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DEVELOPMENT OF THE ENDANGERED WILDLIFE OPERATIONAL CENTRE ON PORTION 6 OF FARM RUIMTE-74 IN THE DINOKENG GAME RESERVE, LIMPOPO PROVINCE

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

February 2023

PO Box 12410 • Die Boord 7613 • South Africa

www.legacyemc.co.za

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AUTHOR	Lauren Abrahams
PEER REVIEWED BY	Kim Pontac
CLIENT REF. NO.	-

COMMISSIONED BY

Endangered Wildlife Operational Centre (NPC)

234 Harold Kitson Crescent

Alexander Mews Complex Unit 5

Pretoria

0004

Tel: 072 189 1033

rhugo@ewoc.co.za

frans@ewoc.co.za

CONSULTANT

Legacy Environmental Management Consulting (Pty) Ltd.

PO Box 12410

Die Boord

Stellenbosch, 7613

Tel: (021) 887 4000

Fax: (021) 2051966

info@legacyemc.co.za

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Lauren Abrahams

(Environmental Assessment Practitioner)

Signature of the Environmental Assessment Practitioner

Legacy Environmental Management Consulting (Pty) Ltd.

Name of the Company

February 2023

Date

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Terminology

The following abbreviations are used in this report:

Abbreviations	Description
BA	Basic Assessment
BAR	Basic Assessment Report
BLM	Bela-Bela Local Municipality
BPEO	Best Practical Environmental Option
CA	Competent authority
CARA	Conservation of Agricultural Resources Act, (Act 43 of 1983)
CBA	Critical Biodiversity Area
CBO	Community Based Organisation
DFFE	Department of Forestry, Fisheries, and the Environment
DGR	Dinokeng Game Reserve
DoA	Department of Agriculture
DoH	Department of Health
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report/
EMC	Environmental Management Consulting
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
ESR	Engineering Services Report
EWOC	Emdamgered Wildlife Operational
FMP	Fire Management Plan
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GNR	Government Notice Regulation
GPS	Global Positioning Systems
ha	Hectare
HCRW	Health Care Risk Waste
HIA	Heritage Impact Assessment

Abbreviations	Description
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LUPA	Land Use Planning Act, (Act 3 of 2014)
NEM:BA	National Environmental Management: Biodiversity Act, (Act 10 of 2004)
NEMA	National Environmental Management Act, (Act No 107 of 1998)
NEMWA	National Environmental Management: Waste Act, (Act 59 of 2008)
NGO	Non-Governmental Organisation
NHRA	National Heritage Resources Act, Act 25 of 1999
NPC	Non-Profit Company
NWA	National Water Act
PPP	Public Participation Process
PSDF	Provincial Spatial Development Framework
RPA	Ratepayers Association
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SDP	Site Development Plan
ToPS	Threatened or Protected Species
WDM	Waterberg District Municipality
WWTP	Wastewater Treatment Plant

1 ACTIVITY INFORMATION

1.1 Introduction

The Environmental Management Programme (EMPr) outlines the procedures that control the way the Applicant[1], Endangered Wildlife Operational Centre (NPC), the Project Manager, and the Contractors appointed for the various construction and operational phase activities shall conduct himself/ herself/ themselves whilst undertaking the development of the Endangered Wildlife Operational Centre on Portion 6 of Farm Ruimte-74 in The Dinokeng Game Reserve, Limpopo Province.

The EMPr covers the spectrum of pre-construction, construction, and operation phases and incorporates the recommendations of the Basic Assessment Report (BAR) and specialist studies in respect of the various actions that need to be taken to avoid / minimise / mitigate potential adverse impacts and enhance potential beneficial impacts of the project.

The EMPr describes impact management outcomes and impact management actions that need to be implemented during the various phases of the proposed project, including the careful implementation and management of the various proposed activities on the property from conception to implementation. The focus is usually placed on the activities to occur on the application properties; however, consideration of the adjacent or receiving environment (socially and ecologically) is equally important.

The impact management actions represented in this EMPr should not be regarded as static measures, but rather as procedures that can be adapted, as and when site conditions require. This EMPr sufficiently serves to provide the most practicable methods to promote sound environmental management during the construction and operational phases of the development. The EMPr subsequently is an on-site working and dynamic document.

This EMPr must be read in conjunction with the BAR, and the conditions of authorisation that the Limpopo Department of Economic Development, Environment and Tourism (LEDET) is likely to put forward should authorisation be granted. In the unlikely event of any conflicting responsibilities or procedures, the precautionary principle must be adopted. Hard copies of the aforementioned documents should be kept on-site along with the EMPr.

The EMPr is a fundamental element of the management process that aims to ensure the proposed development's environmental sustainability. The implementation of the EMPr will also aim to ensure that the conditions of approval laid down by the competent authority will be met. It is imperative for the EMPr to be actively implemented and used at all management levels as an integral part of the project. It is equally important to revise the EMPr according to information available from the monitoring processes during the construction and operational phases and any new management practices that may be developed in the future.

1.2 Property Description

The Applicant, Endangered Wildlife Operational Centre (NPC), proposes the development of the Endangered Wildlife Operational Centre (EWOC), located on Portion 6 of Farm Ruimte-74 in the Dinokeng Game Reserve (DGR), Limpopo Province. Refer to Error! Reference source not found.. The property details are as follows:

- Portion 6 of Farm Ruimte-74 (SG Code: T0JR00000000007400006), ±342,857 m^2 in extent.

[1]The term 'Applicant' and 'Holder of the Environmental Authorisation' are interchangeable.

1.3 Project Description / Components (Scope)

The current scope of the proposed development includes activities relating to the application, constitute the clearance of indigenous vegetation for the proposed development of The proposed facilities, land uses, and footprint of the proposed development include the following:

- Staff accommodation –
  - Managers House ~192 m^2;
  - Volunteers Camp ~120 m^2;
  - A dining hall, kitchen and Back of House (laundry etc.) ~216 m^2;
- Fully equipped veterinary hospital ~3783 m^2, which will comprise of –
  - Holding Area;
  - Outdoor Aviary;
  - Theatre Rooms;
  - Offices; and
  - Reception;
- Wildlife animal enclosures: [2]short and long-term holding facilities for compromised patients with a development footprint of ~6 711 m^2, which includes –
  - Rhino boma-paddock holding ~864 m^2;
  - Elephant stockades ~ 864 m^2;
  - Wild Dog bonding boma ~317 m^2;
  - Cheetah Recovery Camp ~1 144 m^2;
  - Small Animal Reproduction Area ~216 m^2;
  - Buffalo Quarantine Boma ~1 728 m^2;
  - Horse Pen ~314 m^2;
  - Horse Stable ~64 m^2;
  - Horse Paddock ~1 200 m^2;
  - Future animal holding areas ~30 255 m^2;
- Other zones which entail:
  - The MEP/Tourism Information Hub ~255 m^2;
  - 5 m Clearance Building Platforms ~18 300 m^2; and
  - Access Roads (gravel) ~5 423 m^2.

Existing Services and Access Roads on the site –

As per the Civil Engineering Services Report (dated November 2021, by WEC Consulting Engineers), water for the proposed development is intended to be sourced from an existing active borehole (BH7) located near the proposed development location.

Road infrastructure to the location comprises gravel roadways surrounding the plot's perimeter, which is accessed mainly via the N1 freeway, onto the R734 offramp and a gravel road (parallel to the N1) for an

[2] Design specifications of enclosures must meet Big 5 Game fencing standard as a minimum requirement. Refer to fencing specifications included As Appendix I of the Draft BAR.

approximated 25 km. There are also minor gravel roads surrounding the nearby existing development on the Eastern portion of the Farm.

No formal stormwater or sewer infrastructure currently exists near the proposed site location.

Water Supply Infrastructure –

A preliminary layout of the internal water reticulation network will only be available during the detailed design phase.

As per the Civil Engineering Services Report (WEC, 2021), the average daily water demand for the proposed development is 0.84 peak flow (l/s). As indicated above, water will be sourced from the existing borehole (BH7), which is located at the following coordinates 25º16'41.5" S 28º21'03.7" E.

The proposed site is located within the Quaternary Catchment '*A23C*'. The National Water Act (No. 36 of 1998) (NWA) permits a maximum abstraction volume of groundwater at this location in the '*A23C*' catchment at *45 m³/ha/year*.

As per the Borehole Test Certificate (dated 27 May 2021, by Boorgat Guru), the actual yield of the existing borehole is 6 000 litres per hour, while the maximum allowable groundwater abstraction volume calculated is *30 Ha x 45 m³ = 1.35 ML* per year. Further, this equates to a maximum abstraction rate of approximately *3 700 L/day* that may be abstracted from this borehole.

In terms of Section 21 of the NWA, a Water Use Authorisation will be required for the following listed water use triggered by the proposed development:

- Section 21(a): taking water from a water resource.

The water use authorisation will most likely require a General Authorisation process to be followed. A pre-enquiry application has been loadged for the above water use on the eWULAA online portal. Refer to the proof of submission included in **Appendix H** of the Draft BAR.

Other potential water useswhich may be triggered by the facility includes:

- Section 21(b): storing water;
- Section 21(e): engaging in a controlled activity (irrigation with waste water); and
- Section 21(g): disposing of waste in a manner which may detrimentally impact on a water resource.

The above-mentioned water uses will likely fall within the General Authorisation (GA) provisions and depending on the volume of water stored and the quality of the treated effluent water produced by the Waste Water Treatment Plant (WWTP), only a Water Use Registration may be required. Furthermore, EWOC are aware that a Water Use Licence Application will be applicable if the volume of water abstracted exceeds GA thresholds and the quality of treated effluent water does not comply with GA quality standards. The applicability of these water uses can however only be determined once the detailed designs which confirms the volume of water to be stored, as well as the the volume and quality of wastewater produced at the WWTW has been provided.

Therefore, the only water use deemed applicable at this stage, for which application has been made is in terms of Section 21 a of the NWA.

Storm Water Reticulation –

As per the Civil Engineering Services Report (WEC, 2021), This proposed development site's elevation is the lowest of the surrounding farm portion, near the existing gravel road intersection. No local or regional stormwater detention facilities are located nearby the site. The stormwater will discharge onto the surface at the lowest point of the site and join the natural watercourse for runoff flowing towards the Pienaars River. Erosion protection or energy dissipation structures may need to be utilized due to the nature of the topsoil.

Sanitation –

As per the Civil Engineering Services Report (WEC, 2021), the peak wet weather flows for the project site is estimated at 0.45 l/s. The Average Daily Water Demand and Peak Factor criteria have been taken from the Neighbourhood Planning and Design Guide (Known as "Red Book" – 2005 & 2019) for zoological activities, amongst the habitable and non-habitable facilities.

A preliminary layout of the internal sewer reticulation network will only be available during the detailed design phase.

Connection of a new internal sewer network cannot be made to nearby existing infrastructure due to the remote location of the development site. Therefore, sewerage generated by the facilities on the site will be discharged onto a closed system/package plant. EWOC proposes using the CALCAMITE BloMite Treatment Plant, a SABS approved septic tank. From the septic tank, sewage is transferred to the Waste Water Treatment Plant (WWTP) tanks, treated to an odourless and clear waste water, to a water quality standard that is safe for re-use for irrigation or dust suppression on the site. The system is entirely automated and requires no full-time operator on site.

As per the technical specifications of the WWTP, the daily flow-through rate is ~30 000 ℓ capable of handling ~350 bodies with a typical hydraulic load of 25 ℓ per minute per m^2. The WWTP will be constructed within concrete bunds to capture potential spills and prevent possible soil and groundwater contamination. The WWTP will reach full working efficiency within ninety days (bio-mass to be build up) on the condition that eco-friendly chemicals are introduced and maintained at all times. The Department of Water and Sanitation (DWS) has previously approved this specific package plant; references of current installations include the Ritsako Game Lodge (within the Dinokeng Game Reserve); Empangeni Buckanana Clinic; Iswowi Clinic; Josini Clini; Pretoria O.M Training Base; Magaliespark Resort, to name but a few.

Solid General and Health Care Risk Waste –

The general solid waste generated by the Facility will be removed by a private waste management service provider on a weekly basis and disposed of at a suitably licenced WMF.

In addition, the health care risk waste generated by the Facility will be removed by Compass Medical Waste Services (Pty) Ltd, where it will be disposed of at a suitably licenced WMF.

Electricity Supply –

As per the Electrical Load Services Report (Elfranja Boerdery CC, August 2021), there is an 11kV line with a 50kVA transformer next to the site that currently feeds the Farm and would be available to feed the load of the Facility.

However, considering the current power shortages affecting South Africa, it is recommended that EWOC considers powering portions of the Facility (such as the electric fencing and lights) from a small solar system(s). This can easily be applied to all the animal enclosures remote from the main hospital. It may also be feasible to consider installing a bigger solar system for the main hospital to circumvent load shedding and also to save some costs. It would eliminate the need for a standby generation unit if designed correctly. This should be considered in the detail design of circuits even of this option will not be implemented initially. Design the system with essential and non-essential loads separate with separate feeds.

Refer to the concept Site Development Plan (SDP) attached as **Figure 2** to this document.

2 PURPOSE OF THE EMPr

2.1 Scope of the EMPr

The aim of the EMPr is to ensure that proper controls are in place to address the potential environmental and social impacts of the proposed pre-construction, construction, and operation phases of the development. The key activities to be undertaken in each phase are elaborated on below.

The **pre-construction (or planning/ design)** phase of the proposed development will include, amongst other activities, the following:

- Undertaking the various application processes for the required authorisations (permits) from the relevant competent authorities to implement the proposed development. This phase also involves planning for the required engineering services and preparing/ refining the site layout plan for the proposed development.
- Appointment of a suitably experienced project team; this may include a Project Manager, Landscape Architect, Professional Architect, Heritage Practitioner, Consulting Engineer, Environmental Control Officer (ECO), External Auditor and an Occupational Health and Safety (H&S) Officer.
- Refinement of the Site Development Plan, if required.
- Preparation of a 'Procurement Strategy' to encourage the use of local labour/ staff.
- Notification of adjacent property owners regarding the construction programme.

The **construction** of the proposed development will include the following primary activities:

- The establishment of a construction yard/ office on the application site in non-environmentally sensitive area(s), to be ratified on-site by the ECO.
- Site clearance, including the disposal of building rubble/ spoil to landfill.
- Conservation (removal and storage) of topsoil for re-use in landscaping on the site.
- Site preparation by the Applicant/ Developer's contractor(s), including the creation of building platforms on the development site, installation of services infrastructure, internal roads, and boundary fence.
- Training for members of the project team, contractors, and subcontractors in accordance with the provisions of the EMPr and the implementation of all safety measures in accordance with the Occupational Health and Safety Act.
- The appointed ECO is to undertake site inspections at the frequency stipulated in the EA and or approved EMPr.

During the **operational** phase of the projects kife cycle the EWOC intends to provide veterinary services to a range of wildlife typically occurring on game farms in South Africa. The operational activities generally associated with the facility shall broadly include:

- Receiving wildlife;
- Complete medical evaluation by a team of world-leading veterinarians;
- Treatment/surgery of the wildlife in the hospital;
- Short-term holding facilities for compromised wildlife that have undergone surgery;
- Long-term holding facilities to strengthen the wildlife before they are released. For example, a cheetah who has undergone surgery may need to get fit before being released into the wild;

- Staff will be on-site to manage and coordinate the wildlife at the Facility; and
- Reproduction research will be done to ensure the genetic viability of endangered species.

Due to its unique position in the DGR Operational aspects of the EWOC must comply with the general principles of the Dinokeng EMPr, DGR EMPr, and any other specifications as per applicable local, provincial, and National legislation governing the veterinary care provided to wildlife and/or big game. The facility must ensure that the welfare of wildlife is not negatively affected and will not result in an adverse risk to people, property, and the environment. As such, the facility's operations will be undertaken per the operational management plan compiled for the facility, which aims to comply with applicable legislation, guidelines and policy objectives.

The provisions of the EMPr are binding on the Applicant and all Contractors during the life of the project and the lives of all contracts. If any conflict occurs between the terms of the EMPr and the project specifications or pending Environmental Authorisation, the terms in the EMPr shall be subordinate.

The EMPr is a dynamic document subject to similar influences and changes as are wrought by variations to the provisions of the project specification. Any substantial changes must be submitted to the relevant authorities in writing for approval, in accordance with the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations (2014), as amended.

