



ECO ROUTE ENVIRONMENTAL CONSULTANCY

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

**The Proposed Construction of a Residential Dwelling on Erf 1510, St
Francis Bay, Kouga Municipality**

DEDEAT REF: EC08/C/LN1&3/M/51-2022



October 2022

Compiled by:

Eco Route Environmental Consultancy

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This EMPr will need to be amended to contain specific conditions if Environmental Authorisation is granted.

Appendix 4 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Management Programme (EMPr). The checklist below serves as a summary of these requirements:

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| <p>(a) Details of</p> <p>(i) the EAP who prepared the EMPr; and</p> <p>(ii) The expertise of that EAP to prepare an EMPr, including a curriculum vitae.</p> | <p>This EMPr was prepared by Janet Ebersohn of Eco Route Environmental Consultancy. Janet has a BSc. Honours in Environmental Management and has 14 years' experience as an Environmental Assessment Practitioner. Please see attached CV of the EAP.</p> |
| <p>(b) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.</p> | <p>This EMPr covers all aspects involved in the Proposed Construction of a Residential Dwelling on Erf 1510, St Francis Bay, Kouga Municipality</p> <p>Section 2 provides specific project details.</p> |
| <p>(c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers</p> | <p>Section 2 provides GIS mapping which superimpose the proposed activity onto environmentally sensitive areas.</p> |
| <p>(d) A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all the phases of the development including –</p> <p>(i) Planning and design;</p> <p>(ii) Pre-construction activities;</p> <p>(iii) Construction activities;</p> <p>(iv) Rehabilitation of the environment after construction and where applicable post closure; and</p> <p>(v) Where relevant, operation activities</p> | <p>Addressed in Sections 3, 4 and 10.</p> |
| <p>(e) A description and identification of impact management outcomes required for the aspects contemplated above.</p> | <p>Addressed in Sections 3, 4 and 10.</p> |
| <p>(f) A description of the proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated above will be achieved and must, where applicable include actions to –</p> | <p>Addressed in Section 10.</p> |

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| <p>(i) Avoid, modify, remedy control or stop any action, activity or process which causes pollution or environmental degradation;</p> <p>(ii) Comply with any prescribed environmental management standards or practises;</p> <p>(iii) Comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.</p> | |
| (g) The method of monitoring the implantation of the impact management actions contemplated above. | Section 7.1 and 10. |
| (h) The frequency of monitoring the implementation of the impact management actions contemplated above. | Section 7.2 and 10. |
| (i) An indication of the persons who will be responsible for the implementation of the impact management actions. | Sections 10 and 14. |
| (j) The time periods within which the impact management actions must be implemented. | Section 10. |
| (k) The mechanism for monitoring compliance with the impact management actions. | Section 7. |
| (l) A program for reporting on compliance, taking into account the requirements as prescribed in the Regulations. | Section 7 and 10. |
| <p>(m) An environmental awareness plan describing the manner in which –</p> <p>(i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and</p> <p>(ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment</p> | Sections 10 and 14. |
| (n) Any specific information that may be required by the competent authority. | All required information has been addressed within this EMPr and annexures. |

1. INTRODUCTION

In accordance with the Integrated Environmental Management Guidelines published by the Department of Environmental Affairs & Tourism (DEAT) in 1992, the purpose of an Environmental Management Programme (EMPr) is “to describe how negative environmental impacts will be managed, rehabilitated or monitored and how positive impacts will be maximised”.

National Environmental Management Act, (Act 107 of 1998)

(i) Section 28 of NEMA (National Environmental Management Act, Act 107 of 1998) states that:

Duty of care and remediation of environmental damage

"(1) Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot be reasonably avoided or stopped, to minimise and rectify such pollution or degradation of the environment"

This EMPr must be read in conjunction with the Environmental Impact Assessment Report dated October 2022 and the accompanying specialist reports. All recommendations, relevant conditions and mitigation measures provided in these documents must also be adhered to.

This EMPr must form an integral part of the contract documents, as it outlines the methodology & duties required so that the project objectives can be achieved in an environmentally sustainable manner; with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with this project.

These requirements will have a financial impact on the projects costings.

This EMPr is a dynamic document that may need to evolve during its implementation period so that it recognises any new issues that may arise; or changes in the parameters of identified issues and can address these issues with the required/amended mitigation.

The Polluter-Pays Principle

This principle provides for “the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.” The Polluter Pays Principle will be rigorously applied throughout the construction phase of this project.

2. PROJECT DETAILS

Eco Route Environmental Consultancy has been appointed as independent environmental practitioners by the proponent, Dr. Ivan Marx, to ensure the lawful construction of a Residential Dwelling on Erf 1510, St Francis Bay, Kouga Municipality in terms of the National Environmental Management Act (Act 107 of 1998).

The proposed residential dwelling will be developed on Erf 1510 Sea Vista, a suburb of St Francis Bay, Eastern Cape (GPS coordinates: 34°10'42.20"S| 24°50'31.65"E).

Erf 1510 is zoned for Residential use. The property is 815m² in extent and is currently vacant. The dwelling footprint will be 320m² and is located in a coastal dune landscape just over 60m from the littoral zone. The proposed residential development will entail the construction of a three-storey (lower ground, ground and first floor) house, associated decking and paving for vehicular access.

Access to Erf 1510 is via Tom Brown Boulevard, which lies to the south of the property.

The residential dwelling will make use of municipal services.

Terrestrial Biodiversity:

The vegetation type present on the site is St Francis Dune Thicket vegetation which has been listed as “Least Concern” in terms of conservation status (SANBI, 2018b; Skowno et al., 2019). No CBA or ESAs are present.

Coastal Management:

The property occurs within 100m inland from the high-water mark of the sea and thus falls within the Coastal Protection Zone.

A climate change assessment was undertaken by the Department of Forestry, Fisheries, and the Environment (DFFE), Branch Oceans and Coasts. The assessment found that the proposed development site is in a location with no short-term erosion risk and mostly moderate long-term coastal erosion risk, and with no flooding risk.



Figure 1: Locality map of Erf 1510, Sea Vista, St Francis Bay (1:5000)



Figure 2: Distance to the High-Water Mark of the sea – Erf 1510 is approx. 74m from the the HWM

3. IMPACTS ASSOCIATED WITH THE PLANNING/DESIGN, CONSTRUCTION AND OPERATION OF THE ACTIVITY

| Project Phase | Construction | |
|-----------------------|---|---|
| Impact | Clearance of terrestrial vegetation for the construction of the dwelling and associated infrastructure | |
| Description of impact | Habitat loss for terrestrial wildlife, mortalities to various species unable to evade the disturbance, loss of viable propagules, fragmentation of ecological infrastructure | |
| Mitigable | Low | Mitigation does not exist; or mitigation will slightly reduce the significance of impacts |
| Potential mitigation | <ul style="list-style-type: none"> the removal and translocation of protected plants should be undertaken prior to construction clearing activities. A permit is required prior to removal. Protected plants must either be moved to a safer, no-go area on the property or taken to a nursery for temporary storage until rehabilitation takes place. Access by heavy machinery should be limited on the site. Only areas necessary for the development footprint should be cleared and the remainder of the property should be left natural. During the construction phase of the proposed development, disturbance to | |

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| | <p>patches of dune thicket on adjacent properties must be avoided – laydown areas for construction materials must therefore be contained within the clearing footprint of the proposed development.</p> <ul style="list-style-type: none"> During the construction phase of the proposed development, disturbance to patches of dune thicket on adjacent properties must be avoided – laydown areas for construction materials must therefore be contained within the clearing footprint of the proposed development. | | | |
| Assessment | Without mitigation | | With mitigation | |
| Nature | Negative | | Low negative | |
| Duration | Permanent | Impact may be permanent, or in excess of 20years | Permanent | Impact may be permanent, or in excess of 20years |
| Extent | Limited | Limited to the site and its immediate surroundings | Very limited | Limited to specific isolated parts of the site |
| Intensity | Very low | Natural and/ or social functions and/ or processes are slightly altered | Low | Natural and/ or social functions and/ or processes are somewhat altered |
| Probability | Probable | Has occurred here or elsewhere and could therefore occur | Rare / improbable | Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere |
| Confidence | High | Substantive supportive data exists to verify the assessment | Medium | Determination is based on common sense and general knowledge |
| Reversibility | Medium | The affected environment will only recover from the impact with significant intervention | High | The affected environment will be able to recover from the impact |
| Resource irreplaceability | Medium | The resource is damaged irreparably but is represented elsewhere | Low | The resource is not damaged irreparably or is not scarce |
| Significance | Minor - negative | | Negligible - negative | |
| Comment on significance | The previous clearing of vegetation and disturbance of top soil at the site, together with the absence of plant SCC (high confidence) translates to a LOW site sensitivity. | | | |
| Cumulative impacts | The impact would result in insignificant cumulative effects | | | |

