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Environmental Management Programme

Proposed Residential dwellings and associated infrastructure on Portion 4 of the Farm 643, Stanford, Caledon RD

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STATEMENT OF INDEPENDENCE

Lornay Environmental Consultants nor any of the authors of this report have any material present or contingent interest in the outcome of this report, nor do they have any financial or other interest which may affect the independence of the author(s) or Lornay Environmental Consulting. The consultant fees paid to Lornay Environmental Consulting for the completion of this report is in line with standard professional fees and daily rates. The settling of the professional fee is not dependent on the outcome of the report.

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KEY TERMS AND ABBREVIATIONS

BAR	Basic Assessment Report
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
DEA&DP	Department of Environmental Affairs and Development Planning (Western Cape)
EA	Environmental Authorisation
ECA	Environment Conservation Act (Act No. 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM:BA	National Environmental Management Biodiversity Act (Act No. 10 of 2004)
NEM:WA	National Environmental Management Waste Act (Act No. 59 of 2008)

PPE	Personal Protective Equipment
SDS	Safety Data Sheets
SHE	Safety Health and Environmental

Basic Assessment - Process followed to receive Environmental Authorisation from the Competent Authority, necessitated by NEMA. The Basic Assessment Report (BAR) is drafted in line with the legislation.

Competent authority - The Department of Environmental Affairs and Development Planning (DEA&DP)

Contractor - the main or specialised contractors as appointed by the developer / applicant for the execution of the works, including all sub-contractors

Developer / Applicant – Cheddles Pty Ltd

Environmental Control Officer (ECO) - a suitably qualified person to be appointed by the Developer / Applicant, to oversee the implementation of the EMP and environmental agreement until the completion of works on the site

Environmental Management Plan / Programme (EMP/r) - this document, approved by the competent authority, to control the implementation of the works on the site in such a way as to ensure that they do not result in undue or reasonably adverse impacts on the environment.

General waste - Waste that does not pose an immediate hazard or threat to health or to the environment, and includes domestic waste, building and demolition waste, business waste and inert waste

Hazardous waste - Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

Project manager - Overall responsible and accountable person for the site during the construction, operation and decommissioning of the facility.

Project Management team - The responsibility of the EMP implementation resides with this team. This team includes a Project Manager and appointed contractors and consultants.

Safety, Health and Environmental Officer (SHE Representative) – Applicant / developer will appoint one Safety Health and Environmental Officer, assisting the construction manager on Safety, Health and Environmental aspects of the project on the construction site.

Site Manager **–** the employee of the main contractor responsible for the day to day control of all activities and operation on site.

Sub-contractor and Contractor - Any provider of services, goods or people to the Applicant / Developer, for the construction, operation or decommissioning.

LEGISLATIVE REQUIREMENTS

A Basic Environmental Assessment process is applicable in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) regulations (2014) (as amended). Appendix 4 of the NEMA EIA Regulations (GN. R982) sets out the minimum requirements for the drafting of an Environmental Management Plan (EMP). This EMP has been created in fulfilment of these prescribed requirements for the construction and post-construction phase of the activity applied for. The implementation of this EMP will be a condition of approval of the Environmental Authorisation (EA). Failure by the applicant, to comply with this EMP, will therefore constitute an offence, and the applicant and / or the appointed contractors can be held liable for penalties and / or legal action. It is therefore important that a copy of this EMP be issued to each contractor, preferably at the appointment stage, in order to allow for the costs of implementing the EMP, to be included in cost proposals. This will also ensure that the contractor is aware of his responsibilities prior to appointment and commencement. Each appointed contractor involved in the project, as well as the project manager (as applicable), will be required to sign for and thereby acknowledge contents of, the approved EMP and therefore abide by the specifications of the document and any amendments thereto.

Other applicable legislation

The Constitution of The Republic of South Africa (Act 108 of 1996)

The Constitution of the Republic of South Africa states that everyone has a right to a non-threatening environment and that reasonable measures are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

National Environmental Management Act (Act 107 of 1998)

The National Environmental Management Act (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant competent authorities. NEMA is a National Act, which is enforced by the Department of Environmental Affairs (DEA). These powers are delegated in the Western Cape to the Department of Environmental Affairs and Development Planning (DEA&DP).

National Environmental Management: Biodiversity Act (Act 10 of 2004)

Chapter 4 of the National Environmental Management: Biodiversity Act, 2004 (NEMBA) deals with threatened and protected ecosystems and species. The need to protect listed ecosystems is addressed (Section 54). Section 73 deals with Duty of Care relating to invasive species, while Section 76(2) calls for development of invasive species monitoring, control and eradication plans by all organs of state in all spheres of government, as part of environmental management plans required in terms of Section 11 of NEMA.

National Environmental Management: Waste Act (Act No. 59 of 2008)

The National Environmental Management: Waste Act (NEM:WA) provides for specific waste management measures (disposal and storage) and the remediation of contaminated land.

National Environmental Management: Air Quality Act (Act No. 39 of 2004)

Section 32 provides provision for the control of dust, section 34 provides provision for the control of noise and section 35 provides provision for the control of offensive odours, all which may be experienced during the construction or operation of an applicable development.

Environment Conservation Act (Act No. 73 of 1989)

The Environment Conservation Act (ECA) provides provision for the prevention of littering by employees and subcontractors during construction and the maintenance phases of development.

Occupational Health and Safety Act (Act No. 85 of 1993)

Section 8 outlines the general duties of employers to their employees and section 9 outlines the general duties of employers and self-employed persons, to persons other than their employees.

Hazardous Substances Act (Act No. 5 of 1973)

This Act provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.

1. INTRODUCTION

Cheddles (Pty) Ltd, herein referred to as the Applicant, has appointed Lornay Environmental Consulting (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to apply for Environmental Authorisation in terms of the National Environmental Management Act (Act 107 of 1998) and the Environmental Impact Assessment Regulations (2014), as amended. This appointment relates to the application for environmental authorisation of listed activities associated with the Proposed Residential development as well as associated infrastructure, as well as jetty and slipways on Portion 4 of the Farm Middelburg No. 643, Stanford.

The Environmental Management Programme (EMPr) presented in this document is a legally binding instrument applicable to the applicant, all successors in title, and any future developers or property owners, whether they assume ownership of the whole or any portion of the development. This EMPr governs the proposed residential development on the subject property, Portion 4 of the Farm 643, as outlined in this application, including any future amendments to the approved layout or development plan. It further extends to all property owners within the development, ensuring a consistent and enforceable framework for environmental management.

This EMPr has been prepared and submitted as part of the Basic Assessment process, in accordance with the requirements of NEMA and its associated regulations. It serves as a comprehensive guideline for managing environmental impacts during both the construction and post-construction phases of the project. The scope of the development includes the establishment of roads, residential dwellings, slipways and jetties, as well as the associated infrastructure on Portion 4 of the Farm 643. The document is prescriptive in nature, detailing mitigation measures and assigning specific responsibilities to individuals or organizations tasked with implementing actions during the construction and post-construction phases.

The primary objective of this EMPr is to minimise or, where possible, entirely avoid potential environmental impacts arising from the proposed development. It addresses key activities such as vegetation clearing, civil works, residential construction, rehabilitation plans and the installation of services, while promoting sustainable development practices. As a dynamic document, the EMPr is designed to be adaptable, allowing for periodic updates to reflect changing site conditions or project requirements. While it is compiled as an integral component of the Basic Assessment process, this EMPr becomes legally enforceable upon approval by the Competent Authority, Department of Environmental Affairs and Development Planning (DEADP).

Compliance with the EMPr is critical throughout the construction and post-construction phases, particularly during activities such as vegetation clearing and the installation of civil services, road construction, and residential units. Upon completion of the construction phase, a completion audit is anticipated to be required, as may be stipulated in the Environmental Authorisation (EA). This audit will verify adherence to the EMPr and ensure that all environmental management commitments have been met.

This EMPr has been drafted in strict accordance with Section 24N of the National Environmental Management Act (NEMA, Act 107 of 1998), ensuring alignment with statutory requirements and best practices in environmental management. It reflects a commitment to balancing the developmental needs of the proposed residential project with the imperative to protect and preserve the natural environment of the subject properties and its surroundings.

2. DEVELOPMENT PROPOSAL

The property is located outside the urban edge and is currently zoned Agricultural Zone I, which permits agricultural activities and, under certain conditions, related uses. The surrounding properties are also zoned for agricultural purposes and have been transformed to support agricultural operations, contributing to the rural character and land-use pattern of the area. The property abuts Kleinriver to the north, vacant properties to the east and the west, which appear to have been historically transformed for agricultural purposes (farming) as well as a transformed portion of the properties situated to the south. The project involves the construction of two single residential dwelling, a manager's cottage and associated infrastructure, primarily concentrated within previously disturbed or transformed areas to limit environmental impact. The proposed development will cover a total area of approximately 5222 m² within the broader 13.53 ha (135,300 m²) farm property.

Residential Buildings

The development includes two residential dwellings:

- House 01 will be partially located within an existing disturbed road footprint and will cover approximately 1410 m².
- House 02 will be located primarily outside the existing disturbed road area and will require vegetation clearance for an area of approximately 2930 m².

Both dwellings will be single-storey and designed with architectural sensitivity to the surrounding rural character. Each unit will include bedrooms, living spaces, kitchens, bathrooms, and outdoor verandas or terraces.

Manager's Cottage

A Manager's Cottage is proposed to accommodate on-site management personnel. The structure will cover approximately 1000 m²

Recreational Features

A swimming pool, firepit, and connecting pathway are proposed as recreational features for the residential component. These features will occupy an area of approximately 100 m² and will be situated outside of the existing disturbed road area and below the 5 m contour line.