This development's construction and operational phase aspects must be undertaken according to best industry practice, as identified in the EMPr and any relevant project documentation. This EMPr, which forms an integral (**and compulsory**) part of all Contract Documents, informs the Contractors/ Responsible Persons as to his/ her/ their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of potential negative environmental impacts caused by the activities associated with the project.

All Contractors must note that obligations imposed by the EMPr are legally binding in terms of statutory environmental legislation. If any rights and obligations contained in this document contradict those specified in the standards or project specifications, then the latter will prevail.

2.1.1 Statutory and other applicable legislation

It is expected that the Contractor(s) is conversant with all environmental legislation pertaining to the project. In addition, the Contractor must also take cognisance of Provincial and Local Government Ordinances and by-laws, which may be applicable to the project.

2.2 Impact Management Outcomes and Impact Management Actions

Impact management outcomes and proposed impact management actions to achieve these outcomes have been determined for the project based on the impact assessment undertaken and recommendations made by the EAP and specialist practitioners. The impact management actions include measures to avoid, manage and/or mitigate the identified impacts.

2.3 Fundamental Principles of the EMPr

The EMPr is based on fundamental principles[3] derived from applicable government policy statements contained in various government documents and legislation (e.g., the *National Environmental*

[3] **Principles** are shared assumptions and truths that policy and action can be based upon.

Management Act, (Act 107 of 1998). The following principles contained in these documents and laws will be used in the EMPr to guide the various phases of the proposed development, namely:

- Environmental management must place people and their needs at the forefront of its concern and equitably serve their physical, psychological, developmental, cultural, and social interests.
- Development must be socially, environmentally, and economically sustainable, i.e., meet the "triple bottom line" criteria for development.
- Sustainable development requires the consideration of all relevant factors, including the following:
  - that the disturbance of ecosystems and loss of biological diversity are avoided, minimised and remedied;
  - that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
  - that the development, use and exploitation of renewable resources and the ecosystems of which they are a part do not exceed the level beyond which their integrity is jeopardised;
  - that a risk-averse and cautious approach is applied (also called the Precautionary Approach), which takes into account the limits of current knowledge about the consequences of decisions and actions;
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
- Community wellbeing and Empowerment (e.g., of the construction personnel) must be promoted through environmental education, raising environmental awareness, sharing knowledge and experience and other appropriate means.
- Capacity building and education: The EMPr must play a dynamic role in developing the understanding, skills, and capacity of the Employees (e.g., construction personnel) to promote sustainable development.
- Consider all alternatives: Considering all alternatives results in making the best decisions. Therefore, the BAR and EMPr must ensure that all alternatives are considered in all decision-making. Developmental and environmental planning, problem-solving, and decision-making are often complex. Possible consequences of conflicting interests and the consequences of not acting need careful consideration.
- Co-ordination: Various concerns and issues cut across the key sectors and functions in the area. Sustainability and integrated planning and management (including monitoring) will depend on the co-ordination and integration of the relevant role players in the construction and operational phases of the proposed development.
- Due process: Due process must be applied in all integrated management activities. This includes adherence to the provisions in the Constitution and statutes dealing with just administration and public participation in regional and local governance.
- Duty of care: Every person (e.g., the Applicant and the contract workers) associated with the development and its associated infrastructure has a duty to act with due care to avoid damage to the environment, or pollution of the environment or waste a precious resource. Also called the Environmental Responsibility Principle.
- Equity: The EMPr ensures equitable access to natural resources, benefits, and services to meet basic needs and ensure human wellbeing. Each generation has a duty to avoid impairing the ability of future generations to ensure its wellbeing.
- Full cost accounting: Decisions must be based on an assessment of the full social and environmental costs.
- Good governance: Good governance depends on mutual trust and reciprocal relations between the various groups and sectors of the area and the controlling officials. This must be based on fulfilling constitutional, legislative, and executive obligations and maintaining transparency and accountability.

- Prevention: The EMPr must be flexible enough to be adapted to account for any potential problems that may arise in the future and thereby prevent any negative impacts on the environment and on people's rights.
- Polluter Pays: Those responsible for environmental damage must pay the repair costs to the environment and human health and carry the costs of preventative measures to reduce or prevent further pollution or degradation.
- Subsidiary: Regulatory responsibilities belong at the most local level at which the tasks can be carried out effectively. Environmental management structures must match the ecological scale of the managed resource.
- Waste management: Waste management must minimise and avoid the creation of waste at the source. The EMPr encourages waste recycling, separation at source and safe disposal of unavoidable waste.

2.4 Structure of the EMPr

Appendix 4 of the NEMA EIA Regulations, 2014, as amended, specifies the information to be included in an EMPr. These information requirements are summarised below in Table 1 and are cross-referenced with the contents of this report, where relevant.

Table 1: Content of EMPr as required by the 2014 EIA Regulations, as amended

Regulation	Description	Reference in the Report
(1)	An EMPr must comply with section 24N of the Act and include:	
(a)	(a) details of; (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae	Section 11 and Appendix A
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description	Section 1.3 and Section 2.1
(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 should be avoided, including buffers	Figures 1 - 2
(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 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	Section 4.1, Section 5.1, and Section 6.1
(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 4.2, Section 5.2, and Section 6.2

Regulation	Description	Reference in the Report
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3.2.7
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3.2.7
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions	Section 3.2
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented	In most cases ongoing during the particular phase of development, except where otherwise specified in the EMPr.
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 3.2.7 and Section 8
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 3.2.7 and Section 8.1
(m)	an environmental awareness plan describing the manner in which; (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 10
(n)	any specific information that may be required by the competent authority	Sections 4 – 6 (incorporated, as relevant)
(2)	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such a notice will apply	N/A

3 GENERAL SITE MANAGEMENT

3.1 Project and Environmental Management Team

The Project Management Team will consist of the Applicant (Developer), Project/ Site Manager (Resident Engineer/ Site Agent), Environmental Control Officer (ECO), External Environmental Auditor, Health and Safety Officer, Contractors and associated sub-contractors.

The specific names and contact details of the persons responsible within these positions and the sub-contractors involved are tabulated below.

The daily on-site activities will be controlled by the Project/ Site Manager.

Table 2: Site Management Contact Details

Designation	Name	Contact Details
Applicant / Developer / Holder of EA	Endangered Wildlife Operational Centre (NPC)	Mr Frans Jooste Tel: 021 850 9680 johan@arun.co.za
Project / Construction Site Manager / Principal Agent	To be appointed	
Environmental Control Officer (ECO)	To be appointed	
External Environmental Auditor	To be appointed	
Occupational Health and Safety Officer	To be appointed	
Contractor(s)	To be appointed	

3.2 Communication, Responsibilities and Complaints Management

3.2.1 General Public

It is the responsibility of the **Applicant** to facilitate interaction with the public. This responsibility includes:

- Informing the neighbouring residents of the intent to commence with the activities and, in doing so, provide background information as to the duration of the project, the working hours, and necessary contact details;
- Responding to all public complaints or queries whether such complaints are received by the Project/Site Manager, ECO and/or the appointed Contractors;
- Develop and maintain a register of all public complaints/ queries, as well as the Applicant's response to these complaints and queries; and
- Respond to the media and prepare media reports should such requests be received.

3.2.2 Duty of Care

The Applicant, Project Manager and Contractors have a Duty of Care towards the environment in terms of Section 28 of NEMA. Section 28 states that "E*very person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is*

authorised by Law or cannot reasonably be avoided or stopped, to minimise and rectify pollution or degradation of the environment."

The EMPr requires all involved with the development to act in the spirit of "Duty of Care" throughout the various phases of the project.

3.2.3 Contractors

It is the responsibility of the Contractor(s) is to:

- Undertake all work on site in accordance with the requirements of the EMPr and Environmental Authorisation;
- Undertake all work on site in accordance with the requirements of the applicable legislation, including the Basic Conditions of Employment Act, 1997 (Act No. 75 of 1997), Occupational Health and Safety (OSH) Act, 1993 (Act No. 85 of 1993) (as amended).
- Undertake regular (at least weekly) "tool-box talks" with personnel, the contents of which must include reference to the EMPr (with a focus on any issues raised by the ECO). Personnel to be made aware of the dangers associated with the work and that they have the right to refuse work that is harmful to human health or the environment;
- Liaise directly with the Applicant, Project/ Site Manager regarding any queries concerning the EMPr or complaints received from the public;
- Liaise directly with the Project/ Site Manager should any environmental problems be identified or actions in breach of the objectives set, take place, e.g., littering and oil spill;
- Keep on file proof of safe/ lawful disposal of all wastes generated during the construction phase
- Carry out instructions issued by the Project/ Site Manager; and
- Implementation of / Adherence to the Procurement Strategy.

3.2.4 Project Applicant / Holder of the Environmental Authorisation

The Project Applicant's (Holder of the Environmental Authorisation) responsibilities include the following:

- Attain all necessary approvals and ensure that they are acted on within their validity period and that the conditions of approval are adhered to;
- Appoint a project team capable of implementing the requirements of the EMPr and EA, including an ECO;
- Fulfil all public relations responsibilities in conjunction with the Municipality;
- Inform the relevant authorities of any site related problems that may occur during the various phases of the project;
- Attend site meetings when appropriate;
- Liaise with the Project/ Site Manager regarding environmental management on site; and
- Assist the Project/ Site Manager in making decisions and finding solutions to environmental problems that may arise during the operation and closure phases.

NOTE: The Holder of the Environmental Authorisation is ultimately **responsible for ensuring compliance** with the conditions of authorisation by any person acting on its behalf, including but not limited to, an agent, sub-contractor, employee, or any person rendering a service to the holder of the authorisation.

3.2.5 Local Authority

The Local Authority's responsibilities include the following:

- Attend site meetings when appropriate;
- Liaise with the Project/ Site Manager regarding environmental management on site; and
- Assist the Applicant, Project/ Site Manager in making decisions and finding solutions to environmental problems that may arise.

3.2.6 Project (Construction) Site Manager / Principal Agent

The Project/ Site Manager's responsibilities include the following:

- Oversee the day-to-day activities on the site and keep an up-to-date diary of site activities;
- Ensure that the requirements as set out in the EMPr and the conditions of EA are adhered to throughout the lifecycle of the project;
- Direct the Contractors, whenever necessary, to comply with the conditions of the EMPr and EA and recommend corrective action where there is non-compliance with the EMPr;
- The Project/ Site Manager must attend site meetings where required to be able to report on, and respond to any environmental issues, and be issued with copies of minutes of such meetings;
- The Project/ Site Manager must obtain, examine, and approve method statements where applicable;
- Advise the project team on environmental issues within the defined work and surrounding areas;
- Collect and record all waste manifest data sheets;
- Maintain the public complaints register on the site; and
- Review the results of the ECO site visits (Reports) and facilitate any corrective actions that may be necessary.

The Project/ Site Manager has the authority to **stop work** if in his/ her opinion, there is a serious threat to or impact on the natural and/or social environment because of construction activities. This authority is to be limited to emergency situations where consultation with the applicant and/or contractor is not immediately possible. In all such work stoppage situations, the Project/ Site Manager is to inform the applicant and contractor of the reasons for the stoppage as soon as possible. The necessary instructions should be issued verbally and followed up with written instruction (e.g., via email).

Upon failure by the contractor to show adequate consideration of the environmental aspects of this contract, the Project/ Site Manager may recommend having the contractor's representative or any employee(s) removed from the site or suspend work until the matter is remedied. No extension of time will be considered in the case of such suspensions, and all costs will be borne by the responsible contractor.

3.2.7 Environmental Control Officer

The Environmental Control Officer's (ECO) responsibilities (if required by the Environmental Authorisation conditions) include the following:

- The ECO must submit written notification of the commencement of work on site to the competent authority;
- The ECO must monitor and report on the level of compliance by the Applicant, Project Manager and Contractors with the approved EMPr and the conditions stipulated in the Environmental

Authorisation for the proposed development at the frequency(ies) as stipulated in Section 3.2.7.2 below;

- The ECO must meet with the Project Manager and Contractor(s) before construction begins to present the environmental education training and to go through the contents of the EMPr and EA. The ECO must explain to the Contractors, their environmental responsibilities whilst employed on the site, in particular their Duty of Care towards the environment;
- The ECO will issue an ECO Report/ Checklist after each site visit (or at a minimum once per month) which provides a summary of project progress in general and the findings of the site visit and the level of compliance with the EMPr and EA. The ECO Report must be circulated to the LEDET and the Municipality.
- The ECO must be contacted to attend to environmental problems, should they arise on site, and shall recommend corrective action where there is partial- or non-compliance with the EMPr and/or EA;
- The ECO must attend site meetings where required to be able to report on, and respond to, any environmental issues, and be issued with copies of minutes of such meetings;
- The ECO must obtain, examine, and approve method statements where applicable;
- The ECO must manage and keep an up-to-date diary of site activities and a detailed photo record of all site visits;
- The ECO must advise the applicant, Project/ Site manager and Contractors on environmental issues within the defined work areas;
- The ECO shall liaise with the local authority's environmental officer on an as required basis.

The ECO has the authority to **stop work** if in his/ her opinion, there is a serious threat to or impact on the environment because of construction activities. This authority is to be limited to emergency situations where consultation with the Project/ Site Manager or Applicant is not immediately available. In all such work stoppage situations, the ECO is to inform the Project/ Site Manager and Applicant of the reasons for the stoppage as soon as possible. The necessary instructions should be issued verbally and followed up with written instruction (e.g., via email).

Upon failure by the Contractor or his employee to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Project/ Site Manager to have the Contractor's representative, or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions, and all costs will be borne by the responsible Contractor.

3.2.7.1 Level and Type of Competency of ECO

A suitably experienced environmental practitioner(s) with at least 3 years relevant site supervision experience will need to act as the ECO.

3.2.7.2 Frequency of ECO Site Visits

The frequency of ECO site visits during the construction phase of civils infrastructure should be as follows:

- Twice per month during the first month of establishment, site clearance and earthworks. *Twice per month may be too infrequent during certain construction activities, and therefore the frequency should be adapted as required.*
- Thereafter once per month for the duration of the civils component, based on the level of compliance with the EMPr and EA.

The monthly site visits should, as far as possible, coincide with the monthly site meetings [with the Project Manager and contractor(s)].

An ECO checklist must be completed once per month and must be forwarded to the Project Manager, Contractor(s) and Applicant (developer) within 5 days of the site visit and meeting. *Any environmental problems noted during a site inspection should, however, be brought to the attention of the Project Manager and Contractor as soon as reasonably possible.*

The ECO should undertake *ad hoc* site inspections should environmental problems arise during construction or when certain milestones have been reached.

The ECO will carry out a final site inspection at the end of the civils construction phase to undertake an environmental 'close-out' inspection/ audit, to assess compliance with the EA, EMPr and the construction guidelines, and to ensure that satisfactory rehabilitation of any disturbed areas and access roads around the construction sites have been carried out.

Should any environmental problems arise during the construction phase, the RE and/or contractor must immediately inform the ECO to undertake a site visit to assess and attend to the potential environmental problem(s). All works where problems exist are to be stopped until the ECO has been to site and assessed the situation and rectified the problem(s).

3.2.7.3 Reporting on Compliance

The ECO is required to report on compliance in writing to the Project Manager, Applicant, and relevant authorities monthly during the civils construction phase. The construction of civils infrastructure (including building platforms) is anticipated to occur over 4 to 6 months.

Refer to **Section 3.3** with respect to external auditing requirements.

3.2.8 Communication and Record Keeping Procedures on Site

All records related to the implementation of this EMPr (e.g., site instruction book, Site Manager Diary, method statements, environmental authorisation) must be kept together on site where it is safe and can be retrieved easily. These records should be kept for submission to the relevant authorities, if so requested.

3.2.8.1 Site Instruction Entries

An instruction book/ file should be kept on site by the appointed Contractor for the purposes of recording specific important site instructions that need immediate attention. The site instruction book will also be used for issuing "stop work" orders for the purposes of immediately stopping any activities on site due to the environmental risk or impact that may result.

Site inspections will be conducted by an ECO appointed by Applicant/ Developer. The ECO Checklists will serve as a general record of compliances and non-compliances in accordance with the content of the EMPr and EA that need to be addressed during the construction or operational phases of the development. The Project Manager must give immediate attention to any environmental issues that need to be dealt with.

3.2.8.2 Environmental Incidents and External Complaints Register

A register should be maintained by the Project Manager of all environmental incidents occurring on site. The register should record the following information for each incident: date, time, type of incident, person responsible for the incident, corrective action required, immediate corrective action implemented, and whether the incident was reported to the ECO and/or other parties.

