PRE-CONSTRUCTION, CONSTRUCTION AND OPERATIONAL ENVIRONMENTAL MANAGEMENT PROGRAMME

For

THE PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 3122, HARTENBOS HEUWELS, MOSSEL BAY

Prepared for:

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LIST OF ABREVIATIONS AND ACRONYMS

A.....Lead Authority
C.....Contractor
CE ..... Consulting Engineer
CLO..... Community Liaison Officer
D..... Developer
DEA.....Department of Environmental Affairs
EA .....Environmental Authorisation
EAP.....Environmental Assessment Practitioner
ECO..... Environmental Control Officer
EM..... Environmental Manager
EIR .....Environmental Impact Report
EMPr .....Environmental Management Programme
EO .....Environmental Officer
ESO.....Environmental Site Officer
HIA .....Heritage Impact Assessment
HSO..... Health and Safety Officer
HOA ..... Health and Safety Officer
I&AP.....Homeowner Association
IDP .....Integrated Development Plan
MSDS.....Material Safety Data Sheet
NEMA..... National Environmental Management Act, 1998 (Act 107 of 1998), as amended
OA.....Other Authority
PM..... Project Manager
RE .....Resident Engineer
SAHRA.....South African Heritage Resource Agency
SDF ..... Spatial Development Framework
SEF .....Strategic Environmental Focus
SHE..... Safety, Health & Environment
VIA ..... Visual Impact Assessment
WC-DEA&DP.....Western Cape Department of Environmental Affairs and Development Planning

GLOSSERY OF TERMS

Alien Invasive Species - Plants and animals which do not occur naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area and are invasive due to a lack of natural enemies and favourable conditions.

Alternative - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives. Plans or proposals for alternatives need to be approved by the ECO if part of the Record of Decision conditions (which may include the EMPr).

Aspect - Element of an organisation's activities, products or services that can interact with the environment.

Auditing - A systematic, documented, periodic and objective evaluation of how well the environmental management plan is being implemented and is performing with the aim of helping to safeguard the environment by: facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems and mitigate environmental impacts.

Biodiversity - The rich variety of plants and animals that live in their own environment. Fynbos is a good example of rich biodiversity in the Cape.

Built environment - Physical surroundings created by human activity, e.g. buildings, houses, roads, bridges and harbours.

Conservation - Protecting, using and saving resources wisely, especially the biodiversity found in an area.

Construction Activity - Any action undertaken during the construction process by the Contractor, his Sub-contractors, suppliers or personnel or any entity acting on his behalf.

Construction camp - The area designated for all temporary site offices, lay-down areas, storage sheds and areas, parking areas, maintenance workshops, staff welfare facilities, accommodation, etc.

Contamination - The addition of foreign matter to a natural system, polluting or making something impure.

Contractor - Refers to the main organization or individual which have been appointed by the Developer, through the Project Manager, to undertake construction activities on the site.

Corrective (or remedial) action - Response required in order to address an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action may be determined through monitoring, audits or management review.

Degradation - The lowering of the condition of the environment through human activities, e.g. reducing the condition / integrity of a wetland environment due to siltation caused by upstream soil disturbance.

Demolition - Refers to the activity of the tearing-down buildings and other structures, thus the opposite of construction. Demolition contrasts with deconstruction.

Developer - The person or organisation responsible for building on land or for altering the use of land for a new purpose.

Ecology - The scientific study of the relationship between living things (animals, plants and humans) and their environment.

Ecosystem - The relationship and interaction between plants, animals and the non-living environment.

Environment - Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.

Environmental Control Officer (ECO) - Relates to an independent appointment of a consultant by the Developer or Project Manager to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMPr for the project.

Environmental Management Programme (EMPr) - The EMPr provides a description of the methods and procedures for mitigating and monitoring impacts associated with the project in order to ensure that activities are conducted and managed in an environmentally sound and responsible manner. The EMPr can also contain environmental objectives and targets which the project proponent or developer needs to achieve in order to reduce or eliminate negative impacts.

Environmental Management System (EMS) - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Standards Organisation.

Environmental Officer - Appointment by the Consulting Engineer or Project Manager as their environmental representative on site. The EO is not independent but must rather act on behalf of the consulting engineer or project manager with the mandate to enforce compliance under the project contract, which must include the requirements of the EMPr.

Environmental policy - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

Environmental Site Officer - An employee of the Contractor to act as his/her environmental representative to monitor, review and verify compliance with the EMPr by the contractor. This is not an independent appointment as the ESO must be a respected member of the contractor's management team.

Environmental specifications - Specifications, instructions and guidelines designed to help prevent, reduce and/or control the potential environmental implications as a result of the development and any associated activities.

Habitat - The physical environment that is home to plants and animals in an area, and where they live, feed and reproduce.

Hazardous waste - Waste, even in small amounts, that can pollute, contaminate or cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, paint containers, shutter oil, glaze, bitumen, glue containers, electronic waste etc.

Impact - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Indigenous species - Plants and animals that are usually located in a specific region as a result of only natural processes, with no human intervention.

Infrastructure - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

Integrated - Mixing or combining all useful information and factors into a joint or unified whole. See Integrated Environmental Management.

Integrated Environmental Management (IEM) - A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social,

cultural and economic factors and consulting with all the people affected by the proposed developments. Also called "IEM".

Land use - The use of land for human activities, e.g. residential, commercial, industrial use.

Lead Authority - The Lead Authority is the relevant environmental department (National or Provincial) who is responsible for issuing an Environmental Authorisation. This authority is responsible for ensuring that monitoring of the EMPr and other authorisation documentation is carried out.

Material Safety Data Sheet (MSDS) - Material Safety Data Sheet (MSDS) is a form with data regarding the properties of a particular substance. This document contains information on the potential health and environmental effects of the applicable substances as well as safe working procedures users should adhere to when hadling the substance. Furthermore, the document details treatment measures to mitigate impacts on the environment in the event of spillages.

Method Statements - Method Statements are written submissions to the Engineer / Project Manager by the Contractor in collaboration with his/her ESO. The Method Statements must address the following for each applicable activity to be undertaken during the project:

- Materials and equipment to be used
- Getting the equipment to and from site
- How the equipment/material will be moved while on site
- How and where material will be stored
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or solid material that may occur
- Timing and location of activities
- Compliance/ non-compliance with the Specifications
- Any other information deemed necessary by the PM.

The Method Statements must contain the appropriate detail in order for the EO and Engineer / Project Manager to assess whether the Contractor's proposal is in accordance with the requirements of the EMPr. The contractor must sign each Method Statement along with the EO (or ECO on projects where no EO is present) and Engineer / Project Manager to formalise the approved Method Statement.

Mitigation - Measures designed to avoid, reduce or remedy adverse impacts on the environment due to construction activities.

Natural environment - Our physical surroundings, including plants and animals, when they are unspoiled by human activities.

Policy - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies a

re based on people's values and goals. See Integrated Metropolitan Environmental Policy.

Process - Development usually happens through a process - a number of planned steps or stages.

Proponent – Also known as the Developer. Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMPr.

Rehabilitation - Rehabilitation is the process of returning a disturbed area, feature or structure to a natural state meaning to the state that it was before disruption (where possible), or to an improved state.

Recycling - The practice of sorting and collecting waste materials for new use.

Resources - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

Solid waste - Any solid undesirable or superfluous by-product or remainder of any process or activity. This includes construction debris, chemical waste, cement/concrete remains, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. foodstuffs, clothing, packaging materials such as glass, paper and cardboard, plastics, and, in certain cases, ash).

Stakeholders - A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.

Storm water management - Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

Sustainable development - Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability - The capacity to support, maintain or endure.

Visual impact - Changes to the visual character of available views resulting from the development that include: obstruction of existing views; removal of screening elements thereby exposing viewers to unsightly views; the introduction of new elements into the view shed experienced by visual receptors and intrusion of foreign elements into the view shed of landscape features thereby detracting from the visual amenity of the area.

Waste Management - Categorization, classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

Working area - Any area within the boundaries of the Site where active construction takes place including any working space.

Zoning - The control of land use by only allowing specific type development in fixed areas or zones

REFERENCES

DEA (1992) Integrated Environmental Management Guideline Series, Volumes 1-6, Department of Environmental Affairs, Pretoria.

DEA (2004a) Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

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SECTION 1: CONTEXTUAL INFORMATION

1.1 INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF) has been appointed by the Afrikaanse Taal- en Kultuurvereniging (ATKV) to undertake an environmental application process for the proposed residential development on Erf 3122 of Hartenbos Heuwels in the Western Cape. The study area is located on Erf 3122 of Hartenbos Heuwels (on the corner of Kameeldoring- and Geelhout Avenue) approximately 1.5km west of the centre of Hartenbos town, in the Mossel Bay Local Municipality. The study area falls within Quarter Degree Grid Cell (QDGC). The N2 highway as well as the R102 provincial road between Hartenbos and Mossel Bay is situated to the east of the study area while the R328 provincial road between Hartenbos and Oudshoorn is situated to the north (Refer to **Error! Reference source not found.**).

1.2 APPROACH

This document is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992). IEM is a key instrument of the National Environmental Management Act [NEMA] (Act No. 107 of 1998). NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an Environmental Management Programme (EMPr). The IEM guidelines encourage a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels. The basic principles underpinning IEM are that there be:

- informed decision-making;
- accountability for information on which decisions are taken;
- accountability for decisions taken;
- a broad meaning given to the term environment (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- an attempt to ensure that the ‘social costs’ of development proposals (those borne by society, rather than the developers) be outweighed by the ‘social benefits’ (benefits to society as a results of the actions of the developers);
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of the proposals (i.e. from ‘cradle to grave’); and
- the opportunity for public and specialist input in the decision-making process.

These principles are in line with NEMA, which has repealed a number of the provisions of the Environment Conservation Act, 1989 [ECA] (Act No. 73 of 1989), and is focussed primarily on co-operative governance, public participation and sustainable development. The Environmental Impact Assessment Regulations 2006, which was replaced by the Environmental Impact Assessment Regulations 2010 that took effect in August 2010, regulate the procedures and criteria for the

submission, processing, consideration and decision on applications for environmental authorisation of listed activities.

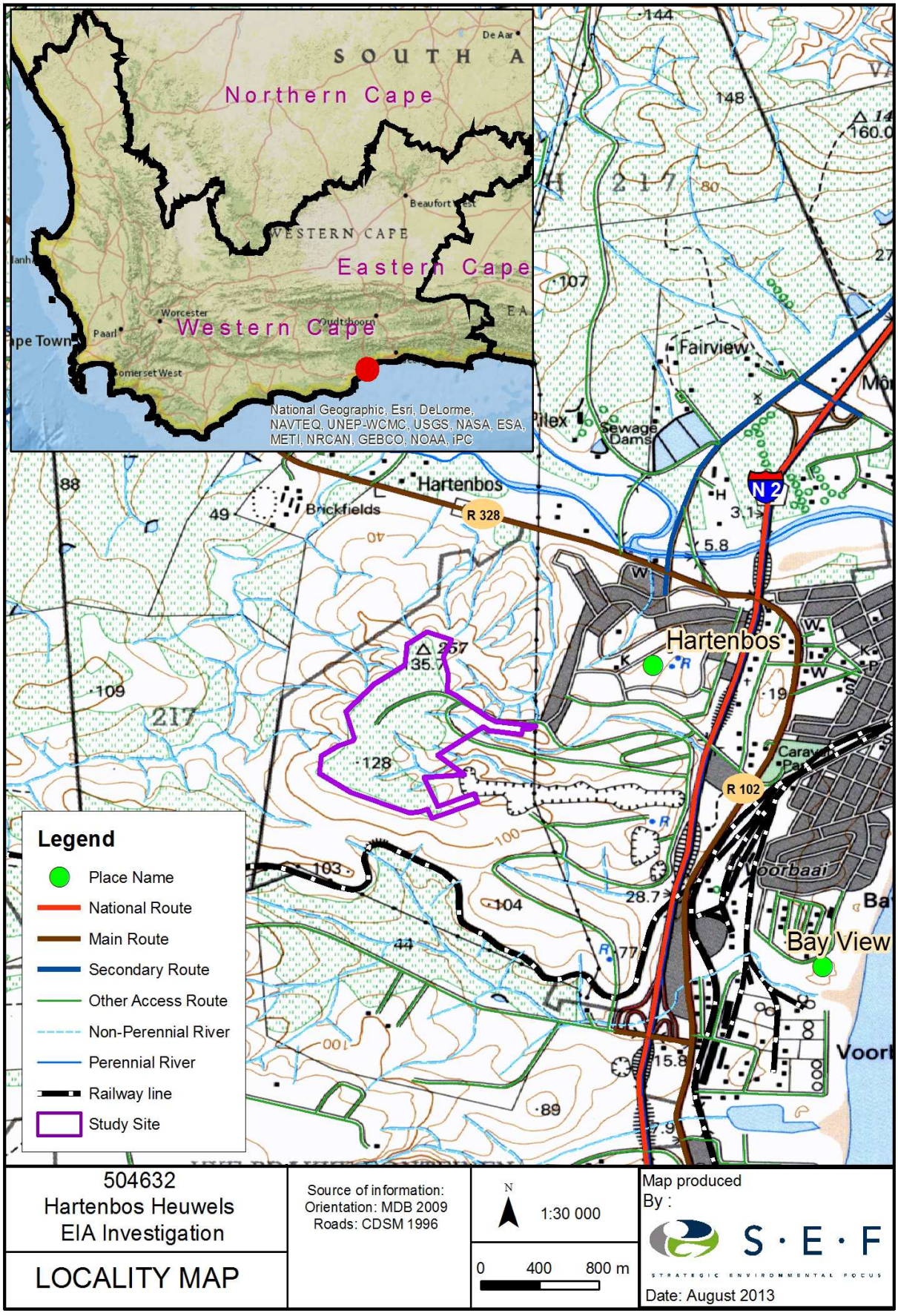

Figure 1: Locality Map

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Regulations, 2010, an Environmental Management Programme (EMPr) must accompany the Environmental Impact Report.

The EMPr, which must comply with section 24N of the Act, must include all the information specified in Regulation 33 of the EIA Regulations, published as Government Notice (GN) No R. 543 in Government Gazette No 33306 of 18 June 2010 in terms of Chapter 5 of the National Environmental Management Act No 107 of 1998 (NEMA), and include -

a) Details of –
   (i) the person who prepared the EMPr; and
   (ii) the expertise of that person to prepare an EMPr;
b) Information on any management of mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
   (i) Planning and design;
   (ii) Pre-construction and construction activities;
   (iii) Operation and undertaking of the activity;
   (iv) Rehabilitation of the environment; and
   (v) Closure, where relevant.
c) A detailed description of the aspects of the activity that are covered by the environmental management plan;
d) An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b);
e) Proposed mechanisms for monitoring compliance with the EMPr and reporting thereon;
f) As far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land-use which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures;
g) A description of the manner in which it intends to -
   (i) Modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
   (ii) Remedy the cause of pollution or degradation and migration of pollutants;
   (iii) Comply with any applicable provisions of the Act regarding closure, were applicable;
   (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
h) Time periods within which the measures contemplated in the environmental management programme must be implemented;
i) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;
j) An Environmental Awareness Plan describing the manner in which -
   (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
   (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and
k) Where appropriate, closure plans, including closure objectives.

Provided in the sections that follow is the EMPr for the proposed development, based on the requirements of Regulation 33 of the EIA Regulations (GNR 543) as detailed above, with the exception of management measures for the operation and undertaking of the activity. It is recommended that an Operational EMPr is generated for the activity once all of the anticipated activities and impacts associated with the development can be ascertained.