Access Road

An internal access road will be constructed or upgraded, using existing disturbed pathways where possible to minimise new disturbance. The road will be surfaced with permeable material (e.g., gravel) to support natural drainage and reduce erosion. It will provide connectivity between the entrance, residential buildings, and the Manager's Cottage.

Jetty and Slipway

A dedicated access route and water-based facilities are proposed as follows:

- An access road covering a footprint of approximately **337 m²** will link the dwelling to the river-based structures.
- A jetty with a development footprint of approximately **53 m²** will be constructed to provide river access for recreational purposes.

- A slipway with a development footprint of approximately **170 m²** will facilitate small watercraft launching and retrieval.

In total, the combined footprint of the road, jetty, and slipway will amount to approximately **560 m²,** all situated below the 5 m contour line.

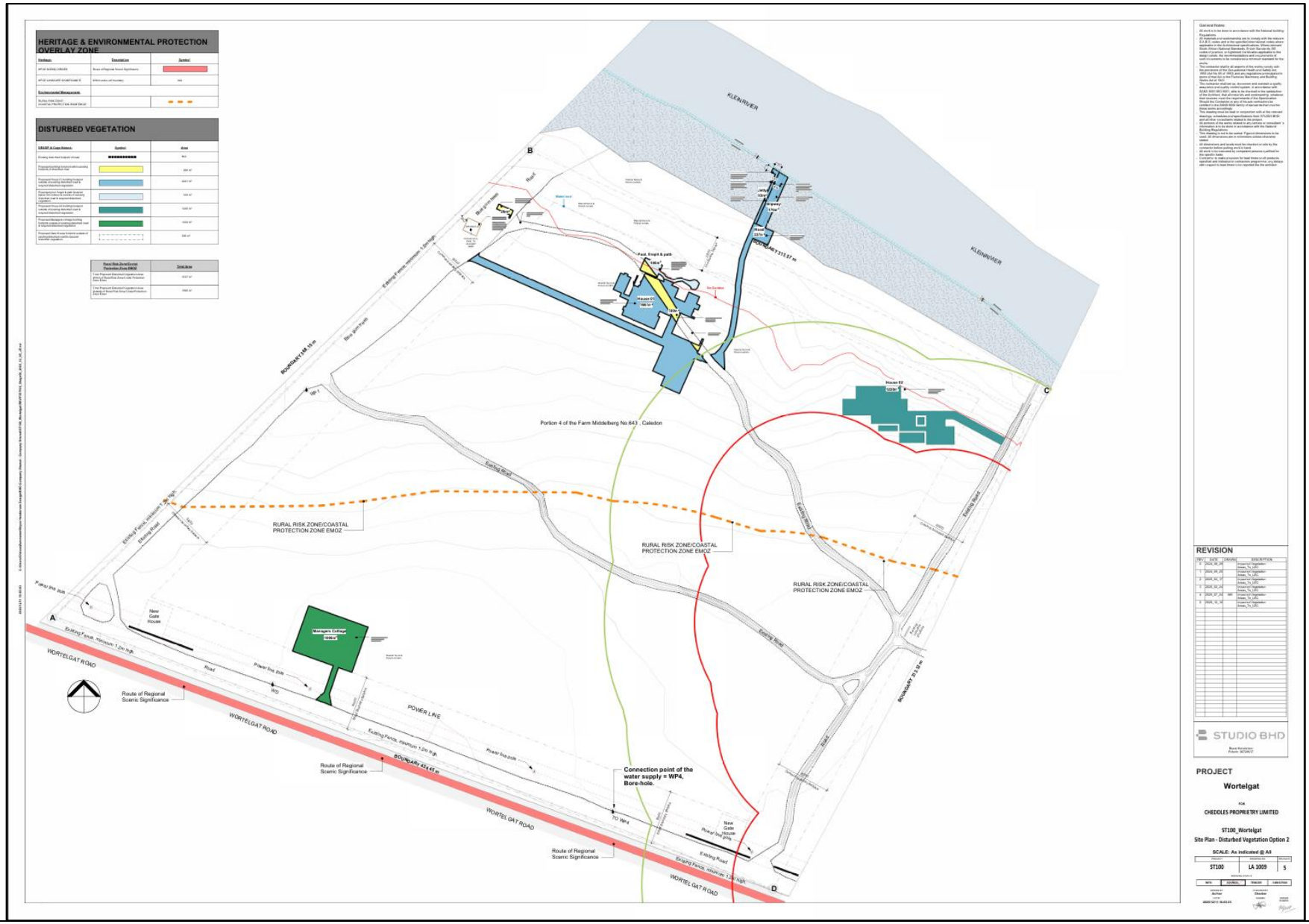

Figure 1: Proposed site development plan

3. TERMS OF REFERENCE

The primary objective of this Environmental Management Programme (EMPr) is to identify, manage, and mitigate any potential negative environmental impacts that may arise during the construction and post-construction phases of the proposed residential development and associated infrastructure. The EMPr serves as a guiding document to ensure that the construction and post-construction phases of the development are carried out in an environmentally responsible manner, in compliance with relevant legislation and best practices.

3.1. Scope of Application:

- This EMPr applies to all construction and post-construction / operational activities associated with the proposed development, including site preparation, building construction, access roads, service infrastructure and any associated infrastructure.
- It must be made available to all contractors, subcontractors, and relevant stakeholders involved in the project, ensuring that it forms an integral part of all tender documentation and contracts.

3.2. Binding Requirements:

- The provisions of this EMPr are binding on the applicant/owner, all contractors, subcontractors, and any third parties acting on their behalf.
- The applicant/owner is responsible for ensuring that all contractors and subcontractors are fully informed of the environmental requirements contained within this document.
- Failure to comply with the EMPr's requirements by any party involved in the construction will result in appropriate penalties, and the contractor will be obligated to remedy any environmental damage caused by their actions or the actions of their subcontractors.

3.3. Responsibilities and Accountability

- The contractor is accountable for the environmental performance of the site and must ensure that all activities are conducted in accordance with the environmental standards and guidelines set out in the EMPr.
- The contractor must also take proactive steps to prevent environmental damage and address any environmental issues that may arise during construction.
- In the event of environmental harm or non-compliance, the contractor will be required to restore the affected areas and bear any costs associated with remediation or penalties imposed.

3.4. Implementation and Compliance Monitoring

- Regular site inspections and audits will be conducted to monitor compliance with the EMPr. Any non-compliance will be recorded, and corrective actions will be mandated to mitigate environmental risks.
- Contractors and subcontractors are required to cooperate fully during audits and inspections, and all personnel must receive appropriate environmental training to ensure adherence to the EMPr’s guidelines.

4. ENVIRONMENTAL CONTROL ON SITE

4.1. Approach

The Table below illustrates the various approaches to be undertaken to manage potential scenarios as a result of the activity on site:

Table 1: Impact management

Avoidance	Avoiding activities that could result in adverse impacts and/or resources or areas considered sensitive.
Prevention	Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having negative impacts.
Preservation	Preventing any future actions that might adversely affect an environmental resource.
Minimisation	Limiting or reducing the degree, extent, magnitude or duration of adverse impacts through scaling down, relocating, redesigning and/or realigning elements of the project.
Mitigation	Measures taken to minimise adverse impacts on the environment.
Enhancement	Magnifying and/or improving the positive effects or benefits of a project.
Rehabilitation	Repairing affected resources, such as natural habitats or water resources.
Restoration	Restoring affected resources to an earlier (possibly more stable and productive) state, typically, 'background' or 'pristine' condition. These resources may include soils and biodiversity
Compensation	Compensating for lost resources, and where possible, the creation, enhancement or protection of the same type of resource at another suitable and acceptable location.

4.2. Organisational Structure and Responsibilities

The Applicant and their appointed contractors will be responsible for the construction phase of each house, internal and access roads and associated infrastructure. All construction related staff are to be briefed on the requirements of the EA and EMP and copies of these documents are to be kept on site during all phases of construction. Long term management will be required in the post construction / operational phase and this will be done in conjunction with the Home Owners Association / similar structure.

4.3. Environmental Control Officer

Due to the sensitivity of the site, it is recommended that an ECO be appointed for the construction phase of the development. ECO site visits should take place for the duration of the construction phase as per the conditions of the Environmental Authorisation. This will ensure that the additional conditions contained in the EA, EMP and BAR are implemented.

It will be the ECO's responsibility to ensure that the mitigation / rehabilitation measures and recommendations referred to in the EA (still to be issued) are implemented and complied with by the owner.

The applicant (owner/holder) will be responsible for the remuneration of the ECO and any other expenses encountered in the process of environmental monitoring of the construction.

Roles and Responsibilities of an ECO

The responsibilities of the ECO during the construction and operational phase of the project, will include, but not be limited to, the following:

- → Ensure compliance with the EMPr at all times during the pre-construction and construction phase;
- → Ensure compliance with relevant management conditions of the EA during the preconstruction and construction phase;
- → Meet with the contractors to set out the environmental parameters within which they must work (pre-construction and construction phase);
- → To environmentally educate and raise the awareness of the Contractors and their staff and to target responsible individuals as key players for environmental education and to facilitate the spread of the correct environmental attitude during the contract work.
- → Approve the previously disturbed areas set out;
- → Indicate where all no-go areas are to be demarcated and to ensure adherence to these delimitations at the induction session BEFORE any construction or site clearance commences on-site (pre-construction phase).
- → Must inspect the construction footprint on a weekly basis during construction of these elements of the development; and must take immediate measures to address unforeseen disturbances to the river and its associated buffer area.
- → Must check the non-perennial stream as well as the recommended buffer area for erosion damage and sedimentation weekly and after every heavy rainfall event.
- → To review method statements and to determine the most environmentally sensitive options
- → To oversee the implementation of environmental procedures set out in this document
- → Indicate where plant rescue may be necessary, and what species should be rescued on this site (pre-construction phase)
- → Advise on rehabilitation/landscaping measures to be implemented
- → Ensure that the correct earthworks practices are adhered to; e.g. no encroachment into the surrounding vegetation, separation of topsoil and subsoil, correct stockpiling and stripping of topsoil);
- → To attend site contractor's meetings, as required and report on environmental issues
- → To receive notices and minutes of all site meetings.
- → To maintain an open and direct channel of communication with the construction team and site manager
- → To take immediate action on site where clearly defined no-go areas are violated, or in danger of being violated, and to inform the site manager immediately, of the documents and the action taken.
- → To keep an up-to-date record of works on site, as they relate to environmental issues in the site diary.
- → To be contactable by the public regarding matters of environmental concern during the construction phase.
- → The ECO is to submit a completion report to the competent authority (DEADP) and applicant upon completion of the construction phase and before the EA lapses.