A register should also be maintained of any complaints and/or comments received from external parties (such as from neighbours and members of the surrounding community or staff of the proposed development site). The register should record the following information for each complaint and/or comment received: date, time, details of the person who lodged the complaint/ comment, details of the complaint/ comment, action required, immediate action implemented, whether the complaint/ comment was reported to the ECO and/or other parties.

3.2.8.3 Minutes of the Site Meetings

The Minutes of each monthly site meeting must be forwarded to the ECO, Contractor, and the Applicant within one week of the meeting taking place. The minutes of the meeting must record any environmental issues that have been raised by the ECO, and that need to be addressed or rectified.

3.2.8.4 Photographs

It is recommended that photographs are taken of the site regularly by the Project Manager and during site visits by the ECO as a visual reference. These photographs should be filed with other records related to this EMPr.

3.2.8.5 Method Statements

Method Statements

Written submissions by the Contractor(s) must be prepared prior to any activity occurring on site if requested by the Applicant, Project/ Site Manager or ECO, or for activities not addressed in this EMPr. The submission will include the plant or equipment to be used as well as materials, labour, and methods to be used to undertake the activity.

The method statement must be completed in such detail that the Project/ Site Manager is enabled to assess whether the Contractor's proposal is in accordance with the environmental objectives set. The format for such a method statement should follow the following format and include the following information:

- **What**? A brief description of the project;
- **How**? A detailed description of the process of work, methods and materials; and where material will be stored;
- **Where**? A description/sketch map of the locality of work (if applicable); and compliance/ noncompliance with the specifications;
- **When**? The sequencing of actions with due commencement and completion date estimates (duration of the activity);
- **Who**? The names of the person/s or companies who are going to undertake the work; and
- **Why**? An explanation of the reason why the work needs to be carried out.

Copies of all approved Method Statement must be kept on site as required in **Section 3.2.8** above.

3.3 External Auditing Requirements

Auditing of compliance with the EA and EMPr needs to be undertaken in accordance with Section 34 of the EIA Regulations 2014 (as amended from time to time). Audit Reports need to meet the objectives and content requirements as laid out in Appendix 7 to the EIA Regulations 2014 (GNR326) (as amended from time to time). LEDET is likely to include conditions relating to auditing in the EA.

3.4 Environmental Awareness

All Contractor teams involved in work on the development are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr and conditions of the EA prior to work commencing. In addition the provisions oif the Dinokeng EMF to be considered and implemented as far as reasonably possible.

3.5 Financing of Environmental Control

Financing of all control measures is the direct responsibility of the Applicant, or each contractor appointed by the Applicant. It is therefore accepted that the costs incurred for implementing the required environmental controls to ensure compliance with local authority By-laws, Provincial and National legislation, the EA and the objectives or requirements specified in this EMPr would be provided for in the specific tender documents.

All responsibilities not defined in the EMPr, or which fall outside of the tender specifications will be the responsibility of the Applicant.

4 ENVIRONMENTAL MANAGEMENT: PRE-CONSTRUCTION PHASE

4.1 Description of the Impact Management Outcomes for the Pre-Construction Phase

The impact management outcomes for the pre-construction phase include the following:

- To ensure that the recommended plans and strategies are prepared and implemented timeously to maximise the benefits of the proposed development and manage the anticipated negative impacts prior to the construction phase commencing.
- To ensure the recommendations of the heritage and terrestrial practitioners are considered during the detailed design phase.
- Demarcation of any no go and or sensitive areas and species, with special reference to the demarcation and or identification and marking of ToPS trees.

4.2 Environmental Specifications: Pre-Construction

4.2.1 Prepare Recommended Plans and Strategies

Responsible Entity: The Applicant must take responsibility for ensuring that the required plans and strategies, as recommended by the specialist practitioners, are timeously prepared and implemented.

The appointed **ECO** is to monitor compliance with the required actions below.

NOTE: The required actions below must be prepared **prior to** commencement of construction.

Required Actions:

- The Consulting Engineer is to ensure that the final stormwater design of the development considers the impacts of climate change, e.g., intensified rainfall events and that the stormwater design of the development is designed accordingly.
- The facility intends to provide veterinary services to a range of wildlife typically occurring on game farms in South Africa. The design specifications of the facility must comply with industry and best practice standards for the transporting, holding, treating, rehabilitating and releasing of wildlife. In addition, the Facility is located within areas which intercept with the Dinokeng and Waterberg EMFs. And therefore, the facility design, specifically the safety specifications of enclosures for wildlife/game, must meet the requirements of those frameworks as well as any other specific local, provincial and/or national legislation, guideline, policy and or protocol specific to the care and rehabilitation of wildlife.

  As indicated in the Dinokeng EMF: “The design, construction, operation and decommissioning of facilities must comply with the general principles of this SEMP, the DGR Development Guidelines, as well as any other specifications laid down by regulatory bodies responsible for development coordination or environmental management in the DGR. Structures outside of urban areas may not exceed 2 storeys above natural ground level.” The preferred alternative must comply with the principles included in the Dinokeng EMF and is considered the only reasonable and feasible alternative in this application. No further investigation or assessment is therefore deemed necessary.

  Refer to the Excerpt of the DGR EMF included as App J, which deals with fence / enclosure specifications and management under section 2.2.2.3 – Risk Management. Fence and enclosure specifications is also included under the Breakout Policy [section 2.2.2.1.1 (l) of Appendix J]. Specofic enclosure specificatrions is also provided under each species nanagement.

The detailed design phase should ensure the following general specifications as a minimum.:

- Ensure that water-wise technologies (such as low flow showerheads, flow restrictors and aerators on taps, and dual flush systems) are specified. These technologies are to be employed in all toilets, bathrooms and basins.
- Make provision for an effective water harvesting system for all roof water in accordance with the requirements of the local Municipality or according to latest best practice.
- Ensure that energy-efficient building designs and energy-saving electrical appliances such as solar heating systems and thermal insulation in roofs and ceilings are specified.
- Ensure that low-level lights and screened lighting is provided to reduce potential light impacts.
- Ensure that measures for climate change mitigation and resilience are incorporated into the design of the buildings, according to latest best practice.
- Ensure that relevant conditions of the Environmental Authorisation and Environmental Management Programme are incorporated into the detailed design of the facility.

- Guidelines should be prepared for the implementation of a Procurement and Communication Strategy that includes the following:
  - Initiate the activity during the first phase of the development after which the implementation of the strategy becomes the responsibility of the contractor(s) collectively under the guidance of the developer;
  - Develop a database of local contractors who are competitive and possess the required skills and capacity to obtain contracts; and
  - Local contractors are invited to tender for work in the context of the terms and conditions that should be included in Request for Proposal (RFP) documentation.
  - Inform local people that enquire about employment opportunities of the procurement strategy and the terms of conditions that are applicable to procurement and employment.
- Define/ determine the performance criteria for the project and institute a monitoring programme of construction performance.

4.2.2 Heritage and Ecological Specialists Mitigation

4.2.2.1 Ecological Mitigation

Protected Trees

The following total figures were calculated in regards to any pending application for removal of protected trees and plants:

- 13 trees and plant stands as an actual count
- The final figure of 13, representing actual marked protected trees should be fed into any application process

The end result of this protected tree assessment is that an estimated 13 individual protected trees of one recorded species may need to be removed/felled for the successful construction and operation of this facility.

The following information was obtained from the Centre for Wildlife Management, University of Pretoria. The figures provided are not exact, but rather estimates based on prior management plans and official quotations no older than two years. It is estimated that moving each tree (to another location) will cost approximately R9000 for a 5-6 m tree with a stem diameter not exceeding 30 cm, and R 12000 for a 6-8 m tree with a stem diameter of 40 to 50 cm. The average cost is thus estimated to be approximately R 10000 per tree (total of

R 130 000). However, it must be noted that many of the trees exceed this diameter and therefore cannot be successfully translocated without significant risk to the individual tree. Apart from the high cost of the translocation, the estimated survival rate is only 60%, thus equating to a high potential mortality. In addition, suitable land must be located into which to relocate the tree species.

Furthermore, the transplantation of these individual trees can cause additional ecological issues that are highly counterproductive to the preservation of the overall habitat. The heavy earth moving equipment required to transplant the individual trees will cause extensive damage to the system through soil compaction, indiscriminate vegetation removal and road creation.

In summary, the relocation is not considered to be a viable option due to the low survival rate of the tree species. The only other alternative solution is to plant young seedlings to replace the trees removed. This option is recommended as the expected survival rate is much higher (80%) if sufficient aftercare such as watering is implemented. However, and it must be noted that discretion may be used in the re planting process and should only equate to the number of trees actually lost. Offset numbers should in actuality be much lower than this projected value. The location of seedling generation is under the auspices of the assigned contractor. If this option is not considered to be feasible, on-site mitigations as defined by the ecological results and mitigations must be followed.

Ultimately, avoidance of removal of any protected species should be seen as the most preferable mitigation measure, alternatively a destruction permit should be applied for.

Conclusion and Professional opinion

Based on the field, desktop and literature studies, the proposed future development activities are largely viewed as a positive advancement within the study area as long as mitigation measures are followed).

The following GENERAL recommendations should be implemented before any further development takes place;

1. An EMPr consultant should be appointed for a pre-construction and post-construction inspection audit, incorporating all mitigation and recommendations as outlined in all of the specialist investigations conducted to date for the property area
2. Development should incorporate and adhere to principles as outlined in The South African Guidelines for Sustainable Drainage Systems (Armitage, Vice, Fisher-Jeffes, Winter, Spiegel, & Dunstan, 2013)
3. All protected trees should be integrated into the project design and protected from animals through adequate fencing and sequestration (inspected by an Ecologist or ECO).

From a minimum standard and methodological perspective, the survey effort was sufficient to produce a reasonably representative set of data from which to formulate the professional opinion, albeit in the absence of long-term monitoring data. The study area is located in a region dominated by natural to semi natural, albeit somewhat disturbed habitats, including an abundance of tall roosts. No obvious drainage lines were present.

In summary, the specialist can see no reason why the intended facility cannot proceed in accordance with the aforementioned recommendations and legislation.

4.2.2.2 Heritage Mitigation

Conclusion and recommendations

The study area has a flat topography with no major topographic focal points that would have attracted human occupation in antiquity and is considered to be of low heritage potential. This was confirmed during the field survey and no archaeological sites of significance were noted and finds were limited to isolated Stone Age lithics that are out of context and can be attributed to background scatter (Orton 2016) that is of low heritage significance.

According to the SAHRA Paleontological sensitivity map the development footprint is of insignificant

paleontological significance and no further studies are required for this aspect.

The impact to heritage resources is low and the project can be authorised provided that the recommendations in this report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval

Recommendations for condition of authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:

Recommendations:

- Implementation of the Chance Find Procedure for the project;
- Monitoring of the study area during construction by the ECO.

Chance Find Procedures

Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines for this procedure are provided in Section 10.5. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations.

The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

Reasoned Opinion

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

Potential risk

Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves and subsurface cultural material are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation and possible layout changes.

Monitoring Requirements

Day to day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other

responsible persons should be trained along the following lines:

- Induction training: Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- Site monitoring and watching brief: As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The ECO should monitor all such activities. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Figure 1: Heritage monitoring

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
Cultural Heritage Resources	Entire project area	EO & ECO	Weekly (Pre construction and construction phase)	Proactively	• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: 1. Cease all works immediately; 2. Report incident to Site Manager 3. EPC (Engineering Procurement and Construction) Contractor to contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to SAHRA; as advised by specialist and 5. Employ site specific mitigation measures recommended by the specialist after assessment in accordance with the requirements of the relevant authorities. • Only recommence operations once impacts have been mitigated.

Figure 2: Management Measures for inclusion in the EMPr

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General project area	Implement chance find procedures in case possible heritage finds are uncovered	Pre-Construction and Construction	Throughout the project	Applicant EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of the NHRA	ECO Checklist/Report
General Project areas	Monitoring of the study area during construction by the ECO.	Pre-Construction and construction	Throughout the project	Applicant/ EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35,36 and 38 of the NHRA	ECO Checklist/Report

5 ENVIRONMENTAL MANAGEMENT: CONSTRUCTION PHASE

5.1 Description of the Impact Management Outcomes for the Construction Phase

The impact management outcomes for the construction phase include the following:

- To control all aspects of the construction phase by implementing the necessary impact management actions and recommendations to manage any temporary or permanent negative environmental impacts.
- To ensure the conservation of the natural resource base on the site, and institute measures to prevent the degradation of the natural resource base from taking place, including:
  - To ensure the conservation of the topsoil on the site and institute measures to prevent soil erosion and pollution (contamination) from taking place.
  - To protect and conserve animal life, including birds and snakes, which may occur within the development area.
  - To prevent fires from arising from the construction site.
- To ensure the conservation and sustainable use of scarce water resources by instituting measures to minimise water use during the construction phase of the project.
- To ensure waste minimisation and recycling of all waste at source and ensure that recyclables enter the waste stream by engendering an ethic of waste management amongst construction staff.
- To ensure that no stormwater is discharged to the working areas and further to ensure that the stormwater leaving the footprint of the proposed development area is not contaminated by any substance.
- To prevent any impacts on air quality, such as dust and smoke pollution, that could result during the construction phase of the project.
- To minimise the visual (aesthetic) impact of the development, during the construction phase, on the surrounding environment.
- To ensure the conservation of the archaeological and heritage resources on the site, by checking for such resources in any excavations undertaken.
- To optimise the social benefits of the development, local builders and contractors should enjoy preferential appointments to install infrastructure.
- To maintain and/or enhance security levels around the development site, during the construction phase of the development.

5.2 Environmental Specifications: Construction

5.2.1 General

5.2.1.1 Establish appropriate partnerships

Responsible Entity: The **Project Manager** must take responsibility for establishing appropriate partnerships and good relationships with local authorities, the local community (including adjacent landowners) and contractors.

The appointed **ECO** is to monitor environmental contractual obligations of contractors on an ongoing basis and must undertake the required environmental inductions and training of contractors.

Required Actions:

- Ensure appropriate communication with all local authorities, local communities, and contractors.
- Contractors to be fully informed by the ECO as to their environmental contractual obligations.
- The ECO to give a presentation to contractor and site staff to familiarise them with the environmental aspects of the contract. The Project Team, Contractor(s) and staff must attend this meeting.
- A geotechnical specialist is required to inspect foundation excavations prior to the casting of concrete to ensure that founding takes place in competent material compatible with the design and below any fill layers that may be present.

5.2.1.2 Set-up of the construction site and site offices

Responsible Entity: The **Project Manager** must take responsibility for setting up the construction site and site offices and ensure that construction activities are undertaken in such a manner as to not adversely affect the environment.

The appointed **ECO** must ratify the areas designated for the below uses and monitor compliance with the required actions below.

Required Actions:

- Communicate with contractor(s) to ensure that all the environmental specifications are understood and carried out.
- The contractor must point out and demarcate the following areas: construction site and site offices, storage areas and concrete batching plant site (if required).
- Control all construction in terms of the Construction Guidelines (refer to **Appendix 1**).
- Construction materials (concrete and raw materials) must be stored in designated areas neat and orderly.
- The contractor must indicate the storage area for all spoil (building rubble) from the site. Trucks removing spoil must remain on designated access roads. Rubble must be removed on an on-going basis. Invoices for dumping spoil at a suitably registered WMF must be copied to the ECO monthly.
- All solid domestic waste to be kept in appropriate containers with scavenger and weather-proof lids and removed from the site by the contractor on a weekly basis to a licensed waste disposal facility. The burning of solid waste and paper on site will not be allowed. Recyclable waste (e.g., paper, glass, tin, plastic) should be separated at source and recycled if possible.
- Concrete mixing must be restricted to a designated area(s) on site, and any cement residues are to be removed from the site at the end of the contract period. Wastewater catch pits must be constructed in series to capture cement residues from cleaning the cement mixer. Residues are to be removed from the site from time to time (or at a frequency to be determined by the ECO).
- All parked mechanical vehicles must have a drip tray present to prevent spillage of oils and fuels. Used oil (from servicing of vehicles) should be recycled or disposed of at a registered hazardous waste disposal facility. Hazardous and flammable substances must be stored and used in compliance with applicable regulations and safety instructions. **Health and Safety Officer to monitor compliance.**
- All excavations deeper than 1.5m (albeit unlikely) must be protected from collapsing by shoring up with boards and demarcated if left open overnight. **Health and Safety Officer to monitor compliance.**
- Disturbed areas where dust can arise should be kept moist by spraying with water from a water bowser or other suitable means as advised by the ECO.