1.3 PRINCIPLES OF THIS EMPR

This EMPr is compiled using the following concepts and implementation requirements so that the higher principles of sustainable development are realised:

- Continuous improvement. The project proponent (or implementing organisation) must commit to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- Broad level of commitment. A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of this EMPr to be successful and effective.
- Accountability. A strong sense of accountability should be maintained by the proponent, contractor and sub-contractor to prevent any party from distancing itself from commitments made to the EMPr.
- Flexible and responsive. The implementation of the EMPr must respond to new and changing circumstances, i.e. rapid short-term responses to problems or incidents. The EMPr is a dynamic "living" document and thus regular planned review and revision of the EMPr must be carried out.
- Integration across operations. This EMPr must integrate across existing line functions and operational units such as health, safety and environmental departments in a company/project. This is done to change the redundant mindset of seeing environmental management as a single domain unit.
- Legislation. It is understood that any development project during its construction phase is a dynamic activity within a dynamic environment. The Developer, Engineer, Contractor and Sub-contractor must therefore be aware that certain activities conducted during construction may require further licensing or environmental approval, e.g. river or stream diversions, bulk fuel storage, waste disposal, etc. The Contractor must consult the ER, EO and ECO on a regular basis in this regard.

1.4 SCOPE

The general principles contained within this document apply to all **PRE-CONSTRUCTION, CONSTRUCTION** and **OPERATIONAL** activities associated with the proposed Residential Development on Erf 3122, Hartenbos Heuwels.

1.4.1 Legal Requirement of the EMPr

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Regulations, 2010, an Environmental Management Programme (EMPr) must accompany the Environmental Impact Report (EIR).

This EMPr is generated subject to the requirement of Regulation 22, subsection 2(l) of the EIA Regulations, published as Government Notice (GN) No R. 543 in Government Gazette No 33306 of 18 June 2010 in terms of Chapter 5 of the National Environmental Management Act No 107 of 1998 (NEMA).

1.4.2 Site specific information

1.4.2.1 Proposed activity

The ATKV focuses (amongst other objectives) on establishing resorts and retirement villages for which there is an increasing demand. The good climate as well as the location (on the garden route and next to the coast) makes Hartenbos popular for retirement. The proposed development aims to be a retirement village/nursing home but will also have a number of residential units. Although there is currently little activity in the property market, there remains a growing demand for properties, especially in coastal towns such as Mossel Bay and Hartenbos. Erf 3122 is too small to operate as an economic farming unit and is situated so that it forms a natural extension of the existing town of Hartenbos. It is therefore that the proposed development seems like the ideal landuse for Erf 3122.

The proposed development will consist of the following:

Use Zone	Erven	% of Area	Details of Development Area
Single residential	153	20	153 dwelling units
Retirement village (special zone)	131	8	131 dwelling units
Institution	3	5	11502m^2 floor area including: • 144 bed nurses accommodation • 2876m^2 medical centre/clinic • 240 frail care beds
Local business	1	1	2632m^2 GLA convenience centre
Local government	1	1	Reservoir
Streets	N/A	12	71686m^2 public and private streets
Open space	7	1	3651m^2 private open space
Conservation	7	52	314560m^2 conservation

1.4.2.2 Services

Electricity:

- The electricity demand generated by the proposed development will approximately be 1,850 kVA;
- Electricity will be supplied to the proposed development via an 11kV underground cable;
- The installation of energy saving systems the will enable the proposed development to save up to 40% of electricity.
- The Mossel Bay Local Municipality confirmed in writing that they have capacity to supply the proposed development with electricity from the Sonskyn substation. Refer to Appendix 6.

Water supply:

- The average daily water demand of the proposed development is approximately 455kl/day.
- A 3.5Ml water reservoir, belonging to the Mossel Bay Local Municipality, is situated at the highest point of the proposed site. The ATKV is currently funding this reservoir and it has been calculated that the reservoir has enough capacity to supply the development. If it is found that the demand exceeds the capacity, a 20m high water tower will be constructed next to the existing reservoir.

- The Mossel Bay Local Municipality confirmed in writing that the formal water supply system also has enough capacity to supply water to the proposed development.

Sewage:

- The average daily sewage flow for the proposed development will be 80% of the daily water use (i.e. 364m^3/day);
- Due to the high elevation of Erf 3122, a gravitational sewage system in compliance with the "Red Book Standards" is proposed;

  The Mossel Bay Local Municipality confirmed that the local Waste Water Treatment Works (WWTW) will have enough capacity to receive sewage generated by the proposed development.

Stormwater:

- The proposed development is located at the top of the stormwater catchment and will not receive stormwater from any adjacent areas.
- Stormwater generated by the property flows to a natural drainage line in the centre of Erf 3122.
- An internal stormwater network will be designed for the proposed development and will comply with the "Red Book Standards".
- In order to protect lower, adjacent properties stormwater diffusion trenches is considered – refer to the Wetland Impact Assessment and the Draft Stormwater Management Plan (Appendix 7 of the Final EIR).

Roads:

- The proposed project will be accessed from Kameeldoring- and Geelhout Avenue in the east and will also be connected to the proposed adjacent Highlands development in the south. Refer to Figure 2.

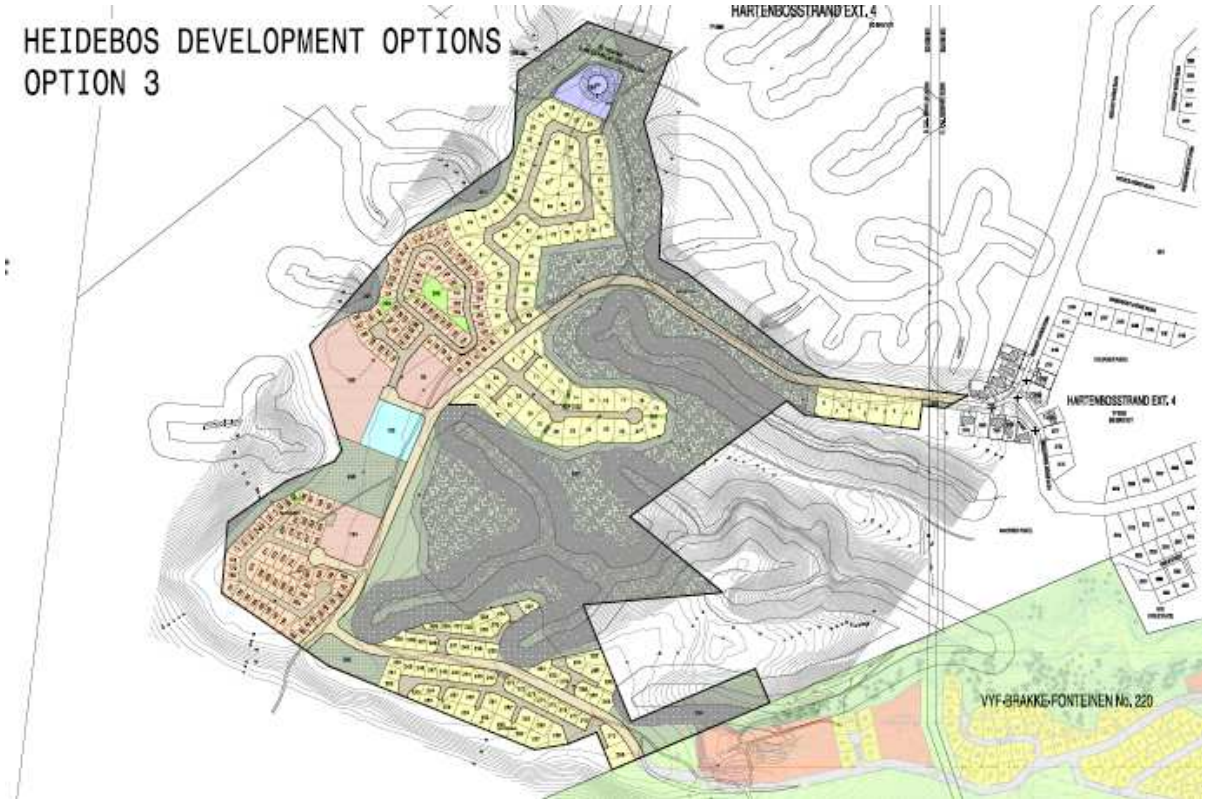

Figure 2: Preferred Layout

1.4.2.3 Summary of anticipated impacts associated with the proposed activity

Table 1: Anticipated impacts associated with the proposed activity

ENVIRONMENTAL ASPECT	RELEVANT AREA	ENVIRONMENTAL OBJECTIVE	POTENTIAL IMPACTS
Erosion	Local	To prevent the loss of nutrient rich topsoil To prevent gulley erosion	• Soil erosion during construction and operational phases; • Sediment laden water courses.
Terrestrial Ecology	Local	To ensure that species of conservation importance are identified and preserved.	• Loss of species of conservation importance, disruption of natural processes and functionality.
Safety & Security	Site	To ensure safety within the site, particularly to prevent trespassers from neighbouring countries.	• Trespassers; • Threat to safety of residents and tourists.
Heritage and Culture	Site	To ensure that all artefacts and symbols of culture and heritage significance are identified & preserved.	• Loss of significant symbols of heritage and culture.
Soils	Local	To prevent the disruption of catchment processes and functioning; Prevent surface and water contamination.	• Altered flow regimes as a result of hardened surfaces; and, • Potential contamination of surface and groundwater (due to aspects such as hydrocarbons and sewerage); • Disruption of natural drainage patterns.
Geotechnical instability	Local	To ensure that the foundations are suitable for development and/or the necessary measures are implemented in order to ensure its suitability.	• Subsidence, cracking of built structures; • Unstable foundations.
Surface Water Quality	Local	To maintain a surface water quality suitable to be deposited into hydrological systems	• Contaminants occurring as a result of hard surfaces (hydrocarbons and litter) might end up in the hydrological system.
Air pollution	Local	To prevent the further pollution of the air of Hartenbos during the construction and operation phases of the development.	• Increased airborne particulate matter and emissions (mostly dust) due to construction activities and improper rehabilitation procedure.
Noise	Local	To minimise the effect of noise on surrounding residents both during construction and operational phases	• Noise limits being exceeded.
Visual impact	Local	To minimise light and visual pollution; To ensure that the development blends in with the landscape character; To minimise unsightly views during the construction phase.	• Visual Impacts to surrounding land users; and, • Alteration of Landscape Character.
Traffic impact	Local	To reduce the effects of construction activities on the local traffic patterns.	• Traffic congestion due to construction activities; • Exponential growth of traffic volumes within the area.
Socio-economic	Regional	To assure that the development is sustainable through employment, transfer of skills and training of local people.	• Employment, Social upliftment.

1.4.2.4 The ATKV's environmental management policy and commitments

The ATKV would ensure that the environmental management policy, objectives and vision of South Africa, managed by the National Department of Environmental Affairs (DEA) are upheld. This policy emphasises that integrated and sustainable management of the environment, now and in the future, is the essential basis of sustainable development in all areas of human activity. Therefore adherence to the principles and guidelines defined within the Integrated Environmental Management (IEM) procedure is essential.

1.4.3 Interpretations

The implementation of the EMPr is not an additional or "add on" requirement. The EMPr is legally binding through NEMA (and the relevant Environmental Authorisation [EA] once issued). The proponent is to ensure that through the project tender process the EMPr forms part of the Project Construction Contract Document to be incorporated in line with:

a) General project specifications; and

b) Relevant Standards, Guidelines and Publications (i.e. SANS 1200, SANS 2001, etc., as applicable).

1.4.4 Project phase

This EMPr is specifically compiled for the period of time prior to, during and after construction when the proposed development is fully operational.

1.5 PURPOSE OF THE EMPR

The purpose of this EMPr is to address and clearly outline control strategies which must be implemented during the pre-construction, construction and operational phases of the proposed development, in order to achieve the desired level of performance in terms of potential environmental impacts identified.

The EMPr is meant to ensure that the following is undertaken:

- Management and control of storm water;
- Management of open space areas;
- Management of waste in general;
- Implementation of alien vegetation controls;
- Implementation of a fire prevention plan;
- Comprehensive monitoring; and
- The main obligations of key role players are reflected.

1.6 REVISION OF THE EMPR

The EMPr must be seen as a "living" document. As such, the EMPr and its associated environmental specifications may be amended subject to probable cause. Causes constituting the need for updating or amending of the EMPr may include:

- Receipt of an Environmental Authorisation (EA);
- Amendments to the Environmental Authorisation;
- Instructions from the Lead Authority [Western Cape Department of Environmental Affairs and Development Planning (WC - DEA&DP)] to do so;

- Significant change in applicable environmental legislation; and
- Significant changes to circumstances on site, subject to approval from the WC-DEA&DP.

Although the EMPr is a living, functioning and dynamic document; no significant changes may be made without approval from the WC-DEA&DP once it has been approved. The amendment process should be undertaken as specified in Regulation 46 of the EIA Regulations, Regulations published as Government Notice (GN) No R. 543 in Government Gazette No 33306 of 18 June 2010 in terms of Chapter 5 of the National Environmental Management Act No 107 of 1998 (NEMA)

SECTION 2: IMPLEMENTATION OF THE EMPr

2.1 ROLE PLAYERS AND RESPONSIBILITY MATRIX

In order for the EMPr to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must:

- Clearly understand their roles and responsibilities in the project;
- Must be professional;
- Form respectful and transparent relationships; and
- Maintain open lines of communication.

These role players or the project team include the Authorities (A), Other Authority (OA), Developer/Proponent (D), Consulting Engineers (CE), Engineers Representative (ER), Environmental Officers (EO), Environmental Site Officer (ESO), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP). Further; landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.
Please refer to Table 2 below for a representation of the different roles and responsibilities as well as Figure 3 for recommended communication lines.

Table 2: Functions and Responsibilities of the Project Team

FUNCTION	ROLE	RESPONSIBILITIES
AUTHORITY (A) (WC-DEA&DP)	Responsible for issuing of the relevant Environmental Authorisation (if applicable), overall environmental management within the province and ensuring compliance with all applicable environmental legislation.	The authorities are responsible for overall environmental management within the province and ensuring that the monitoring of the EMPr and other authorisation documentation is carried out, transgressions with the EMPr or environmental legislation.
OTHER AUTHORITY (OA)	Includes organisations and bodies like Municipalities, Heritage Resource Agencies, National Department of Water, etc. Other authorities are those that may be involved in the approval process of an EMPr or issuing and enforcing of relevant licenses / approvals.	• May be required to review EMPr's and provide comment to ensure the accuracy of the information relevant to their specific mandate. • May be involved in the development, review or implementation of an EMPr (e.g. if a specific development requires consent from a relevant authority, then that authority should review and comment on the content of the particular EMPr).