4.4. Project Manager

In addition to the ECO, the Project Manager will be responsible for the following:

- → All activities relating to the construction phase
- → Delegate activities in accordance with the EMP
- → Communicate design changes and technical issues to the team timeously
- → Ensure that all contractors are managing their team adequately and abiding by the conditions of the EMP and EA
- → Ensuring that the Contractors are aware of the conditions of the EMP and EA

4.5. Contractor

The Contractor (including sub-contractors) will be responsible for:

- → Familiarising themselves with the EIA and EMP
- → Complying with the EMP and EA commitments and any other legislative requirements as applicable
- → Adhering to any instructions issued by the Project Manager or the Safety, Health and Environmental (SHE) Officer, if applicable
- → Submitting an environmental report at designated site meetings on the environmental incidents that have occurred, if applicable
- → Arranging that all employees and those of the subcontractors receive appropriate training prior to the commencement of construction, taking cognisance of this EMP and EA

4.6. Site Documentation and Reporting

Site logbook

A logbook should be kept on a construction site for the purposes of recording on-site instructions and as a general record of environmental issues. The logbook should be kept for a minimum of two years after the activity is completed for the relevant authority to review if deemed necessary. A photographic record of before and after construction should also be kept for visual reference purposes. The logbook should also contain the following sections:

Environmental Site Instruction

The Environmental Site Instruction section will be used for the recording of general site instructions relating to the protection of environmentally sensitive or potentially impacted areas or features on the site as applicable, by the ECO / site manager / construction team.

Site Diary

The purpose of this section will be to record the comments of the ECO / site manager / contractor etc., as they relate to activities on the site. The diary should also hold the complaints register, received from onsite personnel and the general public, Environmental Incident Register, disposal certificates for waste and sewage, non-conformance information, and written corrective active instructions.

Monitoring Section

The purpose of this section will be to record the comments of the ECO / site manager / contractor, during construction, relating to the implementation of the mitigation measures as well as waste, recycling, landscaping

and renewable energy measures used during the construction. The findings of all inspections and internal audits should be structured into instructive reporting, providing information to all responsible personnel. Corrective actions must be clearly defined where required. Within the reporting function a structured review component will be enforced. This review function will assist in prescribing necessary corrective actions. During construction, the ECO / Project management team, will be responsible for onsite monitoring to ensure that the contractor abides by the conditions of the EA and EMP.

The Environmental Authorisation (EA) as well as a copy of the approved Environmental Management Plan (EMP) for Construction, should also be accessible on site at all times.

4.7. Homeowners association

A Homeowners Association or similar structure is required to implement and manage the long-term management actions required on site.

5. CONDITIONS OF AUTHORISATION

The Environmental Authorisation (EA), once issued, will be included here and will be mandatory for all contractors, sub-contractors, agents, consultants, and construction personnel working on the property.

6. ENVIRONMENTAL AWARENESS

It is important to ensure that the contractors and employees associated with the proposed activity receive the appropriate level of training and awareness to ensure that continual environmental due diligence and conservation is applied at all levels of work carried out on site. Employees, contractors and sub-contractors must be made aware of their responsibilities in terms of relevant legislation, guidelines, as well as this EMP and EA.

The environmental conditions should be included in the contracts issued to the contractors, making them aware of the potential environmental impacts and risks associated with the proposed development as well as what measures are expected of them whilst conducting work on site. The importance of implementing the conditions in the EMP and the necessity of good housekeeping practices, will be made known to the contractors and employees.

6.1. Aim of the Environmental Awareness Plan

- → Promote environmental education and conservation on site
- → Inform employees and contractors on the applicable environmental procedures and plans

6.2. Environmental Awareness Training and content

- → All personnel should undergo induction, which as a minimum should include Safety, Health and Environmental awareness
- → All attendees should sign an acknowledgement register upon receiving and understanding the induction
- → Construction and operational staff should be trained on the implementation of emergency procedures where applicable
- → Definitions as used in this EMP should be provided
- → How and why environmental protection is necessary, should be explained
- → Management measures required to prevent environmental impacts should be outlined

→ Emergency and spills response procedures should be outlined

Environmental conditions in the induction should focus on the following:

→ Good house-keeping practices
→ Air quality (Dust)
→ Waste Management
→ Odour/vermin Control
→ Proper use of sanitation facilities; and
→ Chemicals and materials storage, use and handling.

Environmental training should be implemented at the onset of the construction and can be done verbally or in written format. Proof of training should be kept on record.

7. CONSTRUCTION PHASE IMPACTS AND MITIGATIONS

7.1 Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment

The assessment identified the following key potential impacts as well as mitigations measures for the management of impacts during the construction phase:

***Potential impacts**:*

The proposed development may contribute to loss of animal species of conservation concern, including confirmed records of Mute Winter Katydid, Western Leopard and African Marsh Harrier.

The development will also contribute to the loss of functional landscape connectivity between Kleinriver and surrounding fynbos.

Management of impacts and Mitigation measures:

General Site-Wide Mitigation

→ Restrict built infrastructure to ~30% of the 12-ha property.

→ Cap development at three dwellings, as assessed in this application.

→ Adopt dark-sky compliant lighting (low-spectrum, full cut-off fittings, shield estuary-facing lights) to reduce disturbance to nocturnal fauna and birds.

→ Enforce pet curfews at night and discourage free-ranging cats and dogs to limit predation and disturbance to birds, reptiles and amphibians.

→ Implement a formal alien clearing and follow-up programme across retained natural areas to prevent decline in functional integrity.

→ Consider assigning all retained natural habitat (~70% of site) to a formal conservation status, such as a biodiversity stewardship agreement, to ensure long-term ecological management.

Faunal Landscape Connectivity

→ Maintain a continuous natural corridor across at least 70% of the property to allow free movement between the Klein River estuary and adjacent upland habitats.

→ Prohibit impermeable fencing; if fences are required, ensure wildlife-permeable design (≥30 cm ground clearance, no mesh smaller than 100×100 mm).

→ Consolidate infrastructure and driveways to reduce fragmentation and maintain open strips for fauna.

→ Actively rehabilitate degraded strips post-construction and manage alien regrowth to preserve corridor functionality.

Estuarine and Water-Associated Birds (African Marsh Harrier, Caspian Tern, Great White Pelican)

→ Reduce proposed jetties from two to a single low-intensity jetty to limit repeated disturbance pulses.

→ Maintain a no-work buffer at reed margins and estuary edges during construction; enforce quiet hours at dusk and dawn to protect hunting harriers and roosting terns.

→ Lighting controls: Shield and direct lighting away from the estuary to prevent disorientation or displacement of estuary-dependent species.

→ Schedule noisy construction away from peak breeding/foraging seasons (Aug–Nov for marsh harrier; peak roost periods for terns/pelicans).

→ Secure long-term management of estuary-edge natural habitat through stewardship or conservation agreements.

Terrestrial SCC Birds (Southern Black Korhaan, Denham's Bustard)

→ Align dwellings and infrastructure away from the few lower, more open fynbos patches that may be marginally suitable for korhaan or bustard activity.

→ Use alien clearing and appropriate fire management to preserve a patchy vegetation structure, favouring species sensitive to tall, dense shrub encroachment.

→ Disturbance reduction: Limit human and pet activity in marginal open patches and restrict additional disturbance near sensitive zones.

Amphibians (Western Leopard Toad)

→ Shape access tracks with shallow U/V profiles; include amphibian-safe drainage.

→ Prohibit pesticides and herbicides on site.

→ Fit escape ramps or "toad savers" in swimming pools.

→ Retain indigenous groundcover and vegetated strips between dwellings to support terrestrial dispersal.

→ Provide residents with awareness material on toad movement periods and safe behaviours.

Reptiles (Southern Adder)

→ Pre-construction search and rescue: Conduct supervised vegetation clearance with relocation of snakes and refugia where possible.

→ Retain or recreate rock piles, woody debris, and shrub thickets as refugia.

→ Educate contractors and residents about the conservation importance of Southern Adder and provide protocols for safe handling.

→ Impose strict speed limits on internal tracks to reduce roadkill risk.

→ Maintain functional fynbos structure with alien clearing and fire in line with ecological cycles.

Invertebrates (Mute Winter Katydid, Other SCCs)

Mute Winter Katydid

→ Keep development outside the 50 m no-go buffer surrounding mapped katydid habitat.

→ Avoid hard road surface construction

→ Mark and protect occupied patches as no-go areas during and after construction.

→ Prohibit mowing, gardening or herbicide or pesticide use within buffers.

→ Regularly survey katydid populations post-construction to verify persistence and recolonisation.

Yellow-winged Agile Grasshopper

→ No targeted mitigation required as the species' specific habitat is absent; site-wide alien control and natural vegetation retention suffice.