5.2.1.3 Construction Personnel Training

Responsible Entity: The **Project Manager** and responsible **Contractor(s)** must take responsibility for regular staff training and education regarding the environmental implications of construction activities to prevent / minimise the impacts of construction activities on the environment.

The appointed **ECO** is to monitor compliance with the required actions below for the duration of the contract(s). *ECO must inform construction personnel of environmental rules which apply during construction period. This includes informing personnel of the environmental sensitivities of the receiving environment as well as how they should conduct themselves on site.*

Required Actions:

- Contractors will be responsible for the conduct of their personnel on site, as it pertains to trespassing, littering, and unacceptable social behaviour.
- Maintain strict supervision over all construction activities.
- All construction workers must stay within the demarcated development area and no personnel will be allowed beyond such demarcated areas or to trespass onto neighbouring farms.
- The perimeter wall/ fencing should be constructed early on during the project, as a demarcation of the site.
- The contractor must provide temporary chemical toilet facilities at the stores/ site office area, and work sites, where possible. A minimum of one toilet and one handwash basin shall be provided per 15 persons at each working area or as stipulated by the local authority. In addition, at least one urinal should be provided for every 40 males on site or as stipulated by the local authority. The toilets and urinal(s) must be kept clean and sanitary and regularly serviced (on at least a weekly basis).
- Construction personnel may not be housed on the site. Construction personnel will need to be transported to and from work daily.
- Contractors must be informed of the efficient energy (electricity) use during construction. When not in use, lights, angle grinders, motors etc., must be switched off.
- Contractors must ensure that no open fires are made on site.

5.2.1.4 Performance Criteria

Responsible Entity: The **Project Manager** must ensure that the construction phase meets the required performance criteria and inform the Client of any time delays or non-performance during the contract period.

The appointed **ECO** is to monitor compliance with the required actions below for the duration of the contract(s).

Required Actions

- Inform all contractors and their staff of the performance criteria.
- Monitor construction work and maintain a monitoring programme of construction performance.
- Ensure that contractors adhere to the guidelines in respect of littering, sanitation, spills of hazardous substances, and general behaviour.
- Ensure that contractors adhere to the relevant working hours as per the National Building Regulations and/or Municipal By-laws. At the time of writing this was from 06h00 – 18h00 during weekdays and 06h00 – 17h00 on Saturdays. No construction may take place on Sundays or Public Holidays.

5.2.2 Fauna Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that harm to fauna and avifauna is prevented and disturbance is minimised. All incidents must be recorded and reported to the ECO on an ongoing basis.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Contractors must not harm or disturb any wildlife, especially tortoises, snakes, lizards, birds, and small game.
- Snakes and tortoises must be physically removed from the construction site without harming them. Snakes may be allowed to escape from the construction site and may not be killed or harmed.
- Care must be taken when driving on site to not accidentally drive over tortoises or other animals.
- Consideration should be given to the design of the perimeter security fencing so that it allows the movement of smaller animal species through the area, by allowing for a gap (50mm) between the foundation and the fence.
- Contractors must not use chemicals/ pesticides for the maintenance of land/ vegetation and should rather use mowing, grazing, or trimming to control vegetation growth.

5.2.3 Use of Pesticides and Insecticides

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that all chemicals used are ratified by the **ECO**. The use of such chemicals is to be conducted by experienced contractors.

The ECO (in collaboration with the **Resident Engineer**) is to monitor all aspects of herbicide, insecticide, and fertiliser use.

Required Actions

- Care must be taken when using any pesticides, herbicides, and insecticides to prevent pollution of the environment. No pollution of surface or ground water may occur due to any activity on the property. The relevant requirements of the National Water Act (Act 36 of 1998) must always be complied with.
- The relevant requirements of the Hazardous Substances Act (Act 15 of 1973) must always be complied with . Control over the use, storage, application, and disposal of these substances (and empty containers) is needed.
- The relevant requirements of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) must always be complied with .
- Pesticides/herbicides/insecticides should have low environmental toxicity (the active ingredients should have short half-lives). Use pesticides that possess chemical properties that are less conducive to runoff (such as low water solubility and high absorption coefficients).
- Organic slow-release fertilisers should be used wherever possible. Alternatively, slow-release, less soluble and mobile chemical fertilisers should be used.
- Maintain and clean fertiliser and pesticide application equipment in a designated area, which eliminates the potential for on- or off-site environmental pollution.
- Mix and load pesticides and herbicides in a designated area where spills may be effectively contained and which eliminates the potential for on- or off-site environmental pollution,
- Read and follow label instructions when applying chemical products.
- Dispose of empty containers and waste materials at a registered waste disposal facility.

- Current Material Safety Data Sheets must be available for all chemicals used. Such chemicals must be stored in appropriate lockable stores.

5.2.4 Fire Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must take the necessary measures to reduce the risk of fire on the property.

The **Project Manager** must ensure that the require insurance(s) is in place.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Utmost caution must be taken not to make any fires on the site (e.g., burning of removed brushwood or for heating of food), especially during summer.
- The contractor(s) must have the appropriate insurance for fires caused by their personnel.
- Fire safety equipment (fire beaters and extinguishers) should be kept on site, and fire training should be provided to personnel.

5.2.5 Soil Management

5.2.5.1 Prevent Soil Erosion

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to prevent soil erosion by wind and water (and prevent the generation of dust).

The **Contractor(s)** must implement the necessary erosion prevention (soil conservation) measures in accordance with the approved Method Statement(s)[4].

The appointed **ECO** is to monitor compliance with the required actions below. The ECO is also to monitor site clearance and check for any erosion that may take place.

Required Actions

- The contractor must take appropriate and active measures to prevent soil erosion resulting from construction works (including access roads), operations and activities to the satisfaction of the ECO. Soil conservation measures, such as the construction of diagonal berms over disturbed areas to disperse stormwater, should be implemented where necessary.
- The contractor will protect areas susceptible to erosion by installing the necessary temporary and permanent drainage works as soon as possible and measures to prevent windblown sand and dust (such as stabilisation by chipped vegetation). Additional measures deemed necessary by the ECO or Project Manager must be taken to prevent wind erosion or surface water runoff from resulting in erosion (such as planting of suitable indigenous grass or plant species or using earth berms).
- Institute rehabilitation measures at areas where soil has been denuded or where erosion has taken place. Eroded areas will need to be backfilled and compacted. Straw may need to be worked into the upper soil horizon to bind the soil and prevent dust and windblown sand.

5.2.5.2 Topsoil Management and Landscaping

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that topsoil is stripped and stored on site for later use in landscaping.

[4] Method Statements are to be prepared by the Contractor(s) for approval by the Project Manager and ECO.

The appointed **ECO** is to monitor compliance with the required actions below.

The appointed **Landscape Architect** is to monitor and report on the implementation of the approved Landscape Plan.

Required Actions

- The application site (construction area) and topsoil storage area(s) must be clearly demarcated.
- Brushwood and topsoil removed from the development area should be stored in suitable designated areas for later use in the landscaping.
- The appointed **Landscape Contractor** is to undertake the spreading of any topsoil removed from site within the open space / landscaping areas, under the supervision of the **Landscape Architect** and/or ECO and/or Project Manager, as soon as such areas become available for landscaping, in accordance with the SDP / site layout plans.
- The planting list to be ratified by the appointed landscaper. No kikuyu grass should be planted. Buffalo grass should be used for lawns.

5.2.5.3 Prevent Soil Pollution/ Contamination

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to prevent soil pollution/ contamination and remedy incidents. All incidents must be reports to the ECO.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Prevent cement spills or clear such accidental spills as soon as possible as cement powder has a high alkalinity pH rating that can contaminate and affect both soil and water pH dramatically. This will have negative impacts on surrounding vegetation.
- All refuelling and servicing of vehicles must have a drip tray to prevent accidental spillage of oils and fuels. Refuelling must take place in a dedicated area. Similarly, any concrete mixers, dumpers, compressors, or generators must have drip trays under them.
- All vehicles, equipment, and fuel tanks (e.g., diesel bowser) must be maintained in a good condition to prevent leakages and potential contamination of soil. Plant maintenance to be undertaken off site as far as possible.
- All oils, paints, fuels, hydrocarbons, and other potentially hazardous materials must be stored in an impermeable concrete (or suitable lined) bunded area, designed to be able to accommodate 110% of the volume of the materials stored therein. Alternatively, such potentially hazardous materials may be temporarily stored on drip-trays.
- A hydrocarbon spill kit must be provided on site and personnel must be trained in its use.
- The requirements of the Hazardous Substances Act, 1973 (Act No 15 of 1973) must be adhered to where relevant.
- Emergency incidents that fall under section 30(1) (a) of the National Environment Management Act (NEMA), Act 107 of 1998 must be dealt with as required. Containment and clean-up must commence immediately, and any incidents must be reported to the relevant authorities and within the prescribed period. Incidents must be reported to Limpopo provincial department contact person for emergency incidents: Patience Makgoka, contact numbers: 015 295 3980 / 083 640 5583, email address: MakgokaTP@ledet.gov.za.

5.2.6 Water Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute the necessary measures to minimise the use of water during the construction phase of the project.

The appointed **ECO** is to monitor compliance with the required actions below throughout the construction period.

Required Actions

- No abstraction of any use of surface water or groundwater may be done without prior authorisation from the Department of Water and Sanitation unless it is a Schedule 1 Use or an Existing Lawful Use.
- No pollution of surface or ground water may occur due to any activity(ies) on the site. All mitigation measures to minimise the contamination of water resources must always be adhered to. All the requirements of the National Water Act, 1998 (Act 36 of 1998) regarding water use and pollution management must always be adhered to.
- Contractors must use water sparingly during the construction phase (e.g., for mixing of concrete and washing of equipment). Should dust become a nuisance, efficient use of non-potable water to wet dusty surfaces should be employed.
- The necessary ablution facilities must be provided (one chemical toilet per 15 workers).

5.2.7 Stormwater Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures for stormwater management to prevent erosion, damage to property and the pollution of surface and/or groundwater.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Access to and from the work site must be controlled to prevent migration of sediments off the work site.
- Material storage areas should be enclosed or covered to prevent contact with stormwater run off.
- Temporary sediment control fences should be installed prior to the commencement of construction to provide a physical barrier to sediment movement and reducing run off velocities. Filtration bags (e.g., sandbags) may be used as an alternative.
- Storm drain inlets are to be temporarily protected by means of filtration berms or a sandbag barrier.
- Temporary interceptor dikes and swales must be used during rainstorms. Alternatively, stormwater barriers in the form of sandbag check dams could be used.
- All low flow channels inside the attenuation pond will be covered with Armorflex DN-140 (or similar) to prevent any erosion from taking place.
- Stormwater infrastructure is to be constructed as per the appointed emgineer's specifications based on the determined engineering control / mitigations required to control stormwater runoff.
- Stormwater infrastructure should be designed to reduce flow velocity and avoid stream bank and soil erosion
- Surfaces must be re-vegetated immediately after completion of construction activities in each area.
- Regular inspection and maintenance of road storm water management measures, as well as erosion control measures on road surface and along road verges, is important. Apart from regular routine inspections, inspections should also be conducted after every significant storm events.
- No pollution of surface or ground water may occur due to any activity on the site. The relevant requirements of the National Water Act, 1998 (Act No. 36 of 1998) must always be complied with.

5.2.8 Waste and Effluent Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise the generation of waste and to implement the sorting (at source) or recyclables materials out of the waste stream.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- An integrated waste management approach must be used that is based on waste minimisation and must include reduction, recycling, re-use, and disposal where appropriate. Recycled waste (cement packets, paper, and cardboard) should be separately stored for inclusion into the waste stream.
- Solid waste must be property disposed of at a licensed waste disposal facility and must comply to the relevant legislation
- Waste bins must be used on site. The bins must have lids and an external closing mechanism to prevent scavenging and/or the contents blowing out. Access to the temporary storage area should be controlled.
- All waste must be deposited in the waste bins for removal. The bins must not be used for any other purpose than waste collection and must be emptied on a regular basis by the contractor at a suitably licensed waste disposal facility. Proof of disposal slips must be kept on site.
- No domestic waste should be stored on site for longer than two (2) weeks.
- No solid waste is to be burnt on site.
- Portable toilets to be placed further than 50m from the closest residential dwelling.
- Vegetation to be removed can be chipped and used for soil stabilisation and/or landscaping (or can be sold as firewood). The vegetation may also be taken to a green/ garden waste chipping/ composting facility but may not be disposed of on adjacent land.
- Building rubble from the demolition of buildings or generated during the construction phase should be diverted from landfill where possible for re-use in the construction of internal roads or take to the nearest drop-off facility for crushing.
- All general and hazardous waste generated during all project phases must be recorded and records of applicable documentation are to be filed and kept on-site, including safe disposal certificates from a registered service provider. The service provider must dispose of all general and hazardous waste at a registered waste disposal facility. All records of waste generated, and any waste related complaints must be kept on site.
- Waste storage must comply with the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) National Norms and Standards for Storage of Waste, 2013, if the storage of general waste exceeds 100m^3 or that of hazardous waste exceeds 80m^3.

5.2.9 Traffic Management

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise the risk of construction-related activities on motorists using the roads in the vicinity of the site.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Road construction signs to be erected along appropriate roads, warning motorists of construction-related activities and heavy vehicles. The use of flagmen should be considered, if necessary.
- Large construction vehicles and trucks must travel outside of typical weekday peak hours in the vicinity of the development site.

- If low hanging branches of trees need to be trimmed to prevent damage by large vehicles, these should be undertaken by an arborist and a good photographic and written record must be kept by the arborist and ECO. Permits/ permission may be required from the relevant competent authority should any of the identified ToPs trees located within the development is likely to be affected.
- Structural damage to roads in the vicinity of the construction site must immediately be repaired by the contractor responsible (in accordance with Provincial/ Municipal Road standards).
- Roads must be kept clear of sediment due to construction activities.

5.2.10 Energy Management

Responsible Entity: ECO and site agent to monitor for the duration of the contract period. **Engineers** and **Architects** to acknowledge the required actions regarding energy saving and to incorporate into their designs. The Municipality should only approve energy efficient designs.

Required Actions

- Contractors must be informed of the efficient energy use during construction. When not in use, electrical appliances must be switched off.
- Electrical and electronic installations are to be undertaken in accordance with the specifications of the appointed electrical engineers.
- Solar-generated lighting should be used where possible to reduce the development's dependence on electricity from the municipal supply grid.

5.2.11 Dust and Air Quality Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise dust pollution during the construction phase of the project.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Bare surfaces should be kept moist by spraying water during windy periods to prevent dust formation. Exposed surfaces must be re-vegetated or stabilised as soon as is practically possible.
- Any stored building material from which dust could be generated, such as stockpiled building sand, should be covered or kept moist during windy periods to prevent dust from being generated.
- The excavation, handling and transport of erodible materials must be avoided under high wind conditions.
- Dust generated from the construction activities must comply with the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) National Dust Control Regulation (GN No. R. 827) of 1 November 2013. These regulations prohibit a person from conducting any activity in such a way as to give rise to dust in such quantities and concentrations that the dust, or dust fall, has a detrimental effect on the environment and nearby receptors.
- Staff may only be allowed to smoke within demarcated areas. Cigarette butts **must** be disposed of in the lidded waste bins provided.
- No fires will be allowed on site. The burning of solid waste and paper on site will therefore also not be allowed.
- All vehicles and motorised equipment used on site must be maintained in good condition to prevent and/or minimise excessive diesel fumes from such vehicles and equipment.

5.2.12 Noise Management Plan

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise noise pollution during the construction phase of the project.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- All plant equipment, including vehicles, must be properly maintained to minimise noise generation.
- Any complaints regarding noise must be investigated, sources identified, and mitigation measures implemented. Feedback on resolution of the issue must be provided to the complainant and the noise control officer of the Local Authority.
- Noise generated from construction activity(ies) must comply with the applicable noise control regulations.

5.2.13 Aesthetics (Visual)

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise the visual impacts of the development.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- For security and operational lighting to result in minimal visual impact to the immediate context, the Contractor should use lighting only where necessary, and lighting should be positioned at a lower level, i.e., bollard height.
- For the reduction of potential negative impacts during the construction phase, the following management procedures should be implemented:
    - Reduce the construction period through proper planning and management, in addition to the productive implementation of resources;
    - Restrict the activities and movement of construction workers and vehicles to the immediate construction site as much as possible;
    - Ensure that rubble, litter, and disused construction materials are managed and removed regularly;
    - Ensure that all infrastructure and the site are maintained in a neat manner;
    - Reduce and control construction dust using approved dust suppression techniques;
    - Rehabilitate all disturbed and construction areas to acceptable visual standards.