DEVELOPER/ PROPONENT (D/P) **(ATKV)**	Proponent ultimately accountable for ensuring compliance to the EMPr and good management practice requirements for the duration of the project.	• Ensuring that the prospective Tenderers/Contractors adequately provide for the provisions of the EMPr in their submissions. • Appointing an independent ECO to objectively monitor implementation of relevant environmental legislation and requirements of the EMPr for the project. • Support and provide mandate to enable the ECO to perform responsibilities. • Ensuring that the ECO is integrated as part of the project team. • Establishing and maintaining proactive communications with the Contractor and ECO. • Undertaking periodic site visits and inspections to ensure that the environmental requirements are implemented. • Reviewing and commenting on environmental compliance assessments and/or reports. • Giving instructions on any procedures and corrective actions. • Ensuring that the EMPr is fully implemented and remains so, and when necessary is revised and updated. • Reviewing the Complaints Register. • Issuing fines, penalties or suspending work for contravention of the EMPr. • Giving instructions regarding corrective action to the Contractor.
CONSULTING ENGINEER (CE)	Contracted by the developer to design and specify the project engineering aspects. Generally the engineer runs the works contract. The CE may also fulfil the role of Project Manager on the proponent's behalf (See PM).	• Understanding the EMPr and all its specifications and implications. • Including all relevant EMPr specifications in the tender documents and subcontractor appointments. • Ensuring that the tendered Contractor fully comply with the EMPr and all its relevant specifications in the supplied Tender; • Making himself / herself, as well as any other identified key members, available for induction training on the EMPr by the ECO. • Providing appropriate training on the latest version of the EMPr and all approved Method Statements to all employees, contractors and sub-contractors. Further to keep record of such training (e.g. keep record of the date of training, version of the EMPr the training was for, the employee/sub-contractor trained). • Notifying the Resident Engineer or Engineer's Representative and ECO of the proposed programme for works to be undertaken during the project and to fully disclose all details of the activities involved even when occurring off-site. • Ensuring that the EMPr specifications (of this document including any revisions, additions or amendments) are effectively implemented. • Providing motivation and/or alternative specifications through Method Statement(s) for any deviation from or 'tailor making' of the EMPr for consideration. • Signing off on approved Method Statements. • Ensuring that all approved Method Statements are effectively implemented during undertaking of the relevant activity. • Implementing on-site steps to mitigate environmental impacts. • Ensuring that all employees, contractors and sub-contractors employed comply with the requirements and provisions of the EMPr at all times. • Appointing a competent, experienced and responsible individual as PM to administer and implement EMPr with regard to engineering and construction. • Reporting of any serious environmental incidents or impacts to the Developer, PM and ECO

ENGINEERS REPRESENTATIVE (ER)	Acting as the consulting engineer's representative on site and is on site on a daily basis.	• Understanding the EMPr and all its specifications and implications. • Overseeing site works. • Issuing site instructions / variation orders to the contractor, following request by the EO or ECO • May act as the liaison with the Contractor and ECO.
PROJECT MANAGER (PM) / SITE MANAGER (SM)	The Project Manager has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements including any EMPr implementation, EMPr compliance and environmental related activities, issues and impacts are met.	• Understanding the EMPr and all its specifications and implications. • Ensuring that all aspects and specifications of the EMPr and approved Method Statements are implemented. • Enforcing the implementation of the EMPr and ensuring that Contractor and Subcontractor employees comply with EMPr. • Monitoring environmental impacts and verifying that they are kept to a minimum at all times. • Approving all decisions regarding environmental procedures. Note that all decisions regarding environmental procedures must be approved by the PM. • Overseeing site works. • Taking action to address all EMPr, Method Statement and/or environmental legislation non compliances as well as keeping record of these actions. • Issuing penalties for contravention of the EMPr to Contractor and Sub-contractor (as deemed necessary). • Stopping any construction activity which is in contravention of the EMPr in accordance with an agreed warning procedure. • Recording and informing the CE and ECO of incidents or problems while implementing the EMPr as well as recommending ways of resolving these incidents or problems. • Reporting and recording all accidents and incidents resulting in injury, death or significant environmental liability immediately to the CE and ECO. • Recording all public complaints received and immediately inform the CE and ECO of these. • Ensuring that proper records are kept of all compliance status/feedback reports, incident reports and complaints register and that these documents are available for auditing by the PM, Authorities or ECO upon request. • Communicating the content of the ECO reports and any advice received from the ECO (verbally / in writing) to Contractor and Sub-contractors employees. • Designating the working areas and ensuring that these are managed (including sensitive environments) as per the approved construction site layout plan.

ENVIRONMENTAL OFFICER (EO) / ENVIRONMENTAL MANAGER (EM)	Appointed by the Consulting Engineers as their environmental representative on site. The EO is not independent but must rather act on behalf of the consulting engineers with the mandate to enforce compliance under the project contract, which must include the EMPr. The EO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site.	• Understanding the EMPr and all its specifications and implications. • Issuing of non-conformance and hazard certificates. • Issuing the equivalent of a "cease works" instruction in terms of accepted industry practice in circumstances where serious environmental harm has been or is about to be caused i.e. in cases of extreme urgency and then only when the ER is absent. • Acting as the liaison between the contractor and landowners on certain types of projects, such as linear developments (fences, pipelines, etc). • Attending all relevant project meetings. • Conducting daily inspections to monitor compliance with the EMP. • Generating reports and providing feedback to the project team and ECO on potential environmental problems associated with the development. • Communicating the content of the EMPr (verbally / in writing) to Contractor and Sub-contractors employees. • Conducting an induction and an environmental awareness training session prior to site handover to all Contractor and Sub-contractors employees.
CONTRACTOR (C)	The principle contractor, known from hereon as the "Contractor" implements and complies with the requirements of the EMPr and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMPr.	• Making him / her, as well as any employee deemed necessary, available for induction training on the requirements of the EMPr. • Familiarise himself/herself with all relevant sections and specifications of the EMPr as well as the approved Method Statements in order to gain a full understanding of the requirements. • Implementing all relevant EMPr sections, specifications and approved Method Statements. • Preparing and providing Environmental Method Statements (setting out in detail how the management actions contained in the EMPr will be implemented) as required by the EMPr and per the Developer's instructions. • The ESO will be responsible for conducting toolbox talks with employees for the duration of construction. • Being responsible for the employees of all Sub-contractors. • Reporting progress in terms of complying with the relevant sections of the latest EMPr version and approved Method Statements to the Developer/ECO as well as reasons for non-conformances. • Notify the Developer/ECO of any and all 'near misses', incidents, accidents and transgressions on site with respect to environmental management and non-compliance with the latest EMPr version and approved Method Statements and seek advice from the Developer/ECO for required corrective actions and/or site remediation. • Recording the date, nature and the corrective actions/remedial action taken in terms of all incidents in an incident report and submitting of these to the Developer/ECO for signing off. • Recording and reporting all complaints received to the Developer/ECO. • The contractor is required, where specified, to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.

ENVIRONMENTAL SITE OFFICER (ESO)	The ESO is employed by the Contractor as his/her environmental representative to monitor, review and verify compliance with the EMPr by the contractor.	• Making him / her available for induction training on the requirements of the EMPr. • Assisting in preparing of Environmental Method Statements (setting out in detail how the management actions contained in the EMPr will be implemented) as required by the EMPr and per the PM's instructions. • Familiarise himself/herself with all relevant sections and specifications of the EMPr as well as the approved Method Statements in order to gain a full understanding of the requirements. • Implementing and ensuring compliance with all relevant EMPr sections, specifications and approved Method Statements. • The ESO will be responsible for conducting toolbox talks to employees for the duration of construction. • Being involved in all phases of the constriction (from site clearance to rehabilitation). • Responsible for the day-to-day environmental management on site.
ENVIRONMENTAL CONTROL OFFICER (ECO)	An independent appointment as an advisory consultancy, monitoring and reporting role to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMPr for the project. Updating of the EMPr and making recommendations for addressing EMPr and/or environmental legal non-compliances. Liaising with the relevant Environmental Authorities on environmental issues and confirming their requirements, as well as communicating such requirements to the Developer, Consulting Engineer and/or PM The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices.	• Being pro-active throughout the project which includes access to specialist expertise (botanists, ecologists, etc.) as and when required. • Advising the CE, PM and Developer on any necessary environmental authorisations and permits that would be needed to be applied for. • Revising and updating the EMPr as and when necessary and submit such updates to the CE, PM and Lead Authority for review. • Submitting copies of revised EMPr to all relevant stakeholders for their information and review. • Where no EO/EM is appointed, the ECO must convey the contents of this EMPr to the Contractor site team and discuss the contents in detail with the CE, Contractor, PM and possibly sub-contractors, including any employee member they deem necessary, prior to them starting any work on site (once-off). • Keeping record of everyone who attended the EMPr introduction training course. • Handling and addressing of information received from whistle blowers as confidential and reporting these incidences to the relevant Authority as soon as possible • Maintaining a photographic record of the site prior, during and after construction activities is undertaken. • Conducting audits on compliance to relevant environmental legislation, conditions of EA, and the EMPr for the project at a frequency as determined by the Lead Authority. • Monitoring that environmental impacts are kept to a minimum. • Immediately reporting any serious environmental incidents or impacts to the PM and/or CE. • Preparing of monitoring/audit reports which reflect the EMPr compliance status, findings, issues and recommendations for addressing non-compliances and submitting these to the project team and Lead Authorities. • Keeping record of EMPr audits, monitoring and incidents. • Reviewing and commenting on all Environmental Method Statements and making recommendations to the CE or ER on whether or not to accept the Method Statement and/or if any amendments or revisions is required. • Making recommendations on any additional Method Statements that may be required as construction activities progress.

ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)	Appointment by the Developer to handle all applications for Environmental Authorisations and conducting of specialist studies as required by the Lead Authority.	The definition of an environmental assessment practitioner in Section 1 of NEMA is "*the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations".*

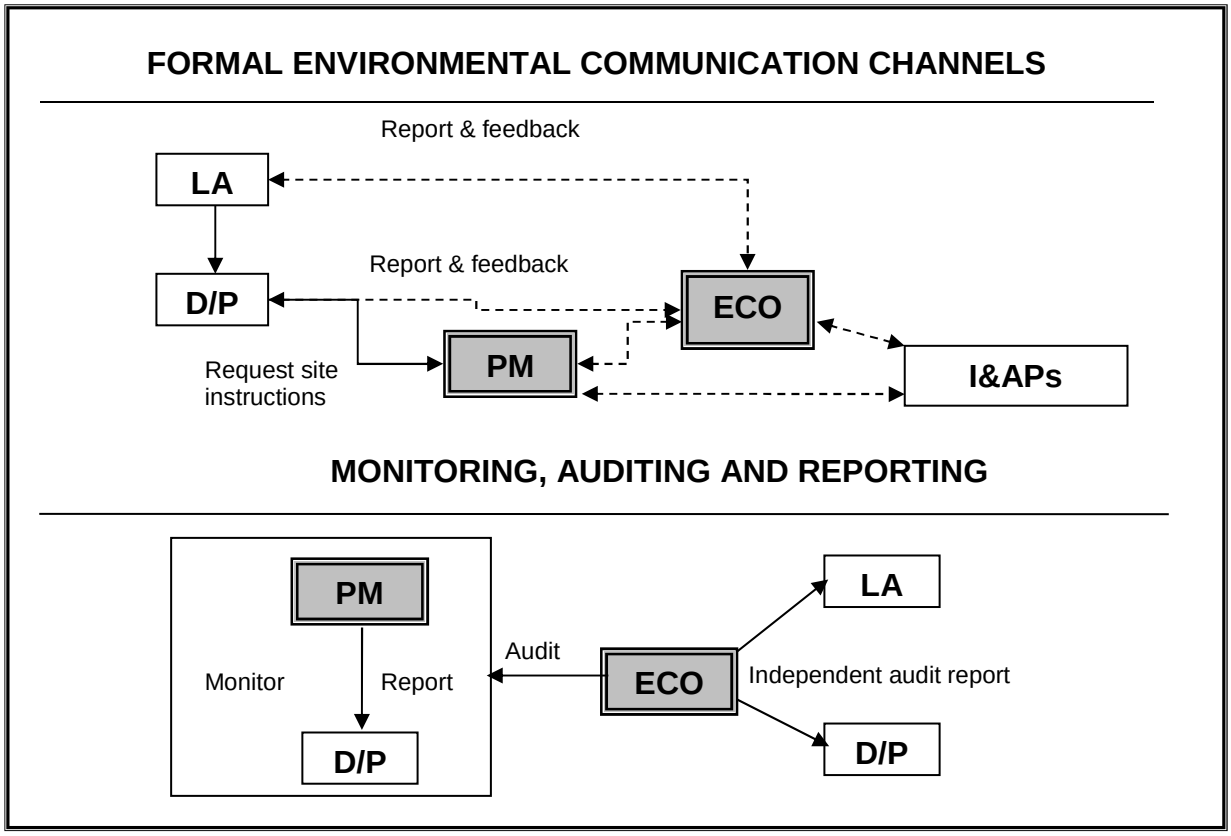

Figure 3: Recommended lines of communication, reporting and monitoring

2.2 AWARENESS TRAINING

This EMPr is drafted in accordance to the principles of the National Environmental Management Act (No. 107 of 1998) [NEMA], as amended; which constitute that development must be sustainable. Sustainable development is planned to meet the needs of present and future generations, e.g. the need for basic environmental, social and economic services. Sustainable development includes using and maintaining resources responsibly.

Under Section 28 of NEMA (Duty of Care) provision is made that anyone who causes or is likely to cause pollution or degradation of the environment; is responsible for preventing impacts occurring, continuing or recurring as well as for the costs of repair to the environment.

One tool to make provision for sustainable development is the awareness making of the workforce on the requirements and commitments of the EMPr and conditions of the EA (once issued). The EO or ESO, or ECO on small projects where an EO and or ESO are not appointed, are responsible for ensuring everyone on site is given an environmental awareness induction session, prior to commencement of construction, which not only clearly defines what the environment is and gives specifics detailing the local environment but outlines the requirements of the EMPr as a management tool to protect the environment.

Refresher courses must be conducted as and when required. The EO or ESO must ensure periodic environmental toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area/habitat in which they are working. Additional media such as awareness posters and hand outs must be considered to create awareness throughout the site.

2.3 CONTRACTOR ENVIRONMENTAL METHOD STATEMENTS

Method Statements are written submissions to the Engineer or Project Manager by the Contractor (in collaboration with his/her ESO), in response to a request by the EO/ECO and or PM/Engineer. The Method Statements set out the plant, materials, labour and method that the contractor proposes using to carry out an activity, identified by the EO/ECO and/or PM/Engineer. The Method Statements contain the appropriate detail such that the EO/ECO and PM/Engineer are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMPr. The contractor must sign each Method Statement along with the EO/ECO and PM/Engineer to formalise the approved Method Statement.

All Method Statements, including those which may be required as *ad hoc* or emergency construction method statements, must be submitted to the Engineer/PM/ECO for approval prior to the commencement of the activity. Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the EO/ECO and PM/Engineer on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMPr.

The *pro forma* Method Statements for the following activities listed below must be submitted to the EO/ECO and PM/Engineer for approval before construction commences (Refer to Annexure 4A and 4B for an example and a template which may be used). These include *inter alia*:

- Solid waste management;
- Hazardous waste management;
- Crew camps and construction lay down areas;
- Workshop and maintenance/cleaning of plant;
- Cement and concrete batching;
- Dust control;
- Traffic control;
- Hydrocarbon and emergency spills procedures;
- Diesel tanks (fuel storage) and refuelling procedures;
- Sourcing, excavating, transporting and dumping of fill and spoil material;
- Topsoil management;
- Fire management; and
- Rehabilitation of crew camp and other disturbed areas.

2.4 ENVIRONMENTAL INCIDENTS AND COMPLAINTS REGISTER

All environmental incidents occurring on the site must be recorded by the contractor in an Environmental Incident Register (Refer to Annexure 5 for a sample) kept on site. Recording of incidents will assist in identifying trends and determining the root cause of aspects, ensuring that overall environmental management on site improves. Incidents must be submitted to the PM and the ECO must be copied in this. The following information must be documented:

- Time, date, location and nature of the incident;
- Corrective actions taken and by whom;
- Comments on the cause of the incident; and
- Signature.

The PM or the EO in conjunction with the ECO will identify and approve remediation actions where necessary. The Contractor must further also record any complaints (pertaining to environmental aspects) received from the affected parties (community, workforce, adjacent landowners, etc.) in a complaints register kept on-site (Refer to Annexure 6 for a sample). The lodged complaint must be brought to the attention of the PM who will respond accordingly. The following information will be recorded:

- Time and date of the complaint;
- Name and contact details of the lodger of complaint;
- Location and nature of the complaint;
- Corrective actions taken and by whom; and
- Signature.

An investigation must ensue and a response by the ECO to the complainant must be provided within **seven working days**.

2.5 SITE DOCUMENTATION

The following is list of documentation that must be held on site and must be made available to the ECO and/or Approving Authority on request.

- Access negotiations and physical access plan;
- Way leaves, letters of agreements, etc.;
- Incident reports and Incident registers;
- Records of all remediation / rehabilitation activities;
- Copies of ECO reports (external management and monitoring);
- Copies of EO/ESO reports (internal management and monitoring);
- A copy of Environmental Management Programme (EMPr);
- Complaints register;
- Awareness training material (toolbox talks, inductions, etc.);
- Service receipts and/or a Waste manifest; and
- Environmental Method statements.