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| Project Phase | Construction | |
| Impact | Geotechnical restraints due to steep slopes and highly compressible sands | |
| Description of impact | Settlement issues, slope stability problems, possible damage to adjacent properties | |
| Mitigable | High | Mitigation exists and will considerably reduce significance of impacts |
| Potential mitigation | <p>Earthworks:</p> <ul style="list-style-type: none"> Some bulk earthworks are anticipated to clear, level and compact the site in preparation of construction. Terracing of the site with a retaining wall (or a series of retaining walls) may be required if a portion of the proposed structure is to be constructed below NGL (e.g. lower ground or basement levels). Earthworks can be accomplished using light machinery and all excavations to a depth of at least 3m are provisionally classified as per SABS1200D as “soft”. The insitu “clean” sandy soils are fine-grained but will be generally suitable for backfilling and compaction on platforms, under floors, behind retaining walls and below foundations at the optimum moisture content. Organic matter, such as roots and humus/topsoil should be removed from the footprint of structures and stockpiled separately for landscaping purposes. | |

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| | <ul style="list-style-type: none"> Excavations may be highly unstable at angles steeper than 35° and battering or shoring of excavation sidewalls may be required. Lateral support systems may be required along site boundaries. <p>Foundations and floors:</p> <ul style="list-style-type: none"> Piled foundations should only be considered for excessively heavy structures as this method is generally an uneconomical in the area due to high establishment costs of specialist contractors. Strip and pad foundations should be founded at a minimum depth of 0.8m below ground level (platform level) on well compacted insitu sands. Bearing pressures should be limited to 125-150kPa where possible, to minimise settlement. As a guideline to achieve adequate compaction to avoid settlement, the foundation trenches should be excavated to the recommended minimum founding depth, well wetted and compacted with several passes of a mechanical trench rammer (Wacker), until the DCP penetration rate is less than 20mm/blow to a depth of 1m below the foundation invert. If adequate compaction cannot be achieved with this method, the contractor should remove additional loose soil from below the founding level (e.g. overexcavate 0.3-0.5m), recompact the base of the excavation and then replace the insitu soil in compacted layers. The structural engineer can consider additional techniques such as replacing insitu soil with 3-5% cement-stabilised sand. Foundations near/above retaining walls and steep natural slopes (within 3m) will require careful consideration, possibly including special measures such as deeper foundations to prevent surcharge loading of walls or slopes. The structural engineer should inspect foundation trenches and ensure adequate testing of before casting concrete. Filling under reinforced concrete floors should be compacted at the optimum moisture content (10-12%) to 100% of maximum dry density. <p>Roads:</p> <ul style="list-style-type: none"> The insitu roadbed material consists of very fine sandy soil, which is loose and prone to rutting, and should be compacted to 100%MDD. Following the compaction of the roadbed, 100mm of imported SSG gravel material is recommended to support the driveway layerworks, which include 150mm of G5 subbase, compacted to 95%MDD, and cement interlocking pavers on 20mm bedding sand. |
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| Assessment | Without mitigation | | With mitigation | |
|--------------------|--------------------|--|-------------------|---|
| Nature | Negative | | Negative | |
| Duration | Permanent | Impact may be permanent, or in excess of 20years | Brief | Impact will not last longer than 1 year |
| Extent | Very limited | Limited to specific isolated parts of the site | Very limited | Limited to specific isolated parts of the site |
| Intensity | Very high | Natural and/ or social functions and/ or processes are majorly altered | Low | Natural and/ or social functions and/ or processes are somewhat altered |
| Probability | Certain / Definite | There are sound scientific reasons to expect that the impact will definitely occur | Rare / improbable | Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere |
| Confidence | High | Substantive supportive data exists to verify the assessment | Medium | Determination is based on common sense and general |

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| | | | | knowledge |
| Reversibility | Low | The affected environment will not be able to recover from the impact - permanently modified | Medium | The affected environment will only recover from the impact with significant intervention |
| Resource irreplaceability | Not relevant | | Not relevant | |
| Significance | Moderate - negative | | Negligible - negative | |
| Comment on significance | Due to the steep site gradient and compressible soils, specific engineering inputs are required to reduce the negative geotechnical restraints on the site. | | | |
| Cumulative impacts | Without mitigation, the geotechnical restraints on the site could result in significant destruction to the development site, but also to adjacent sites (specifically downhill). | | | |

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| Project Phase | Construction | | | |
| Impact | Noise pollution | | | |
| Description of impact | Noise caused by machinery and staff | | | |
| Mitigable | Low | Mitigation does not exist; or mitigation will slightly reduce the significance of impacts | | |
| Potential mitigation | <ul style="list-style-type: none"> • Construction activities must only take place during normal working times between 07:00-17:00 on weekdays. • Machinery may be fitted with silences to dampen noise. • Staff must be reminded that they are working within a residential area and noise levels must be kept low. | | | |
| Assessment | Without mitigation | | With mitigation | |
| Nature | Negative | | Negative | |
| Duration | Brief | Impact will not last longer than 1 year | Brief | Impact will not last longer than 1 year |
| Extent | Limited | Limited to the site and its immediate surroundings | Limited | Limited to the site and its immediate surroundings |
| Intensity | Very low | Natural and/ or social functions and/ or processes are slightly altered | Negligible | Natural and/ or social functions and/ or processes are negligibly altered |
| Probability | Almost certain / Highly probable | It is most likely that the impact will occur | Almost certain / Highly probable | It is most likely that the impact will occur |
| Confidence | Medium | Determination is based on common sense and general knowledge | Medium | Determination is based on common sense and general knowledge |
| Reversibility | High | The affected environmental will be able to recover from the impact | High | The affected environmental will be able to recover from the impact |
| Resource irreplaceability | Not relevant | | Not relevant | |
| Significance | Minor - negative | | Negligible - negative | |
| Comment on significance | Some extent of noise pollution during construction is expected; however, with mitigation the impact will be reduced. | | | |
| Cumulative impacts | No cumulative impacts exist. | | | |

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| Project Phase | Construction | | |
| Impact | Visual impact/ Sense of place | | |
| Description of impact | Visual & aesthetic consequences of the proposed project | | |
| Mitigable | Medium | Mitigation exists and will notably reduce significance of impacts | |

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| Potential mitigation | <ul style="list-style-type: none"> Due to the proposed dwelling being surrounded by already existing dwellings, there is little to be done to mitigate against visual pollution; however, shade cloth may be used to demarcate and reduce visual consequences caused by construction. | | | |
| Assessment | Without mitigation | | With mitigation | |
| Nature | Negative | | Negative | |
| Duration | Short term | Impact will last between 1 and 5 years | Short term | Impact will last between 1 and 5 years |
| Extent | Limited | Limited to the site and its immediate surroundings | Limited | Limited to the site and its immediate surroundings |
| Intensity | Low | Natural and/ or social functions and/ or processes are somewhat altered | Very low | Natural and/ or social functions and/ or processes are slightly altered |
| Probability | Certain / Definite | There are sound scientific reasons to expect that the impact will definitely occur | Likely | The impact may occur |
| Confidence | Medium | Determination is based on common sense and general knowledge | Medium | Determination is based on common sense and general knowledge |
| Reversibility | Medium | The affected environment will only recover from the impact with significant intervention | High | The affected environmental will be able to recover from the impact |
| Resource irreplaceability | Not relevant | | Not relevant | |
| Significance | Minor - negative | | Negligible - negative | |
| Comment on significance | Due to the change in visual impact of the property from vacant land to residential dwelling, there is some visual/aesthetic consequences to be expected. However, due to the surrounding area being residential, a low negative impact is expected and little can be mitigated against. | | | |
| Cumulative impacts | No cumulative impacts exist. | | | |