Other SCC Invertebrates

→ Map and avoid patches supporting confirmed SCCs where possible.

→ Establish indicator taxa monitoring to detect changes in population presence or habitat quality.

→ Actively restore and reseed disturbed patches post decommissioning to return invertebrate habitat function.

7.2 Terrestrial Biodiversity Impact Assessment

The assessment identified the following key potential impacts as well as mitigations measures for the management of impacts during the construction phase:

Potential impacts:

Loss of terrestrial vegetation with low sensitivity above the 5 m contour and loss of riparian vegetation with medium sensitivity at the river i.e. above and below 5 m contour.

Management of impacts and mitigation measures

→ Designing the development to stay above the 5 m contour and the estuarine functional zone to reduce ecological impacts.
→ Using existing roads and paths for access to minimize new disturbances to the environment.
→ Limiting infrastructure like slipways and jetties, as only one jetty per property is typically permitted and slipways are discouraged.
→ Clearing of alien invasive plant species.
→ Avoidance of the estuarine functional zone to reduce ecological impacts.
→ Existing roads would be used to avoid unnecessary disturbances to the environment.
→ Only one jetty and one slipway would be constructed.
→ Clearing of alien invasive plant species.

8. POST-CONSTRUCTION PHASE IMPACTS AND MITIGATIONS

8.1. Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment

Potential impacts:

- Direct habitat loss for SCC such as the Mute Winter Katydid.
- Fragmentation and reduced faunal connectivity between estuary and upland habitats.
- Disturbance and displacement of estuarine birds from increased human activity and jetty use.
- Mortality risks for amphibians and reptiles from vehicles, pets, and persecution.
- Long-term edge effects from lighting, gardens and alien plants.

Mitigation measures recommended by the specialist

General Site-Wide Mitigation

→ Restrict built infrastructure to ~30% of the 12-ha property.

→ Cap development at three dwellings, as assessed in this application.

→ Adopt dark-sky compliant lighting (low-spectrum, full cut-off fittings, shield estuary-facing lights) to reduce disturbance to nocturnal fauna and birds.

→ Enforce pet curfews at night and discourage free-ranging cats and dogs to limit predation and disturbance to birds, reptiles and amphibians.

→ Implement a formal alien clearing and follow-up programme across retained natural areas to prevent decline in functional integrity.

→ Consider assigning all retained natural habitat (~70% of site) to a formal conservation status, such as a biodiversity stewardship agreement, to ensure long-term ecological management.

Faunal Landscape Connectivity

→ Maintain a continuous natural corridor across at least 70% of the property to allow free movement between the Klein River estuary and adjacent upland habitats.

→ Prohibit impermeable fencing; if fences are required, ensure wildlife-permeable design (≥30 cm ground clearance, no mesh smaller than 100×100 mm).

→ Consolidate infrastructure and driveways to reduce fragmentation and maintain open strips for fauna.

→ Actively rehabilitate degraded strips post-construction and manage alien regrowth to preserve corridor functionality.

Estuarine and Water-Associated Birds (African Marsh Harrier, Caspian Tern, Great White Pelican)

→ Reduce proposed jetties from two to a single low-intensity jetty to limit repeated disturbance pulses.

→ Maintain a no-work buffer at reed margins and estuary edges during construction; enforce quiet hours at dusk and dawn to protect hunting harriers and roosting terns.

→ Lighting controls: Shield and direct lighting away from the estuary to prevent disorientation or displacement of estuary-dependent species.

→ Schedule noisy construction away from peak breeding/foraging seasons (Aug–Nov for marsh harrier; peak roost periods for terns/pelicans).

→ Secure long-term management of estuary-edge natural habitat through stewardship or conservation agreements.

Terrestrial SCC Birds (Southern Black Korhaan, Denham's Bustard)

→ Align dwellings and infrastructure away from the few lower, more open fynbos patches that may be marginally suitable for korhaan or bustard activity.

→ Use alien clearing and appropriate fire management to preserve a patchy vegetation structure, favouring species sensitive to tall, dense shrub encroachment.

→ Disturbance reduction: Limit human and pet activity in marginal open patches and restrict additional disturbance near sensitive zones.

Amphibians (Western Leopard Toad)

→ Shape access tracks with shallow U/V profiles; include amphibian-safe drainage.

→ Prohibit pesticides and herbicides on site.

→ Fit escape ramps or "toad savers" in swimming pools.

→ Retain indigenous groundcover and vegetated strips between dwellings to support terrestrial dispersal.

→ Provide residents with awareness material on toad movement periods and safe behaviours.

Reptiles (Southern Adder)

→ Pre-construction search and rescue: Conduct supervised vegetation clearance with relocation of snakes and refugia where possible.

→ Retain or recreate rock piles, woody debris, and shrub thickets as refugia.

→ Educate contractors and residents about the conservation importance of Southern Adder and provide protocols for safe handling.

→ Impose strict speed limits on internal tracks to reduce roadkill risk.

→ Maintain functional fynbos structure with alien clearing and fire in line with ecological cycles.

Invertebrates (Mute Winter Katydid, Other SCCs)

Mute Winter Katydid

→ Keep development outside the 50 m no-go buffer surrounding mapped katydid habitat.

→ Avoid hard road surface construction

→ Mark and protect occupied patches as no-go areas during and after construction.

→ Prohibit mowing, gardening or herbicide or pesticide use within buffers.

→ Regularly survey katydid populations post-construction to verify persistence and recolonisation.

Yellow-winged Agile Grasshopper

→ No targeted mitigation required as the species' specific habitat is absent; site-wide alien control and natural vegetation retention suffice.

Other SCC Invertebrates

→ Map and avoid patches supporting confirmed SCCs where possible.

→ Establish indicator taxa monitoring to detect changes in population presence or habitat quality.

→ Actively restore and reseed disturbed patches post decommissioning to return invertebrate habitat function.

8.2. Terrestrial Biodiversity Impact Assessment

Loss of low-lying vegetation close to the river that provides stability to the environment.

Mitigation measures recommended by the specialist

→ Development of residences should be above the 5 m contours and should wherever possible avoid well-established old trees, particularly of wild olive (*Olea europaea subsp. cuspidata*).

Table 2. Activity specific impacts and mitigations

PRE-CONSTRUCTION/ CONSTRUCTION PHASE AND POST-CONSTRUCTION PHASE			
IMPACT	**DESCRIPTION**	**MITIGATION MEASURES**	**RESPONSIBLE PERSONS**
Socioeconomic impacts	***Construction*** Job creation during the development / construction phase	- Ensure labour force is sourced locally as far as possible. - Consider gender balance during when sourcing labour.	Applicant Contractor ECO
Visual impacts	***Construction*** Visual impacts of construction site and construction activities.	- Good design approved by local authority. - Good housekeeping of construction site and working areas. - Screen the visual elements of site construction camp with netting. - Locate the site camp in a transformed area. Not on proposed Open Space. - Site officer to walk the site on a daily basis to check for general site aesthetics and visual impacts, particularly prior to weekends and holidays. - Officer to ensure that waste and batching areas are correctly screened and secured to prevent spread by wind, rain or animals.	Applicant Contractor ECO
Dust impacts	***Construction*** Dust generated from site clearing and site preparation.	- Maintain ground cover for as long as possible to reduce the total surface area exposed to wind. Do not clear entire plots and rather clear building sites only . - Ensure vehicle speed limits on site are kept to a minimum. - Delivery vehicles to keep loads covered. - Cover fine material stockpiles. - Wet dry and dusty surfaces using non-potable water. - Staff to wear correct PPE if dust is generated for long periods. Road surfaces to be swept and kept clean of sand and fine materials.	Applicant Contractor ECO
Noise impacts	*Construction* Noise generated by vehicles and machinery during construction phase.	- Limit noise levels (e.g. install and maintain silencers on machinery) - Provide protective wear for workers i.e. ear plugs. - Ensure that construction vehicles and machinery are maintained regularly to reduce noise generation. - Restrict construction to normal work hours.	Applicant Contractor ECO
Botanical/Ecological impacts	*Construction*	- Designing the development to stay above the 5 m contour and the estuarine functional zone to reduce ecological impacts.	Applicant Contractor ECO

	Loss of undescribed terrestrial vegetation and riparian reedbeds below 5 m contour Loss of terrestrial vegetation with low sensitivity above the 5 m contour and loss of riparian vegetation with medium sensitivity at the river i.e. below 5 m contour. *Postconstruction phase* Loss of low-lying vegetation close to the river that provides stability to the environment.	- Using existing roads and paths for access to minimize new disturbances to the environment. - Limiting infrastructure like slipways and jetties, as only one jetty per property is typically permitted and slipways are discouraged. - Clearing of alien invasive plant species. - Avoidance of the estuarine functional zone to reduce ecological impacts. - Existing roads would be used to avoid unnecessary disturbances to the environment. - Only one jetty and one slipway would be constructed. - Clearing of alien invasive plant species. - Development of residences should be above the 5 m contours and should wherever possible avoid well-established old trees, particularly of wild olive (*Olea europaea subsp. cuspidata*)	
Faunal landscape connectivity	*Construction and Post-construction phase* Construction of the development may temporarily disrupt this connectivity through the removal of vegetation, increased human presence, and establishment of physical barriers such as buildings, roads, and fences.	- Maintain a continuous natural corridor across at least 70% of the property to allow free movement between the Klein River estuary and adjacent upland habitats. - Prohibit impermeable fencing; if fences are required, ensure wildlife-permeable design (≥30 cm ground clearance, no mesh smaller than 100×100 mm). - Consolidate infrastructure and driveways to reduce fragmentation and maintain open strips for fauna. - Actively rehabilitate degraded strips post-construction and manage alien regrowth to preserve corridor functionality.	Applicant Contractor ECO
Black Harrier	*Construction and Post-construction phase* Habitat loss/fragmentation within potential territories; construction disturbance.	- Reduce proposed jetties from two to a single low-intensity jetty to limit repeated disturbance pulses. - Maintain a no-work buffer at reed margins and estuary edges during construction; enforce quiet hours at dusk and dawn to protect hunting harriers and roosting terns. - Shield and direct lighting away from the estuary to prevent disorientation or displacement of estuary-dependent species. - Schedule noisy construction away from peak breeding/foraging seasons (Aug–Nov for marsh harrier; peak roost periods for terns/pelicans). - Secure long-term management of estuary-edge natural habitat through stewardship or conservation agreements -	Applicant Contractor ECO