2.6 PRO FORMA DOCUMENTATION

2.6.1 Prior to the commencement of construction activities

The following attached (Refer to Annexure 1 – 4 & 7) *pro forma* documentation is to be completed and is binding to the EMPr and project contract; and includes *inter alia*:

- Declaration of understanding by the Developer;
- Declaration of understanding by the Engineer;
- Declaration of understanding by the Contractor;
- Environmental Method statements;
- ECO / Engineer approval for method statements; and
- Physical site layout and access plan.

2.6.2 During construction activities

The following documentation is to be maintained once filled out during the project period. These are binding to the EMPr and project contract. They include *inter alia*:

- Amended Environmental Method Statements;
- ECO / Engineer approval for amended method statements;
- Environmental incidents; and
- Records of all remediation / rehabilitation activities.

SECTION 3: MANAGEMENT OF ASPECTS

3.1 PREAMBLE

The point of departure for this EMPr is to ensure a **pro-active rather than re-active** approach to environmental performance; by addressing potential problems before they occur. This will limit corrective measures needed during the construction phase of the project. Therefore, the purpose of an EMPr is to provide management measures that must be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of a proposed development are minimised. It must also be ensured that the EMPr is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances, the ECO may make such changes subject to authorisation by the approving authority (See Section 1.6).

The following tables (see page 12 to 47) form the core mitigation measures appropriate to the **pre-construction**, **construction and operational phases**. The tables present the objectives to be achieved and the management actions that need to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria/targets and required frequencies are clearly specified.

The ***'pre-construction'*** section (SECTION A of the core mitigation Table), refers to the period of time leading up to and prior to the commencement of construction activities. This is to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the contingency plans identified during the pre-construction phase.

The "***construction***" section refers to all construction and its operation-related activities that will occur within the approved areas and access roads, until the project is completed. This "construction" section is divided into three functional areas, namely "materials" (SECTION B); "plant" (SECTION C); and "construction" (SECTION D). Each of these functional areas within the EMPr contains specific mitigation requirements and requested contractor environmental method statements where required.

The bulk of environmental impacts will have immediate effect during the ***'construction'*** phase (e.g. noise, dust, and destruction of vegetation). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts prior to, or as they occur. These impacts will then be mitigated through the measures outlined sections A, B and C together with a commitment to sound environmental management from the project team.

The "***operational***" section refers to all operational activates that will occur after construction has been completed and the development is fully operational and occupied by residents. This "operational" section is discussed under SECTION E of the Core Mitigation Table (Table 3).

3.2 STRUCTURE AND CONTENTS OF TABLES

The table consists of seven parts as follows:
"Phase of development" - This row will identify either pre-construction (planning) or actual construction phase.
"Impact / issue" - This row will identify the issue being addressed, e.g. Materials, site demarcation, heritage, etc.
"Control/Mitigation Measure" - This column will include all the necessary mitigation measures for each impact/issue'.
"Management objectives" - This column will indicate what the management objectives to be achieved for each mitigation measure are.

"Measurable targets" - This column will indicate what evidence is to be used as an indication to whether or not the 'Management objectives' have been implemented and hence achieved.
"Frequency of action" - These columns provide time guidelines for the 'Responsible party' by which he/she is to action or manage the required mitigation.

3.3 SPECIALIST RECOMMENDATIONS

The following specialist studies, as reflected below, were undertaken for the proposed development. Specialist recommendations have been included in the Core Mitigation Table (Table 3).

- Botanical Survey and Sensitivity Assessment by Dr David J. McDonald from Bergwind Botanical Surveys and Tours (2011);
- Botanical Survey by Nick Helme Botanical Surveys (2012);
- Faunal (including Avifaunal) Assessment by Karin van der Walt from SEF (2013);
- Fire Management Plan by Christiaan Pool and Salmon van Zyl (2011);
- Phase 1: Heritage Impact Assessment by CHARM (2011);
- Archaeological Impact Assessment by CHARM (2011);
- Paleontological Desktop Study by CHARM (2010);
- Visual Impact Assessment Report by Cave and Klapwijk and Associates (2011);
- Traffic Impact Assessment by KSB Consulting Engineers JV (2011); and
- Wetland Delineation and Functional Assessment, by Willem Lubbe from SEF (2014)

Table 3: Core Mitigation Table

PHASE OF DEVELOPMENT	**PRE-CONSTRUCTION**
IMPACT / ISSUE	**GENERAL PLANNING**
SECTION	**A**

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
A1 PLANNING			
i. Adequate planning must take place in order to ensure that all aspects of construction are managed. This will ensure that nuisance and disturbance to existing residence is minimised. ii. The site layout shall include access points for deliveries and services, and future works. Minimising disturbance to neighbours shall be considered. iii. All significant activities must be planned and communicated to residence in advance. The Project Manager/Site Manager must be responsible to ensure that residence are reminded on the day should significant activities take place e.g. large deliveries of materials, significantly noisy activities etc. iv. The communications strategy must be documented in the form of a method statement and maintained on site. v. Since the presence or absence of threatened *Lepidoptera* species could not be confirmed within the study area at the time of the survey due to the weather conditions, it is recommended that a *Lepidoptera* specialist study is conducted during a more suitable time period to determine if these species are present within the study area and also develop a habitat management plan where needed. vi. The concept of how buildings on steeper slopes should be designed and shown in sections should be considered in the Architectural Guidelines. This will ensure that only one storey and not two storey structures are constructed above the road level on the down-slope side of the road.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Approved method statements and relevant pro forma documents	• As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
A2 PROJECT CONTRACT AND PROGRAMME			
i. The EMPr must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract. ii. The Contractor shall inform the Project Manager/Site Manager of the intended actions and programme for site establishment. iii. All site establishment components shall be positioned to: a. limit visual intrusion on neighbours, and, b. minimise the area disturbed. iv. A copy of this EMPr must be available on site. The Contractor must ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMPr. v. The "declarations of understanding" on the EMPr (Annexure 1 – 3) must be signed prior to the commencement of construction. Signed declarations of understanding must form part of site documentation.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase • Ensure environmental awareness and formalise environmental responsibilities and implementation	• Contract records • Signed declaration pro forma's	• Prior to construction during planning
A3 APPOINTMENTS AND DUTIES OF PROJECT TEAM			
i. An ECO must be appointed prior to any construction activities taking place (this includes site preparation, initial site clearance or establishment of site camps). ii. The contact details for the ECO must be completed on the attached pro-forma and a copy kept on site. This document must be made available to the approving authority on request. iii. Before construction activities commence, role players must have a clear indication of to their role in the implementation of this EMPr as indicated in Section 2.1, Table 2. iv. Subcontractor(s) contracts with the principle contractor must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMPr.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Contract records • Signed declaration pro forma's	• Prior to construction during planning

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
A4 METHOD STATEMENTS			
i. As required in Section 2.3, certain method statements must be provided by the contractor. All activities which require method statements may only commence once the method statements have been approved by the Project Manager/Site Manager/Engineer and or ECO as applicable. ii. Where applicable, the contractor will provide job-specific training on an ad hoc basis when workers are engaged in activities, which require method statements.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Approved method statements and relevant pro forma documents • Training records	• As and when required
A5 SITE DEMARCATION AND DEVELOPMENT			
i. Prior to any development of the site the approved development area must be demarcated on site by surveyors, and the development boundary must then be indicated by coloured rope stretched between fence droppers, which should be placed every 10-20m. No disturbance, dumping or earthmoving may take place outside the designated areas. ii. Search and Rescue should be undertaken for any translocatable plant species in the development footprint, notably succulents and bulbs (geophytes), prior to bulk service installation. The rescued material should be moved to a suitable receiving area that should have a similar soil type, and it should be an area in need of rehabilitation. It is recommended that public areas and roadsides be selected for this purpose. This work must be undertaken by an independent horticultural contractor, in liaison with the botanist. iii. The design of stormwater drainage systems must ensure there is no contamination, eutrophication or increased erosion of wetland or riparian habitat prior to construction; iv. The surveys for the overall project area and construction footprint must be complete and clearly demarcated and fenced before the contractors set up their crew camps or begin construction. v. The Contractor shall restrict all his activities, materials, equipment and personnel to within the area/s specified. vi. The Contractor shall erect and maintain permanent and/or temporary fences around camps and lay-down areas (as directed by the Project Manager/Site Manager in consultation with the ECO), prior to start of other activities. vii. The Contractor shall maintain all demarcation fencing and barriers in good order, for the duration of construction activities, or as otherwise instructed. viii. The Contractor shall ensure that access to the site, including associated infrastructure and equipment, is off-limits to the public at all times during construction. ix. Additional areas restricted to the public and suggested detours shall be clearly marked on information boards to the satisfaction of the Site Manager.	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Demarcated area's • Filled in section of this document	• As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
x. All no-go areas (wetlands and buffer areas) must be demarcated with red tape / fencing under guidance of the ECO; xi. Any damage to "No-go" features must be documented and rehabilitated to the satisfaction of the Project Manager/Site Manager and/or the ECO. xii. All occurrences of existing contaminated land or anticipated pollutants should be collected and removed to a registered waste management facility licensed to process these. Such occurrences should be recorded. Safe Disposal Certificates must be obtained upon treatment.			
A6 EMERGENCIES, NON-COMPLIANCE AND COMMUNICATION			
i. The contractor must provide **method statements** on the protocols to be followed, and contingencies to be put in place **(Emergency Response Plans)** for the following potential incidents before construction may begin: • Contamination of natural water resources from spills; • Contamination of soils from spills; and • Fire. ii. Communication in emergencies must follow the suggested lines of communication as stipulated Section 2.1, Figure 3. Should a different communication line be implemented on site, a formal communications plan should be generated and kept on site; iii. The contractor understands that failure to adhere to the requirements of the EMPr will result in fines as stipulated in Section 4.1.1 "Non-Compliance".	• Contingencies for minimising negative impacts anticipated to occur during the construction phase	• Method statements	• As and when required

PHASE OF DEVELOPMENT	**CONSTRUCTION**
IMPACT / ISSUE	**MATERIALS**
SECTION	**B**

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B1 STOCKPILES			
i. The contractor must provide **method statements** for the "stockpiling" prior to construction taking place. ii. All stockpiled material must be easily accessible without any environmental damage. iii. All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised. iv. The stockpiles may only be placed within the demarcated areas the location of which must be approved by the CE/PM/Site Manager or ECO. v. The contractor must avoid vegetated areas that will not be cleared. vi. Storm water run-off from the stockpile sites and other related areas must be fitted with the necessary pollution prevention measures such as silt traps and may not run freely into the immediate and surrounding environments or into the storm water system. vii. Stockpiles are to be stabilised if signs of erosion are visible. viii. Soils from different horizons must be stock piled such that topsoil stockpiles do not get contaminated by sub-soil material. ix. Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the ECO. x. Topsoil stockpiles must be clearly demarcated as no-go areas and no plant, workforce or any construction related activities may be allowed onto the topsoil stockpiles. xi. Topsoil stock piles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition. xii. For excessive heights of fill and spoil stockpiles, approval must be received from the ECO and the necessary management measures as communicated by the ECO implemented.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil's for landscaping and rehabilitation • Containment of invasive plant growth • Minimise contamination of storm water run-off	• No visible erosion scars once construction is completed • The footprint has not exceeded the approved development site, etc. • Minimal invasive weed growth • No signs of sedimentation and erosion	• Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B2 SOURCING AND TRANSPORT OF SPOIL AND FILL MATERIAL			
i. The contractor must provide **method statements** for the "Sourcing and transport of fill and spoil material" prior to construction taking place. ii. The Contractor shall ensure that delivery drivers are informed of all procedures and restrictions as stipulated in this document. Such drivers shall be supervised during off-loading by a person knowledgeable of the requirements. iii. Materials shall be appropriately secured to ensure safe passage between destinations. Loose loads (e.g. sand, stone chip, fine vegetation, refuse, paper and cement) shall be covered or loads will be half-filled. iv. The Contractor shall be responsible for any clean up resulting from the failure by his employees or suppliers to properly secure transported materials or any spillage due to transport. v. Imported fill / soil / sand materials shall be free of weeds, litter and contaminants.	• Minimise disturbance to nearby communities • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Containment of invasive plant growth • Minimise contamination of storm water run-off	• No complaints from I&APs • No visible erosion scars once construction is completed • The footprint has not exceeded the approved development site, etc. • Minimal invasive weed growth • No signs of sedimentation and erosion	• Monitored daily
B3 CEMENT			
i. The contractors must provide and maintain a **method statement** for "cement and concrete storing, handling and batching" prior to construction taking place. The method statement must provide information on proposed storage, washing & disposal of cement, packaging, tools and plant. ii. Cement containing run-off into soils, rocky outcrops, streams and natural vegetation must be avoided at all times. The mixing of concrete must be done at specifically selected sites on mortar boards or concrete aprons (or similar structures) where applicable. iii. Proper cleaning trays must be implemented and utilised on site for the cleaning of cement mixing and handling equipment. iv. All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility. Note that empty cement bags must be "washed" (wetted down) prior to disposal to ensure that all toxic dust reacts. v. Any spillage that may occur must be investigated and immediate remedial action must be taken. vi. The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a registered landfill site. vii. Centralised cement batching areas must be located in consultation with the ER, EO/EM or ECO to ensure that the proposed location does not fall within sensitive areas. Measures must be put in place to further ensure that residues are contained and will not enter drainage lines, storm water channels, etc.	• Minimise the possibility of cement residue entering into the surrounding environment • Minimise pollution of soil, surface and ground water resources	• No evidence of contaminated soil on the construction site • No evidence of contaminated water resources • Method statement	• Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B4 HYDROCARBONS AND OTHER CHEMICALS			
i. The contractor must provide method statements for the "handling & storage of oils and chemicals" and "emergency spills procedures" prior to construction taking place. ii. These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall. iii. Drip trays (minimum of 10cm deep) must be placed under all plant and vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. iv. The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. v. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle. vi. Emergency spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practice (SUNSORB is a recommended product that is environmentally friendly). vii. All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material). viii. All spilled material must be recorded in a spills register/incident register along with the date of occurrence and corrective action taken. ix. Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants; x. A walled concrete platform, dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas; xi. Storage areas must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks xii. Storage of potentially hazardous materials should be above any 100-year flood line, or as agreed with the ECO. These materials include fuel, oil, cement, bitumen etc.; xiii. Sufficient care must be taken when handling these materials to prevent pollution; xiv. Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils;	• Prevention of pollution of the environment • Minimise chances of transgression of the acts controlling pollution	• No pollution of the environment • No litigation due to transgression of pollution control acts • No complaints from I&APs • Method statements	• Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
xv. Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste site; xvi. Concrete and tar shall only be mixed on mixing trays and in areas which have been specially demarcated for this purpose; xvii. All concrete and tar that is spilled outside these areas shall be promptly removed by the Contractor and taken to an approved dumpsite; xviii. After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at an approved dumpsite; xix. Storm water shall not be allowed to flow through the batching area. Cement sediment shall be removed from time to time and disposed of in a manner as instructed by the Consulting Engineer; xx. All construction materials liable to spillage are to be stored in appropriate structures with impermeable flooring; xxi. No uncontrolled discharges from the construction crew camps to any surface water resources shall be permitted. Any discharge points need to be approved by the relevant authority; xxii. In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately; xxiii. Where construction in close proximity to sewer lines is unavoidable then excavations must be done by hand while at all times ensuring that the soil beneath the sewer lines is not destabilised; xxiv. Store all litter carefully so it cannot be washed or blown into any of the water courses within the study area; xxv. Provide bins for construction workers and staff at appropriate locations, particularly where food is consumed; xxvi. The construction site should be cleaned daily and litter removed; xxvii. Conduct ongoing staff awareness programs so as to reinforce the need to avoid littering; xxviii. The current load above the sewer lines must at no time be exceeded; and xxix. Emergency plans must be in place in case of pollutant spillages.			