5.2.14 Archaeological and Heritage Resources

Responsible Entity: The **Project Manager** and **Contractor(s)** must ensure that all archaeological settings and artefacts are reported and conserved.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- No archaeological mitigation is required prior to construction activities commencing.
- If any unmarked human remains are uncovered or exposed during construction activities, these must immediately be reported to the archaeologist (Jaco van der Walt, Beyond Heritage), or SAHRA.

5.2.15 Procurement Strategy (Job Opportunities)

Responsible Entity: The **Project Manager** and **Contractor(s)** must adhere to the below-mentioned plans.

The **Applicant** or **Project Manager** is to report on compliance with the below-mentioned plans.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- Contractors need to show a commitment to employ people from the immediate area whenever possible.
- Implementation of the Procurement Strategy referred to in **Section 4.2.1** above. The temporary job opportunities during the construction phase should be allocated to persons from the local communities as far as possible.
- Implementation of the Communication Strategy referred to in **Section 4.2.1** above.

5.2.16 Security

Responsible Entity: The **Project Manager** and **Contractor(s)** must institute measures to minimise security risk during the construction phase.

Contractor(s) are responsible for the behaviour of their personnel on site and is to assume responsibility for stock and game theft.

The appointed **ECO** is to monitor compliance with the required actions below.

Required Actions

- The contractor(s) will be responsible for the security on the construction site and the conduct of their personnel for the duration of the construction contract.
- A Big 5 compliant perimeter fence to be constructed, which conforms to the following specifications to reduce the risk of a breakout.:

  (i) An electrified perimeter game proof fence of 2.4 m height with a minimum of 24 strands (non-electrified);

  (ii) Electrified on the inside of the game fence with at least five strands of electrical wires, with a minimum diameter of 2.24 mm.

  (iii) Trip line 0.6 m from fence base and electrified.

  (iv) Bottom strand: at ground level with 225 mm double offset brackets.

  (v) Second strand: at 500mm above ground level with 225mm double offset brackets.

  (vi) Third strand: 1m above ground level with 225mm double offset brackets.

  (vii) Fourth strand: 1.5 m with 225 mm or 450 mm double offset brackets (viii) Top strand: on top of fence (2.4m above ground level) with 450 mm double offset brackets

  (viii) Earth strand: (double offset) 10 cm on the inside of each live wire strand

  (ix) Minimum voltage of 6000 V should be maintained on the whole peripheral electrified fence.

  (x) Energisers large enough to maintain at least 6000 V over a distance of 8 km and that do not release less than 6 Joules.

6 ENVIRONMENTAL MANAGEMENT: OPERATIONAL PHASE

6.1 Description of the Impact Management Outcomes for the Operational Phase

The impact management outcomes for the operational phase include the following:

- To control all aspects of the operational phase of the development by implementing the necessary impact management actions and recommendations to prevent any temporary or permanent negative environmental impacts from occurring in the future.
- To maintain the communal landscaped areas and stormwater infrastructure on the development site.
- To ensure the conservation and sustainable use of scarce water resources by instituting measures to minimise potable water use during the operational phase of the project.
- To engender an ethic of waste ministration, re-use and recycling amongst homeowners.
- To minimise the visual (aesthetic) impact of the development, during the operational phase, on the surrounding environment.

6.2 Environmental Specifications: Operational Phase

6.2.1 Use of Pesticides and Insecticides

Responsible Entity: The **EWOC** must ensure that the landscape contractor is aware of the chemicals that may be used.

The **landscape contractor(s)** may only use the ratified list of pesticides and insecticides.

Required Actions

- As per Section 5.2.4 above.

6.2.2 Water Use and Prevention of Water Pollution

Responsible Entity: The **Management Entity** of the development must engender an ethic of responsible water use on site.

Required Actions:

- On-site reduction of potential contaminants to the stormwater should be encouraged, such as limiting the use of fertilisers on lawns and, if applicable.
- Water conservation measures must be implemented within the site. Ensure that water is sparingly used during the operational phase (e.g., irrigation of landscaped areas).
- The collection and re-use of rainwater on site must be encouraged.
- No pollution of surface or ground water may occur due to any activity on the site. The relevant requirements of the National Water Act, 1998 (Act No. 36 of 1998) must always be complied with.

6.2.3 Stormwater Management

Responsible Entity: The **Management Entity** of the development must maintain the stormwater infrastructure in accordance with the recommendations as determined by the appointed engineer.

Required Actions: A stormwater plan to be compiled as part of the detailed design phase of the project.

6.2.4 Waste Management

GENERAL WASTE

Responsible Entity: The **Management Entity** must engender an ethic of waste minimisation and recycling **Required Actions**:

- Recyclables should be separated at source.
- All solid waste that will be temporarily stored on site, must be stored in weatherproof bins.
- The waste from the development will be collected by a suitably registered service provider and disposed of at a suitably licensed waste management facility.
- The refuse area is to be kept in a hygienic condition to prevent nuisances such as flies, vermin and odours.
- Organic waste should be separated from the general waste stream and beneficiated where possible.
- The EWOC must ensure that waste storage complies with the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) National Norms and Standards for Storage of Waste, 2013, if the storage of general waste exceeds 100m^3 or that of hazardous waste exceeds 80m^3.

HEALTH CARE GENERAL WASTE (HCGW)

HCGW comprises of the non-hazardous portion of the waste that is generated at the healthcare facility e.g. paper, plastic, cardboard, flowers, cans, water bottles, packaging etc. This waste stream can be greatly reduced by recycling initiatives. This is the only part of the healthcare waste stream that can be recycled. Responsible Entity: The Management Entity must engender an ethic of waste minimisation and recycling Required Actions:

HEALTH CARE RISK WASTE (HCRW)

HCRW comprises of the hazardous portion of the waste that is generated at the healthcare facility. This is any waste that is a hazard to human health or the environment. No healthcare risk waste is allowed to be recycled and should be collected, treated and landfilled.

HCRW is broken down into nine different waste Categories of healthcare risk waste streams (HCRW), namely:

1. **Infectious waste:** gloves, bandages, nappies, dressings and swabs etc.
2. **Sharps waste:** needles, scalpel blades, knives, infusion sets, saws, amino hooks, broken glass, ampoules etc.
3. **Anatomical waste:** non-viable foetuses, placentas, blood and bodily fluids from patients.
4. **Pharmaceutical waste:** expired, unused, spilled and contaminated pharmaceutical products or medication.
5. **Cytotoxic / Genotoxic waste:** genotoxic waste which may include drugs, vomit and urine from patients treated with cytotoxic drugs.
6. **Radioactive waste:** items contaminated with radioactive substances that are under 74 Becquerel.
7. **poisonous at low concentrations e**.g. Mercury, cadmium, lead
8. **Pressurised containers:** container with internal pressure higher than external pressure e.g. gas cylinders.

Compass collects, transports, treats and disposes of HCRW from categories 1 - 6

Responsible Entity: The Management Entity must engender an ethic of waste minimisation and recycling Required Actions:

SEGREGATION AND CONTAINERISATION

- The segregation of the waste is done by the generator of the waste.
- The HCGW must be separated from HCRW.
- There are two types of containers for HCRW, single-use and reusable containers.
- Healthcare practitioners are responsible to segregate the waste correctly.
- By law, all waste must be segregated into the correct containers.
- Correct waste segregation will assist the facilities in avoiding unnecessary costs.
- Cost control is in the hands of each healthcare worker.

INTERMEDIATE STORAGE

- This is the temporary storage of waste inside the wards and departments of a healthcare facility, before transportation to the central storage area.
- In most facilities this is the sluice room.
- There must be a daily collection of HCRW from this area.
- All waste liners (infectious and general) should be kept in their containers and off the floor.
- The area should be cleaned daily.

Refer to the training booklet in **Appendix K** for further details relating waste management actions associated with the on-site management of health care waste to be generated by the facility.

6.2.5 Aesthetics (Visual)

Responsible Entity: The **EWOC** must employ the services of a suitably qualified landscape architect/ technologist to audit the activities of the Landscape Contractor in accordance with the Landscape Master Plan.
Required Actions:

Visual pollution should be strictly controlled. The following guidelines should apply:

- Develop a policy on building appearance and outdoor signage, including architectural design, choice of colours and materials, etc.
- Over illumination should be prevented. Lighting should be limited to the maximum extent possible, and no unnecessary lighting should be allowed. Where possible, lighting should be switched off during periods of low or no usage, e.g. late evenings and early morning hours, as well as during periods of low/no occupancy.
- Light trespass should be avoided. The direction of lighting should be limited to the area where absolutely needed and not allowed to spread onto the surrounding veld or neighbouring properties.
- Lights should be pointed downwards to limit contribution to sky glow (which will be significant in the Dinokeng area due to high levels of suspended particles in the area).
- Screening vegetation (indigenous trees and shrubs) should be planted and maintained by all land owners to reduce the visual impact of buildings, roads and other infrastructure, disturbed areas, excavations and other features that may reduce the visual appearance of the landscape, on their properties.

Note: The required actions to minimise impacts during the operational phase are also included in Section 4.2.1 Visual Design Considerations during pre-construction.

7 ARCHAEOLOGY AND CULTURAL FINDS

Should archaeological objects of any nature (including fossils, graves, or remains of structures) be found, the Contractor will stop all works on site, and notify the appointed ECO and Legacy EMC (Pty) Ltd. immediately. South African Heritage Resources Agency (SAHRA) must be consulted for further investigation and clarification.

In addition, the following mitigation measures will be implemented:

- When archaeological and heritage resources are discovered during excavation and earthmoving activities, SAHRA must be contacted immediately, and the related activities must be stopped.
- All finds of human remains must be reported to the nearest police station. Furthermore, the SAHRA must be contacted if any human remains are found during the construction phase of the project.
- Human remains or any burial ground or part thereof that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed, or removed from their original positions without a permit from SAHRA ;
- Work in areas where artefacts are found must cease immediately;
- Under no circumstances must the Contractor, his/ her employees, his/ her subcontractors, or his/ her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the National Heritage Resources Act, 25 of 1999;
- A temporary fence/ demarcation at least 2m outside the extremities of the site, must be erected to protect archaeological sites;
- All known and identified archaeological and historical sites must be left untouched;
- Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work may resume.

Refer to Section 4.2.2 above which details the Specialists recommendation and mitigations with respect to heritage resources.

8 MONITORING AND MANAGEMENT MEASURES

In keeping with current environmental and associated legislation, all environmental management procedures and actions should be reviewed and refined on an on-going basis. This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light. The process of review and refinement, built into the requirements of the EMPr, is known as Monitoring and Auditing.

8.1 Monitoring Procedures

Environmental Monitoring is the continuous evaluation of the status and condition of environmental elements. Its purpose is to detect change that takes place in the environment over time and involves the measuring and recording of physical, social, and economic variables associated with development impacts.

To these ends, the ECO will monitor the site for compliance (i.e., Compliance Monitoring) with the EMPr and EA. Many techniques for Environmental Monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the aim is that each environmental management specification (and associated impact management actions) be checked by means of a system in which a score may be allocated for:

- Full compliance,
- Satisfactory performance,
- Unsatisfactory performance and
- No action.

Monitoring will take place regularly (to coincide with safety inspections, where relevant). Completed ECO Monitoring Reports will be submitted to the Project Manager and Contractor(s), who will attend to issues/ rectify non-compliances and report back to the ECO. These ECO reports must be kept on record and be made available upon request by the Applicant and the Competent Authority.

The EMPr and EA conditions of authorisation apply as follows:

- All persons employed by the Applicant, Contractor(s) and/or Management Entity must abide by the requirements of these EMPr and EA as they apply to the site.
- Any employees of the Applicant, and/or Contractor(s) found to be in breach of any of the Environmental Specifications may be ordered to leave the site forthwith. The order may be given orally or in writing by the Project Manager or ECO. Confirmation of an oral order will be given as soon as practicable but lack of confirmation in writing shall not be a cause for the offender to remain on site.
- Supervisory staff of the Applicant, Contractor(s) and/or Management Entity may not direct any person to undertake any activities which would place such person in contravention of the environmental management specifications.

The Applicant, Contractor(s), Project Manager, and/or Management Entity are deemed not to have complied with the Performance Specifications if:

- There is evidence of wilful or accidental contravention of any specification included in the EMPr and EA.
- There is evidence of the Applicant, Contractor(s), Project Manager and/or Management Entity carrying out activities not permitted in terms of the Specification.

- There is evidence of environmental negligence and/or mismanagement resulting in negative impacts on the environment.

The Applicant, Project Manager, Contractor(s) and/or Management Entity will be informed via ECO Reports as well as by means of direct instruction as to what corrective actions are required in terms of Environmental Compliance:

- Disregard for instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance.
- Non-compliance may lead to the Contractor(s) and/or Management Entity Employee(s) being blacklisted, or, in more serious cases, the Contractor(s) and/or Management Entity Employee(s) may be evicted from site. Only the Project Manager may issue such instruction, claiming any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

8.2 Document Control

The EMPr is a basic planning framework, guiding the various phases of the project. It is important for the EMPr to be revised (improved), if need be, by documenting all actions and management results in a structured format, and especially in accordance with the results of any external audits. It will be important for the EMPr and its supporting documents to be accessible to all the implementing and management members responsible for implementing its actions.

The content and results of the ECO checklist to be submitted after each site meeting can be used for compiling audits and making the necessary changes to the EMPr.

A dated photographic record of site works must be kept by the ECO and Site Agent/ RE.

8.3 Management Review

The EMPr should be a **dynamic document**, which depends on continual revision to maintain its relevance. It is therefore imperative for the EMPr to be updated and revised in accordance with information and data that emerges from the monitoring processes (such as ECO checklists), and any new management techniques and technology that may become available in the future.

To maintain continual revision, appropriateness, and effectiveness of the EMPr, and thereby enhance its performance, the ECO/ Auditor (as appropriate) should review and evaluate the EMPr at defined intervals. The reviews should include the following:

- review the results of the monitoring undertaken during ECO site inspections and audits;
- review the extent to which the impact management outcomes originally set in the EMPr have been met;
- review the applicability of the EMPr in relation to changing conditions, circumstances, and information; and
- obtain and review any concerns amongst relevant I&APs, property owners and relevant authorities that may arise during the construction phase and operational phase in the future.

9 TOLERANCE

9.1 Fines

Fines will be issued for the transgressions listed below. Fines may be issued per incident at the discretion of the Project Manager. Such fines will be issued in addition to any remedial costs incurred because of non-compliance with this document (where applicable). The Project Manager will inform the responsible Contractor of the contravention and the amount of the fine and will deduct the amount from monies due under the Contract.

Fines for the activities detailed below, will be imposed by the Project Manager on the responsible Contractor and/or his Subcontractors.

A	Any person, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a “no-go” area	R 4 000
B	Any vehicle driving in excess of designated speed limits	R 1 000
C	Any vehicle being driven, and items of plant or material being parked or stored outside the demarcated boundaries of the site	R 2 000
D	Any person walking outside the demarcated boundaries of the site	R 500
E	Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refueling such as the use of funnel rather than a pump.	R 1 000
F	Litter of site	R 500
G	Deliberate lighting of illegal fires on site	R 5 000
H	The eating of meals on site outside the defined eating areas. Individuals not making use of the site ablution facilities.	R 500
I	Dust or excess noise on or emanating from the site.	R 1 000
J	Any person, vehicle, item of plant, or anything related to the Contractors operation causing a public nuisance.	R 2 000

For each subsequent similar offence, the fine may, at the discretion of the Project Manager, be doubled in value to a maximum value of R50 000.00. All fine values are excluding VAT.

All fines and penalties must be made out to an environmental organisation to be determined in consultation with the developer, ECO, and the Bela-Bela Local and Waterberg District Municipality’s Environmental Management Department.

9.2 Penalties

Penalties for the activities detailed below, will be imposed by the Project Manager/ Site Manager on the responsible Contractor and/or his Sub-contractors.