African Marsh Harrier (*Circus ranivorus)*	*Construction and Post-construction phase* Construction noise and presence adjacent to reeds cause temporary displacement from foraging routes."	- Reduce proposed jetties from two to a single low-intensity jetty to limit repeated disturbance pulses. - Maintain a no-work buffer at reed margins and estuary edges during construction; enforce quiet hours at dusk and dawn to protect hunting harriers and roosting terns. - Shield and direct lighting away from the estuary to prevent disorientation or displacement of estuary-dependent species. - Schedule noisy construction away from peak breeding/foraging seasons (Aug–Nov for marsh harrier; peak roost periods for terns/pelicans). - Secure long-term management of estuary-edge natural habitat through stewardship or conservation agreements.	ECO, Contractor Applicant
Denham's Bustard *(Neotis denhami)*	*Construction and Post-construction phase* Temporary disturbance near estuary still immaterial for bustard	- Align dwellings and infrastructure away from the few lower, more open fynbos patches that may be marginally suitable for korhaan or bustard activity. - Use alien clearing and appropriate fire management to preserve a patchy vegetation structure, favouring species sensitive to tall, dense shrub encroachment. - Limit human and pet activity in marginal open patches and restrict additional disturbance near sensitive zones.	ECO, Contractor Applicant
Southern Black Korhaan *(Afrotis afra)*	*Construction and Post-construction phase* Loss/ disturbance to small, patchy suitable area; construction noise.	- Align dwellings and infrastructure away from the few lower, more open fynbos patches that may be marginally suitable for korhaan or bustard activity. - Use alien clearing and appropriate fire management to preserve a patchy vegetation structure, favouring species sensitive to tall, dense shrub encroachment. - Limit human and pet activity in marginal open patches and restrict additional disturbance near sensitive zones	ECO, Contractor Applicant
Great White Pelican	*Construction phase* Disturbance of foraging and roosting birds near reed margins and estuary edges.	- Reduce proposed jetties from two to a single low-intensity jetty to limit repeated disturbance pulses. - Maintain a no-work buffer at reed margins and estuary edges during construction; enforce quiet hours at dusk and dawn to protect hunting harriers and roosting terns. - Shield and direct lighting away from the estuary to prevent disorientation or displacement of estuary-dependent species.	ECO, Contractor Applicant

		- Schedule noisy construction away from peak breeding/foraging seasons (Aug–Nov for marsh harrier; peak roost periods for terns/pelicans). - Secure long-term management of estuary-edge natural habitat through stewardship or conservation agreements.	
Martial Eagle	*Construction and Post-construction phase* Disturbance to overflying birds; no nesting/open hunting habitat on site.	- Align dwellings and infrastructure away from the few lower, more open fynbos patches that may be marginally suitable for korhaan or bustard activity. - Use alien clearing and appropriate fire management to preserve a patchy vegetation structure, favouring species sensitive to tall, dense shrub encroachment. - Limit human and pet activity in marginal open patches and restrict additional disturbance near sensitive zones	ECO, Contractor Applicant
Caspian Tern	*Construction phase:* Temporary disturbance during works; no breeding on site.	- Reduce proposed jetties from two to a single low-intensity jetty to limit repeated disturbance pulses. - Maintain a no-work buffer at reed margins and estuary edges during construction; enforce quiet hours at dusk and dawn to protect hunting harriers and roosting terns. - Shield and direct lighting away from the estuary to prevent disorientation or displacement of estuary-dependent species. - Schedule noisy construction away from peak breeding/foraging seasons (Aug–Nov for marsh harrier; peak roost periods for terns/pelicans). - Secure long-term management of estuary-edge natural habitat through stewardship or conservation agreements.	ECO, Contractor Applicant
Western Leopard Toad	*Construction phase* Construction disturbance; occasional roadkill *Post-construction phase:* Edge effects (lighting, pets, pesticides) on terrestrial movement.	- Shape access tracks with shallow U/V profiles; include amphibian-safe drainage. - Prohibit pesticides and herbicides on site. - Fit escape ramps or “toad savers” in swimming pools. - Retain indigenous groundcover and vegetated strips between dwellings to support terrestrial dispersal. - Provide residents with awareness material on toad movement periods and safe behaviours.	ECO, Contractor Applicant
Southern Adder	*Construction phase*	- Conduct supervised vegetation clearance with relocation of snakes and refugia where possible.	ECO, Contractor

	Direct loss of refugia during clearing; persecution risk; roadkill during works. *Post-construction phase* Ongoing persecution and roadkill near dwellings; edge effects on refugia.	- Retain or recreate rock piles, woody debris, and shrub thickets as refugia. - Educate contractors and residents about the conservation importance of Southern Adder and provide protocols for safe handling. - Impose strict speed limits on internal tracks to reduce roadkill risk. - Maintain functional fynbos structure with alien clearing and fire in line with ecological cycles.	Applicant
Mute Winter Katydid,	*Construction* Direct loss of occupied microhabitats; local collapse risk due to low mobility. *Post-construction phase* Trampling and gardening degrade occupied patches; edge stress.	- Keep development outside the 50 m no-go buffer surrounding mapped katydid habitat. - Avoid hard road surface construction - Mark and protect occupied patches as no-go areas during and after construction. - Prohibit mowing, gardening or herbicide or pesticide use within buffers. - Regularly survey katydid populations post-construction to verify persistence and recolonisation.	ECO, Contractor Applicant

The Very High Sensitivity area (Katydid Buffer 50m) represents a no-go zone due to its ecological importance and sensitivity and is therefore excluded from the development footprint.

9. GENERAL CONSTRUCTION PHASE IMPACTS AND REQUIREMENTS

9.1 Contractors camp

Responsibility – Contractor / ECO / owner

The contractor shall comply will all relevant laws and regulations concerning water provision, sanitation, wastewater discharge and liquid and solid waste handling and disposal during the construction phase. The contractor is referred to the requirements of the NEMA and the NEM:WA and related regulations. The contractor shall not locate the camp, or sanitation facilities, in any areas that can cause nuisance or safety hazards to surrounding land users, inhabitants or the general public. Suitable temporary toilet facilities should be provided to the construction team. These facilities should be emptied and cleaned on a regular basis by a registered contractor and the waste is to be removed by contractor to a registered facility. The contractor shall at all times carefully consider the machinery required for the desired task while minimizing the extent of environmental damage. The contractor shall keep construction campsites clean and tidy at all times. The contractor shall not leave domestic waste uncontained, and temporary storage shall be enclosed to keep out people and animals. No permanent domestic waste disposal shall be permitted. All domestic refuse is to be removed to an existing licensed landfill site. The contractor shall take specific measures to prevent the spread of veld fires, which may be caused by activities at the camp. These measures may include appropriate instruction of employees about the fire risks and the construction of firebreaks around the site perimeter, as required. The contractor shall prevent accelerated erosion from the construction campsite and shall not discharge polluted runoff into the environment. Adequate firefighting equipment shall be made available and maintained on site. the contractors camp should be located in area proposed for development, in order to reduce impacting undisturbed areas. No overnighting will be permitted at the contractors camp, unless specifically arranged or required. Decommissioning of the campsite will involve removal of all compacted platforms, equipment machinery, tools, waste, etc.

9.2 Health and Safety

Responsibility - Project Manager / Contractor / ECO / owner

Correct Personal Protective Equipment (PPE) must be worn at all times by the personnel on site. Personnel must be trained on the use of PPE. The applicant will appoint one safety officer for the activities. Suitable warning and information signage should be erected at the commencement of construction. The handling of hazardous materials should only be done by trained personnel. Safety Data Sheets (SDSs) must be readily available for all hazardous substances on site and employees should be aware of the risks associated with any hazardous materials used. All provisions of the Occupational Health and Safety Act (Act No. 85 of 1993) must be complied with. In the event of an emergency relating to a hazardous substance, procedures detailed in the SDSs should be immediately implemented.

9.3 Fire risk management

Responsibility - Project Manager / Contractor / ECO / owner

The Applicant / Project manager / contractor should identify a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedure to be followed. The Fire Officer shall ensure that there is basic fire-fighting equipment available on site at all times. Any fires should be reported to the fire officer immediately.

9.4 Fuels and hazardous materials

Responsibility - Project Manager / Contractor / owner

Fuels and flammable materials are to be suitably stored, inside the contractor's camp or as appropriate. Impervious materials are to be used in these storage areas to prevent contamination of the ground in the event of spillages or leaks. Quantities of fuels and hazardous materials stored on site should be appropriate to the requirement for these substances on site.

Bulk fuel depots, if required, should be placed within bunded areas to prevent soil contamination in the event of leaks of spills. Bunded areas are to have a holding capacity equal to 110% of the largest fuel container. The relevant Health and Safety requirements for the hazardous materials and fuels should be kept on site in the event of an emergency.