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
B5 DANGEROUS AND TOXIC MATERIALS (PROVISION OF STORAGE FACILITIES)			
i. The contractor must supply a method statement for the "storage of hazardous materials" at tender stage or prior to construction taking place. ii. Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas, on impermeable surfaces, under lock and key, in well-ventilated areas. iii. Storage areas must display the required safety signs depicting "No Smoking", "No Naked lights" and "Danger". Containers must be clearly marked to indicate contents as well as safety requirements. iv. Material Safety Data Sheets (MSDS) must be available for all hazardous substances on site and sourced by the supplier where relevant. MSDS's must be updated as required. v. Sufficient care must be taken when handling these materials to prevent pollution and the appropriate PPE should be worn at all times. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction. vi. In the case of pollution of any surface or groundwater, the ECO must immediately be informed in order to ensure that Regional Representative of the Department of Water and Sanitation (DWS) is notified accordingly. vii. All spilled material must be recorded in a spills register/incident register along with the date of occurrence and corrective action taken. viii. The contractor must keep the necessary materials and equipment on site to deal with spills and fire of the materials present, should they occur. ix. When dangerous and toxic materials or oils and chemicals are to be used on site, they should be conveyed in drip trays and never placed/stored on bare soil. x. The contractor must set up a procedure for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. These procedures must be developed with consultation and approval by the appointed PM/SM or ECO. xi. All spilled material must be recorded in a spills register/incident register along with the date of occurrence and corrective action taken.	• Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise chances of transgression of the acts controlling pollution	• No visible signs of pollution • No litigation due to transgression of pollution control acts	• Monitor daily
B7 BULK STORAGE OF FUELS AND OILS (IF APPLICABLE)			
i. The contractors must provide and maintain a method statement for "Diesel tanks and refuelling procedures" as well as "decommissioning of bulk fuel storage facilities" prior to construction taking place. ii. Bulk fuel storage tanks on the site must be on an impervious surface that is bunded	• Prevention of pollution of soil, surface and ground water resources in the immediate and	• No visible signs of pollution • No litigation due to	• Once off on inception; and • As required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
and able to contain at least 110% of the total volume of the tanks/storage containers. The bund capacity and total storage volumes should be indicated on the bund facility. iii. The filler tap/ dispensing unit must be located inside the bunded area iv. The bund should be fitted with a drainage tap linked to an "oil-water separator" to facilitate servicing during periods of high precipitation or rupturing of the tank. v. A Flammable Liquid License must be obtained for flammable liquids as follow: • Fluids with flash points: >18°C (if quantities exceed 100l) • Fluids with flash points: 18°C < 23°C (if quantities exceed 420l) • Fluids with flash points: 23°C < 61°C (if quantities exceed 1 100l) • Fluids with flash points: 61°C< 100°C (if quantities exceed 1 100l) vi. A temporary certificate of registration for a period of not more than six months should be obtained if dangerous goods are required on site which exceeds the quantities listed above if the dangerous goods are required for, or in connection with, excavations, construction work and road construction (the quantity must then be limited to 14 000l). vii. Bulk fuel storage tanks must be located in a portion of the construction camp where they do not pose a high risk in terms of water pollution (i.e. they must be located away from water courses and drainage lines). viii. Bulk fuel storage tanks must be placed so that they are out of the way of traffic, to minimise the risk of the tanks being ruptured or damaged. ix. Bulk fuel storage areas should be covered during the rainy season by means of a corrugated iron roof or tarpaulin covers. x. Tally sheets of all Diesel procured and used on site must be kept to ensure that theft/spills and evaporation is accounted for.	surrounding environments • Minimise chances of transgression of the acts controlling pollution	transgression of pollution control acts • Method statement	

PHASE OF DEVELOPMENT	**CONSTRUCTION**
IMPACT / ISSUE	**PLANT**
SECTION	**C**

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C1 EATING AREAS AND CAMP FOLLOWERS			
i. The contractors must provide and maintain a **method statement** for "Crew camps and construction lay down areas" prior to construction taking place. ii. The Contractor must, in conjunction with the PM/SM or ECO, designate restricted eating areas for eating during normal working hours (eating areas to conform to the requirements of the Occupational Health and Safety Act, Act 85 of 1993). iii. Adequate closed refuse bins must be provided and cleaned on a daily basis. iv. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited. v. Should vectors (stray animals, flies, etc.) become problematic on site, the appropriate control measures must be implemented (such as environmentally friendly traps, contacting of animal control, etc.). vi. Camp followers/informal traders must not be allowed to congregate on pavements or outside the construction site. However, at the contractors discretion facilities can be made available within the designated eating area. vii. Only security personnel will be allowed to sleep over on site. viii. Litter (even if originating outside the camp) and empty concrete bags, etc. must be picked up daily and put into suitably closed bins. ix. Cooking areas shall be designated and demarcated. If cooking fires are permitted, these shall be strictly controlled. Firefighting equipment must be provided. x. No fires are to be lit without written authorisation by the landowner. Should permission be received, fires may not be constructed outside of specially equipped and designed facilities, with appropriate firefighting measures in order to contain fires. The adequacy and positioning of these structures must be determined in consultation with the PM/SM and ECO.	• Control potential influx of vermin and flies • Neat work place and hygienic environment • Minimise negative social impacts to local residents and businesses	• No visual sign of vermin and flies • No complaints from I&APs	• Once off on inception; and • Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C2 TOILETS, SANITATION AND ABLUTION FACILITIES			
i. The contractor is responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet must be provided per 20 persons (different facilities for men and women). ii. The contractor must ensure that the staff is sensitised to the fact that they must use these toilets at all times. iii. Sanitary arrangements must be to the satisfaction of the ECO and the local authority. Toilets must be of the chemical type or flush-toilets connected to the municipal sewer system. No Lilliput-type ablutions will be accepted. iv. The contractor must keep the toilets in a clean, neat and hygienic condition. The contractor must supply toilet paper and basins for washing of hands at all toilets at all times. v. Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilised. All toilets will be located within the contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the PM/SM or ECO. vi. The contractor (who must use reputable toilet-servicing company) must be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) must ensure that all toilets are cleaned and emptied before the builders' or other public holidays. vii. Service receipts for the cleaning, maintenance and servicing of the toilets must be retained and produced on request. viii. The contractor must ensure that the reputable toilet-servicing company dispose of sewage waste (from chemical toilets) at a waste disposal facility licensed to do so. ix. Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times. x. Toilets must not be the cause of visual impact and shade net should be erected around toilets where these are visible to the general public xi. Maintenance of toilets must include their removal without sewage spillage; xii. Toilets are to be located outside of the 1:100 year floodline; xiii. Under no circumstances may ablutions occur outside of the provided facilities;	• Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat • Minimise potential of diseases on site • Minimise potential to pollute soils, water resources and natural habitats	• Workforce use toilets provided • No complaints received from I&APs as well as members of the workforce • No visible or measurable signs pollution of the environment (soils, ground and surface water)	• As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C3 WASTE MANAGEMENT			
i. The contractors must provide and maintain a **method statement** for "solid waste management" prior to construction taking place. The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. ii. Waste management should occur in line with the National Waste Management Strategy and the Waste Hierarchy which is: a. Waste avoidance and reduction; b. Recovery, Reuse and Recycling; c. Treatment; d. Disposal; and e. Remediation. iii. Bins must be clearly marked for ease of management. Waste must be separated into recyclable and non-recyclable waste, and must be separated as follows: a. Hazardous waste: including (but not limited to) old oil, paint, etc, b. General waste: including (but not limited to) construction rubble, c. Reusable construction material. d. Recyclable waste must preferably be deposited in separate bins. iv. Any illegal dumping, burning or burying of waste must not be tolerated. This action will result in a fine and if required, further legal action will be taken. Proof of legal dumping must be able to be produced on request. v. Refuse bins must be fitted with secured lids should it become necessary in order to prevent animals from gaining access or windblown litter occurring. vi. Refuse bins must be strategically located around the construction site to handle the amount of litter, debris, and builder's wastes generated. vii. Sub-contractor(s) must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question. Proof of this undertaking must be issued to the ECO. viii. Subcontractors must be bound to all management activities of this EMPr. ix. All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The contractor is to provide proof of such to the PM/SM and ECO. x. All uncontained waste and litter should be collected on a regular basis. Litter parades should take place to ensure this.	• Sustainable management of waste by recycling • To keep the site neat and tidy • Minimise litigation and complaints by I&APs • Reduce visual impact • Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment • Minimise potential to pollute soils, water resources and natural habitats	• Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site • Site is neat and tidy • No complaints from surrounding residents and businesses • Sufficient containers available on site • No visible or measurable signs of pollution of the environment (soils, ground and surface water) • Method statement	• Daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C4 DUST			
i. The contractors must provide and maintain a **method statement** for "dust control" prior to construction taking place. The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage. ii. As far as possible, potable water must not be used as a means of dust suppression, and alternative measures must be sourced. The use of 'grey', 'brown' or raw water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals to utilise this water for the purpose of dust suppression. iii. The construction camp must be watered during dry and windy conditions to control dust fallout. iv. Dust production must be controlled by regular watering of roads and works area, should the need arise. (**NB:** Concrete dust is toxic and damages soil properties. Therefore watering to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust). v. When it is deemed that the standard dust suppression measures are not sufficient or if complaints are received, main access roads and site camps must be surfaced with a temporary surface such as gravel to assist with dust suppression. vi. All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to. vii. Excessive dust conditions must be reported to the ECO. viii. Should excessive dust fallout be noted on site, regular monitoring of dust fallout must then be carried out and the records kept on site. ix. All forms of dust pollution must be managed in terms of the National Environmental Management: Air Quality Act (Act no. 39 of 2004) [NEM:AQA]. x. At the end of construction, the site camp must be fully rehabilitated (if relevant) by removing the temporary surface, ripping the area to loosen the soil and the area must be re-vegetated with locally indigenous vegetation only, according to the landscape development plan for the project.	• Reduce dust fall out • Reduce visual impact • Minimise loss of valuable soil material	• No visible signs of dust • No complaints from interested and Affected parties • No incidences reported to ECO • No visible evidence of dust contamination on the surrounding environment • Method statement • Targets not exceeded during monitoring of dust counts (when taking place)	• Monitored daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C5 WORKSHOP EQUIPMENT, MAINTENANCE AND STORAGE			
i. The contractors must provide and maintain a **method statement** for "workshop maintenance and cleaning of plant" prior to construction taking place. ii. All maintenance and washing of vehicles and equipment must take place in the workshop area that is equipped with a bund wall and grease trap oil separator and if no such facility exist on site, maintenance and washing of vehicles and equipment must take place off-site. iii. During emergency servicing of vehicles or equipment, a suitable drip tray must be used to prevent spills onto the soil, especially where emergency repairs are done outside the workshop area. iv. Equipment must be inspected regularly for serviceability. All leaking equipment must be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste must be collected and removed to a registered waste site. v. Workshop areas must be monitored for oil and fuel spills and such spills must be cleaned and remediated to the satisfaction of the PM/SM or ECO. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. SUNSORB, Drizit, etc. vi. The Contractor must be in possession of an emergency spill kit that is complete and available at all times on site. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits. vii. Drip trays shall be provided for stationary plant and for "parked" plant. viii. The following must be applied: • All contaminated soil / yard stone shall be removed and disposed of as hazardous waste at a registered facility or placed in containers to be taken to one central point where bio-remediation can be done. • A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site. • All spills of hazardous substances must be reported to the PM/SM or ECO. • The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	• Prevent pollution of the environment • Minimise chance of transgression of the acts controlling pollution • Disposal of hazardous substances in an appropriate manner	• No pollution of the environment • No litigation due to transgression of pollution control acts • Method statement	• Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
C6 NOISE			
i. In terms of noise impact for various increases over the ambient, the National Noise Regulations define an increase of 7dB as "disturbing". Noise levels during construction must therefore be kept within 7dB of the baseline data. ii. Should excessive complaints be received, monitoring of noise levels must be conducted regularly during construction and the records kept on site. iii. All construction vehicles must be in a good working order to reduce possible noise pollution. iv. Work hours during (07:00 – 18:00 during weekdays; 08:00 – 13:00 on Saturdays; and no work on Sundays and Public Holidays) the construction phase must be strictly enforced unless permission is otherwise granted. Permission must not be granted without consultation with the local residents and businesses by the PM/SM. v. Noise reduction is essential and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement. vi. Noisy activities must take place only during working hours. The PM/SM must inform the residents of houses and businesses adjacent to the development in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to, blasting, piling, use of pneumatic jack-hammers and compressors, bulk demolitions, etc.	• Maintain noise levels below "disturbing" as defined in the National Noise Regulations • Minimise the nuisance factor of the development	• No complaints from surrounding landowners or I&APs	• As and when required

