Local Authority.</p>	Developer	Once off
	<ul style="list-style-type: none"> <li>The Developer must appoint an Occupational Health and Safety officer (OHSO) and Environmental Consultant/Environmental Control Officer to oversee the safety, health and environmental aspects of the project respectively.</li> <li>The OHSO and ECO must form part of the project management team and must attend all project meetings.</li> </ul>	Developer	Once off
<b>Planning</b>	<ul style="list-style-type: none"> <li>Resources should be made available to ensure the construction of the proposed development is carried out as per the relevant legislative requirements</li> <li>This EMP is binding and will form part of all agreements between the developer and contractors</li> <li>All recommendations from specialist studies must be incorporated in the planning phase</li> </ul>	Developer	Once-Off

## CONSTRUCTION PHASE EMP

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Employment</b>	<ul style="list-style-type: none"> <li>The contractor shall ensure that local labour is used where possible in order to improve the local economy of the area.</li> </ul>	Contractor	Once off
<b>Site Establishment</b>	<ul style="list-style-type: none"> <li>The construction area must be clearly demarcated and fenced off using shade cloth fencing.</li> <li>The location of the site camp should be agreed on by the contractor and ECO. A layout showing the positions of the storage areas, vehicle servicing areas and waste stockpiling areas should be presented by the Contractor for approval by the ECO.</li> <li>All no go areas, within and outside of the boundary should be indicated and the personnel on site should be made aware of such areas.</li> <li>Appropriate signage must be placed on site for the public to be aware of the construction activities.</li> <li>The site camp should not be located on any inclined slopes.</li> <li>The construction camp should have waste storage areas</li> <li>Sufficient space to accommodate all other equipment's required or to be used for the construction activities should be available.</li> </ul>	Contractor	Once-Off

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
	<ul style="list-style-type: none"> <li>No maintenance of construction vehicles should take place on site, in order to prevent soil contamination. If it happens that the maintenance of construction vehicles takes place on site, it should be done at a designated area as agreed with the ECO and the area should have an impermeable lining to contain any spillages. Any surface water runoff from this area should be directed to a container/basin for disposal as the water would be contaminated.</li> <li>A suitable area should be allocated where personnel should take their breaks.</li> <li>Access control measures should be implemented and adhered to on site.</li> <li>The contractor should provide portable toilets and implement a scheduled maintenance plan.</li> <li>Disposing of waste from the portable toilets on the environment is prohibited.</li> </ul>	Contractor	On-Going
	<ul style="list-style-type: none"> <li>Recommendations on the traffic impact assessment should be adhered to. This includes but not limited to speed regulations.</li> <li>The existing access roads to site should be used as far as possible</li> </ul>	Contractor	Once-Off

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Waste Management</b>	<b>General Waste</b> <ul style="list-style-type: none"> <li>An agreement should be reached with the MCLM: DIEM on the general waste collection intervals and containment to be used for collection purposes i.e. waste skips.</li> <li>In order to ensure that littering is avoided or minimised on site sufficient general waste containers should be made available for collection purposes.</li> <li>No general waste should be mixed with hazardous waste.</li> <li>Waste separation should be implemented on site, thus waste containers for different waste streams should be provided.</li> <li>No waste should be burnt on site.</li> <li>All the generated general waste should be removed on a daily basis within the construction areas and disposed off at designated areas on site.</li> <li>A fenced off area designated for disposal of general waste and sorting must be provided on site.</li> <li>The MCLM: DIEM should be informed prior construction activities on the commencement of activities on site.</li> </ul>	Contractor	Daily
	<b>Hazardous Waste</b> <ul style="list-style-type: none"> <li>Containers for hazardous waste should be clearly labelled and be leak proof i.e. for greases and oils drip trays can be used with lids.</li> <li>A designated area for hazardous waste with an impermeable surface should be provided.</li> </ul>		