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| Project Phase | Construction | | | |
| Impact | Employment | | | |
| Description of impact | Empowerment of the local community members living in the area relating to temporary employment opportunities | | | |
| Mitigable | Medium | Mitigation only exists to ensure that the positive impact is followed through. | | |
| Potential mitigation | <ul style="list-style-type: none"> Use existing social structures and communication channels to ensure social representation. | | | |
| Assessment | Without mitigation | | With mitigation | |
| Nature | Negative | | Positive | |
| Duration | Short term | Impact will last between 1 and 5 years | Short term | Impact will last between 1 and 5 years |
| Extent | Local | Extending across the site and to nearby settlements | Local | Extending across the site and to nearby settlements |
| Intensity | Low | Natural and/ or social functions and/ or processes are somewhat altered | Low | Natural and/ or social functions and/ or processes are somewhat altered |
| Probability | Rare / improbable | Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere | Almost certain / Highly probable | It is most likely that the impact will occur |
| Confidence | Low | Judgement is based on intuition | Medium | Determination is based on common sense and general |

| | | | | |
|----------------------------------|--|--|------------------------------|-----------|
| | | | | knowledge |
| Reversibility | Not relevant | | Not relevant | |
| Resource irreplaceability | Not relevant | | Not relevant | |
| Significance | Negligible - negative | | Negligible - positive | |
| Comment on significance | Due to the proposed development being on a small-scale, there is a low difference in impacts between without mitigation and with mitigation. However, as the impact would be positive for the local community to be employed during construction, mitigation is recommended to ensure this occurs. | | | |
| Cumulative impacts | Minor upliftment for the local community. | | | |

Impacts foreseen during the operational phase:

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|----------------------------------|--|---|------------------------------|---|
| Project Phase | Operation | | | |
| Impact | Light Pollution | | | |
| Description of impact | Visual/ aesthetic consequences due to incorrect or excessive lighting, especially outdoor lighting | | | |
| Mitigable | Medium | Mitigation exists and will notably reduce significance of impacts | | |
| Potential mitigation | <ul style="list-style-type: none"> • Municipal by-laws need to be adhered to. • It is strongly advised that only downward facing lights are used on the outside of the house. | | | |
| Assessment | Without mitigation | | With mitigation | |
| Nature | Negative | | Positive | |
| Duration | Permanent | Impact may be permanent, or in excess of 20 years | Brief | Impact will not last longer than 1 year |
| Extent | Limited | Limited to the site and its immediate surroundings | Very limited | Limited to specific isolated parts of the site |
| Intensity | Low | Natural and/ or social functions and/ or processes are somewhat altered | Negligible | Natural and/ or social functions and/ or processes are negligibly altered |
| Probability | Probable | Has occurred here or elsewhere and could therefore occur | Rare / improbable | Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere |
| Confidence | Medium | Determination is based on common sense and general knowledge | Medium | Determination is based on common sense and general knowledge |
| Reversibility | Low | The affected environment will not be able to recover from the impact - permanently modified | Medium | The affected environment will only recover from the impact with significant intervention |
| Resource irreplaceability | Not relevant | | Not relevant | |
| Significance | Minor - negative | | Negligible - positive | |
| Comment on significance | Lighting, specifically outdoor lighting is not only aesthetic, but it provides a level of security to property owners. Therefore, outdoor lighting is essential, but should be implemented in a way which does not cause negative impacts to neighbours. | | | |
| Cumulative impacts | Without mitigation the development would not be meeting design guidelines enforced by the municipality. Specifically design guidelines for the local area. | | | |

| Project Phase | Operation | | | |
|---------------------------|--|--|----------------------------------|---|
| Impact | Formal gardens | | | |
| Description of impact | Habitat loss for terrestrial wildlife, fragmentation of ecological corridor | | | |
| Mitigable | High | Mitigation exists and will considerably reduce the significance of impacts | | |
| Potential mitigation | <ul style="list-style-type: none"> It is advised that no manicured gardens are created without necessity. Specifically downhill/east of the development footprint. Areas that are not required for development purposes should remain natural with indigenous vegetation. All alien invasive plants must be removed from the site on an on-going basis. | | | |
| Assessment | Without mitigation | | With mitigation | |
| Nature | Negative | | Positive | |
| Duration | Brief | Impact will not last longer than 1 year | Permanent | Impact may be permanent, or in excess of 20 years |
| Extent | Limited | Limited to the site and its immediate surroundings | Very limited | Limited to specific isolated parts of the site |
| Intensity | Negligible | Natural and/ or social functions and/ or processes are negligibly altered | Very low | Natural and/ or social functions and/ or processes are slightly altered |
| Probability | Highly unlikely / None | Expected never to happen | Almost certain / Highly probable | It is most likely that the impact will occur |
| Confidence | Medium | Determination is based on common sense and general knowledge | Medium | Determination is based on common sense and general knowledge |
| Reversibility | Medium | The affected environment will only recover from the impact with significant intervention | Not relevant | |
| Resource irreplaceability | Low | The resource is not damaged irreparably or is not scarce | Not relevant | |
| Significance | Negligible - negative | | Minor - positive | |
| Comment on significance | With mitigation the impact is likely to have more beneficial impact to retaining a wider ecological corridor, than without mitigation. | | | |
| Cumulative impacts | Without mitigation this impact could result in potential erosion downhill of the site caused by stormwater flow. | | | |

4. SPECIALIST RECOMMENDATIONS/MANAGEMENT ACTIONS

4.1 Terrestrial Biodiversity and Plant Species

The following management actions are proposed to limit and mitigate ecological impacts of the development:

- In accordance with the ENCO, a permit for the destruction of specimens of *C. aethiopica* and *C. obtusifolium* must be procured from the Province of the Eastern Cape: Department of Economic Development, Environmental Affairs and Tourism before construction commences.
- In accordance with the NFA, a permit for the destruction of specimens of *S. inerme* must be procured from the national Department of Forestry, Fisheries and the Environment.

- In accordance with the National Environmental Management: Biodiversity Act (2004) (NEMBA), the Category 1b alien invasive plant *A. cyclops* must be eradicated from the site and a plan for their ongoing control should be included in the environmental management plan of the development.
- During the construction phase of the proposed development, disturbance to patches of dune thicket on adjacent properties must be avoided – laydown areas for construction materials must therefore be contained within the clearing footprint of the proposed development.

4.2 Geotechnical Recommendations

Earthworks: Some bulk earthworks were anticipated to clear, level and compact the site in preparation of construction. Terracing of the site with a retaining wall (or a series of retaining walls) may be required if a portion of the proposed structure is to be constructed below NGL (e.g. lower ground or basement levels). Earthworks can be accomplished light machinery and all excavations to a depth of at least 3m are provisionally classified as per SABS1200D as “soft”. The insitu “clean” sandy soils are fine-grained but will be generally suitable for backfilling and compaction on platforms, under floors, behind retaining walls and below foundations at the optimum moisture content. Organic matter, such as roots and humus/topsoil should be removed from the footprint of structures and stockpiled separately for landscaping purposes. Excavations may be highly unstable at angles steeper than 35° and battering or shoring of excavation sidewalls may be required. Lateral support systems may be required along site boundaries.

Foundations and floors: Single/double/triple storey masonry structures can be founded on reinforced concrete strip, pad or raft foundations. Piled foundations should only be considered for excessively heavy structures as this method is generally an uneconomical in the area due to high establishment costs of specialist contractors. Strip and pad foundations should be founded at a minimum depth of 0.8m below ground level (platform level) on well compacted insitu sands. Bearing pressures should be limited to 125-150kPa where possible, to minimise settlement. As a guideline to achieve adequate compaction to avoid settlement, the foundation trenches should be excavated to the recommended minimum founding depth, well wetted and compacted with several passes of a mechanical trench rammer (Wacker), until the DCP penetration rate is less than 20mm/blow to a depth of 1m below the foundation invert. If adequate compaction cannot be achieved with this method, the contractor should remove additional loose soil from below the founding level (e.g. overexcavate 0.3-0.5m), recompact the base of the excavation and then replace the insitu soil in compacted layers. The structural engineer can consider additional techniques such as replacing insitu soil with 3-5% cement-stabilised sand. Foundations near/above retaining walls and steep natural slopes (within 3m) will require careful consideration, possibly including special measures such as deeper foundations to prevent surcharge loading of walls or slopes. The structural engineer should inspect foundation trenches and ensure adequate testing of before casting concrete. Filling under reinforced concrete floors should be compacted at the optimum moisture content (10-12%) to 100% of maximum dry density.

Roads: The insitu roadbed material consists of very fine sandy soil, which is loose and prone to rutting, and should be compacted to 100%MDD. Following the compaction of the roadbed, 100mm of imported SSG gravel material is recommended to support the driveway layerworks, which include 150mm of G5 subbase, compacted to 95%MDD, and cement interlocking pavers on 20mm bedding sand.