The following penalties are suggested for transgressions:

A	Erosion	A penalty equivalent in value to the cost of rehabilitation plus 20%
B	Oil spills	A penalty equivalent in value to the cost of cleanup operations plus 20%
C	Damage to indigenous vegetation, including the landscaped areas	A penalty equivalent in value to the cost of restoration plus 20%
D	Damage to sensitive environments	A penalty equivalent in value to the cost of restoration plus 20%
E	Damage to cultural sites	A penalty to a maximum of R100 000 shall be paid for any damage to any cultural/historical sites

10 ENVIRONMENTAL AWARENESS AND TRAINING

Site training must be provided for all Contractors and Workers/ Personnel/ Employees in accordance with the provisions of this document.

Ensure that the relevant Environmental Awareness training is presented before the commencement of activities. Ensure that a Health and Safety Officer (compulsory) is appointed before the commencement of activities.

The Contractor must arrange that all of his/her employees receive a degree of environmental training during orientation. Such training should be compulsory for all employees, structured in accordance with their relevant rank, level and responsibility, in order that these employees:

- acquire a basic understanding of the environment and the environmental features pertaining to the site and its environs;
- are familiar with the requirements of the EMPr and EA as they apply to the site.

10.1 Environmental Awareness Plan

The following training programmes will be presented:

- Occupational Health and Safety (OHS) – Done internally by Health Officer;
- Personal Protection Equipment (PPE) – Done internally by Safety Officer; and
- Environmental training - Done internally by ECO.

The training is done either annually or bi-annually depending on the need identified by management of the development, as well as training for any new personnel. The environmental training and awareness will be implemented as close as possible to the commencement of the works on site and the training materials will be provided to the Contractor/ Project Manager for environmental induction of new staff.

The Environmental Awareness Plan will serve as the basis for the induction of all new employees (as well as contractors pending the nature of their work on site) on matters as described herein. The Plan will also be used to hone awareness for all employees on a continuous basis.

Specific environmental awareness performance criteria will also form part of the job descriptions of employees, to ensure diligence and full responsibility at all levels of the organisational work force.

10.1.1 Fostering Environmental Awareness

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensure that environmental accidents are minimised and environmental compliance maximised.

Environmental awareness will be fostered in the following manner:

- Induction course for all workers on site, before commencing work on site;
- Refresher courses as and when required;
- Taking part in national and international environmental campaigns like National Arbour Day, and National Wetlands Day;
- Displaying of information posters and other environmental awareness material in the general assembly points.

10.1.2 Training and environmental awareness

The Applicant/ Management Entity accepts that environmental awareness training is critical for the workforce to understand how they can play a role in achieving the objectives specified in the EMPr and ensure that the actions specified in the EMPr are implemented effectively and efficiently. Training needs will be identified based on the available and existing capacity of site and project personnel to undertake the required EMPr management actions and monitoring activities. Environmental awareness training, conducted by the ECO prior to construction, will be in addition to any specific detailed training required to implementing the EMPr. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard.

10.1.3 The environmental awareness training course

All employees should attend the course, regardless of position, status, or level of responsibility. With a background of basic environmental awareness and an understanding of basic environmental issues and sensitivities, personnel may be motivated and empowered to do their share in helping to maintain the integrity of the environment on the site through environmental impact management. The goal of this course is therefore to enable a shared understanding and common vision of the environment, the impact of the development on the environment (and why this is important) and the role of personnel in terms of environmental management and compliance. The induction course will comprise of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it;
- The second step will be a description of the components and phases of the operation;
- The third step will be a general account of how the operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts;
- The fourth and most important step will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.
- Lastly the consequences of non-compliance will be explained.

10.1.4 Course content

The following can be seen as draft course content as it will be building on as specific needs as it arises and will be supplemented with the handout of reading material and extracts of the EMPr on which the course will be based.

10.1.4.1 The Environment

The environment consists essentially of the living environment, the non-living environment, and the man-made environment.

The living environment consists of our plant and animal resources. The non-living environment includes the soil, water, and geological resources.

The man-made environment comprises our infrastructure, social, cultural, and archaeological resources.

These aspects of the living and man-made environment depend on one another, and man depends on them all for his survival. Damage to one will be felt by others so an effort must be made to try and protect the environment as well as their interactions with one another as they occur in nature. When undertaking an operation or any other form of development this concept must be kept in mind. Development must be implemented in such a way that we benefit today without compromising the ability of future generations to

benefit as well. Employees should understand this concept of sustainability and sustainable development. The specific environment should also be explained as part of the induction course.

10.1.4.2 Description of the components and phases of the operation

The project description as set out in the BAR should be explained as part of induction together with the main components or activities that can affect the environment, giving rise to what we call Environmental Impacts. The operation consists of several different components including the following:

- Firebreaks;
- Water Abstraction and Supply;
- Stormwater Management;
- Waste Management;
- Landscaping;
- Wastewater treatment;
- Security.

10.1.4.3 Description of Environmental impacts

A general account of how the operation and its associated activities can affect the environment must be explained. This is basically a description of the concept of environmental impacts.

a) What is an Environmental impact?

An environmental impact is the result, either good or bad of man's actions on the natural environment This results in one or many changes in the environment and may also affect the availability of resources and the environment's capacity to function.

Impacts can occur either because of:

- The use of a resource;
- Or the pollution of a resource.

In addition, impacts can be categorised as the following:

- Foreseen: such as the necessary clearing of the vegetation before works on site begin; or
- Unforeseen: such as the flooding of an area following heavy rains;
- Avoidable: such as the unnecessary spillage of diesel during refuelling;
- Unavoidable: such as the disturbance created during works;
- Simple: such as litter untidying the site; or
- Cumulative: such as the pollution of water upstream, which then makes downstream users sick.

b) Types of Environmental Impacts

Typical environmental impacts anticipated include the following:

- The loss of indigenous plants;
- The loss of animals;

- Dust liberation;
- Soil compaction and erosion;
- Litter and waste;
- Fire;
- Water pollution.

c) Causes of environmental impacts

These environmental impacts are caused primarily by inadequate planning and not adhering to the EMPr Specifications, e.g.:

- The injudicious removal / disturbance of vegetation and habitat;
- The unnecessary loss of soil;
- Uncontrolled vehicular movement and circulation;
- The haphazard storage of vehicles, equipment and material;
- The uncontrolled servicing, repair and refuelling of vehicles;
- Unclear policy on solid waste management;
- Unclear policy on waste water;
- The uninformed use, storage and disposal of hazardous material;
- The erosive power of storm water and runoff;
- Unintentional and/or uncontrolled fires.

The specific significant impacts of the operation as described in the BAR/ EIAr must be explained.

10.1.4.4 Description of Environmental Mitigation

The fourth and most important step of an induction course will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading their environment. This is known as Environmental Impact Management and is described in the EMPr. The course discussion should also include general environmental code of conduct practices that is not listed as a significant impact or as a mitigation measure such as:

Impact management: Health & Safety (general)

- Always use the toilet and hand washing facilities provided;
- Only use the water provided on site - do not collect water from or dispose water into a natural water course;
- Make use of the specified protective gear for noisy and dusty conditions;
- Always wear proper protective head and foot gear while on site;
- Know where to find a list of emergency numbers in the event of one;
- Report accidents, injuries and unsafe site conditions to the Project Manager or Safety Officer;
- Adhere to the posted speed limits of construction vehicles whilst driving on the access roads.

Impact management: Storage of vehicles, equipment, and materials (general)

- Store machinery, vehicles and materials only in demarcated areas, and within drip trays;

- Do not leave machinery and equipment standing around if not in use;
- Only park vehicles in designated areas;
- Do not park heavy vehicles or store equipment under or near trees;
- Do not store machinery, vehicles, or materials in undisturbed or rehabilitating areas.

Impact management: Servicing, repair and refuelling of vehicles (general)

- No machinery and vehicles will be serviced on site;
- Regularly check your vehicle for fuel and oil leaks;
- Inform the foreman/ environmental manager of leaking vehicles and machinery so that it can be scheduled for repairs;
- Immediately clean any accidental fuel and oil spills using a hydrocarbon spill kit – do not hose spills into the natural environment;
- Dispose of contaminated soil as hazardous waste in the correct location on site;
- Explain the negative consequences of oil and diesel pollution.

Impact management: Solid waste management (general)

- Do not litter – make use of refuse bins provided;
- Do not hose spills into the natural environment – inform the foreman / project manager of spills you are unable to clean yourself;
- Do not bury, hide or burn any waste of any nature;
- Inform the foreman / project manager of any illegal litter or dumping site that you encounter.

Impact management: Waste water management (general)

- Do not use any natural watercourse to wash machinery, vehicles or equipment;
- Only wash machinery, vehicles or equipment in designated areas;
- Conserve water and report any leaks and overflow to the foreman / project manager.

Impact management: Management of hazardous material (general)

- Make sure that you know how to handle all hazardous substances;
- Do not access stores for hazardous substances without permission;
- Immediately clean any minor accidental spills and leaks using an appropriate hydrocarbon spill kit;
- Do not hose any leaks or spills into the natural environment;
- Dispose of all hazardous waste in specified storage areas - if in doubt, ask;
- Immediately report any major leaks and spills to the foreman / project manager.

Impact management: Fire management (general)

- Do not make open fires except in permitted areas and at permitted times;
- Do not leave any fires unattended. Extinguish fires before you leave the area;
- All cooking is to be done on gas / electric stoves and only in the areas provided;
- No burning of waste;
- Smoking only allowed in designated areas and cigarette butts must be disposed of in a bin;

- Ensure that you know where firefighting equipment is located.

Impact management: Wildlife Management (general)

- Any wildlife encountered during earthworks and construction must not be harmed;
- Snakes especially must be treated with care and should be left alone to escape from the construction area. If they do not escape by themselves, a competent person should remove them to a safe area;
- Snares may not be set to catch hares and small buck;
- Tortoises, lizards and other wildlife may not be harmed or collected and must be removed from the construction area or be allowed to escape from the construction area.

Impact management: Soil Erosion(general)

- Prevent erosion from diversion, restriction or increase in stormwater;
- Rainwater should be appropriately channelled to prevent erosion or flooding;
- If erosion or any damage caused by construction vehicles occurs (e.g. on access roads and tracks), appropriate measures will need to be undertaken to prevent erosion, and to rehabilitate any damage caused.

Impact management: Dust Abatement (general)

- Reasonable measures to minimise the generation of dust should be undertaken (e.g., removal of the bare minimum of vegetation);
- Areas where earth is moved should be kept wet with water in order to reduce dust.

Impact management: Pollution (general)

- Engender an ethic of waste pollution management and how plastic bags and paper waste cause, not only visual pollution, but can lead to animal deaths if ingested by them;
- All solid waste must be stored in wind – proof bins to prevent waste being blown around the site;
- Explain also that burning of waste, especially PVC can cause toxic air pollution that is harmful to man, and unsupervised fires can lead to run-away fires;
- The importance of the use of chemical or other toilets will also be emphasised.

10.1.4.5 Consequences of non-compliance

- Explain the consequences of not complying with the conditions of approval and the content of the EMPr which can include the issuing of fines and/or a stop works order and/or result in dismissal.

11 DETAILS OF THE PERSON / COMPANY WHO PREPARED THE EMPr

Legacy Environmental Management Consulting (Pty) Ltd. was appointed as the Independent Environmental Assessment Practitioner (EAP) and has adequate experience within the required Environmental Impact Assessment (EIA) field to facilitate the required Assessment Process. See **Appendix A** for a full CV. The persons involved in the project include:

Kim Pontac	**Project Manager & Reviewer**
	As the Managing Director of Legacy EMC and Principle Environmental Consultant, Kim has many years' experience in applying the principles of Integrated Environmental Management (IEM) and the Environmental Impact Assessment Regulations to several development projects and initiatives in southern Africa and abroad. She has worked in various sectors which include transport, utilities, social infrastructure and minerals, metals and chemicals, hydrocarbons, and nuclear industries. Kim has co-ordinated and managed numerous environmental processes within the public and private sectors for national and international companies. As Principal Consultant, she has successfully conducted a variety of environmental investigations and evaluations for green and brown field projects. Her core experience includes IEM and guiding projects through tendering, design, and construction, operational and decommissioning phases. Kim also has experience in environmental and social due diligence (in accordance with IFC Standards and Equator Principles), environmental compliance audits and environmental legal reviews, permitting and/ or licencing, facilitation and training, and environmental construction monitoring.
Relevant Years of Experience	10+ years
Qualifications	LLM (Environmental Law), University of Cape Town, 2017; BTech (Environmental Management), Cape Peninsula University of Technology, 2008; National Diploma (Oceanography), Cape Peninsula University of Technology, 2004
Professional Registration / Memberships	EAPASA Registered EAP (2019/1269); SACNASP Professional Natural Scientist (Environmental Science) (No: 117908); Institute of Waste Management of Southern Africa (IWMSA) Member No.: 30118035; International Association for Impact Assessment South Africa (2762) (04/10/2010) Member: Environmental Law Association
Role in Project	Internal Review

Lauren Abrahams	Author of Report
	Lauren Abrahams is an Environmental Consultant with experience in applying the principles of Integrated Environmental Management (IEM), and in applying the Environmental Impact Assessment Regulations to various development projects in South Africa. She has experience in various sectors including residential, commercial and industrial developments. Her core experience includes Project Management of environmental projects, including oversight through the tendering, design, and construction, operational and decommissioning phases. Lauren also has extensive experience in Permitting and/or Licencing in respect with Specific Environmental Management Acts (SEMA), Environmental Compliance Monitoring, and Water Use Licence Applications in terms of the National Water Act, to mention a few. In addition, Lauren has valuable knowledge and experience in Public Participation Processes. Lauren started working at Legacy EMC as an Environmental Consultant since January 2022.
Relevant Years of Experience	7+ years
Qualifications	BTech (Oceanography), Cape Peninsula University of Technology, 2010. ND (Oceanography), Cape Peninsula University of Technology, 2009
Professional Registration / Memberships	EAPASA Registered EAP (2019/656); SACNASP Cand.Nat.Sci (100126/12); Member: International Association for Impact Assessment South Africa (6891)
Role in Project	Report writing and stakeholder engagement.

Appendix A: EAP CV

LEGACY | ENVIRONMENTAL MANAGEMENT CONSULTING
Postal Address: PO Box 12410, Die Boord, Stellenbosch, 7613
Tel.: +27 (0) 21 887 4000
Fax: +27 (0) 21 205 1966
Cell.: +27 (0) 66 210 9892
Date: June 2022

CURRICULUM VITAE

Lauren Abrahams

Environmental Assessment Practitioner

Overview

Name of Firm	Legacy Environmental Management Consulting (Pty) Ltd.
Contact details	lauren@legacyemc.co.za
Name	Lauren Abrahams
Date of Birth	25 April 1989
Tertiary Qualification	BTech (Oceanography), Cape Peninsula University of Technology, 2010. ND (Oceanography), Cape Peninsula University of Technology, 2009.
Professional Membership and Accreditation	Registered EAP EAPASA (2019/656) Cand. Nat. Sci. SACNASP (100126/12) Member: International Association for Impact Assessment South Africa (6891). Ergonomic Risk Auditor (Cert. No. 03/08/2017-04)

Areas of Expertise

Lauren Abrahams is an Environmental Consultant with experience in applying the principles of Integrated Environmental Management (IEM), and in applying the Environmental Impact Assessment Regulations to various development projects in South Africa. She has experience in various sectors including residential, commercial and industrial developments.

Her core experience includes Project Management of environmental projects, including oversight through the tendering, design, and construction, operational and decommissioning phases. Lauren also has extensive experience in Permitting and/or Licencing in respect with Specific Environmental Management Acts (SEMA), Environmental Compliance Monitoring, and Water Use Licence Applications in terms of the National Water Act, to mention a few. In addition, Lauren has valuable knowledge and experience in Public Participation Processes.

Areas of expertise includes (but not limited to):

- Project Management
- Environmental Impact Assessments
- Stakeholder engagement or Public Participation
- Environmental Control Officer
- Environmental/Legal Compliance Audits and Assessments
- Environmental Management Programmes
- Section 24G Applications
- Water Use Licensing via the e-WULAAS platform
- Ergonomic Compliance Obligations (workplace) in accordance with the requirements of the Ergonomic Regulations

Relevant Experience (2016 – Present)

De Hoop Integrated Mixed-Use Residential Development – Swartland Municipality | Malmesbury, Western Cape | 2021

Role and Responsibilities:	Environmental Practitioner, as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Full Scoping EIA. Compilation of the Water Use Authorisation application in accordance with the requirements of the National Water Act. Liaison with client and authorities.