PHASE OF DEVELOPMENT	**CONSTRUCTION**
IMPACT / ISSUE	**CONSTRUCTION**
SECTION	**D**

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D1 CREW CAMPS			
i. The contractors must provide and maintain a **method statement** for "Crew camps and construction lay down areas" prior to construction taking place. ii. Accommodation for members of the workforce is not permitted on site unless authorisation has been given by the Landowner and Proponent in consultation with the ECO. iii. The contractor's camp, offices and storage facilities must be located within the site boundaries. No person must be allowed to stay on neighbouring sites, unless it is cleared with the owner. In such an event, all requirements of the EMPr will apply. iv. Dedicated wash areas (if approved by the PM/SM and or ECO) must be situated away from watercourses and areas of shallow groundwater. v. Dust suppression must be applied at the contractor's camp as required. This may include the laying of gravel. The use of grey water can be considered as an option if the required permits have been acquired. vi. The contractor must provide labourers plastic bags to clean up the contractor's camp and construction site on a daily basis. These areas must then be inspected by the contractor or his/her ESO to ensure compliance with this requirement. vii. The contractor is responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period and topsoil restored in areas where landscaping is to take place. viii. Open uncontrolled fires shall be forbidden at the camp site. Rather, 'contained' cooking mechanisms should be used if approved by the PM/SM or ECO – e.g. gas stoves or an enclosed braai facility. See section D2 for controls and mitigation measures in terms of Fire. ix. Appropriate ablution facilities must be located in close proximity to the site camp – as per specifications in above.	• Minimise water pollution • Minimise dust fallout • Minimise unwarranted environmental damage outside the footprint • Maintain a clean and healthy working environment • Minimise impact to surrounding environment	• No signs of water or soil pollution • No complaints from surrounding landowners or I&APs • No visible signs of litter • Method statements	• Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D2 FIRES			
i. The contractors must, prior to construction taking place, provide and maintain a **method statement** for "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised. ii. Absolutely no burning of waste is permitted. iii. Fires will only be allowed in facilities especially constructed for this purpose within fenced Contractor's camps. iv. Wood, charcoal or anthracite are the only fuels permitted to be used for fires. The contractor must provide sufficient wood (fuel) for this purpose. v. Fires within the designated areas must be small in scale so as to prevent excessive smoke being released into the air. vi. No wood or any other material is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive areas within the site and any surrounding natural vegetation. vii. The site specific Fire Management Plan (Appendix 7) must be implemented.	• Minimise risk of veldt fires • Minimise destruction of natural fauna and flora • Maintain safety on site	• No veldt fires started by the contractor' s workforce • No claims from landowners for damages due to veldt fires • Method statement	• Monitor daily
D3 EROSION AND SEDIMENTATION			
i. The key stormwater infrastructure facilities must be built and completed before other construction activities are allowed to commence, including attenuation, retention and diffuse release infrastructure; ii. Vegetation and soil must be retained in position for as long as possible, and removed immediately ahead of construction and/or earthworks in that area; iii. Backfill must be compacted to form a stabilised and durable blanket; iv. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. It should also only be stored for the minimum amount of time necessary; v. Silt traps and culverts should be regularly maintained and cleared so as to ensure effective drainage; vi. Re-vegetation of disturbed areas must be undertaken with site indigenous species and in accordance with the instructions issued by the ECO. Areas where soil compaction or ruts developed should be rehabilitated; and vii. Runoff from roads must be managed to avoid erosion and pollution problems. Where excessive loose sediment is created, attenuation swales and / or soils screens should be installed.	• Minimise erosion damage • Minimise impeding the natural flow of water • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Re-growth of disturbed areas	• No erosion scars • No loss of topsoil • No interference with the natural flow of water • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated	• As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D4 FAUNA			
i. Landscaping should be done with floral species that occur naturally within the study area and the use of any exotic species should be strictly prohibited. The recommendations made based on Lepidoptera studies should also be included in the landscaping plan for the development; ii. Bat and owl nesting boxes should be used to encourage these species to reside within the study area. This will also provide a natural control method for rodents and invertebrates; iii. All alien vegetation currently within the study area should be removed and these areas should be rehabilitated to prevent erosion; iv. To prevent the transmission of diseases or faunal injury or mortality, no dogs or cats should be allowed to enter the natural areas surrounding the development; v. Access to the natural areas surrounding the development should be restricted to prevent poaching and snaring of wild life. vi. Construction should be restricted to the winter months when faunal breeding activities are generally low; vii. Construction should only be conducted during day light hours and the use of artificial lights should be prevented as far as possible; viii. An education programme should be compiled for all contractors, subcontractors and workers to ensure compliance to all aspects of the EMPr as well as educating personnel in the safe and proper conduct within areas of natural habitat; ix. No wild animal may under any circumstance be handled, removed or be interfered with by construction workers; x. No wild animal may be fed on site; xi. No wild animal may under any circumstance be hunted, snared, captured, injured or killed. This includes animals perceived to be vermin. Checks of the surrounding natural vegetation must be regularly undertaken to ensure no traps have been set. Any snares or traps found on or adjacent to the site must be removed and disposed of; xii. To prevent possible collisions with animals, drivers of construction vehicles must remain vigilant to the possibility of animals crossing their paths and a strict speed limit of 30 km/h should be adhered to; xiii. All food should be securely stored away to prevent attraction of faunal species and all rubbish should be disposed of away from the site. Bins located around the infrastructure should have tightly fitting lids to prevent faunal species raiding the bins and thereby becoming habituated to humans.	• Minimise disturbance to animals • Minimise interruption of breeding patterns of birds • Minimise destruction of habitat	• No complaints from Nature Conservation • No litigation concerning applicable animal protection acts • No measurable or visible signs of habitat destruction	• Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
xiv. If any wooden poles are used within the study area, these poles should be treated with environmentally safe chemicals; xv. The used of any herbicides or pesticides is strongly discouraged; xvi. All domestic waste and building rubble should be disposed of at official dump sites and should not be dumped in the natural areas surrounding the development.			
D5 FLORA			
i. The Contractor shall be responsible for controlling all alien invasive species, as per the requirements of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), during the contract period. ii. Alien invasive plant material shall preferably be removed in entirety through mechanical means (e.g. combination of chainsaw, bulldozer, hand-pulling of small specimens). iii. Alien invasive plant material shall not be stockpiled. All such material removed shall be removed from the site and dumped at an approved disposal site. iv. A monitoring programme should be developed to ensure that re-growth of alien invasive plants species does not occur, or that such re-growth is controlled. v. No open fires shall be allowed on site under any circumstances, fires will only be permitted in adequate facility within the crew camp, Forest Act, 1984 (Act No. 122 of 1984). vi. The contractor must rehabilitate the construction camp and any other disturbed areas once construction activities have terminated. Compacted areas will be ripped and mulched in order to ensure recovery of the natural vegetation cover. A method statement must be provided and maintained by the contractor. vii. No development should be undertaken in areas of mapped High conservation value, and all these areas should be buffered from any development by at least 15m (Refer to **Error! Reference source not found.** of the EIR).	• Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority • Prevent litigation concerning removal of vegetation • Encourage natural habitat fauna • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil • Minimise risk of veldt fires • Minimise risk of fauna and flora destruction • Conform to the requirements of specialist studies	• No litigation due to removal of vegetation without necessary permission • No exotic plants used for landscaping • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated • No veldt fires started by contractors work force • No claims from landowners for damages due to veldt fires • Method statement	• As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D6 HERITAGE			
i. In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), construction personnel must be alert and must inform the PM/SM/ESO or ECO should they come across any findings of heritage resources, other than those already identified; who should turn will notify the local heritage agency within 24 hours. ii. Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found must cease immediately and the ECO must be notified within 24 hours. iii. Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist which will deal with the find in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the Applicant. iv. In the event of fossil finds a Palaeontologist must assess the information and liaise with the manager and the ECO and a suitable response will be established. v. Should potential fossil material be found, it is proposed that Dr Peter Nilssen (Author of the Paleontological Impact Assessment) should be contracted to carry out the initial field assessment and liaise with the appointed Palaeontologist as to its context, significance and appropriate actions. vi. Under no circumstances must archaeological or paleontological artefacts be removed, destroyed or interfered. vii. Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the South African Heritage Resources Agency on the appropriate provincial heritage resource agency. viii. In the event of exposing human remains during construction, the matter will fall into the domain of Heritage Western Cape or the South African Heritage Resources Agency and will require a professional Archaeologist to undertake mitigation if needed.	• Limit the destruction of the country's heritage resources • The preservation and appropriate management of new archaeological finds should these be discovered during construction • Conform to the requirements of specialist studies	• No destruction of or damage to known archaeological sites	• Monitor Daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D7 NO-GO / SENSITIVE AREAS			
i. All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. ii. The construction footprint must be kept to a minimum must be clearly demarcated (e.g. warning tape) and fenced prior to the commencement of construction activities, thus reducing the infringement of the development on surrounding habitats. iii. No-go areas (refer to Section D12) must be demarcated with fencing/warning tape and signs before any construction activities commence. These areas and the type of fencing/demarcation must be approved by the PM/SM and ECO and the ECO in conjunction with a site surveyor must be involved in the demarcation process to make sure the correct areas are fully demarcated.	• Minimise the potential for the spread of the of the construction footprint • Reduce loss of fauna and flora habitat • Minimise the potential for loss of protected and or endangered fauna and flora species	• No sign of movement through “no go” areas. • Containment of footprint	• Monitor daily
D8 ACCESS ROUTE/HAUL ROADS			
i. Where possible, existing roads and services must be utilised thereby, reducing the infringement of the development on surrounding natural habitat. ii. No unauthorised access is permitted to the construction area. Any authorised clearing for access roads must be done under the supervision of the ECO. iii. Any damaged or degradation will be investigated and fines issued, the affected areas must be immediately rehabilitated. iv. Access roads for earthmoving-equipment must be clearly designated and be positioned as close as possible to the proposed development site. v. No driving off from the marked roads is permitted. vi. Designated parking areas must be identified and demarcated with applicable signage. vii. Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require application for a water use licence. viii. Neither the site nor its access roads must be allowed to be utilised for recreational activities, this includes but is not limited to quad bikes, 4x4’s and dirt bikes. Security personnel must be informed and ensure that this is enforced.	• Minimise loss of topsoil and enhancement of erosion • Minimise fauna and flora displacement by destruction of natural habitats	• No erosion on access roads after completion of construction • No loss of topsoil due to run-off water on access roads	• As required, monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D9 CRIME, SAFETY AND SECURITY			
i. No site staff, other than security personnel and skeleton staff will be housed on site. Security personnel and skeleton staff must be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities, facilities for cooking and heating so that open fires are not necessary. ii. The construction area must be secured by means of a boundary/ perimeter fence. This will serve to prevent public access to the site, for public safety and for security reasons (theft). iii. Access to the site must be controlled so as to restrict unauthorised personnel from entering the site. iv. The workers on site must retain some means of identification. The ESO and the contractor are responsible for ensuring that only authorised personnel are on site at all times. v. The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations. vi. The contractor must ensure that all **emergency procedures/method statements** are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc. vii. The contractor must ensure that lists of all emergency telephone numbers and contact persons are kept up to date. All numbers and names are to be posted at relevant locations throughout the construction site. viii. The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.	• Reduce the risk of potential incidences • Minimise the potential impact on the environment	• No incidences reported	• Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D10 VISUAL IMPACT			
i. The Fynbos area of the site needs to be retained where possible and practical so that the residential units can fit visually more easily into the site and thereby retain some of the visual quality that exists in the undeveloped state of the site. ii. Enclose the construction site and stockyards with a dark green or khaki brown shade cloth of at least 20% density. iii. Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance. iv. Remove rubble and other construction rubbish off site as soon as possible or place it in containers in order to keep the construction site free from additional unsightly elements. v. Dust suppression techniques should be implemented especially on windy days, preferably using biodegradable binding agents. vi. If practically possible, locate construction camps in areas that are already disturbed or where it is not necessary to remove established vegetation. vii. Exposed soil must be covered or 'camouflaged' using a biodegradable soil mat and vegetation cover to reduce the duration of visible scarring of the landscape. viii. Rehabilitation of all stripped and damaged areas must be implemented as soon as practically possible. ix. It is suggested that construction should start and stop during normal working hours without starting too early or continuing until late into the night to avoid night-time visual impacts, also avoid working over weekends and holiday periods. x. If construction is necessary during night-time, light sources should be directed downwards and inwards away from sensitive view points and roads to prevent obtrusive lighting.	• Minimise visual impact	• No complaints from I&APs	• Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
D11 GEOTECHNICAL			
i. Founding conditions for individual structures must be confirmed by a qualified Geotechnical Engineer / Structural Engineer / Geologist. ii. All trenches and excavation works must be properly backfilled and compacted according to specifications given in sub-clause 5.2.4. Of SANS 1200DA. iii. Mechanical methods of rock breaking will have noise and dust impacts that must be managed in accordance to the relevant sections in this EMPr. iv. **Method Statements** for chemical breaking must be provided by the ER.	• Minimise potential structural faults • Minimise trench collapse	• No visible signs of backfill deterioration or trench collapse	• As and when required
D12 HYDROLOGY			
i. The PM/SM or ECO must assess whether regular water sampling of surface and or ground water resources within the immediate and surrounding environment are necessary. Should this be the case, baseline data from sampling must be obtained relevant to the activity and sensitivity of the area. Regular sampling must then be carried out to determine deviations from the baseline data. ii. No construction activities are allowed within wetland habitat, riparian habitat or a 30m buffer zone from the edge of a wetland and riparian habitat. The preliminary proposed lay-out should therefore be revised to include the no-go areas within the design (Refer to **Error! Reference source not found.** of the EIR); iii. In order to avoid negative impacts on the 30m buffer (which should remain natural), an initial 40m to 50m buffer should be demarcated (depending on available space); iv. Drainage systems should be maintained regularly; v. The construction of surface stormwater drainage systems during the construction phase must be done in a manner that would protect the quality and quantity of the downstream system. For example, the use of swales which could then be grassed for the operational phase; vi. Stormwater outflows should not enter directly into a wetland, drainage line or 30m buffer zone. The velocity of water that may reach the buffer zone should be slowed before it is intercepted by virgin soils using a siltation and erosion control structure such as attenuation swales and be released in a diffused manner; vii. The Contractor should inform all staff of the need to be vigilant against any practice that will have a harmful effect on wetlands and riparian habitat. This information shall form part of the Environmental Education Programme to be	• Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise impeding the natural flow of water • Minimise the impact on natural water flow dynamics • Minimise scarring of the soil surface and land features • Minimise damage to river and stream embankments • Minimise erosion of embankments and subsequent siltation of rivers and streams • Minimise damage to riverine habitats	• No visible signs of pollution • No signs of siltation of water courses • No visible erosion scaring once construction is completed • Minimum loss of topsoil • No access roads through river and stream banks • No visible erosion scars on embankments once construction is completed • No erosion or siltation downstream • No deviation from baseline data during regular sampling	• As and when required, monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
effected by the Contractor; viii. Infilling, excavation, drainage, dumping of building material and hardened surfaces (including buildings and asphalt) should not occur in any of the wetland, riparian or within the 30m buffer zone as a minimum, but should preferably be done as far away as practically possible from these areas; ix. Imported fill material should be monitored during and after construction for the presence of any alien species. Any such species should be removed immediately; x. Erosion control of all banks must take place so as to reduce erosion and sedimentation into riparian channels or wetland areas. xi. A wetland monitoring program should be initiated at the start of the construction phase. The monitoring program should be designed in situ with construction and rehabilitation plans by a wetland specialist. A wetland monitoring program must also ensure that all wetland protection infrastructure and storm-water systems are properly installed and that all affected wetland areas are adequately rehabilitated; xii. The ECO should be briefed by a wetland specialist on specific monitoring issues. Appropriate mitigation needs to be implemented after consultation with relevant specialist if any problems are detected.			
D13 SOIL			
i. The contractors must provide and maintain a **method statement** for "management of topsoil" prior to the commencement of construction. ii. Topsoil must be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include the permanent works, pipeline trenches, stockpiles, access roads, construction camps and lay-down areas. iii. Topsoil must be stripped after clearing of woody vegetation and before excavation or construction commences. iv. At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 150 mm and stockpiled on the demarcated topsoil stockpile areas. v. Topsoil must be deemed to be the top layer of soil containing organic material, nutrients and plant seeds. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas. vi. All topsoil must be removed and stockpiled on the site. These areas are to be marked as "no-go" areas.	• Minimise scaring of the soil surface and land features • Minimise disturbance and loss of soil • Minimise construction footprint • Minimise sedimentation of nearby drainage lines • Maintain the integrity of topsoil's for future landscaping and rehabilitation • Containment of invasive plant growth	• No visible erosion scars once construction is completed • The footprint has not exceeded the proved development site. • Minimal invasive weed growth • No signs of sedimentation and erosion • Method statement	• Daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
vii. Single handling is recommended. Stock piles must not be higher than 2m to avoid compaction. viii. However, the use of topsoil for rehabilitation contaminated by the seed of alien vegetation (e.g. devil's trumpet, blackjacks, etc.) must not be permitted unless a programme to germinate the seed and eradicate the seedlings is drawn up and approved, or some other mitigatory feature is found. This must be approved by the ECO. ix. Dust suppression is necessary for stockpiles older than a month if deemed necessary by the PM/SM or ECO – with either water or a biodegradable chemical binding agent. x. Backfilling must be undertaken in such a way that the final contours blend with the surrounding environment. xi. Remediated slopes must preferably be graded to slopes between 1:3 and 1:2. xii. Remediated slopes can then be capped with topsoil. This requires a minimum layer of 100 mm in most areas. xiii. Disturbed surfaces to be rehabilitated must be ripped and the area must be covered with a layer of topsoil material excavated from the site. xiv. Ripping must be done to a depth of 250 mm in two directions at right angles. Topsoil must be placed in the same soil zone from which it has been stripped.			
D14 REHABILITATION			
i. Rehabilitation shall ensure that all areas disturbed by the construction activity to return these areas to a near as possible natural state (similar or better state than before construction occurred). ii. Rehabilitation includes, but is not limited to, the following activities: • Removal of all contaminated soil by hydrocarbons (regarded as hazardous waste), by excavating to the depth of contaminant penetration and removal to a facility registered for the disposal of hazardous materials. Safe disposal certificates to be obtained for removal of hazardous materials. • Clearance and legal disposal of all rubble and construction waste associated with the development (unused materials including spoils, waste concrete and cement, concrete and cement wash water, litter etc). • Backfilling and contouring. • Ripping of compacted disturbed areas to a depth of 250 mm prior to the replacement of topsoil. • The eradication of invasive floral species that may have promulgated on the site	• Rectify any adverse aspects occurring during construction • Maintain the integrity of topsoil's for future landscaping and rehabilitation • Containment of invasive plant growth	• No visible signs of affected areas (contaminated soils, erosion, compacted areas, etc.) • Minimal invasive weed growth • No signs of sedimentation and erosion • Method statement	• Daily once rehabilitation is initiated.