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Impact on Geology, Soil and Erosion</b>	<ul style="list-style-type: none"> <li>• Recommendations from the Geotechnical investigation report completed form part of conditions of this EMP and should be adhered to.</li> <li>• The topsoil removed should be stockpiled in a designated area</li> <li>• Topsoil should not be used for infilling purposes.</li> <li>• Topsoil stockpiles should be protected from wind action and rain to avoid loss.</li> <li>• Soil erosion control measures should be implemented (e.g. re-vegetation, reseeding of grasses and land preparation). Any cleared areas should be stabilised in order to prevent and control surface erosion.</li> <li>• Where applicable construction activities should be phased in order to restrict the removal of vegetation to working areas.</li> <li>• Areas where construction activities are to take place should be demarcated to ensure that areas outside the construction site are not disturbed.</li> <li>• Drainage control measure should be implemented in order to manage surface water runoff that may result in erosion.</li> </ul>	Contractor	On-going



Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Surface and Groundwater Impacts</b>	<ul style="list-style-type: none"> <li>• No water should be abstracted from any water resource for the purpose of construction activities without a water use license</li> <li>• Stockpiling of soil should be done at designated areas as agreed by the contractor and ECO</li> <li>• Soil erosion and loss measures should be implemented.</li> <li>• Construction activities should be limited to the footprint of the proposed development.</li> <li>• Mixing of cement must take place on impervious surfaces. Any runoff from these areas should be contained for disposal at a disposal facility.</li> <li>• Regular construction vehicle's checks prior to being used or during their standing period should be done in order to limit or avoid soil contamination.</li> <li>• No servicing of construction vehicles must take place within the site, to avoid soil contamination with hydrocarbons or oils. Shall it happen that the servicing of vehicles takes place on site; this should be done at a designated impervious surface.</li> <li>• Chemical portable toilets provided by contractors must be maintained for the duration of the construction phase.</li> <li>• Water conservation should be promoted by use of water saving technologies. Awareness on water use should be done during awareness trainings.</li> </ul>	Contractor	On going

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Air Quality Dust and Odour</b>	<ul style="list-style-type: none"> <li>Chemical toilets should be cleaned and serviced weekly depending on usage or as required.</li> <li>Fires should not be allowed on site to avoid emissions into the surrounding ambient air.</li> <li>All surfaces that are not paved and generate dust should be sprayed using a water tank continuously, or other environmentally friendly dust suppressing agents can be used to limit the generation of dust.</li> <li>Vehicular speed to the construction site should be regulated, in order to limit the generation of dust on houses along the access route to site.</li> <li>Any rubble generated during construction shouldn't be left on site for more than two weeks as it will become susceptible to wind action.</li> <li>Unnecessary movement of construction vehicles must be avoided.</li> <li>Vehicles that will be transporting building materials such as sand or rubble need to be covered or wet down to avoid the material being blown by air during windy conditions.</li> <li>The topsoil removal must be done in a phased manner so that large areas of unconsolidated soils are avoided.</li> <li>A register must be made available for reporting any excess dust from construction activities.</li> <li>Any remedial action taken in relation to a complaint must be communicated to the complainant.</li> </ul>	Contractor	On-going

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Flora and Fauna</b>	<ul style="list-style-type: none"> <li>The clearance of vegetation on site must be restricted to construction areas.</li> <li>The disposal of vegetation on neighbouring properties is prohibited.</li> <li>All cleared vegetation should be disposed off at a licensed landfill site. Burning of vegetation is prohibited on site.</li> <li>The sites for development should be scanned for medical plants prior to construction. Any encountered medical plants should be relocated to a suitable alternative site.</li> <li>On completion of the construction activities, any landscaping done should use indigenous plants.</li> </ul>	Contractor	Once-off
<b>Noise Management</b>	<ul style="list-style-type: none"> <li>All operations during the construction phase must be compliant with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993).</li> <li>Activities which involve excessive noise, levels above 85dBA must be prohibited at certain times during construction.</li> <li>On site personnel working on areas where the threshold exceeds the ambient 8 hour noise levels (75dBA) should be provided with PPE to assist in reducing noise level impacts</li> <li>Construction activities must be limited to working hours (from 7am to 5p.m) during the week, not including public holidays.</li> </ul>	OHSO	On-going