Drainage: The soil is generally moderately to highly permeable and site drainage is not envisaged to be a problem. No subsoil drains are deemed necessary, except behind retaining walls in basement structures if necessary.

5. LEGISLATIVE REQUIREMENTS

5.1 Signing of the EMPr

The acknowledgement form at the back of the approved EMPr is to be signed by the holder of the Environmental Authorisation (the Proponent), the Site Manager and the ECO; acknowledging that all parties are familiar with the requirements of the EMPr. All employees, especially the machine and equipment operators, are to be made aware of the conditions as contained in the EMPr as well as the contractual conditions relating to the environment as contained in the contract document.

5.2 Legislation

Of importance are all national, provincial and municipal by-laws and regulations. Statutes are amended periodically and it is the Proponent's responsibility to identify legislation relevant to the proposed activity.

| Title of legislation, policy or guideline: | Administering authority: | Date: |
|---|--|--|
| Constitution of the Republic of South Africa. (Act 108 of 1996) | All State and Provincial Departments as well as Local Authorities that have been identified as relevant Competent Authorities. | Relevant Consideration |
| Environmental Conservation Act (Act 73 of 1989) | Department of Economic Development, Environmental Affairs & Tourism | Relevant Consideration |
| National Environmental Management Act (Act 107 of 1998) | Department of Economic Development, Environmental Affairs & Tourism | Authorization – December 2022/January 2023 |
| National Environmental Management: Biodiversity Act (Act 10 of 2004) | Department of Economic Development, Environmental Affairs & Tourism | Relevant Consideration |
| National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) | Department of Forestry, Fisheries, and the Environment (DFFE), Branch Oceans & Coasts (O&C)/ Department of Economic Development, Environmental Affairs & Tourism | Comment/ Relevant Consideration |
| National Environmental Management: Protected Areas Act (Act 57 of 2003) | Department of Economic Development, Environmental Affairs & Tourism | Relevant Consideration |
| National Water Act (Act 36 of 1998) | Department of Water and Sanitation | Relevant Consideration |

| | | |
|---|--|---------------------------------|
| | | |
| Water Services Act (Act 108 of 1997) | Department of Water and Sanitation | Relevant Consideration |
| Sea Shore Act (Act 21 Of 1935) | Department of Forestry, Fisheries, and the Environment (DFFE), Branch Oceans & Coasts (O&C)/ Department of Economic Development, Environmental Affairs & Tourism | Relevant Consideration |
| Conservation Of Agricultural Resources Act (Act 43 of 1983) | Department of Agriculture, Forestry and Fisheries | Relevant Consideration |
| National Heritage Resources Act (Act 25 of 1999) | Eastern Cape Provincial Heritage Resources Authority | Comment/ Relevant Consideration |

5.3 Project Responsibilities

Responsibility for the implementation of the EMPr lies with the Proponent who must retain the services of a suitably experienced Environmental Control Officer (ECO) who will monitor the construction processes and activities periodically.

The ECO's responsibilities must include, *inter alia*:

- ❖ Secure the protection and rehabilitation of the environment.
- ❖ Guide, advise and consult the relevant authority on environmental issues during construction.
- ❖ Guide, advise and consult any sub-contractors, suppliers etc. who will be involved in this project.
- ❖ Revise the EMPr as required and inform the relevant parties of the changes.
- ❖ Ensure that the EMPr has been accepted and understood as a contractually binding document on all parties involved with this project.
- ❖ Ensure staff operating equipment are adequately trained, certified and sensitised to any potential hazards associated with their tasks.
- ❖ Educate staff as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources, ensure that they (the staff) have received the necessary safety training, and are aware of the importance of a "clean-site policy".
- ❖ The management guidelines contained in this document must form part of the contractual agreements between the Proponent, Site Manager and the ECO. A tabulated synopsis of relevant responsibilities is appended hereto.

6. REPORTING PROCEDURES

6.1 Documentation

The following documentation must be kept on site in order to record compliance with the EMP:

An Environmental File which includes:

- ❖ Copy of the EMP;
- ❖ Copy of the EA;
- ❖ Copy of all other licences/permits;
- ❖ Environmental Method Statements;
- ❖ Non-conformance Reports;
- ❖ Environmental register, which shall include:
 - Communications Register – including records of complaints, minutes and attendance registers of all environmental meetings;
 - Monitoring Results – including environmental monitoring reports, register of audits, non-conformance reports; and
 - Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.
- ❖ Waste Documentation such as, but not necessarily limited to: Waste Manifest Documents;
- ❖ Material Safety Data Sheets (MSDSs) for any hazardous substances; and
- ❖ Written Corrective Action Instructions.

6.2 Environmental Register

The Proponent will put in place an Environmental Register and will ensure that the following information is recorded for all complaints / incidents:

- ❖ Nature of complaint / incident.
- ❖ Causes of complaint / incident.
- ❖ Party/parties responsible for causing complaint / incident.
- ❖ Immediate actions undertaken to stop / reduce / contain the causes of the complaint / incident.
- ❖ Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint / incident.
- ❖ Timeframes and the parties responsible for the implementation of the corrective or remedial actions.

- ❖ Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented.
- ❖ Copies of all correspondence received regarding complaints/incidents.

6.3 Non-Conformance Report

A Non-Conformance Report (NCR) will be issued to the Proponent as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be issued by the ECO to the Proponent in writing. Preceding the issuing of a NCR, the Proponent must be given an opportunity to rectify the issue.

Should the ECO assess an incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it will be reported to the relevant authorities and immediately escalated to the level of a NCR. The following information should be recorded in the NCR:

- ❖ Details of non-conformance;
- ❖ Any plant or equipment involved;
- ❖ Any chemicals or hazardous substances involved;
- ❖ Work procedures not followed;
- ❖ Any other physical aspects;
- ❖ Nature of the risk;
- ❖ Actions agreed to by all parties following consultation to adequately address the non-conformance in terms of specific control measures and should take the hierarchy of controls into account;
- ❖ Agreed timeframe by which the actions documented in the NCR must be carried out; and
- ❖ ECO should verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily; the ECO and Proponent should sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

6.4 Emergency Response

The Proponents environmental emergency procedures must ensure appropriate responses to unexpected / accidental actions / incidents that could cause environmental impacts.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must ensure and include the following:

- ❖ Employees shall be adequately trained in terms of incidents and emergency situations;
- ❖ Details of the organisation (i.e. manpower) and responsibilities, accountability and liability of personnel;
- ❖ A list of key personnel and contact numbers;
- ❖ Details of emergency services (e.g. the fire department / on-site fire detail, spill clean-up services) shall be listed;
- ❖ Internal and external communication plans, including prescribed reporting procedures;
- ❖ Actions to be taken in the event of different types of emergencies;
- ❖ Incident recording, progress reporting and remediation measures to be implemented; and

- ❖ Information on any hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

7. COMPLIANCE WITH THE EMPr

7.1 Monitoring and Compliance

The monitoring and compliance of the development should take place as follows:

- ❖ The ECO has the authority to instruct the Proponent to cease a particular operation causing or liable to cause significant environmental damage, and issue fines or penalties for non-compliance of the Environmental Management Programme/ EMPr.
- ❖ An Environmental Control Officer (ECO) must audit the site and compile an audit report on a **monthly** basis until rehabilitation is successful.
- ❖ The holder of the environmental authorisation (the Proponent) is responsible to ensure that an environmental audit report is submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) as per the timeframes stipulated in the Environmental Authorisation (EA).

7.2 Auditing Process

The terms of reference for the audits must comprise the following:

- ❖ Develop a checklist against which the criteria can be referenced during the audit.
- ❖ During the audit process, key individuals involved with the management of the project are to be given the opportunity to comment on issues being audited and will be invited to accompany the auditor during the site inspection.
- ❖ Compile an audit report on the implementation of the EMPr and compliance to the Environmental Authorisation and submit this report to the competent authority (DEDEAT).

Compliance ratings against which the listed criteria are assessed are as follows:

| Symbol | Rating | Interpretation |
|--------|--------------|---|
| Y | Yes | Evidence of compliance |
| P | Partial | Evidence of partial compliance |
| N | No | Evidence of non-compliance |
| NR | Not Relevant | The condition or commitment is not relevant at this stage of the development or it is inappropriate |
| NA | Not Audited | Not audited |

7.3 Non-Compliance

Definition

The non-compliance is defined as, and will be issued for:

- ❖ Any deviation by the Proponent from the environmental conditions and requirements as set out in the EA and EMPr - or;
- ❖ Any contravention by the Proponent of environmental legislation - or;
- ❖ Any unforeseen environmental impact resulting from direct or indirect actions or activities on site that would be considered as a significant impact. Significance will be determined by the Environmental Control Officer (ECO) but will be informed by geographic extent, duration, lasting effects of the impact and extent of remediation to the impact.