Proposed Central Cemetery Expansion on a Portion of Farm RE/957, Vredenburg –| Swellendam, Western Cape | 2021

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Allesverloren Lifestyle Estate (Integrated Mixed-Use Development) on Erven 23, 32, 36, 138, 1845 – 1849 and a portion of Farm 8/642 Allesverloren, Riebeek West | Riebeek West, Western Cape | 2021

Central Cemetery Expansion on a Portion of Farm RE/957, Vredenburg – Saldanha Bay Municipality | Vredenburg, Western Cape | 2021

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Water Use Authorisation for the sewer network and stormwater network infrastructure upgrades associated with the Swellendam Housing – Swellendam Municipality | Swellendam, Western Cape | 2021

Role and Responsibilities:	Compilation of the Water Use Authorisation application for Section 21 water uses, in accordance with the requirements of the National Water Act. Liaison with client and authorities

Water Use Authorisation for the road crossings and upgrades associated with the Swellendam Housing – Swellendam Municipality | Swellendam, Western Cape | 2021

Role and Responsibilities:	Compilation of the Water Use Authorisation application for Section 21 water uses, in accordance with the requirements of the National Water Act. Liaison with client and authorities

Swartland Junction: The Establishment of an Integrated Mixed-Use Development and Associated Infrastructure on Erf 12526, Erf 12496, Portion 1 of the Farm No. 1113, Remainder of the Farm No. 1113, and Portion 1 of the Farm No. 697, Malmesbury and Erf 353, Abbotsdale – Agri Industria (Pty) Ltd | Malmesbury, Western Cape | 2021

Role and Responsibilities:	Environmental Practitioner, as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Full Scoping EIA. Compilation of the Water Use Authorisation application in accordance with the requirements of the National Water Act. Liaison with client and authorities.

Water Use Authorisation for the Melkhoutfontein Housing Development proposed on Ptn 111 of farm 480 Melkhoutfontein and associated bulk infrastructure – Hessequa Municipality │Melkhoutfontein, Western Cape│ 2021

Role and Responsibilities:	Compilation of the Water Use Authorisation application for Section 21 water uses, in accordance with the requirements of the National Water Act. Liaison with client and authorities

Water Use Authorisation for the infrastructure associated with the Swellendam Housing – Swellendam Municipality │Swellendam, Western Cape│ 2021

Role and Responsibilities:	Compilation of the Water Use Authorisation application for Section 21 water uses, in accordance with the requirements of the National Water Act. Liaison with client and authorities

Melkhoutfontein Housing Development of portion 111 of Farm 480 Melkhoutfontein – Hessequa Municipality │Melkhoutfontein, Western Cape│ 2021

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Clearance of Indigenous Vegetation on Erf 1929, Riebeek West – De Gift Boerdery │Riebeek West, Western Cape│ 2021

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Variation of a Waste Management License - Bonnievale WDF – Langeberg Municipality │Bonnievale, Western Cape│ 2020

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Waste License Variation Application Process.

Clearance of Indigenous Vegetation for the Establishment of a Housing Development and Associated Infrastructure on Erven 7752 and 1003, Louwville, Vredenburg – Saldanha Bay Municipality │Louwville, Western Cape│ 2020

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Compost Facility and Feedlot on Portion 6 of Farm Middelburg No. 10, Robertson [Waste Management License and Environmental Authorisation Application] – South African Farm Assured Meat (SAFAM) │Robertson, Western Cape│ 2019

Role and Responsibilities:	Environmental Practitioner, as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process. Compilation of the Water Use Authorisation application in accordance with the requirements of the National Water Act. Liaison with client and authorities.

Development of a Liquid Petroleum Gas (LPG) Import Facility, Pipeline and Handling Facility in The Port of Saldanha Bay – The Strategic Fuel Fund (SFF) │Saldanha Bay, Western Cape│ 2019

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Full Scoping EIA Process.

The Expansion and Licensing of the Compost Facility on Portions 54 And 56 of Farm Groenfontein Annex No. 716, Paarl [Waste Management License and Environmental Authorisation Application] - Boland Organic Supplies│ Paarl, Western Cape│ 2019

Role and Responsibilities:	Environmental Practitioner, as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process. Compilation of the Water Use Authorisation application in accordance with the requirements of the National Water Act. Liaison with client and authorities.

Removal of Natural Vegetation for Cultivation of Portion 7 of Corner Farm No. 466, Caledon – Corner Farm│ Caledon, Western Cape│ 2018

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Malmesbury External Sewer Pipeline – Swartland Municipality│ Malmesbury, Western Cape│ 2017

Role and Responsibilities:	Environmental Practitioner, as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process. Compilation of the Water Use Authorisation application in accordance with the requirements of the National Water Act. Liaison with client and authorities.

Orange Grove Vegetation Clearing and Dam Expansion – Orange Grove Trust│ Worcester, Western Cape│ 2017

Role and Responsibilities:	Environmental Practitioner, as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process. Compilation of the Water Use Authorisation application in accordance with the requirements of the National Water Act. Liaison with client and authorities.

Robertson Nkanini UISP Housing Project– Langeberg Municipality│ Robertson, Western Cape│ 2017

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Robertson Heights Low-Cost Housing Project– Langeberg Municipality│ Robertson, Western Cape│ 2016

Role and Responsibilities:	Environmental Practitioner as part of a team, responsible for Project Management, Report Writing, Management of Specialist Consultants, Review of Specialist Reports, Client and Authority Liaison and Public Participation as part of the Basic Assessment Process.

Skills & Strengths

- Project Management including the execution of the project, within budget and schedule
- Firm understanding of various legal policies and regulations

- Compliance and enforcement
- Microsoft Word, Microsoft Excel, Microsoft Office, PowerPoint
- Environmental Management, Water Management
- Report writing
- Resilient, able to work under pressure, self-starter or team player

Work History

January 2022 - Present	Environmental Assessment Practitioner, Legacy Environmental Management Consulting (Pty) Ltd
Sept 2019 – Nov 2021	Environmental Assessment Practitioner, Enviro-EAP (Pty) Ltd
Aug 2014 – Aug 2019	Environmental Assessment Practitioner and Online Legal Database Administrator, Eco Impact Legal Consulting (Pty) Ltd
Jun 2013 – Jul 2014	Research Assistant, SANParks Cape Research Centre, Tokai
Jul 2012 – May 2013	Research Assistant, SEAON, Egagasini Offshore Node, Cape Town
Oct 2011 – May 2012	Benthic Biodiversity Internship, SEAON, Egagasini Offshore Node, Cape Town
May 2011 – Jul 2011	Research Assistant, University of Cape Town, Department of Zoology
Jun 2010 – Nov 2010	Technical Assistant, Bayworld Research Centre for Research and Education
Apr 2009 – Mar 2010	Internship, Department of Environmental Affairs and Tourism

Appendix B: Construction Guidelines

APPENDIX 1 to the EMP

GENERIC CONSTRUCTION GUIDELINES

1. INTRODUCTION

Construction is potentially one of the most destructive phases of the development process that can harm the environment permanently if it is not appropriately planned and the necessary mitigation correctly applied and managed.

Construction implies certain inevitable levels of change to the affected environment or 'place'. A certain degree of change to the environment, within acceptable environmental norms, nevertheless has to be accepted. It is, however, important for such inevitable change to be limited within confined boundaries, so as to protect ecological, social, and cultural characteristics (i.e. the 'sense of place') of the affected environment, by pursuing the best practicable environmental option(s) or practices.

A primary environmental objective is, therefore, to limit the unavoidable disturbance or fragmentation of the environment to the *'limits of acceptable change'*.

The EMP, together with these Construction Guidelines, is to form part of the construction contractual documentation, i.e. the appointed contracts must be fully aware of the environmental management programmes that need to be carried out as part of the construction programmes.

The construction programme is to be implemented by the appointed contractors, on behalf of the Implementing Agent, in accordance with the EMPs and these Construction Guidelines.

Compliance with the Construction Guidelines will be monitored by the ECO (Environmental Control Officer), to be appointed, who will also monitor compliance of the conditions of contract and conditions of approval (Environmental Authorisation).

This Construction Guideline document forms part of the Contractor's contractual documentation entered into between the Developer and the Contractor and must be signed by the appointed Contractor as acknowledgement of its content.

2. PRE-CONSTRUCTION PHASE

This phase is to be based on the following principles and guidelines:

- A construction contract must be established between the Implementing Agent and the appointed Contractor(s). The contract should include a penalty clause for both environmental and construction transgressions.

- The construction site office, stores, temporary storage of diesel and concrete batching equipment is to be located on an appropriate, non-environmentally sensitive site and must be accessible to large trucks and be large enough for the secure storage of equipment, pipes and fittings, and mechanical machinery and the delivery of raw materials.

- Construction personnel should not be housed on the site and will need to be transported to work on a daily basis. Only security personnel may live on site to maintain a security presence, should this be necessary.

- The Contractor should provide the necessary training of staff to fill certain construction jobs on site. The Contractor will also be obliged to apply a Stellenbosch first policy when employing staff.

- The ECO must inform all contractors and their personnel in respect of the environmental code of conduct prior to the commencement of any construction work.

- The Contractor must demarcate the boundaries of the construction sites with danger tape or fencing. Construction workers must remain in close proximity to the construction site.

- If a mobile fuel bowser is to be used it must be checked for leaks and efficient operation and must have a drip tray under it when parked. All oils diesel and release oils used in the construction process must be kept within the bunded area. Access to the bunded area must be controlled at all times and must be locked at all times.

- The parking and service area (if required) for construction vehicles should be well-compacted earth or concrete to prevent oil and diesel spills contaminating the soils of the site. Should oil or diesel spills occur, they should be treated with a suitable hydrocarbon absorption or remediation product. Absorbent spill mop-up products need to be on hand - Products to be investigated should include sunsorb absorbents (tel. 021 674 7277 www.sunsorb.com) and the hydrocarbon encapsulator "Oilcap" (www.gh2o.co.za).

- A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be provided if servicing of vehicles takes place at stores/site office. Fuels and oils must be safely located out of harms way from the elements (preferably within the bunded area) and safety and fire prevention must be strictly adhered to. The necessary fire hydrants should be on site.

- Alien vegetation should be cleared according to the directives contained in the EMP and MMP.

- Felled alien plant material must be removed from the property by appropriate means to reduce fire risk.

- Any removed topsoil is to be temporarily stockpiled in suitable designated areas for later use in the rehabilitation of the sites, if needed. It may be necessary for the Contractor to stabilise the exposed sandy areas to prevent erosion and dust by spreading straw or chipped vegetation (removed from the site) over the surface or by covering the stockpile with shade cloth. All soil stockpiles shall not exceed 2m in height. The access roads may also require wetting to suppress dust.

- The Contractor must provide temporary chemical toilet facilities at the stores/site office area. A minimum of **one toilet shall be provided per 15 persons at each working area** or as stipulated by the local authority. The toilets must be kept in a clean and sanitary condition, and must be regularly serviced (at least once per week). Toilet paper and potable water (for washing hands) is to be provided by the Contractor.

3. CONSTRUCTION PHASE

This phase is to be undertaken in accordance with the following principles and guidelines:

- The construction area must be clearly demarcated and no construction activity will be allowed outside of this area. All linear alignments of infrastructure must be appropriately demarcated.

- Construction and delivery vehicles must not be allowed to leave the demarcated areas and should only use the existing access road/s in and out of the construction area. All temporary access points to the river must be ratified by the ECO and rehabilitated after use).

- Any cultural-historic artefacts unearthed during excavations/ earth works must be reported to the ECO as soon as possible and all earthworks should be curtailed in those areas until such time as the ECO and/or a consulting archaeologist has surveyed the site(s) and made his/her recommendations. Heritage Western Cape must immediately be informed if the consulting archaeologist deems the finds to be significant.

- All vehicles, equipment, fuel and petroleum services and tanks must be maintained in a good condition that prevents leakage and possible contamination of soil or ground water supplies.

- All emergency servicing of vehicles must be conducted over a drip tray present to prevent accidental spillage of oils and fuels. Used oil should be recycled or disposed of at a hazardous waste disposal facility.

- All fuel/ oil spills must be reported to the ECO.

- Construction material must be stored in areas designated by the Site Agent and in a neat and orderly manner.

- The Contractor must store any building rubble in a suitable area designated by the ECO and should ideally be removed from site on a weekly basis (if not to be used as fill). The crushing of building rubble must be undertaken at a suitable site. Should dust become a problem, spraying of a water mist may be required. Stormwater controls may be required for diverting stormwater away from sensitive areas where erosion can take place.

- All other solid waste must be kept in appropriate containers and must be removed from the site by the Contractor on a weekly basis to a licensed waste disposal facility. The **burning of solid waste and paper will not be allowed on site**. Recyclable waste should be recycled if at all possible (metal, paper, cardboard, bottles, tins and plastic).

- Concrete mixing and the subsequent cement residues must be restricted to a designated area on the site. Such residues are to be removed from the site within one week of completing each phase of the construction period.

- **Used cement bags are to be stored in a wind and rainproof container for disposal**. Used bags may not lie around on site nor may they be burnt on site.

- Excess or spilled concrete should be confined within the works area and then removed to a waste site.

- Cement powder has a high alkalinity pH rating that can contaminate and affect both soil and water pH dramatically. Cement spills must therefore be prevented or cleared as soon after the spill as possible.

- All excavations (especially within deep unconsolidated sand) deeper than 1.5m must be shored up to prevent collapse of the sides and possible injury to workers or even loss of life.

- All open excavations must be protected with danger tape / danger fencing.

- The seeding or planting of indigenous grass or fynbos species may be considered over exposed soil surfaces to act as a quick binder of the soil in order to speed up the rehabilitation process of disturbed areas.

- Disturbed areas around the building sites, where dust can arise, may need to be kept moist by spraying with water from a water bowser or other suitable means, or alternatively straw can be worked into the surface to bind the soil and prevent windblown dust.

- The Contractor will be responsible for security on the site of works and will ensure that his staff do not trespass onto other properties.

- The Contractor must provide dedicated eating areas for staff. Waste bins with lids must be provided at such areas. Such eating areas are to be maintained in a neat condition.

- No fires will be permitted within the project area.

- The ECO/RE must monitor the contractors' compliance with the construction and progress in terms of the above environmental guidelines on a regular basis. The ECO will issue an ECO Checklist within 5 days after each site visit to provide a record of instructions given to the Contractor/Site Agent for environmental work that needs to be done or where problems have been noted.

4. POST-CONSTRUCTION PHASE

This phase is to be undertaken in accordance with the following principles and guidelines:

- All temporary structures must be removed from the site within three weeks after completion of a particular phase of the project.

- The Contractor must remove all oil and cement spills as soon as possible. Alternatively spills may be picked up and stored in appropriate containers/waste skips prior to removal.

- All rubble and other forms of waste must be removed from the site, within one week after completing a particular phase.

- The Contractor must repair disturbed areas (e.g. ripping of deep tracks left by construction vehicles) within one week after completing each phase of the project.

- The rehabilitation/landscaping of disturbed areas can commence as soon as disturbed areas become available and once climatic conditions allow for it.

- Topsoil and and/or wood chips/straw are to be evenly spread over disturbed areas to facilitate the rehabilitation.

- The ECO must make sure that all the environmental stipulations put forward in the construction contracts and/or ECO Checklists have been complied with, and must advise the Developer/RE if the penalty clause needs to be applied for any environmental impacts that may have occurred.

The Contractor must accept the above Construction Guidelines. **It is expected that the Contractor sign this document as part of the main contract with the Implementing Agent.** The main Contractor will also be solely responsible for the conduct of all subcontractors that may be used in this contract.