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
	<ul style="list-style-type: none"> <li>Signage informing the public of construction activities should be erected on site.</li> <li>Should it happen that construction will take place after working hours the neighbours/IAPs needs to be notified.</li> <li>Construction vehicles and equipment should be maintained in good working conditions.</li> <li>When required, the CLO (Community Liaison Officer) must inform the community of any planned noise disturbances outside of normal working hours.</li> </ul>	Contractor	Once-off
<b>Storm Water Management</b>	<ul style="list-style-type: none"> <li>Storm water management plan should be implemented during and after construction.</li> <li>The contractor and engineer should have a storm water control plan prior to any construction activities. This plan is to be approved by the ECO.</li> </ul>	Engineer	Daily
<b>Visual Aesthetics</b>	<ul style="list-style-type: none"> <li>The site must be screened off by use of fence with shade cloth.</li> <li>Construction camps and stockyards should be located out of the visual field of highly sensitive visual receptors such as residents.</li> <li>The construction sites and camps should be kept neat, clean and organised in order to portray a general tidy appearance.</li> <li>Rubble and other building litter should be removed off site as soon as possible or placed in a container in order to keep the construction site free from additional unsightly elements;</li> <li>Dust suppression measures should be implemented; this includes regulating speeds along access routes to site.</li> </ul>	Contractor	On-going

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Fire Management</b>	<ul style="list-style-type: none"> <li>• No Fires may be made on site.</li> <li>• Burning of waste on site is prohibited.</li> <li>• Compliance reports must be compiled regularly by ECO and OHSO to ensure full compliance with the EMPr.</li> <li>• The facility must be equipped with firefighting equipment which will include;               <ol style="list-style-type: none"> <li>1. Flame arresters</li> <li>2. Water sprinklers</li> <li>3. Gas/ Fire detection equipment</li> <li>4. Nitrogen and carbon dioxide blanketing equipment</li> <li>5. Foam spraying</li> </ol> </li> <li>• The fire-fighting equipment should be satisfactory to the Local Fire Services.</li> <li>• Key personnel should be allocated to manage fire emergencies.</li> </ul>	Contractor	On-going

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Safety and Security</b>	<ul style="list-style-type: none"> <li>• The contractor must ensure adherence to the health and safety plan for the proposed development.</li> <li>• Signs on site must be erected on areas that require PPE.</li> <li>• Trenches which have been excavated must be cordoned off to prevent injury to people who are not aware of their existence.</li> <li>• Emergency contact information should be provided and displayed at the contractor's office and site entrance</li> <li>• The use of PPE should be enforced on site at all times. This includes visitors.</li> <li>• The construction site must be adequately fenced off or access must be restricted to prevent unauthorised persons from entering the construction site.</li> <li>• Appropriate medical equipment must be placed on onsite and made accessible at all times.</li> <li>• An HIV/AIDS policy should be placed at the construction office and implemented by the contractor. HIV/AIDS awareness should form part of safety training, toolbox tools and induction programs.</li> <li>• The appropriate number of staff members must be adequately trained in first-aid in accordance with the Health and Safety Regulations.</li> <li>• 24 Hour security must be provided at the construction site.</li> <li>• Suitable barricades must be erected to secure the site and to avoid unrestricted access to the site during construction activities.</li> <li>• Appropriate signage board/s must be placed on site informing the public on construction activities taking place on site</li> </ul>	Contractor	On-Going