Types of non-compliances issued

Two types of non-compliances may be issued:

A. Stop Works Non-Compliance

Stop Works Non-Compliance will require that all works as described in the non-compliance will stop immediately and may only continue on a formal written permission from the ECO.

Stop Works Non-Compliance will be issued under the following conditions:

- ❖ Total disregard by the Proponent to the environmental conditions and requirements listed in the EA and EMPr;
- ❖ An activity that if left unattended will escalate the degree, severity or extent of the environmental impact.

B. General Non-Compliance

A general non-compliance will allow work and activity by the receiving party to continue while the corrective action takes place.

7.4 Issuing a Non-Compliance

Non-compliance may be issued to:

- ❖ The Proponent
- ❖ Any representative of the Proponent

7.5 Process of Issuing Non-Compliance

The appointed Environmental Control Officer (ECO) may issue a formal non-compliance to the Proponent. A copy of the non-compliance issued will be placed in the EMPr file. The Proponent will be responsible for returning a formally signed off corrective action (as per template) to the ECO to be placed in the EMPr file. The ECO will be required to sign-off on the corrective action, indicating that it has been completed within the timeframes and to the satisfaction of the ECO.

7.6 Failure to complete corrective actions

In the event that the Proponent fails or refuses to complete the corrective action, either at all or within the allocated timeframe, the ECO shall,

- ❖ Inform DEDEAT in writing that a condition of approval for the project is not being met.

The DEDEAT office is responsible for resolving the impasse with the Proponent.

The Proponent is deemed not to have complied with the EA and EMPr if:

- ❖ Within the boundaries of the site and site extensions there is evidence of contravention of clauses;
- ❖ Environmental damage occurs due to negligence; inappropriate actions taken by the Proponent or any of his staff.

On receiving a notice of non-compliance the Proponent is required to swiftly address the issue/s taking all corrective actions required to rectify the situation. Penalties will be applied for non-compliant situations. Penalties/fines are advocated to ensure corrective measures are successfully undertaken and the necessary standard of rehabilitation is achieved.

The penalty associated with a chemical spill is not a set amount but will depend on the nature and extent of the spill; the cost of any soil and /or groundwater monitoring and any soil and /or groundwater remediation required by authorities will be to the Proponent's account.

The imposition of such a penalties / fines shall not preclude the relevant competent authority from applying an additional penalty in accordance with statutory powers.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression as deemed fit.

7.7 Unlawful Activity/ies

NEMA and its Regulations entitle environmental authorities to administer a fine not exceeding R 5 million or 10 years imprisonment and/or a fine and imprisonment for a person guilty of an unlawful activity. The Act makes allowance for the rectification of unlawful activity and may charge up to R1 million administration fees over and above the remediation costs.

NEMA makes provision for damages to be awarded by the courts where loss or damage has occurred as a result of a contravention of other environmental statutes. Importantly, NEMA provides for the liability of conviction of employees, managers, agents and directors for any offences resulting from the failure to take all the reasonable steps that were necessary under the circumstances to prevent the commission of an offence.

8. AMENDMENTS TO THE EMPr

This EMPr outlines the environmental practices and mitigation measures to be adhered to during the construction, operational phases, and rehabilitation in order to curtail and/or minimise potential negative impacts and promote sound environmental practises.

Any major issues not covered in the EMPr as submitted, will be addressed as an addendum to this EMPr, and submitted for approval. The EMPr is a living document and is subject to change from time to time in consultation with the DEDEAT. Any amendments to the EMPr will require approval from the DEDEAT.

9. ENFORCING THE EMPr

The holder of the Environmental Authorisation (EA) has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes casual labour, etc.). The EA and EMPr shall be part of the terms of reference for all stakeholders.

All senior and supervisory staff members shall familiarise themselves with the full contents of the EA and EMPr. They shall know and understand the specifications of the EA and EMPr and shall be able to assist other staff members in matters relating to the EA and EMPr.

TABLE OF RESPONSIBLE PARTIES BELOW:

| Responsibility | Name of Responsible Party |
|---|----------------------------------|
| Proponent | Dr. Ivan Marx |
| Environmental Control Officer/ ECO | (To be appointed) |
| Site Manager | (To be appointed) |