9.5 Emergencies protocol

Responsibility - Project Manager / Contractor / owner

Fire: The fire officer / suitable other person should be notified of any fires. Employees should be aware of the procedure to be followed in the event of a fire.

Hydrocarbon (fuel & oil) leaks and spillages: Employees should be aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the project manager / contractor. All vehicles leaking fuel or other liquids should immediately be removed to the maintenance area and repaired. In the event of a hydrocarbon spillage, the soil must be excavated and treated and adequately disposed. The necessary materials and equipment for dealing with spills and leaks are present on site at all times. The clean-up of sewerage spills and any damage caused by the spill or leak shall be for the applicant's account. The applicant shall ensure that the Health and Safety officer is available for the duration of the construction period.

Raw Sewerage spills (from portable toilets): Employees are to be aware of the procedure to be followed for dealing with spills and leaks. All the necessary materials and equipment for dealing with spills and leaks are present on site at all times. The clean-up of sewerage spills and any damage caused by the spill or leak shall be for the Applicant's account or applicable contractor.

Sudden illness in member of team: emergency numbers should be readily available on site in case of a sudden illness or injury to a construction team member.

Snake bite: Emergency contact numbers must be kept on site in case of a snake siting or snakebite.

9.6 Site Demarcation

Responsibility - Project Manager / Contractor / ECO / owner

Prior to any construction commencing, the boundaries of the site and / or the footprints of each dwelling should be appropriately indicated or fenced off by the contractor. Natural areas that should be retained should also be indicated at this stage. Following this, all construction works, as well as the storage or preparation of any materials must be within the demarcated boundaries of the construction zone. No Go areas are to also be demarcated at this stage. The permanent delineated wetland must be clearly demarcated and made a no-go area, this should apply to the temporary wetland zones too, as far as possible.

9.7 Stockpiles

Responsibility - Project Manager / Contractor / ECO / owner

The contractor and / or project manager should identify sites for the stockpiling of building materials and excavated material. Stockpile sites should preferably be in areas with a gentle gradient. Stockpiles should be stabilised as required and monitored for dust blow and runoff / erosion.

9.8 General Wastes

Responsibility - Project Manager / Contractor / ECO / owner

Refuse refers to all construction debris (cement bags, rubble, timber, cans, nails, wire, spilt bitumen, glass, packaging, plastic, organic matter, etc.). Refuse generated during the construction phase should be stored in an appropriate area on site, should be watertight and wind proof, and removed on a regular basis for disposal at a permitted disposal site. Waste bins should be labelled for their designated use. No burning or burying of general refuse on site should be permitted. Recycling and sorting of waste, at the source, is encouraged. Disposal certificates should be kept.

9.9 Recreational / Eating areas

Responsibility - Project Manager / Contractor / ECO / owner

If construction workers are permitted to eat on the development site, other than within the contractor's camp, the Contractor shall provide adequate refuse bins at all such places and ensure that they are used. Bins are to be cleared on a daily basis. No rest areas are to be permitted in No Go areas.

9.10 Construction water

Responsibility - Project Manager / Contractor / ECO / owner

All cement effluent from mixer washings and run-off from batching areas, as well as other work areas, should be contained in suitable manner, these areas should be lined and allowed to dry from time to time in order to remove the solid materials. Care should be taken to prevent the runoff of construction water, to other areas on site or onto adjacent sites.

9.11 Equipment maintenance

Responsibility - Project Manager / Contractor / ECO / owner

All mechanical equipment and work vehicles which are present on-site during construction, are to be stored, serviced and refuelled only at designated areas or within the contractor's camp. Within these areas drip trays and other impervious materials, for example plastic or metal sheeting, must be used to prevent contamination of the ground. The project manager may order the removal of equipment that is causing continual environmental damage, until such equipment has been repaired.

9.12 Stormwater Management

Responsibility - Project Manager / Contractor / ECO / owner

Due to the small-scale nature of the construction, a Stormwater Management Plan is not required. however, Stormwater should be monitored regularly to ensure no environmental risk or unmanageable load to the existing infrastructure. The contractor must take suitable measures to prevent erosion resulting from a diversion, restriction or increase in flow of stormwater caused by construction. The open space erf will be used for stormwater retention.

9.13 Topsoil Removal and Stockpiling

Responsibility - Project Manager / Contractor / ECO / owner

Where services are to be extended or houses erected, topsoil is to be removed from the work areas, stockpiled separately from subsoil, and must be stabilised within a day of stockpiling. In general, stockpiles should be convex at the top to promote run- off, so that water is not able to accumulate and result in leaching of nutrients from the soil. Stockpiling areas should be determined in consultation with the ECO and only for short term.

9.14 Erosion Control

Responsibility - Project Manager / Contractor / ECO / owner

Action should be taken to prevent erosion of soils on the construction site. Should any erosion be detected on site, the cause of such erosion should be identified, and appropriate remedial action must be immediately implemented.

9.15 Dust Control

Responsibility - Project Manager / Contractor / ECO / owner

Appropriate action should be taken to minimise the generation of dust on the site. This can be done by applying appropriate stabilisation materials, such as straw or mulch or watering of exposed areas. Suppression methods not involving water, are preferred as far as possible.

9.16 Construction Traffic Management

Responsibility - Project Manager / Contractor / ECO / owner

All construction vehicles which carry construction materials, must use sheeting or a suitable cover, to prevent loss of load during travelling or due to wind or rain. Any spills should be cleaned immediately.

9.17 Architecture / Design

Responsibility - Project Manager / Contractor / ECO / owner

The architecture and design of the dwellings will be done in line with the general trend of the area. The houses should be designed to be in line with the surrounding architecture and cape vernacular style common to the area. Neutral colour palettes should be used which blend into the surrounds.

9.18 Sustainable Building Guidelines and materials

Responsibility - Project Manager / Contractor / ECO / owner

The houses should be designed in such a way as to create a sustainable living area. Ensure materials and orientation allow for an environmentally friendly design with lower operating costs, i.e natural ventilation, correct orientation, correct colours and roofing etc. Use recycled materials as far as possible.

Energy efficiency is also an important consideration and the following actions should be considered:

- → North orientation to ensure that as many well-used spaces face north as possible. Sun control is more difficult on East and West facing windows
- → Use of good insulation in the roof and walls to keep the inside temperature warm in winter or cool in summer
- → Solar water heaters to be included in the design phase

- → Suitable roof overhangs to let in the lower winter sun but provide shade from the summer sun
- → Sensible fenestration – let in the light and catch the winter sun, but not too much window area so that warmth or cool cannot be retained inside when needed. They can be combined with shading and reflecting devices - such as overhangs, screens, shutters, awnings, trees, planting and different glass types which will aid to control the amount, quality and time of daylight entering the building
- → Suitable ventilation for fresh air and cool breezes
- → Natural lighting through windows and light wells

Water conservation should be a priority in design of the dwelling. Rainwater tanks are recommended as far as possible. Optimally designed systems for grey water reuse should also be explored during the design phase in order to prevent the expense of retrofitting a system. Water wise and indigenous landscaping is recommended and will reduce the water costs associated with maintaining gardens. Permeable paving is to be used in areas where paving is required. Low flow shower and heads and dual flushing systems should be fitted. Aerators on taps should also be fitted to reduce overall water demand.

Construction activities such as watering, mixing and cleaning should avoid water wastage. Dry brushing and trigger spray nozzles should be used. Reuse of construction water should also be implemented.

9.19 Site Clean Up and Rehabilitation

Responsibility - Project Manager / Contractor / ECO/ owner

The following actions should be implemented once construction has concluded:

- → The construction footprint should be restored to the natural contours of the ground and shall allow normal surface drainage, as far as possible
- → No foreign matter such as rubble, waste or hazardous material will be mixed with the topsoil or used to backfill excavation.
- → All temporary works within the construction footprint, including fences, access, roads etc. disturbed by construction, should be restored to their original condition, as far as practical.
- → Compacted soils within the construction footprint should be loosened by means of a plough or scarified to aid revegetation
- → Runoff and erosion, as a result of the construction phase, should be suitably managed to prevent long term impacts
- → All structures, equipment, materials and facilities used or created on site for or during construction activities are removed once the project has been completed
- → Vegetation cover (using species appropriate to the local area) in all areas disturbed by the works should be reintroduced, as required.

10. COMPLIANCE AND MONITORING

10.1. Non-compliance

The Environmental Authorisation (EA) stipulates that, *"Non-compliance with a condition of this Environmental Authorisation and the EMP may render the holder liable to criminal prosecution."* It is therefore important that the conditions are adhered to as outlined in the EA and EMP. A Penalties scheme can be used during construction for transgressions.

Transgressions relate to actions by the contractor whereby damage or harm is inflicted upon the environment or any feature thereof and where any of the conditions or specifications of the EMP and EA have been infringed upon. In the instance of environmental damage, the damage is to be repaired and rehabilitated using appropriate measures, as far as possible and as directed by appropriate specialists, if required. These remedial actions are for the account of the contractor or other guilty party as identified by the Project Manager, applicant or ECO. Where non-repairable damage is inflicted upon the environment or non-compliance with any of the EMP / EA obligations is registered, then the Contractor may face a monetary penalty to an amount specified by the Project manager / ECO. The Project manager / ECO reserves the right to implement a first offence warning.

If excessive infringement with regard to any of the specifications is registered, the applicant / project manager / owner reserves the right to terminate the contractor's contract.