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
due to construction activities. iii. Rehabilitation must be undertaken at all areas disturbed by the works and site camp as specified by the ECO and/or PM/SM. iv. Rehabilitation of all disturbed areas shall be conducted to the satisfaction of the PM/SM and the ECO. v. Rehabilitation, landscaping and/or re-vegetation must commence once works are complete in a particular area and acceptable groundcover (80% is an accepted standard in practise) must be achieved within 3 months. vi. Access roads and other areas compacted by vehicles during construction must be scarified in order for plant roots to penetrate the soil and in effect promoting the restoration of natural vegetation. vii. Rehabilitation must be monitored in order to determine if methods implemented are successful. Where it is found that methods are not successful, the Contractor will continue to rehabilitate the areas using alternate methods until such time that the PM/SM and ECO are satisfied. The cost of prolonged rehabilitation and alternate methods must be negotiated between the Contractor and the Developer.			

PHASE OF DEVELOPMENT	**OPERATIONAL**
IMPACT / ISSUE	**COMPLETED DEVELOPMENT**
SECTION	**E**

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E1 FIRES			
i. No wood or any other material is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive areas within the site and any surrounding natural vegetation. ii. The site specific Fire Management Plan (Appendix 7) must be implemented and adhered to by Residents as well as Homeowner's Association (HoA).	• Minimise risk of veldt fires • Minimise destruction of natural fauna and flora • Maintain safety	• No veldt fires started by the residents or HoA. • No claims from landowners for damages due to veldt fires • Method statement	• Monitor daily
E2 STORM WATER MANAGEMENT			
i. Storm water, wherever possible, must be allowed to soak into the land in the area on which the water has been discharged. ii. Retention ponds are to maintain groundwater and surrounding wetlands/reduce runoff. iii. The storm water system, especially the discharge points, must be inspected and damaged areas must be repaired if required. iv. Discharge points must be inspected for blockages of any kind; these must be removed timeously to ensure the efficient operation of the storm water management system. v. No waste or refuse must be allowed to access the storm water infrastructure. vi. Excessive quantities of silt laden runoff water must not be allowed to access the storm water system. In the event that silt runoff occurs off the facility site, the cause of this must be investigated and suitable mitigation measures employed. This may include the vegetation of bare areas, installing flow diversion channels in consultation with an engineer, installing velocity reducing structures etc. vii. Where vegetation has been utilised as part of the storm water management system, it is important to ensure that the vegetation is maintained and does not die, as this is essential for effective infiltration. viii. Where silt traps have been incorporated as part of the storm water management system these must be maintained as per the engineers requirements, the maintenance crew must be informed as to the correct procedure, in terms of the engineers specifications, how the silt trap is to be	• Minimise pollution of soil, surface and ground water resources • Minimise the potential loss of topsoil • Minimise the potential of flooding of the development, or its neighbouring properties	• No evidence of pollution at the discharge points • No evidence of silt build-up at the discharge points	• Monitor weekly and after rainfall occurrences

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
maintained. ix. The silt trap must be monitored for efficiency; the management body must consult the engineers should the system not function adequately. x. For all maintenance undertaken reference must be made to recommendations in the engineer's reports and or the approved storm water management plan. xi. All maintenance activities must be monitored to ensure that no environmental damage occurs. All damage must be mitigated immediately.			
E3 FAUNA			
i. All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962). ii. Have problem animals and vermin removed by an appropriate organization or authority (i.e. such as the Parks Board, the SPCA or a registered exterminator). iii. Ensure that domesticated animals belonging to the local community are kept away and are safe from any unprotected or dangerous areas. iv. Where Electric fences are installed, these must be monitored to ensure that animals have not been trapped. If animal fatalities have occurred these must be investigated and the services of a qualified specialist (birds, reptiles, etc.) must be employed to implement the correct management action to prevent further fatalities. v. Power lines should be placed parallel to land features such as ridges, valleys and where possible drainage lines and should not cut across them; vi. Where feasible, the thin neutral or earth wire above the high voltage transmission line should be removed or when it is not possible to remove this, the line should be marked to make it more visible; vii. High voltage wires should be bundled to increase visibility; viii. The vertical spread of the power lines should be minimised since having the lines in a horizontal plane, significantly reduces the collision risk; ix. Care should be taken not to establish areas which might attract large numbers of birds to the area such as waste water treatment plants and solid waste dumps; x. High impact areas should be marked with bird deflectors to increase the visibility of the lines. xi. A monitoring programme should be developed to determine the effects of the newly constructed power lines. This monitoring should be conducted by a suitably qualified avifaunal specialist or ecologist and the data/results should be	• Minimise disturbance to animals • Minimise interruption of breeding patterns of birds • Minimise destruction of habitat	• No complaints from Nature Conservation • No litigation concerning applicable animal protection acts • No measurable or visible signs of habitat destruction	• Monitor continually

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
made available to the EWT. Furthermore, any collisions recorded within the areashould be reported to the Wildlife & Energy Interaction Group at wep@ewt.org.za. xii. To reduce the risk of electrocution the following mitigation measures are recommended: a. Insulators should be hanged under the cross arms and poles if the distance between the area which are likely to be used as a perch and the energised parts are at least 70cm; b. Upright insulators should be capped with a nonconductive material; c. Cables should be insulated close to the poles (at least 70cm on both sides and around the perching area) and in cases where large soaring birds are present, these distances should be increased to 140cm; d. If the poles are made of steel, the conductor lines should be insulated; e. Safe nesting and perching platforms should be provided above the poles at a minimum of 70cm above the energized components (or higher if larger species are present); f. Spacing between conductors should be not less than 140cm and 70cm between perching sites and live components;			
E4 FLORA			
i. Five meter wide firebreaks should be located within these buffer areas, and the firebreaks should be bushcut annually. Obviously certain access roads and bulk services will need to cross some of these High sensitivity areas, but in these areas the disturbance corridor width must be minimised. ii. A fire management plan must be prepared for the High conservation value areas, as the vegetation in these areas requires a fire once every 12 -15 years for optimal ecological functioning. (Refer to Fire Management Plan – Appendix 7 of the EIR). iii. Two ecological corridors (each at least 100m wide) across the plateau area must be maintained, and the positions of these are indicated in **Error! Reference source not found.** of the EIR. A two lane access road (plus buried bulk services) may cross the corridors, but no other infrastructure should intrude on these corridors. iv. All High conservation value areas on Erf 3122 should be formally conserved by means of a Contract Nature Reserve agreement with CapeNature. This should be undertaken within one year of any project approval. v. All invasive alien vegetation on the Open Space parts of the site must be removed within one year of any project authorisation. Ongoing alien vegetation	• Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority • Prevent litigation concerning removal of vegetation • Encourage natural habitat fauna • Minimise scarring of the soil surface and land features • Minimise disturbance and loss of topsoil	• No litigation due to removal of vegetation without necessary permission • No exotic plants used for landscaping • No visible erosion scars once construction is completed • The footprint has not exceeded the agreed boundaries • All damaged areas successfully rehabilitated • No veldt fires started by contractors work force	• As and when required

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
management must be undertaken in the Open Space areas thereafter on an annual basis. vi. All alien vegetation removal should be undertaken using Working for Water approved methodology, and no heavy machinery may be used except within the authorised development footprint. All invasives should be felled as close as possible to ground level, and all cut stumps must be painted with a suitable dye treated Triclopyr containing herbicide, within 5 minutes of being cut, in order to prevent resprouting. No spraying of herbicide should be undertaken in the Open Space areas as it has a negative impact on nearby nontarget species. vii. No alien invasive vegetation (as listed in CARA) should be allowed in private or public open space on this site. In this context it is particularly important that no Pennisetum clandestinum (kikuyu grass) be allowed on any erven or public areas bordering natural areas, as it is highly invasive. Stenotaphrum secundatum (buffalo grass) or Cynodon dactylon (kweek grass) are suitable non-invasive alternatives. viii. The HoA should be responsible for ensuring that homeowners do not dump unwanted plant material over garden fences or walls into the Open Space areas, as this will degrade the natural habitat in these areas. ix. The developer is responsible for ensuring that adequate funds are available for implementation of all required environmental management on the site, and they may decide whether this is to be via a levy administered by the HoA or via whatever other means is deemed appropriate. x. The implementation of all ecological requirements must be audited by an independent botanist or CapeNature representative every year for the first five years after commencement of development of any approved development application, and an audit report submitted to the WC DEA&DP.	• Minimise risk of veldt fires • Minimise risk of fauna and flora destruction • Conform to the requirements of specialist studies	• No claims from landowners for damages due to veldt fires • Method statement	
E5 CONTROL OF ALIEN AND INVADER PLANTS			
i. Identify and locate all exotics and invasive plants to be eradicated. ii. Control exotics and invasive plants to be eradicated. Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. iii. Monitor all sites disturbed by construction and / or operations activities for colonisation by exotics or invasive plants. iv. Follow manufacturers instruction at all times (in terms of herbicides), especially in terms of quantities, time of application etc. v. Ensure that only properly trained people handle and make use of chemicals. Note that the application of herbicides or chemicals may need to be done by a	• Removal of all alien plants and declared invader species.	• No litigation due to the presence of declared invader species • Increase in biodiversity • Method statement	• Monitored continually

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
Pest Control Officer (Any person who for reward OR in the course of a business, industry or trade uses an agricultural remedy must register as a Pest Control Operator in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) as amended and the regulations relating thereto as published in Government Notice No. R1449 of 1 July 1983). vi. Dispose of the eradicated plant material at an approved solid waste disposal site. If no toxic sprays or persistent poisons were used during eradication, then the wood may be sold or donated.			
E6 VISUAL IMPACT			
i. In order to avoid the visually out of place 'dark area' under buildings that are supported on 'columns' the area will need to be stabilised with a stone rip rap. ii. Low shrubs should be planted on the edge of the area to afford some screening of the void; iii. All cut and fill soil surfaces should be adequately protected from erosion either by vegetation or a combination of block retaining walls and vegetation or rock cladding; iv. Buildings should be painted with complementary colours that fit the setting; v. Roads and pathways should be paved with a durable brick of brown/sand colour. vi. The cut and fill slopes should not be steeper than 1:2 vertical to horizontal as this allows vegetation to establish more easily. This will reduce erosion of the soil surface. vii. The water reservoir should be painted with a colour as light as possible in order to help reduce the visual image against the sky. viii. Light fittings should have shields to eliminate sight of the light source; ix. Down lighting of areas is preferred to up lighting; x. Any perimeter lights are to be directed downwards and inwards; xi. Emitted light colour should be a softer light than sodium (yellow) or mercury halide (blue-white). The light colour should also be chosen with knowledge of what colour will attract insects. xii. No light fittings should spill light upwards or be directed upwards from a distance towards the area or building to be illuminated; xiii. The lighting plan should maximise the light energy use and be energy efficient.	• Minimise visual impact	• No complaints from I&APs	• Monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
xiv. Security lights should not flood the area with light continuously but should be activated by a motion sensor.			
E8 HYDROLOGY			
i. The PM/SM or ECO must assess whether regular water sampling of surface and or ground water resources within the immediate and surrounding environment are necessary. Should this be the case, baseline data from sampling must be obtained relevant to the activity and sensitivity of the area. Regular sampling must then be carried out to determine deviations from the baseline data. ii. In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) is be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas. iii. An ecologically-sensitive stormwater management plan should be developed that does not allow concentrated stormwater to enter into a wetland or watercourse directly, but instead makes use of flow diffusers and retention and attenuation areas (such as artificial wetland areas, attenuation swales/ponds, retention areas, baffles and gabion structures). The stormwater plan must include adequate attenuation facilities to ensure that peak flows do not cause negative impacts on wetlands or riparian areas. More specifically as a guideline: a. Post development flows for frequent, average every afternoon type storm event 6 mm over 2 hours, will not exceed pre development flows. b. Post development velocities associated with the 1:5 year return event storm will be within 25% of predevelopment velocities. c. Stormwater release structures must be designed to release diffusely, mimicking seepage wetlands outside of the watercourse. iv. Attenuation and stormwater infrastructure must be established outside of the 30m buffer zone or maximal available distance from the buffer zone where possible. v. The attenuation and retention facilities should retain stormwater runoff and then allow the water to diffusely enter the buffer zone at a slower velocity through appropriate infrastructure such as flow diffusers and reno-mattresses. vi. Diffuse release channels (as recommended by the Wetland Specialist) must be implemented (Refer to Figure 19 of the EIR).	• Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments • Minimise impeding the natural flow of water • Minimise the impact on natural water flow dynamics • Minimise scarring of the soil surface and land features • Minimise damage to river and stream embankments • Minimise erosion of embankments and subsequent siltation of rivers and streams • Minimise damage to riverine habitats	• No visible signs of pollution • No signs of siltation of water courses • No visible erosion scaring once construction is completed • Minimum loss of topsoil • No access roads through river and stream banks • No visible erosion scars on embankments once construction is completed • No erosion or siltation downstream • No deviation from baseline data during regular sampling	• As and when required, monitor daily

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
E11 TRAFFIC, ROADS AND ACCESS			
i. All traffic management must be done in accordance with the National Road Traffic Act No. 93 of 1996 ii. Traffic is to be managed in accordance with the Traffic impact assessment if one has been undertaken for the development. iii. Enforce speed limits at all times, both on public roads and on site roads. iv. Allow for safe pedestrian and cycling access and crossing where necessary. v. Ensure that only authorised roads and access routes are used. vi. Maintain all access routes and roads adequately in order to minimise erosion and undue surface damage. Repair rutting and potholing and maintain stormwater control mechanisms. vii. Runoff from roads must be managed to avoid erosion and pollution problems. viii. Clean and make good any damage to public or private roads in use. ix. Regularly remove sediment (and other material) accumulated in side drains of roadways to keep these open and functional. x. Refuse removal facilities should be provided on the site; xi. That the provision of parking should be in accordance with the parking standards; xii. The site layout plan should indicate the on-site circulation, provision of parking as well as refuse removal; xiii. Provision for traffic signals at the Waboom / Louis Fourie intersection should be made; and xiv. Investigation of an alternative access via Aalwyndal / Seemeeu Park to Hartenbos Heuwels / Menken Kop / New Development (Erf 3122), as part of a mobility strategy for the area by 2015 should be undertaken.	• Minimise congestion and other related traffic issues as a result of an influx of residents to the area.	• No congestion during peak hours.	• Daily

PHASE OF DEVELOPMENT	PRE-CONSTRUCTION & CONSTRUCTION & OPERATIONAL
IMPACT / ISSUE	ENVIRONMENTAL AUTHORISATION
SECTION	F
EA REFERENCE NUMBER	TO BE INSERTED ONCE ISSUED

CONTROL OR MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION
F1 GENERAL CONDITIONS			
General conditions as contained in the EA.	• To comply with the provisions of the Environmental Authorisation.	• No reported aspects in ECO Audit reports. • No pre-compliance or compliance notices from the GDARD:EMI.	• As and when required.
F2 SPECIFIC CONDITIONS			
Specific conditions as contained in the EA	• To comply with the provisions of the Environmental Authorisation.	• No reported aspects in ECO Audit reports. • No pre-compliance or compliance notices from the GDARD:EMI.	• As and when required.

SECTION 4: ENFORCEMENT, AUDITING & MONITORING

4.1 AUDITING AND MONITORING

The ECO must conduct, at a frequency as determined by the Competent Authority and stipulated in the relevant Environmental Authorisation (EA) for the project, independent environmental audits on the requirements of the EMPr. Before any construction activities commence, the ECO must compile an audit checklist based on the contents of this EMPr and conditions of the Environmental Authorisation (EA). The ECO must forward all audit reports to the Project Technical Team and must further at the request of the Department, forward audit reports to the Department for reference.

Evidence of the following **key performance indicators**, must be included in the audit reports where required:

1. Complaints received from landowners and actions taken.
2. Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
3. Incidents leading to litigation and legal contraventions.
4. Environmental damage that needs rehabilitation measures to be taken.