Signed by: _____ on behalf of: _____

Name: _____

Signed by: _____on behalf of: _____

Name: _____

Witness: _____

Name: _____

Date: _____

Figure 1 Locality Map

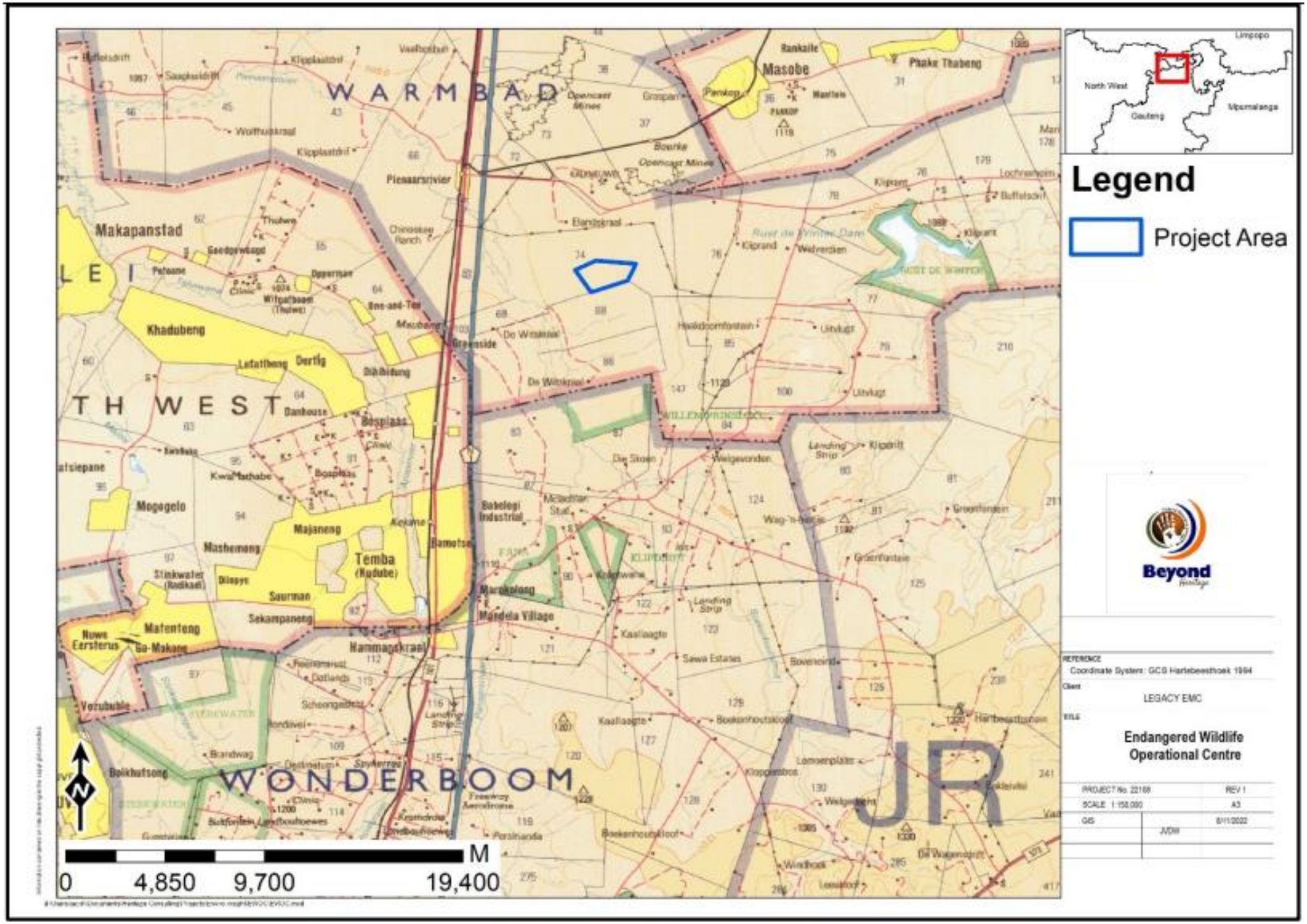


Figure 3: 1: 250 000 Topographical map of portion 6 of Farm Ruimte-74 (development area). Source: HIA, Beyond Heritage, 2022.

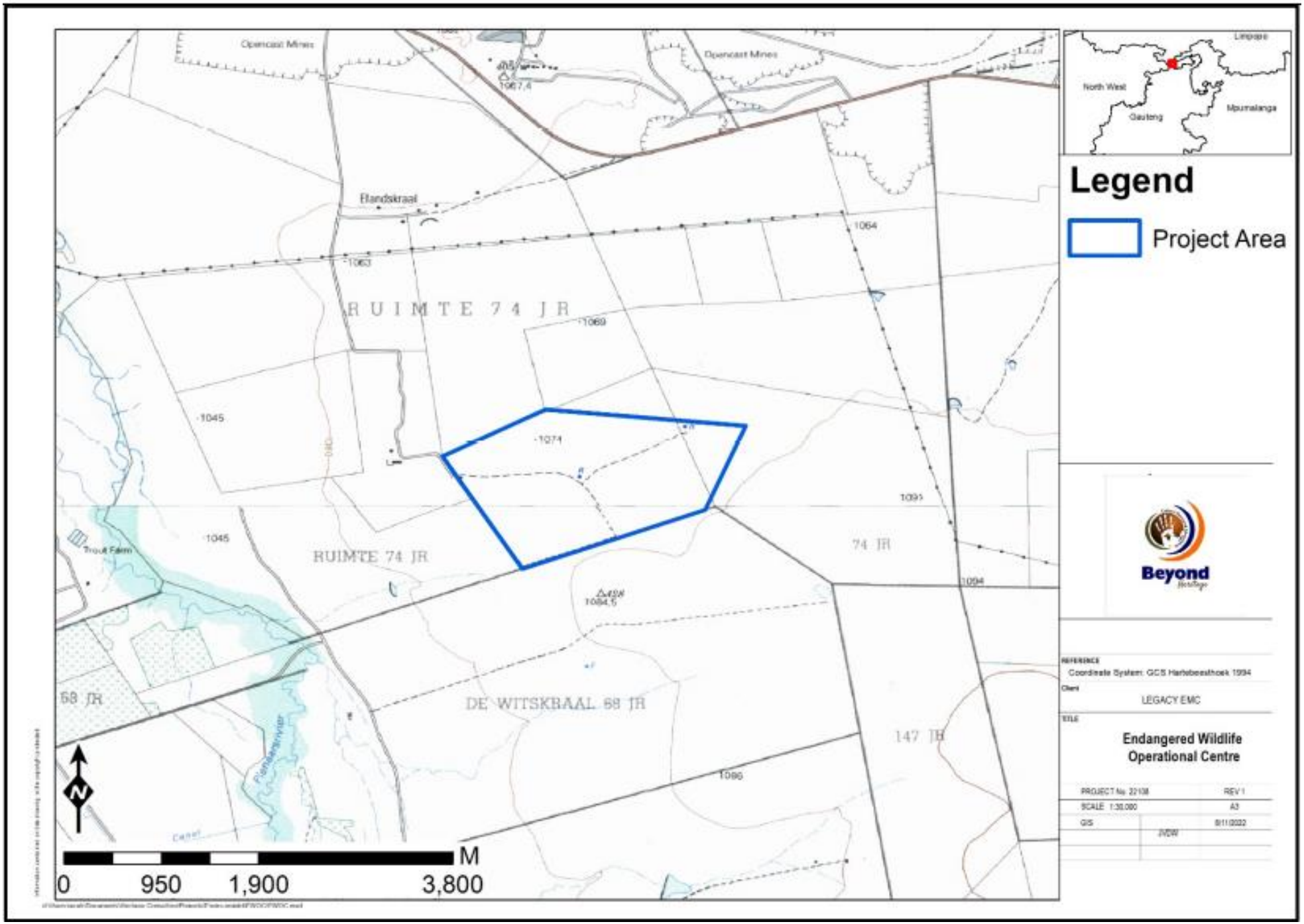


Figure 4: 1: 50 000 Topographical map of portion 6 of Farm Ruimte-74 (development area). Source: HIA, Beyond Heritage, 2022.

Figure 2 Conceptual Development Plan

GENERAL NOTES

* all work to comply with local authorities & NBR by-laws

* read figured dimensions in preference to scaling

* the contractor must verify all levels , heights and dimensions on site and to check same against the set of drawings before commencing work and to convince himself that the information given is correct and in accordance with the conditions on site

* contractors are to locate existing services on site and to protect these from damage throughout the duration of the works.

* the contractor is responsible for the correct identification of all surveyor pegs and markers and setting out of the building with particular reference to grid lines ,column positions ,internal and external walls from surveyor markers boundaries and building lines etc.

* any errors ,discrepancies or omissions to be reported to the architect before commencing any work.

* 4 ply damp proof-course under all walls and sills and vertical dpc. to all changes of floor levels

* flashing to all changes of roof levels and parapet walls

* all concrete beds on well rammed filling.

CONCRETE NOTE

* unless otherwise instructed by the structural engineer the minimum strength of concrete mixes shall be as follows :

blinding:	10 mpa
strip foundations:	15 mpa
75mm traffic surfaces:	20 mpa
75mm surface beds to be screeded:	15 mpa

* reinforced concrete columns, slabs, beams foundations etc. to be strictly in accordance with the structural engineers specifications.

DRAINAGE NOTE

* drainage layout as per NBR part 'N'

* all plumbing and drainage must comply with the relevant local authority and nbr by-laws and regulations

* all bends and junctions in drain to be fitted with ie's and marked covers at ground level.

* waste fittings to have reseal traps and to be fully accessible.

* rain water down pipes to be min. 2450 from gullies

* any portion of drain at a depth of 450 mm or less below ground level shall be encased in concrete having a min. thickness at all points of 100mm measured from the external surface of the pipe.

* any portion of drain passing under any part of the building or footing shall be protected against the load, this pipe must be without bends or junctions along its entire length under the building and should have a re. before and after passing under the building.

* the minimum fall to all drain pipes to be 1 : 40

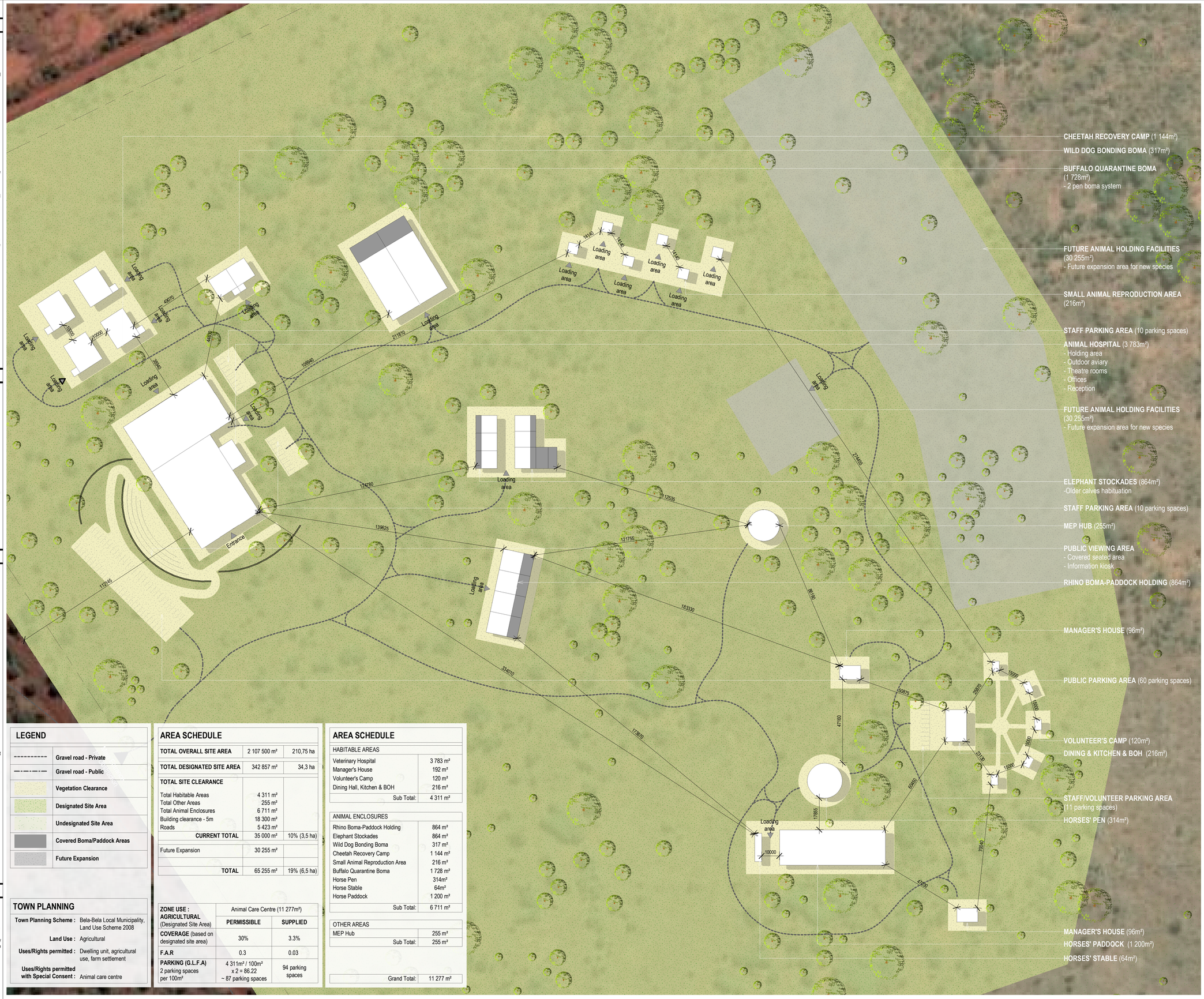
* 100mm Ø for drains and ventilation pipes of approved material.

* 32mm dia waste pipes to wash basins

* 50mm dia waste pipes to all other waste fittings

IMPORTANT NOTE

*Building must be constructed according to all details & specifications contained in these drawings as per SANS 10400. Any changes to details or specifications Must be approved by architects. Energy efficiency specification must be applied to, according to SANS 10400-XA document to be obtained from architect.



LEGEND

----------	Gravel road - Private
-·-·-·-·-	Gravel road - Public
	Vegetation Clearance
	Designated Site Area
	Undesignated Site Area
	Covered Boma/Paddock Areas
	Future Expansion

AREA SCHEDULE

TOTAL OVERALL SITE AREA	2 107 500 m²	210,75 ha
TOTAL DESIGNATED SITE AREA	342 857 m²	34,3 ha
TOTAL SITE CLEARANCE		
Total Habitable Areas	4 311 m²	
Total Other Areas	255 m²	
Total Animal Enclosures	6 711 m²	
Building clearance - 5m	18 300 m²	
Roads	5 423 m²	
CURRENT TOTAL	35 000 m²	10% (3,5 ha)
Future Expansion	30 255 m²	
TOTAL	65 255 m²	19% (6,5 ha)

AREA SCHEDULE

HABITABLE AREAS	
Veterinary Hospital	3 783 m²
Manager's House	192 m²
Volunteer's Camp	120 m²
Dining Hall, Kitchen & BOH	216 m²
Sub Total:	4 311 m²

ANIMAL ENCLOSURES	
Rhino Boma-Paddock Holding	864 m²
Elephant Stockades	864 m²
Wild Dog Bonding Boma	317 m²
Cheetah Recovery Camp	1 144 m²
Small Animal Reproduction Area	216 m²
Buffalo Quarantine Boma	1 728 m²
Horse Pen	314m²
Horse Stable	64m²
Horse Paddock	1 200 m²
Sub Total:	6 711 m²

OTHER AREAS	
MEP Hub	255 m²
Sub Total:	255 m²

Grand Total:	11 277 m²

TOWN PLANNING

Town Planning Scheme :	Bela-Bela Local Municipality, Land Use Scheme 2008
Land Use :	Agricultural
Uses/Rights permitted :	Dwelling unit, agricultural use, farm settlement
Uses/Rights permitted with Special Consent :	Animal care centre

ZONE USE : AGRICULTURAL (Designated Site Area)	Animal Care Centre (11 277m²)	
	PERMISSIBLE	**SUPPLIED**
COVERAGE (based on designated site area)	30%	3.3%
F.A.R	0.3	0.03
PARKING (G.L.F.A) 2 parking spaces per 100m²	4 311m² / 100m² x 2 = 86.22 ~ 87 parking spaces	94 parking spaces

SITE PLAN
1 : 1000

FOR INFORMATION

OWNERS SIGNATURE

ARCHITECTS SIGNATURE

ENGINEERS SIGNATURE

GOTTSMANN ARCHITECTS

www.gottsmann.co.za
t: 011 979 7116 - **c:** 072 629 9596
e: info@gottsmann.co.za
217 Kramer Road, Sandton, 2090
Building No. 3 Kramerville Corner, 2nd floor
Donovan Gottsmann - Pr. Arch. Reg 21343

Site Plan

CLIENT	**EWOC**
ADDRESS	**DINOKENG**

GA	**2114**
DATE	**2022/03/28**
DRAWN BY	**PNC**
CHECKED BY	**PB**
SCALE	**1 : 1000**

002 A1

PLOTTINGDATE **2022/03/28 08:07:04**