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Construction Phase</b>			
<b>Heritage Resources</b>	<ul style="list-style-type: none"> <li>Any heritage resources encountered during the construction phase should be reported to PHRAG.</li> <li>On account of any Heritage Resources discovered activities should stop for further indication in terms of commencement from PHRAG after investigations have been commissioned and concluded with recommendations.</li> <li>The Heritage Building along Helena Street should not be demolished without authorisation from PHRAG/SAHRA</li> </ul>	Contractor	On-Going
<b>Social Impacts</b>	<ul style="list-style-type: none"> <li>Appropriate signage board/s must be placed on site informing the public on construction activities taking place on site</li> <li>A suitable candidate to assist with the employment of local labour and resolving any community disputes should be appointed.</li> <li>Construction activities must be limited to working hours (from 7am to 5p.m) during the week, not including public holidays.</li> <li>An HIV/AIDS policy should be placed at the construction office and implemented by the contractor. HIV/AIDS awareness should form part of safety training, toolbox tools and induction programs.</li> <li>The contractor should ensure that the complaints and environmental incident register are on site.</li> <li>On a agreed schedule with the CLO feedback should be provided to the affected community in line with construction activities.</li> </ul>	Contractor	On-Going

## OPERATIONAL PHASE EMP

Aspect Impact/Issues	Mitigation Measures/Actions	Responsible party	Frequency of Action
<b>Operational Phase</b>			
<b>Waste Management</b>	<ul style="list-style-type: none"> <li>An agreement with the MCLM: DIEM should be in place on collection intervals for all the General Waste generated, for disposal at the Luipaardsvlei landfill site.</li> <li>Where applicable waste management should follow the integrated waste management approach of waste segregation at source and recycling prior to collection for disposal at the licensed landfill site. Different waste containers with differential colours should be provided at designated disposal areas within the development.</li> <li>An agreement can be reached with a local external recycler on collection intervals for waste to be recycled.</li> </ul>	Developer	On-going
<b>Traffic Management</b>	<ul style="list-style-type: none"> <li>Recommendations as contained in the Traffic Impact Assessment (TIA) should be implemented i.e. on the development access, implementation of - Eastbound approach leg with 2 right-turning lanes and 1 left-turning lane; Southbound right-turning lane measuring approximately 120 m; Northbound left-turning lane measuring approximately 120 m; and Optimize the traffic three-phase signal settings at 70 seconds cycle length for both the AM and PM peak hour periods respectively.</li> </ul>	Developer	Once-Off
<b>Post Construction Rehabilitation</b>	<ul style="list-style-type: none"> <li>The rehabilitation of disturbance surfaces should occur concurrently with the construction activities. This will ensure that all required rehabilitation would be completed prior to the operation of the development.</li> <li>All building rubble and waste should not be on site, these should be disposed off at a licensed landfill site.</li> <li>The landscape plan should be implemented, which includes the use of local indigenous vegetation.</li> </ul>	Contractor	Once-Off



## 6. CONCLUSIONS AND RECOMMENDATIONS

This Environmental Management Programme (EMPr) must be used as an on-site reference document during all phases of this development, and auditing must take place in order to monitor compliance with the EMPr. Parties responsible for transgression of this EMPr must be held liable for any rehabilitation that may be required. Parties found liable for environmental degradation through irresponsible behaviour, negligence and/ or non-compliance with the EMPr must receive penalties such as an order to cease activities, withdrawal of the authorisation and/or civil or criminal proceedings to enforce compliance with the EMPr and applicable legislative frameworks.

This EMPr was prepared in terms of the well-recognised integrated environmental management principles and relevant occupational health and safety principles. It is based on the strengths of the information prepared at the time. It must therefore be a living document that is updated and revised based on challenges which arise on site during monitoring. If there are any queries please address them to:

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PO Box 1549

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Acceptance and Commitment to the EMP

\_\_\_\_\_ (Signature)

Name: \_\_\_\_\_

Developer

Date: \_\_\_\_\_