Table 3. Penalties Scheme – to be reviewed by ECO if required

Infringement	Description	Penalty
Hydrocarbon / fuel spill	Penalty to be issued when remediations not implemented timeously	R 5000
Disturbance beyond approved footprint	Disturbance to vegetation beyond approved areas	R 5000
Waste management	Inappropriate waste management	R 3000 dependent of extent
Not adhering to conditions of EA	Not attending to specific EA conditions	R 3000 + per condition

10.2. Environmental Control Sheets

Environmental Control Sheets should be used by the ECO on a weekly basis to monitor construction activities to ensure compliance with recommendations. The ECO should familiarise themselves with the full set of recommendations proposed by the specialists for the site and reasons for these recommendations, as well as understand the site and constraints analysis and be able to identify the constraints / No Go areas.

Table 3. Environmental Control Sheets

					RECORD OF PERFORMANCE		
TASK	**ACTION REQUIRED / MITIGATION & METHOD FOR IMPLEMENTATION**	**FREQUENCY**	**TARGET / OUTCOME**	**RESPONSIBILITY**	**COMPLETED YES/ NO**	**DATE**	**COMMENT**
PRE-CONSTRUCTION							
Procurement	→ EA and EMP to be distributed to contractor at tender stage to include costing incurred due to compliance with EA and EMP METHOD: Distribute with tender documents	As required	Contractors are aware of requirements in terms of NEMA and can budget accordingly	Developer Project Manager			
Environmental File	→ To include EA, EMP, site diary, public complaints section → To be updated on a regular basis → Public complaints register → Kept on site at all times METHOD: Issue all applicable documents to site manager	As required	Construction team(s) and general public can access relevant information f and when required	ECO Project Manager			
Environmental Awareness training and induction	- All contractors to attend briefing prior to commencement of site works - Register to be signed as proof of attendance METHOD: Briefing to be undertaken by project manager and / ECO	As required	Construction team(s) informed of all requirements in terms of EMPr and EA	ECO Project Manager			

Method Statements	- Contractors to submit MS seven working days prior to commencement on site - MS to contain clear methods for pollution control measures during construction including hazardous waste, run off, general waste etc. METHOD: Request for method statements to be contained in tender documents	As required	ECO and project manager to be well informed in terms of methods for construction	Contractor			
Site definition and demarcation	- Site survey and pegging - Site demarcation and fencing (mark construction areas – all other areas are No Go) - Access roads for construction vehicles to be clearly indicated, consideration to be given to turning circles - Review of specialist input to familiarise with mitigation measures - Buffer areas to be indicated and demarcated as No Go METHOD: Demarcation methods to be undertaken as outlined in EMP, suitable to the environment and semi-permanent to last as long as possible during construction phase, to be checked on a regular basis	As required and to be repeated on a regular basis in the event that demarcations shift or disturbed by operators, weather etc.	A well demarcated site Well-defined No-Go areas Well defined construction zones	ECO Project Manager Contractor			
Construction traffic	- All construction vehicles carrying materials must use cover sheeting to prevent loss of loads due to wind or rain - Maximum speed to be enforced	Duration of Construction	A safe working environment with minimal impact on No Go areas, minimal dust impact, minimal loss of load and minimal general public impact	Project Manager Contractor			

	- Movement of construction vehicles must be limited to approved haul and access routes and existing tracks METHOD: To be monitored by ECO and project manager as well as construction team leaders						
Emergencies protocol	- Staff to be aware of actions to be taken in the event of a natural or medical emergency - Applicable Health and Safety required in terms of OH&S Act METHOD: OH&S officer to be appointed, appropriate signage to be implemented	Duration of Construction	A safe working environment with minimal incidences	Project Manager Contractor			
Fire	- Fire Management recommendations to be implemented - Required firefighting equipment is available on site, and in working order - No open fires are lit on site without approval of the ECO and Site Manager METHOD: To be checked by the ECO and project manager and implemented by the contractor	Duration of Construction	A safe working environment with minimal incidences Action plan in the event of a fire	Project Manager Contractor			
Contractors camp	- Contractor's Camp is located at the most suitable site as identified by the ECO and Site Manager, preferably in areas to be developed or used (i.e roads or house footprints) or already transformed areas	Duration of Construction	A well placed and functional contractors camp to minimise impacts on other areas on site	Project Manager Contractor			

	- Contractor team to be briefed regarding Do's and Don'ts of camp and site in general - Suitable toilet facilities are provided for all staff - Ablutions are to be restricted to the facilities provided - Toilets are to be kept in a hygienic condition and emptied regularly - Recommendations by Freshwater specialist will be implemented METHOD: Site to be determined in conjunction with project manager and ECO, to be well demarcated with appropriate signage, serviced and cleaned on a regular basis, checked by ECO						

CONSTRUCTION							
TASK	**ACTION REQUIRED / MITIGATION & METHOD FOR IMPLEMENTATION**	**FREQUENCY**	**TARGET / OUTCOME**	**RESPONSIBILITY**	**COMPLETED YES/ NO**	**DATE**	**COMMENT**
Topsoil removal and stockpiling	- Replaced immediately after works where required - Topsoil which is required to be removed from direct work areas, should be stockpiled separately from subsoil and reused as far as possible - Stockpiles should be suitably shaped to prevent leaching of nutrients, and stabilized, or dispersal by wind or rain - Stockpiles to be monitored for dispersal by rain and wind METHOD: Implement conditions outlined in EMP for stockpiling and topsoil removal	Duration of Construction	Reusable sand and soil stockpiles to facilitate rehabilitation of the site	Project Manager Contractor			
Earthworks	- Works to be restricted construction area only - Bulldozer/ heavy machinery operators to be under constant supervision particularly at onset of works	Duration of Construction	Minimal disturbance to sensitive zones, minimal disturbance to vegetation	Project manager Contractor ECO			

	- Use and excessive movement of heavy machinery to be avoided in areas of environmental sensitivity or high erosion potential - Trenching to be undertaken in a phased manner - Fill material to be replaced in same work area from which it originated - Fill material to be compacted to its approximate original density METHOD: Construction zone to be clearly demarcated, instruction for stockpiling to be implemented, operators to be briefed prior to works						
Material handling, dispatching and storage	- Fuels and hazardous materials to be stored in suitably equipped storage areas in the Contractor's camp and approved by the ECO - Strict measures to be put in place for the use and storage of hazardous materials on site - Disposal to licenced facility only - These areas shall comply with fire safety requirements - Impervious materials are to be used to prevent contamination of the ground in the event of spillages or leaks - Construction materials spilled on public or private roads to be immediately cleaned - No storage other than contractor camp METHODS: Undertake regular inspections of areas and procedures	Duration of Construction	Minimal disturbance to sensitive zones including non-perennial drainage line Minimal incidences	Project Manager Contractor			

Stockpiles	- Sites for stockpiling as identified by the Contractor are to be marked on a plan, and approved by the ECO and Site Manager - Stockpiles must be suitably stabilized where necessary METHODS: Undertake regular checks of stockpiles to ensure methods outlined in the EMP and Dune EMP are implemented	Duration of Construction	Reusable sand and soil stockpiles to facilitate rehabilitation of the site	Project Manager Contractor ECO			
Waste management	- All waste to be stored in an appropriate contained area on site, and protected against wind, rain and animal dispersal - Waste to be removed on a weekly basis for disposal at a permitted disposal site - No burning or burying of refuse on site is allowed - Eating areas must be demarcated and provided with suitable refuse collection areas METHOD: Waste areas to be designed correctly and be wind and weatherproof and emptied on a regular basis	Duration of Construction	A clean waste collection point which is serviced on a regular basis	Project Manager Contractor ECO			
Construction wastewater	- Careful runoff management will be required particularly during construction. No contaminated water should be allowed to seep into the ground or runoff the construction site - All runoff from batching plants, work areas and mixer washings to be contained in sedimentation ponds, which are suitably lined	Duration of Construction	A clean site post construction	Project Manager Contractor ECO			

	- Ponds must be allowed to dry out regularly, and solid waste removed and disposed of at a site approved by the local authority. METHOD: Wastewater areas to be suitably designed and inspected on a regular basis						
Maintenance of equipment	- All mechanical equipment and work vehicles to be stored, serviced and refuelled at designated areas in the contractor's camp - Major services to take place off site - Drip trays or impervious materials to be used to prevent contamination of ground METHOD: Regular inspections undertaken	Duration of Construction	A clean site post construction	Project Manager Contractor ECO			
Stormwater	- Suitable measures must be in place to prevent erosion resulting from diversion, restriction or increase in stormwater runoff - Measures must be taken to prevent stormwater from flowing from excavated areas or stockpiles - Stormwater containing harmful substances to be contained, and removed from site METHOD: Regular inspections undertaken	Duration of Construction	A clean site post construction, avoiding additional impact on surrounds	Project Manager Contractor ECO			
Erosion	- Stormwater channels are to be kept clear from soil and debris - Erosion or stormwater damage resulting from Contractor's operations to be suitably repaired	Duration of Construction	A clean site post construction, avoiding additional impact on surrounds	Project Manager Contractor ECO			

	- Suitable stabilization measures are to be implemented wherever works are taking place as outlined in this document - Where erosion is detected, suitable mitigation methods are to be employed as soon as possible METHOD: Regular visual inspections undertaken						
Dust	- Sand stockpiles are to be covered with Hessian, shade cloth or DPC plastic - Stockpiles are to be located in sheltered areas and the useable face to be orientated away from the prevailing wind - Excavation and transporting erodible material during high wind conditions - water dampening measures or cessation of activities should be required - If necessary, certain components of the work should be stopped until conditions are more favourable - Vehicles must not exceed 40 km/h along gravel roads - If roads generate unacceptable levels of dust, suppression measures should be introduced - If water is used only the critical areas should be watered by cart or hand to avoid unnecessary run-off, erosion or misuse METHOD: Areas and activities of possible dust generation to be	Duration of Construction	A clean site post construction, avoiding additional impact on surrounds, avoidance of impacts on general public	Project Manager Contractor ECO			

	inspected on a regular basis, as well as strategies to address dust						
Site clean-up and rehabilitation	- All structures, equipment materials and facilities are to be removed from site on completion of the project - Construction site shall be cleared and cleaned to the ECO's satisfaction - Site / Area Rehabilitation to be conducted in line with recommendations herein - Specialist advice to be sort where required - No waste or remaining materials to be buried on site - In line with the NEMBA, all AIPS listed under the amended AIPS Lists (DEFF: GN1003, 2020) must either be removed or controlled on land under the management of the proponent. An AIPS control plan must therefore be compiled which includes measures to control and prevent the proliferation of AIPS during the construction phase. METHOD: Inspected upon site closure / suspension of works, rehabilitation methods contained in EMP and Dune EMP to be implemented	Duration of Construction	A functional ecosystem post construction, suitably rehabilitated as required	Project Manager Contractor Applicant ECO			