10. ENVIRONMENTAL MANAGEMENT PROGRAMME

10.1 CONSTRUCTION PHASE

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|---|--|-----------------------|--|
| Authorisations, Licences and Permits | Environmental Authorisations | | |
| | All necessary authorisations, permits and licences must be obtained by the Proponent prior to construction commencement. This includes permits for the removal of protected plants. | Proponent | Once-off |
| Appointment of Environmental Control Officer | Appointment of Environmental Control Officer | | |
| | An Independent ECO must be appointed at the Proponent's cost to monitor the implementation of the EMP. | Proponent & ECO | Once-off |
| | Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence which includes site preparation and demolition. | | |
| | The nomination of the ECO must be given to DEDEAT, in writing fourteen (14) days prior to construction commencement. The notification must include contact details for the ECO and details pertaining to the ECO's relevant experience. | | |
| Should the ECO for the development change at any time, this must be communicated, in writing, to DEDEAT, within fourteen (14) days of appointing the new ECO. The notification must include contact details for the ECO, details pertaining to the ECO's relevant experience and reasons for the change in ECO. | As required | | |
| Preparation of Method Statements | Method Statements | | |
| | Method Statements must be submitted by the Proponent/ Contractor to the ECO and must be adhered to by the Proponent/ Contractor. These relate to water and stormwater management requirements, solid waste management requirements, the storage of hazardous materials (if applicable), and standard emergency procedures. | Proponent/ Contractor | Prior to commencement of construction and during construction (if necessary) |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|--|---|----------------|--------------------------|
| | The ECO will monitor the implementation of the statements. | ECO | On-going |
| Notifying Relevant I&APs | Notice of Environmental Authorisation (EA) | | |
| | A written notice must be given to all relevant I&APs notifying them of the EA. The notice must include a date on which the EA was received and the reference number for the EA. Commencement of construction may not begin until 21 days after the notification, provided no appeals have been lodged against the EA. | Proponent | Prior to commencement |
| Education of Site Staff on General and Environmental Conduct <i>A general regard for the social and ecological wellbeing of the site and adjacent areas is expected of the site staff.</i> | Environmental Awareness and Training | | |
| | Construction staff must be adequately educated by the ECO as to the provisions included in the EMPr, and in terms of general environmentally-friendly practice. | | |
| | The ECO must ensure that all staff, and if applicable, Contractors / Sub-contractors / Suppliers / Service Providers are trained on the environmental, occupational safety and/or legal responsibilities expected from them. | | |
| | The training must take into account language and literacy requirements as well as measures to determine the effectiveness of the training. Proof of training must be attached to the ECO's audit reports. | | |
| | Consideration of the implications of the EA and EMPr must form part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language. | | |
| | The induction training will, as a minimum, include the following: <ul style="list-style-type: none"> ➤ The importance of conformance with all environmental policies; ➤ The environmental impacts, actual or potential, of their work activities; ➤ The environmental benefits of improved personal performance; ➤ Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Consultant's environmental management systems, including emergency preparedness and response requirements; and ➤ The mitigation measures required to be implemented when carrying out their work activities. | ECO | Once-off and as required |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|------------------------|---|---------------------------|---|
| | All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMPr and environmental responsibilities by signing an induction attendance record. | ECO | Once-off |
| | Staff, operating equipment, shall be adequately trained and sensitised to any potential hazards associated with their tasks. | Proponent | During staff induction, followed by on-going monitoring |
| | Translators are to be used where necessary during staff training. | ECO | |
| | The ECO must be on hand to explain more difficult / technical issues and to answer questions which may be raised. | ECO | |
| | Staff must be made aware that they are not to make excessive noise e.g. shouting, hooting. | ECO & Proponent | |
| | All employees must undergo the necessary safety training and wear the necessary protective clothing at all times. | | |
| | No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs. | | |
| | No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel). | | |
| | No unsocial behaviour will be permitted. | | |
| | Bringing pets onto site is forbidden. | | |
| | Staff must make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden). No fires to be permitted on site. | | |
| | Trespassing on private / commercial properties adjoining the site is forbidden. | | |
| | No worker may be forced to do work that is potentially dangerous or for what he / she is not so trained | | |
| | The staff conduct rules are described in a separate table of rules in the EMPr. This is aimed at providing staff with the basic information regarding worker conduct on site. | | |
| Site Management | Access | | |
| | No vehicles may drive onto the adjacent properties and any other no-go areas. | Site Manager | On-going |
| | Site Management | | |
| | To ensure that the ecological integrity of the adjacent properties are maintained and preserved, the proponent and contractor must ensure that the construction footprint is limited to the | Proponent/ Contractor/ | On-going |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|--|--|----------------|------------------------|
| | <p>construction area. The extent of the construction must be marked out to satisfaction of the engineer and ECO. A silt screen fence must be erected 1m from the property boundary, to prevent workers from going beyond the work zone.</p> <p>The Contractor must restrict all activities, materials, equipment, and personnel within the area specified or restricted activities to areas that are necessary to undertake the work.</p> <p>The Contractor must ensure that materials are appropriately secured to ensure safe passage between destinations, loads including, but not limited to, sandstone chips, fine vegetation or refuse should have appropriate cover to prevent pollution of adjacent properties.</p> <p>The proponent will be held responsible for any clean-up in the marine environment resulting from failure by the contractors or suppliers to properly secure material.</p> <p>Adequate drainage and erosion protection must be provided around the site and where necessary.</p> <p>Access points and other cleared surfaces must be dampened whenever necessary and especially in dry and windy conditions to avoid excessive dust. Alternatively, a binding product such as Dustex (supplied by Patch Industrial Supplies) could be used.</p> | Site Manager | |
| Sewage and Sanitation | Ablutions | | |
| | Toilets must be no closer than 32m from any watercourse. Such facilities, which shall comply with local authority regulations, shall be maintained in a clean and hygienic condition. Their use shall be strictly enforced. They must be positioned in an appropriate place, also taking into consideration, gradient of the land. | Site Manager | Immediately & on-going |
| | The Site Manager must ensure that toilets are cleaned weekly or more regularly, if found to be necessary. | | On-going |
| | Unauthorised spilling of waste from the septic tank into the environment and burying of waste are strictly prohibited. | | |
| Ablution facilities must not cause any pollution to any water resource and it must not be a health hazard to the general public. | | | |
| Social Impacts | Communication Between Site Manager, Site Staff and I&APs | | |
| | Should the staff be approached by members of the public or other stakeholders, they must assist them in locating the Site Manager, or provide a number on which they may contact the Proponent/ | Site Manager | On-going |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|--|--|----------------|--|
| | Site Manager. The conduct of the staff when dealing with the public or stakeholders shall be in a manner that is polite and courteous at all times. Drivers of heavy-duty vehicles must exercise care when travelling to and from the site – and adhere to all legally enforceable requirements. | | |
| Equipment lay-down and storage | Storage Areas | | |
| | Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to water bodies, general on-site topography and water erosion potential of the soil. Impervious surfaces, bunded areas or drip trays must be provided where necessary. | Site Manager | On-going |
| | Material stockpiles must be protected against rain and flooding. | | |
| Equipment lay-down and storage areas must be designated, demarcated and signed. | | | |
| Conservation of the Natural Environment | Erosion and Stormwater Control | | |
| | Soil disturbance during the removal of alien invasive plants must be minimised as much as possible. | Site Manager | Throughout the duration of the project |
| | Storm water control must be undertaken to prevent soil loss and erosion impacts from the site. | | Immediately |
| | Erosion prevention and control measures must be implemented. This may be by the use of mulch bags or silt fences. The engineer must provide a method statement for site specific erosion methods. | | On-going |
| | Provision shall be made for storm water management measures that will ensure effective run-off control and prevent erosion at run-off points. | | |
| | Continuous monitoring for evidence of erosion must be undertaken around the site. | | |
| | Earth, stone or rubble is to be properly disposed of so as not to obstruct natural water pathways over the site. | | |
| | Fauna and Flora | | |
| Areas which are identified by the Environmental Control Officer (ECO) as being ecologically sensitive and which are adjacent to the site are to be suitably demarcated to prevent damage by construction practices. These areas are to be recognised as “no-go” areas. | ECO & Site Manager | Immediately | |
| No natural vegetation may be cleared without prior permission from the ECO and if applicable | | On-going | |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|---|---|--------------------|-------------------------------|
| | from any relevant authority. Indigenous vegetation that is removed is to be replanted either back to the point from which it was taken or must be replaced by new relevant indigenous vegetation. | | |
| | All alien invasive plant species must be continuously removed around the site. The best way to do this is to remove the plants from the roots by hand and leave the plants in the sun to dry out and die before disposal. Please refer to the Alien Plant Control Programme. | ECO & Site Manager | Immediate and On-going |
| | Disturbance to birds, animals and reptiles and their habitats must be minimized wherever possible. | Site Manager | |
| Waste Management | On-Site Waste Management | | |
| | The excavation and use of rubbish pits is forbidden. | Site Manager | On-going |
| | Burning of waste is forbidden. <i>A possible exception to this may be that the alien invasive vegetation which is removed from the site should be burned to prevent the spread of the plants. The transportation of Alien Invasive Plants is strictly forbidden in terms of the Conservation of Agricultural Resources Act (CARA), especially if in seed; unless stored in a completely sealed container.</i> | | On-going and monitored weekly |
| | Littering on the site is forbidden and the site shall be cleared of litter at the end of each working day. | | On-going monitoring |
| | An adequate number of general waste bins must be arranged around the site to collect all domestic refuse, and to minimise littering. | | |
| | Solid waste must be managed and separated into recyclable and non-recyclable and disposed of accordingly. | | |
| | Waste must be removed from the site on a weekly basis. | | |
| | All waste generated during construction is to be disposed of at a facility registered in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008). | | |
| | | | |
| Handling of Hazardous Materials (if necessary) | Hazardous Materials | | |
| | Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes. | Site Manager | On-going |
| | Cement and other potential environmental pollutants must be stored within an impermeable | | |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|-----------------------------|---|----------------|------------------------|
| | <p>bunded, roofed and sign posted area.</p> <p>The mixing of cement must be done on Rhino board.</p> <p>All empty contaminated containers must be stored within a hazardous bunded area until collection by a reputable hazardous waste collection company. Waybills must be presented to the ECO for review and filing purposes.</p> <p>No vehicles transporting hazardous materials to the site may be washed on or near site. They must return to the supplier of such material to be cleaned out.</p> | | |
| Cultural Environment | Archaeology and Artefacts | | |
| | <p>No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from Eastern Cape Provincial Heritage Resources Authority.</p> | Site Manager | Immediate and On-going |
| | <p>If any archaeological sites/materials are exposed, mitigation regarding the finds must be conducted with the Eastern Cape Provincial Heritage Resources Authority regarding the destiny of the material.</p> <p>Examples of heritage resources are as follow:</p> <ul style="list-style-type: none"> • Human remains • Coins/Gold/Silver • Fossils • Fossils shell middens/ marine shell heaps • Pottery/ceramics | | |
| | <p>If the Eastern Cape Provincial Heritage Resources Authority agrees to the removal of the material, an archaeologist must apply for a permit from the Eastern Cape Provincial Heritage Resources Authority to scientifically excavate/collect the material.</p> | | |
| | <p>All costs must be financed by the applicant. This may include:</p> <p>All monitoring and mitigation expenses regarding the excavations/collecting of material, travel, accommodation and subsistence, analysis of the material, radiocarbon date(s) of the site(s) and a</p> | | |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|---|--|----------------|--------------------|
| | one-off curation/storage fee payable to the Department of Archaeology at the Albany Museum in Grahamstown (Eastern Cape Repository for Archaeological material). | | |
| Safety and Security | Safety and Security On-Site | | |
| | Material stockpiles or stacks must be stable and well secured to avoid collapse and possible injury to site workers / local residents. | Site Manager | On-going |
| | Firefighting equipment must be present on site at all times. All equipment on site must be used in accordance with the Occupational Health and Safety Act regulations of South Africa (OHSA), Act No. 85 of 1993); staff must be trained in firefighting procedures. | | |
| No unauthorised person may be permitted to enter the site without prior permission of the site manager. | | | |

10.2 REHABILITATION AND MAINTENANCE

***All rehabilitation measures must be implemented with consultation with an Alien Invasive Plant Control Plan**

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|--|---|-------------------------------------|------------------------------|
| Vegetation Rehabilitation | Vegetation | | |
| | A 100% indigenous planting plan must be adhered to in terms of all planting carried out on the site. | Proponent, Site Manager & ECO | On-going site maintenance |
| | Erosion prevention and control measures must be fully implemented (if necessary). | | |
| | All rehabilitated areas must be maintained through weekly inspections until the 80% success rate has been achieved (if applicable). | | |
| Encroachment of invasive alien plants in this regard will need to be monitored on a regular basis to prevent re-infestation. | | | |
| Stormwater Management | Stormwater | | |
| | Any negative stormwater effects, related to the operational phase, must be remediated. | Proponent & Site Manager | On-going site maintenance |

| Activity | Management / Mitigation | Responsibility | Frequency / Timing |
|--------------------------|---|--------------------------|------------------------------|
| | On-going monitoring and assessing of stormwater drainage must occur on site during the operational phase of the proposed project. | | |
| Conservancy Tanks | Sewage Management | | |
| | Installation of conservancy tanks is to be in accordance with the relevant SANS and municipality specifications and to be located in such a manner as to facilitate access thereto by municipal vehicles used for the servicing of conservancy tanks. | Proponent/ Contractor | On-going site maintenance |

11. ALIEN PLANT CONTROL PROGRAMME

Please consult a Botanical specialist before attempting to remove Alien Invasive Plants.