Alien Clearing	- An AIPS control plan must be compiled which includes measures to control and prevent the proliferation of AIPS during the operational phase. - The plants should be removed by digging out all rhizomes / stolons. - In line with the NEMBA, all AIPS listed under the amended AIPS Lists (DEFF: GN1003, 2020) must either be removed or controlled on land under the management of the proponent. An AIPS control plan must therefore be compiled which includes measures to control and prevent the proliferation of AIPS during the construction phase. METHOD: Regular monitoring of rehabilitation progress, alien plant regrowth, and any faunal presence should be conducted during and after the construction phase. Adaptive management practices should be applied to address emerging issues and ensure that the long-term ecological integrity of the site is maintained.	Construction and Post-construction phase	Long term ecological integrity and restoration of vegetation onsite.	Project Manager Applicant Contractor ECO			

Protection of animal species and maintaining faunal landscape connectivity	*General Site-Wide Mitigation* - **Limit development footprint**: Restrict built infrastructure to ~30% of the 12 ha property. - **No further densification**: Cap development at three dwellings, as assessed in this application. - **Lighting management**: Adopt *dark-sky compliant* lighting (low-spectrum, full cut-off fittings, shield estuary-facing lights) to reduce disturbance to nocturnal fauna and birds. - **Pet management**: Enforce pet curfews at night and discourage free-ranging cats and dogs to limit predation and disturbance to birds, reptiles and amphibians. - **Alien plant control**: Implement a formal alien clearing and follow-up programme across retained natural areas to prevent decline in functional integrity. - **Stewardship or conservation status**: Consider assigning all retained natural habitat (~70% of site) to a formal conservation status, such as a biodiversity stewardship agreement, to ensure long-term ecological management. *Faunal Landscape Connectivity* - Maintain a continuous natural corridor across at least 70% of the property to allow free movement	Construction and Post-construction phase	Maintaining the landscape connectivity between the Kleinrivier estuary and surrounding fynbos.	Project Manager Applicant Contractor ECO			

	between the Klein River estuary and adjacent upland habitats. - Prohibit impermeable fencing; if fences are required, ensure wildlife-permeable design (≥30 cm ground clearance, no mesh smaller than 100×100 mm). - Consolidate infrastructure and driveways to reduce fragmentation and maintain open strips for fauna. - Actively rehabilitate degraded strips post-construction and manage alien regrowth to preserve corridor functionality. *Estuarine and Water-Associated Birds (African Marsh Harrier, Caspian Tern, Great White Pelican)* - **Jetty reduction:** Reduce proposed jetties from two to a single low-intensity jetty to limit repeated disturbance pulses. - **Buffer zones:** Maintain a no-work buffer at reed margins and estuary edges during construction; enforce quiet hours at dusk and dawn to protect hunting harriers and roosting terns. - **Lighting controls:** Shield and direct lighting away from the estuary to prevent disorientation or displacement of estuary-dependent species. - **Timing of works**: Schedule noisy construction away from peak						

	breeding/foraging seasons (Aug–Nov for marsh harrier; peak roost periods for terns/pelicans). - **Stewardship:** Secure long-term management of estuary-edge natural habitat through stewardship or conservation agreements. *Terrestrial SCC Birds (Southern Black Korhaan, Denham's Bustard)* - **Avoidance of open patches:** Align dwellings and infrastructure away from the few lower, more open fynbos patches that may be marginally suitable for korhaan or bustard activity. - **Maintain mosaic:** Use alien clearing and appropriate fire management to preserve a patchy vegetation structure, favouring species sensitive to tall, dense shrub encroachment. - **Disturbance reduction:** Limit human and pet activity in marginal open patches and restrict additional disturbance near sensitive zones. *Amphibians (Western Leopard Toad)* - **Road verges and crossings:** Shape access tracks with shallow U/V profiles; include amphibian-safe drainage.						

	- **Pesticide ban:** Prohibit pesticides and herbicides on site. - **Pool safety:** Fit escape ramps or "toad savers" in swimming pools. - **Corridors:** Retain indigenous groundcover and vegetated strips between dwellings to support terrestrial dispersal. - **Education:** Provide residents with awareness material on toad movement periods and safe behaviours. *Reptiles (Southern Adder)* - **Pre-construction search and rescue:** Conduct supervised vegetation clearance with relocation of snakes and refugia where possible. - **Refuge retention:** Retain or recreate rock piles, woody debris, and shrub thickets as refugia. - **Persecution avoidance:** Educate contractors and residents about the conservation importance of Southern Adder and provide protocols for safe handling. - **Traffic calming:** Impose strict speed limits on internal tracks to reduce roadkill risk. - **Alien and fire management:** Maintain functional fynbos						

	structure with alien clearing and fire in line with ecological cycles. *Invertebrates (Mute Winter Katydid, Other SCCs)* *Mute Winter Katydid* - **Critical buffer:** Keep development outside the 50 m no-go buffer surrounding mapped katydid habitat. - Avoid hard road surface construction - **Habitat protection:** Mark and protect occupied patches as no-go areas during and after construction. - **Management restrictions:** Prohibit mowing, gardening or herbicide or pesticide use within buffers. - **Monitoring:** Regularly survey katydid populations post-construction to verify persistence and recolonisation. *Yellow-winged Agile Grasshopper* - No targeted mitigation required as the species' specific habitat is absent; site-wide alien control and natural vegetation retention suffice. *Other SCC Invertebrates*						

	- **Avoidance hierarchy:** Map and avoid patches supporting confirmed SCCs where possible. - **Monitoring:** Establish indicator taxa monitoring to detect changes in population presence or habitat quality. - **Habitat rehabilitation:** Actively restore and reseed disturbed patches post decommissioning to return invertebrate habitat function.						
Vegetation clearance and maintenance of ecological connectivity	- Designing the development to stay above the 5 m contour and the estuarine functional zone to reduce ecological impacts. - Using existing roads and paths for access to minimize new disturbances to the environment. - Limiting infrastructure like slipways and jetties, as only one jetty per property is typically permitted and slipways are discouraged. - Clearing of alien invasive plant species. - Avoidance of the estuarine functional zone to reduce ecological impacts. - Existing roads would be used to avoid unnecessary disturbances to the environment. - Only one jetty and one slipway would be constructed.	Construction and Post-construction phase	Maintaining the landscape connectivity between the Kleinrivier estuary and surrounding fynbos.	Project Manager Applicant Contractor ECO			

	- Clearing of alien invasive plant species. - Development of residences should be above the 5 m contours and should wherever possible avoid well-established old trees, particularly of wild olive (*Olea europaea subsp. cuspidata*)						

11. DECOMMISSIONING PHASE

Not Applicable to this development.

12. ENVIRONMENTAL AUDITS

The purpose of auditing is to determine and monitor compliance with the EMP and EA and measure its effectiveness in mitigating environmental impacts. In terms of Regulation 34 of the NEMA EIA Regulations, 2014, the holder of the EA must conduct environmental audits in order to determine compliance with the conditions of the EA and EMP. Environmental Audit Reports should be submitted to the Competent Authority or as stipulated in the EA. The audit reports should be prepared by an independent person. The audit report should also provide recommendations regarding the need to amend the EMP.

The objective of the environmental audit report is to:

- → Report on the level of compliance with the conditions of the EA and the EMP
- → Report on the extent to which the avoidance, management and mitigation measures outlined in the EMP, achieve the objectives and outcomes of the EMP
- → Identify and assess any new impacts and risks as a result of the activity
- → Evaluate the effectiveness of the EMP
- → Identify shortcomings in the EMP
- → Identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMP

An environmental audit report should contain the following:

- → Details and expertise of the independent person who prepared the environmental audit report
- → A declaration that the auditor is independent
- → An indication of the scope of, and the purpose for which, the environmental audit report was prepared
- → A description of the methodology adopted in preparing the environmental audit report
- → An indication of the ability of the EMP to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity as well as to ensure compliance with the provisions of environmental authorisation and EMP.
- → A description of any assumptions made, and any uncertainties or gaps in knowledge
- → A description of any consultation process that was undertaken during the course of carrying out the environmental audit report if required
- → A summary and copies of any comments that were received during any consultation process
- → Any other information requested by the competent author

13. CONCLUSION

An EMP has been developed as part of the Basic Assessment process to ensure that mitigation and management measures are enforced during the construction phase of the development, and that the conditions of the EA are upheld. The EMP should guide all phases of the project to minimize possible negative impacts and assign responsibility for environmental controls. The EMP provides a tool to recognise the needs of the environment and is intended to be utilised in conjunction with the Environmental Authorisation.

14. DECLARATION OF CONTRACTOR'S ACCEPTANCE

I, _____ (name), representing _____ (company name), have read and understood the above Environmental Management Plan and hereby acknowledge its contents and requirements as a framework for my company's environmental performance during the applicable development.

Signed: _____ Date: _____