Benefits of control

- Elimination of spread of these species into non-affected areas.
- Improvement of water quality and quantity.
- Legal compliance: landowners are required to eradicate or control declared weed and alien invader plants in terms of the Conservation of Agricultural Resources Act 43 of 1983 and the National Environmental Management: Biodiversity Act 10 of 2004.
- Improvement of biodiversity in conservation areas. Fast growing invader plants suppress indigenous flora, with a resultant loss in overall biodiversity.
- Commercial reasons: alien vegetation can spread from conservation areas into production land resulting in greater weed control costs.

Important factors influencing the effectiveness of a control programme

- Timely implementation of control operations is important for alien plants.
- Operations must be directed towards killing alien vegetation. This is best achieved by using an effective herbicide chosen by the ECO and applied by using the “cut-stump; frilling or ring barking methods. Under no circumstances may spraying with a “Rose” or multi- stream nozzle head be done.

Requirements for an effective alien vegetation control programme

- Identify the problem: extent, location and species of problem plant.
- Divide the problem areas into manageable units, taking budget and resource constraints into account.
- Identify any sensitive ecosystems, rare or endangered plants etc. which may be affected by a control programme. Identify the original ecosystem applicable to the area.
- Make provision for a number of follow up operations. The initial clearing operation is only part of the total programme. Failure to follow up will result in a failure of the entire programme.

While the importance of removing or clearing of alien or exotic vegetation is recognised, there should be control over the way in which this takes place. Often what generally appears to be covered by alien vegetation, actually contains pockets of sensitive vegetation or protected species. It is for this reason that clearing of such areas must be undertaken by hand (*Guidelines for the Control and Management of Activities in Sensitive Coastal Areas, first edition, 1998*).

It is important to note that all of the above must be performed with instruction by the ECO, as well as in the presence of an ECO at all times.

11.1 Legislation

The National Environmental Management Act, No 107 of 1998, creates a duty of care towards the environment. Within the preface of this Act, it is stated thus:

“Everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and

secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development: the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must co-operate with, consult and support one another.”

Any person or business found to be responsible for illegally introducing an invasive plant or species, and allowing it to spread, may be compelled, by this Act to desist with their actions and remove the source of invasion.

The Conservation of Agricultural Resources Act, No 43 Of 1983 (CARA) was passed to protect soil, water resources and vegetation. This included measures to manage and control weeds and invader vegetation species. The CARA regulations declare several species of “weeds” or “invader plants.” These species have been divided into three categories:

Category 1a Listed Invasive Species:

Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the National Environmental Management: Biodiversity Act/ NEMBA (Act 10 of 2004) as species which must be combatted and eradicated.

A person in control of a Category 1a Listed Invasive Species must-

- (a) comply with the provisions of section 73(2) of the NEMBA;
- (b) immediately take steps to combat or eradicate listed invasive species in compliance with sections 75(1), (2) and (3) of the NEMBA; and
- (c) allow an authorised official from the Department to enter onto land to monitor, assist with or implement the combatting or eradication of the listed invasive species.

If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Category 1b Listed Invasive Species:

1) Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the NEMBA as species which must be controlled.

2) A person in control of a Category 1b Listed Invasive Species must-

- (a) control the listed invasive species in compliance with sections 75(1), (2) and (3) of the NEMBA.
- (b) must allow an authorised official from the Department to enter onto the land to monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of NEMBA.

3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Category 2 Listed Invasive Species:

- 1) Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the NEMBA as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be.
- 2) Unless otherwise indicated in the Notice, no person may carry out a restricted activity in respect of a Category 2 Listed Invasive Species without a permit.
- 3) A landowner on whose land Category 2 Listed Invasive Species occurs or person in possession of a permit, must ensure that the specimens of the species do not spread outside of the land or the area specified in the Notice or permit.
- 4) Unless otherwise specified in the Notice, any species listed as Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to Regulation 3 above.
- 5) Notwithstanding the specific exemptions relating to existing plantations in respect of Listed Invasive Plant Species published in *Government Gazette* No. 37886, Notice 599 of 1 August 2014 (as amended), any person or organ of state must ensure that the specimens of such Listed Invasive Plant Species do not spread outside of the land over which they have control.
- 6) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Category 3 Listed Invasive Species:

- 1) Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the NEMBA, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of the NEMBA, as specified in the Notice.
- 2) Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3 below.
- 3) If an Invasive Species Management Programme has been developed in terms of section 75(4) of the NEMBA, a person must combat or eradicate the listed invasive species in accordance with such programme.

Should any invasive plant species occur, other than those stated in The Act, the land user must control them by species-specific control methods. Caution should ALWAYS be taken when dealing with noxious chemicals, and care should be taken to cause the least amount of harm to the environment.

11.2 Ways to Eradicate Alien Vegetation

This alien eradication and control program comprises the following three steps:

Step 1

The first step of the Alien Plant Eradication Programme will be to undertake an inception and educational meeting, where the people employed to undertake this activity are able to identify the correct species as aliens and the manner in which to remove and control them.

Step 2

The second step will be to identify the Alien Invasive Species and start a process of removing the individuals that occur on the site. The removal of the alien species must be in a stepwise manner and be undertaken within a single area at a time. This will ensure that all individuals are removed at the same time to reduce re-infestations. Below are a number of methods that may be employed to undertake the activity of removing alien plant species. These methods are dependent on the size and nature of the plant that is to be removed.

Mechanical Methods

Hand-pulling

This method of removal is only really an option during the summer months and when the alien plant species that are requiring removal are very small, and their root system is not very well established. The only precautionary note here is that many alien plant species may look similar to indigenous species when they emerge, so the labour force must be extremely well versed in the individuals that will require removal.

Up-rooting

This method is similar to hand-pulling but is undertaken on slightly older individuals of the target species. It only has one drawback; a relatively large area can be disturbed with the soils being altered and opening the area up to re-infestation.

Lasso & Winch

This method is the upgraded version of the up-rooting, with the same principles applying, that is of trying to remove the entire plant with all the root system attached, to prevent re-growth. This can have a serious destabilizing effect on the receiving environment and should definitely not be undertaken on slopes or sandy soils.

Cutting / Slashing

This method is not a suitable method for control and long term management if used as a stand-alone technique because many of the alien plant species will simply coppice or re-sprout during the summer periods. Many, if not most, alien plants species are annual species, and through their natural life strategy (r-selected) are able to withstand disturbance, even extreme disturbance as in this instance.

Ring-barking

This involves the removal of bark in a 30 centimetre band. This technique is used to desiccate the plant through killing the phloem and xylem and thus preventing transpiration. Further it also facilitates pathogen infestation. It is very effective on large trees if undertaken correctly.

Strip-barking

As with ring-barking, just at a larger scale.

Frilling / Girdling

Girdling and frilling are methods of killing standing trees that may be done with or without an herbicide. Girdling involves cutting a groove or notch into the trunk of a tree to interrupt the flow of sap between the roots and crown of the tree. The groove must completely encircle the trunk and should penetrate into the wood to a depth of at least 1.5 centimetres on small trees, and 2.5 to 4 centimetres on larger trees. Girdling can be done with an axe, panga or chain saw. When done with an axe or panga, the girdle is made by striking from above and below along a line around the trunk so that a notch of wood and bark is removed. The width of the notch varies with the size of the tree. Effective girdles may be as narrow as 2.5 to 5 centimetres on small-diameter trees, and as wide as 15 to 20 centimetres on very large-diameter trees. When a chain saw is used to girdle, two horizontal cuts between 5 and 10 centimetres apart are usually made completely around the tree when no herbicide is used and one horizontal cut is made completely around the tree when herbicide is used.

Frilling is a variation of girdling in which a series of downward angled cuts are made completely around the tree, leaving the partially severed bark and wood anchored at the bottom. Frilling is done with an axe or panga.

By themselves, girdling and frilling are physical methods to deaden trees that require very little equipment and may be done without herbicides. Both techniques require considerable time to carry out, particularly with an axe or panga. The effectiveness of girdling and frilling depends on the tree species and on the size and completeness of the girdle or frill. To be effective, girdles and frills must completely encircle the tree. Because frills can heal-over more easily, girdling is usually more effective.

The effectiveness of both girdling and frilling can be increased by using herbicides. With frilling and girdling, water soluble forms of herbicides are most commonly used to get maximum movement of herbicide within the plant. When using water-soluble herbicides, the herbicide/water mixture is commonly applied by squirting it on the girdle or frill until the cut surface is wet. Hand-held, spray bottles, such as those available at local garden stores, are ideal for applying herbicide to the girdle. Again, note that a single, rather than double chain saw girdle is used when a water soluble herbicide is to be applied.

Chemical Methods

The use of chemicals in controlling and removing of alien plant species should not be excluded as a possible option. Once the alien plant species are more manageable the use of chemicals should be reduced or excluded completely. The best option would be to pursue a combination of mechanical and chemical control in the early stages.

The only negative impact of the use of chemicals is that if used incorrectly may result in plant species being able to develop some form of resistance to the herbicide. If herbicides are used as a foliar spray, drift will cause non-target species to be impacted upon. The only method that should be undertaken is the cutting of the plants prior to the treatment of the remaining stems using a "stem painting" technique.

It is imperative that the herbicides used are dye treated or that the end-user add a dye to ensure that all stems that have been treated are easily identified. Note, the application of the chemical solution must follow directly after the

cutting of the vegetation. Therefore, a small area should be selected and all cutting and stem painting be undertaken on that area prior to moving to the next area.

Environmental Safety

In order to minimise the impact of the construction on the natural environment the following must be observed.

- ❖ Area contamination must be minimised by careful accurate application with a minimum amount of herbicide to achieve good control.
- ❖ All care must be taken to prevent contamination of any water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures.
- ❖ Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of at a suitable site.
- ❖ To avoid damage to indigenous or other desirable vegetation product should be selected that will have the least effect on non-target vegetation.
- ❖ Coarse droplet nozzles should be fitted to avoid drift onto neighbouring vegetation, e.g. TG-1 or equivalent.
- ❖ The correct protective clothing is to be used in line with manufacturer's instructions and / or the Occupational Health & Safety Act, Act 85 of 1993 (and amendments) and,
- ❖ All MSDS sheets are to be made available on site along with a Medical First Aid Kit.

Disposal of Alien Vegetation

- ❖ Plant material should be used beneficially wherever possible, as opposed to disposing of it at a landfill site where it takes up valuable airspace, or let it further propagate on unchecked, vacant land.
- ❖ Woody and dry material, provided no seeds are present, can be chipped and used as mulch or made available to the local community for firewood.
- ❖ Wet material and aquatic weeds should be combined with other organic matter and composed. Alternatively, it may be possible to use it for basket making, animal feed or other uses.
- ❖ Burning of alien vegetation waste material is prohibited.
- ❖ Burying of alien vegetation waste material in or near the stream, drainage lines, dams, wetlands and their buffer zones is prohibited.

- ❖ Any vegetation which is not viable for use must be disposed of at a registered disposal unit.

12. Species Planting List

Please consult with a Botanical specialist for a comprehensive list.

13. STAFF CONDUCT CONTROL AND INFORMATION SHEET

| ALL STAFF MUST OBEY THE FOLLOWING RULES: | |
|--|--|
| 1 | DO NOT tamper with or destroy nesting sites, lairs or any other form of animal shelter. |
| 2 | DO NOT feed the native animals. |
| 3 | DO NOT leave the project site untidy and strewn with rubbish that will attract pests. |
| 4 | DO NOT bring any pets onto the project site. |
| 5 | DO NOT trespass onto private properties not linked to the project. |
| 6 | DO NOT carry a weapon onto the project site or in the vehicles transporting workers to and from the site. |
| 7 | DO NOT set fires. |
| 8 | DO NOT cause any unnecessary disturbing noise at the project site or at any designated worker collection/drop off points. |
| 9 | DO NOT drive a vehicle under the influence of alcohol. |
| 10 | DO NOT exceed the national speed limits on public roads or exceed the recommended speed limits in this management plan (where applicable) |
| 11 | DO NOT drive a vehicle that is generating excessive noise (noisy vehicles must be reported and repaired as soon as possible). |
| 12 | DO NOT litter along the roadsides, including both public and private roads. |
| 13 | DO NOT remove or destroy vegetation around the site without the prior consent of the site manager and Environmental Control Officer. |
| 14 | DO NOT tamper with, destroy or remove vegetation from any areas that have been fenced off or marked. |
| 15 | DO NOT pollute watercourses, whether flowing or not. |
| 16 | DO NOT drive through watercourses. |
| 17 | DO NOT operate critical items of mechanical equipment without having been trained and certified. |
| 18 | ALL employees must undergo the necessary safety training and wear the necessary protective clothing at all times. |
| 19 | NO unsocial behaviour will be permitted e.g., excessive shouting, hooting etc. |
| 20 | NO ad-hoc activities are to be undertaken e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden |
| 21 | NO trespassing on private / commercial properties adjoining the site is forbidden. |
| 22 | NO worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do. |

14. RESPONSIBILITIES

The "Responsibility" column is merely a guide and does not relieve the Proponent of his responsibilities in terms of overall compliance with the EA and EMPr.

| FUNCTION | RESPONSIBILITY |
|--|--|
| Proponent | <ul style="list-style-type: none"> The Proponent is ultimately responsible for the ensuring compliance with all the requirements associated with the construction, operation, rehabilitation and decommissioning phases of the project. |
| Site Manager | <ul style="list-style-type: none"> The Site Manager is responsible to ensure that all necessary communication and submission of required documentation concerning this project is submitted to the relevant authorities. The site manager is required to adhere to the EMPr and is responsible to ensure that all staff appointed also adhere the EMPr. Ensures that all staff are made aware of the need to conduct activities in an environmentally responsible manner. (Site Manager) On instruction by the ECO, ensures that storm/surface water controls are established. Ensures prompt remediation of any sewage spills. Stockpiles are protected from aeolian effects, stormwater effects, or being driven over by workers. Ensures that a "clean-site" policy is applicable at all times. Ensures that all complaints by residents are dealt with promptly. Is responsible for any contravention/s by staff or any non-compliance with the EMPr. |
| Environmental Control Officer (ECO) | <ul style="list-style-type: none"> The ECO is to have access to the site at all times, for the purpose of inspections to ensure that the environmental conditions of the EMPr as well as the conditions stipulated to in the EA and the recommendations made in the EIR are being implemented and adhered to. The ECO must report on the environmental aspects of the project to the responsible person/authority at agreed intervals. The need for any deviations or variations in the environmental conditions must be reported to the DEDEAT for approval prior to these being undertaken. The ECO must be fully cognisant with the contents of the Environmental Authorisation as well as this EMPr and any other applicable legislation |
| Competent Authority | <ul style="list-style-type: none"> The Compliance Officer appointed by the Competent Authority is responsible for the ensuring that the Proponent, Site Manager and ECO are compliant with the provisions of the EA and EMPr. |

ACKNOWLEDGEMENT FORM

Record of signatures providing acknowledgment of being aware of and committed to complying with the contents of this Environmental Management Programme (EMPr), which relates to the environmental mitigation measures for the project outlined below, and the environmental conditions contained in all other contract documents.

PROJECT NAME:

THE PROPOSED CONSTRUCTION OF A RESIDENTIAL DWELLING ON ERF 1510, ST FRANCIS BAY, KOUGA MUNICIPALITY

DEDEA REF: EC08/C/LN1&3/M/51-2022

PROPONENT:

Signed: Date:

SITE MANAGER:

Signed: Date:

ENVIRONMENTAL CONTROL OFFICER

Signed: Date:

Appendix A: CV of the EAP