Site documentation including a copy of all ESO/EO monitoring reports, contractor environmental method statements and *pro forma* documentation (see Section 2.5 & Section 2.6) must be held by the ESO and/or the EO on site and be made available to ECO and any other member of the Project Technical Team upon request. The ECO must verify Environmental Documentation during independent environmental audits.

4.1.1 Non-Compliance

It may not always be possible to carry out the mitigation measures as stipulated in this EMPr which may result in future non-compliance.

The Contractor must comply with the environmental specifications (of which this EMPr forms part of) on an ongoing basis. Any failure on his part to do so, will entitle the Project Manager/Engineer/Site Manager to certify the imposition of a fine or penalty. Allowances must be made for the contractor to rectify all non-compliances, prior to issuance of penalties/fine. Each non-conformance (in terms of this EMPr) not addressed within 4 weeks of being reported in ECO audit reports, will constitute a fine.

Penalties/Fines for non-compliance needs to be included in the contract documentation and should be discussed with the Contractor on appointment. The Contractor must make every effort to ensure that staff members comply with the EMPr, and enforce non-compliance penalties.

The Contractor is deemed **NOT** to have complied with the EMPr if:

a. within the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of the EMPr confirmed and verified by the ECO;
b. environmental damage ensues due to non-compliance of EMPr requirements;
c. the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time, and
d. the Contractor fails to respond adequately to complaints from the public in line with requirements of this EMPr.

4.1.1.1 Penalties

Penalties are suggested for the transgressions listed in Table 3 below.

- Where the Contractor inflicts non-repairable damage upon the environment, he shall be liable to pay a penalty fine over and above any other contractual consequence (In terms of the Conventional Penalties Act, 1962 (Act 15 of 1962); a creditor is not entitled to recover both the penalty and damages. Thus, when a Contractor causes damage, the Employer can either enforce a penalty or make the Contractor rectify the damage - not both).
- Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any applicable law.

Table 3: Proposed Penalties

OFFENCE/TRANSGRESSION		PENALTY
A	Erosion	**Penalty equivalent to cost of rehabilitation plus 20%.**
B	Oil spills	**Penalty equivalent to cost of clean-up operation plus 20%.**
C	Damage to indigenous vegetation	**Penalty equivalent to cost of restoration plus 20%.**
D	Damage to sensitive environment	**Penalty equivalent to cost of restoration plus 20%.**
E	Damage to cultural sites	**Penalty to maximum of R 100,000 shall be paid for any damage to any cultural / historical sites**
F	Damage to trees	**Penalty to maximum of R100,000 shall paid for each tree removed without prior permission, or maximum of R5,000 for damage to any tree to be retained on site.**
PENALTIES FOR REMOVING OR DAMAGING TREES:		
TRUNK GIRTH (1M ABOVE GROUND LEVEL)		REPLACEMENT VALUE PER TREE
0 – 15 mm		**R 100.00**
16 – 30 mm		**R 200.00**
31 – 50 mm		**R 500.00**
51 – 75 mm		**R 1,000.00**
76 – 100 mm		**R 2,500.00**
101 – 150 mm		**R 5,000.00**
151 – 300 mm		**R 10,000.00**
Larger than 300 mm		**R 15,000.00 to R 100,000.00**

4.1.1.2 Fines

Fines are suggested for the activities detailed in Table 4 below (Values assigned for the transgressions are based on values for standard Civil Construction Activities. The onus is on the Project Manager/Site Manager to determine site specific values. Fines should not be too small or the consequence of the transgression is seen as negligible).

Fines shall be imposed by the Project Manager/Site Manager on the Contractor who in turn must negotiate with Sub-contractors where applicable.

Section 4.1 is valid for the entire construction process on the development area.

Fines will be issued for the transgressions listed. Fines may be issued per incident at the discretion of

the Project Manager/Site Manager. Such fines may be issued in addition to any remedial costs incurred as a result of non-compliance with the EMPr requirements.

The Project Manager/Site Manager shall inform the Contractor of the contravention and the amount of the fine, and will certify the amount as a deduction from monies due under the Contract. For each subsequent similar offence the fine may, at the discretion of the Project Manager/Site Manager, be doubled in value to a maximum value of R 50,000.

The Project Manager/Site Manager (in consultation with the ECO) shall be the judge as to what constitutes a transgression in terms of the above clause. Should transgressions continue to an unacceptable level, the Project Manager/Site Manager may cancel the Contract.

Table 4: Proposed Fines

	OFFENCE/TRANSGRESSION	FINE (TO BE FINALISED)
A	Any persons, vehicles, plant, or thing related to the Contractor's operations within the designated boundaries of a "no-go" area.	**4,000**
B	Any vehicle driving in excess of designated speed limits.	**1,000**
C	Any vehicle being driven or parked, plant or materials being placed or stored outside the boundaries of the site without permission or due cause.	**2,000**
D	Persons walking/operating outside the boundaries of the site	**500**
E	Persistent and un-repaired oil leaks from machinery. The use of incorrect methods of decanting dangerous and toxic substances (such as not using of a proper funnel or a pump)	**3,000**
F	Excessive litter on or uncontained waste site	**1,000**
G	Lighting of illegal fires on site or burning of waste	**5,000**
H	The eating of meals on site outside the defined eating area or individual not making use of the site ablution facilities	**1,000**
I	Dust or excess noise on or emanating from site	**1,000**
J	Any person, vehicle, item of plant, or anything related to the Contractor's operations causing a public nuisance (Valid complaint received)	**2,000**
K	Any theft from adjacent landowners	**5,000**
L	Any pollution of drainage systems or water resources	**2,500**
M	Incorrect handling and stockpiling of topsoil material	**1,000**
N	Any persons, vehicles, plant or thing related to the Contractor's operations within the designated boundaries of a Restricted Area without approval in a Method Statement or written permission received from the Engineer/Project Manager.	**1,000**
O	Any other contravention of the Environmental Specification or any degradation to the environmental as identified by the ECO/PM/Engineer.	**Variable**

4.1.2 Measurement and payment

It is understood that environmental requirements included in this EMPr will entail costs over and above those of the construction requirements. These include, but are not limited to, the provision for:

- Mitigation and enhancement actions;
- Training and environmental awareness requirements;
- Monitoring;

- Auditing; and
- Corrective actions.

The proponent must recognise this and make provision for it in the budget allocations as well as the tender process (Contractors to provide for costs associated with the Environmental Specification). Costing for management action should be done with inputs and advice from appropriate technical members of the project team and relevant EAPs who have knowledge of the management actions being recommended, as well as practical experience in implementing similar measures and techniques.

A lump sum must be allocated for the management of "Environmental Specifications" where it is not possible to cost specifically for the requirements of the EMPr.

4.2 RECORD KEEPING

The following is list of documentation which must be held on site by and be made available to the Authorities, ECO and independent auditor on request:

1. Copy of the Environmental Management Programme (EMPr) and subsequent revisions;
2. Copies of the respective Principle Contractor's Environmental Site Documentation / Environmental File (See Section 2.5 and 2.6);
3. Copies of specialist studies undertaken;
4. Records of all remediation / rehabilitation activities;
5. Complaints register and Incident register; and
6. Minutes of meetings.

These records must be kept with the Developer/Proponent at all times, even after construction has been completed. It is advised that all records are archived following final completion of construction, for a period of not less than three (3) years (Should there be any contentious matters raised subsequent to the development taking place).

SECTION 5: NATIONAL AND PROVINVIAL LEGISLATION, POLICIES AND GUIDELINES

The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principals of this document as well as to activities associated with the proposed development.

5.1 APPLICABLE LEGISLATION

National Environmental Management Act, 1998 (Act No. 107 of 1998)
Provides for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

National Water Act, 1998 (Act No. 36 of 1998)
The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in responsible ways.

Of specific importance to this application is Section 19 of the NWA, which states that an owner of land, a person in control of land or a person who occupies or uses the land which thereby causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring and must therefore comply with any prescribed waste standard or management practices.

Due to the proximity of the proposed development to a wetland a Water Use License Application may be required in terms of Section 21 of the NWA:

21(c) impeding or diverting the flow of water in a watercourse; and
21(i) altering the bed, banks, course or characteristics of a watercourse.

National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.

This Act is applicable to this application for environmental authorisation, in the sense that it requires the project applicant to consider the protection and management of local biodiversity.

National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
Reforms the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.

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

Reforms the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

National Heritage Resources Act, 1999 (Act No. 25 of 1999)

This Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments (including roads) exceed 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

Constitution of the Republic of South Africa

The Constitution of the Republic of South Africa has major implications for environmental management. The main effects are the protection of environmental and property rights, the change brought about by the sections dealing with administrative law, such as access to information, just administrative action and broadening of the *locus standi* of litigants. These aspects provide general and overarching support and are of major assistance in the effective implementation of the environmental management principles and structures of the NEMA. Section 24 in the Bill of Rights of the Constitution specifically states that:

Everyone has the right –

- To an environment that is not harmful to their health or well-being; and
- 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.

Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)

The Promotion of Access to Information Act, 2000 (Act No. 2 of 2000) recognises that everyone has a Constitutional right of access to any information held by the state and by another person when that information is required to exercise or protect any rights. The purpose of the Act is to foster a culture of transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their rights.

Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000)

This Act gives effect to the right to administrative action that is lawful, reasonable and procedurally fair. Its main purpose is to:

- Promote efficient administration and good governance; and
- Create a culture of accountability, openness and transparency in the public administration or in the exercise of a public power or the performance of a public function, by giving effect to the right to just administrative action.

National Road Traffic Act No. 93 of 1996

Provides for road traffic matters which shall apply uniformly throughout the Republic and for matters connected therewith.

5.2 APPLICABLE POLICIES AND GUIDELINES

Integrated Environmental Management (IEM).
IEM is a procedure for ensuring that environmental considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). The IEM guidelines intend encouraging a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels.

National Spatial Biodiversity Assessment
The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

Protected species – Provincial Ordinances
Provincial ordinances were developed to protect particular plant species within specific provinces. The protection of these species is enforced through permitting requirements associated with provincial lists of protected species. Permits are administered by the Provincial Departments of Environmental Affairs.

Spatial Development Framework (SDF) for the Mossel Bay Local Municipality
The Mossel Bay SDF will amongst others strive to:

- Promote sustainable development by means of ensuring that development is within the financial, institutional and administrative means of the Mossel Bay Municipality
- Further the establishment of viable communities
- Develop a spatial growth management framework that focuses on:
    - the timeous identification and securing of appropriate land for housing development
    - the containment of urban sprawl
    - the densification and compaction of settlements
    - urban integration and regeneration.
- Promote the equitable distribution of public facilities and services throughout the Mossel Bay Municipal Area
- Support the conservation of the architectural and cultural-historical character of Mossel Bay, as well as the surrounding coastal and rural nodes / settlements
- Integrate and support the application of bioregional planning principles
- Encourage appropriate development in the Mossel Bay Municipal Area, within the confines of acceptable environmental impact.

According to the Mossel bay SDF the proposed property is located within the urban edge and future residential expansion on Erf 3122 is envisaged.

Section 9.1 of the Mossel Bay SDF identifies the existing Hartenbos Heuwels development as a “Middle and High income residential development area” and states that 384 erven was permitted here. It further states that, “due to potential Environmental constraints” only 50% of the available land parcel size was used for calculation of permissible number of units / erven”.

5.3 GENERAL GUIDELINES

The following measures provide guideline solutions to frequently anticipated issues on most development activities.

- The prevention of any site degradation due to non-compliance, administrative or financial problems, and inactivity during the construction phase, illegal activities, delays caused by

archaeological finds, etc. is ultimately the responsibility of the applicant/developer. Section 28, National Environmental Management Act [NEMA] (Act No. 107 of 1998).

- The study area must be clearly defined, surveyed and fenced according to the project authorisation. All workforce members and other construction personnel are not to go beyond the fenced footprint (especially towards the adjacent Wilds Nature Reserve and private property). Landowners are not comfortable when strangers come on to their properties. They will look for reasons to interfere with the construction process and may therefore cause delays in the process that can be very costly to the Contractor.
- The Contractors must adhere to agreed and approved access points and haul roads.
- No camping is allowed on any private property.
- Damage to private or public property such as fences, gates and other infrastructure may occur at any time. All damage to be repaired immediately and to the satisfaction of the relevant owner.
- Relevant landowners and businesses must be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract including this EMPr.
- Proper planning of the construction process must be undertaken to allow for disruptions due to rain and very wet conditions.
- Where existing private roads to be utilised as access are in a bad state of repair, such roads' condition must be well documented, including photographs, before they are used for construction purposes. If necessary some repairs must be done to prevent damage to equipment and plant.
- All private and public manmade structures (as well as those earmarked to be preserved) on or near the project site must be protected against damage at all times and any damage must be rectified immediately.
- Proper site management and regular monitoring of site works should be undertaken.
- Proper documentation and record keeping of all complaints and actions should be taken.
- Regular site inspections to ensue and good control over the construction process throughout the construction period.
- A positive attitude towards Environmental Management by all site personnel must be motivated through regular and effective awareness and training sessions (see Section 2.2).
- An ESO, on behalf of the Contractor, is to be appointed to implement this EMPr. The PM and not the Contractor or his/her ESO is to deal with any landowner related matters (see Figure 3)
- Environmental Audits to be carried out during and upon completion of construction.

SECTION 6: DETAIL OF THE PERSON/S RESPONSIBLE FOR DEVELOPING AND REVIEWING THE EMPr

ANNEXURE 1: DECLARATION OF UNDERSTANDING BY THE DEVELOPER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 2: DECLARATION OF UNDERSTANDING BY THE PROJECT MANAGER / ENGINEER

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 3: DECLARATION OF UNDERSTANDING BY THE CONTRACTOR

I, _____

Representing _____

Declare that I have read and understood the contents of the Environmental Management Programme for:

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness2: _____

ANNEXURE 4A (SAMPLE): METHOD STATEMENT EXAMPLE

Contract No		**Date**		**CONTRACTOR DETAIL (Logo, physical address, etc.)**
Contract Name		**Rev**		

ENVIRONMENTAL METHOD STATEMENT
<ACTIVITY> e.g. SOLID WASTE MANAGEMENT

Scope

Short scope of the method statement in terms of the identified activity (Solid Waste Management) *<e.g. This method statement outlines the collecting, handling, classification, separating, storage and safe disposal of solid waste. Efforts should be made to eliminate or minimize waste in general, but if not possible, recycling, reuse or safe disposal shall be managed.>*

Relevant Legislation, Norms and Standards

National Environmental Management Act, 1998 (Act No. 107 of 1998);
National Environmental Management: Waste Act, 2008 (Act No. 58 of 2008);
Municipal by-laws pertaining to the Management of Waste;
National Domestic Waste Collection Standards GN 1475 in GG 32687 of 2009.11.06;
Draft National Standards for Disposal of Waste to Landfill GN 432 in GG 34414 of 2011.07.01;
Draft National Standards for Assessment of Waste for Landfill Disposal GN 433 in GG 34415 of 2011.07.01;
National Draft Waste Classification and Management Regulations GN 435 in GG 34417 of 2011.07.01;
National Draft Norms and Standards for the Storage of Waste GN 436 in GG 34418 of 2011.07.01;
SANS 10228 – Classification of dangerous goods;
DWAF Minimum Requirements for Waste Disposal by Landfill, 2nd Edition.

Introduction

Short Introduction *<e.g. I.Build Construction has been appointed by A Company (Pty) Ltd. for the construction of a new office block within the Silvercloud Node, Pretoria, Gauteng. Waste anticipated to be generated on site includes: General waste, builders rubble, Spoil material and hazardous waste.>*

Works, Management Actions, Control Measures

This section must be site specific. See example below

- Currently two waste baskets (constructed from wire mesh and enclosed by shade cloth) is present on site. These waste baskets are for the exclusive storage of general waste and shall be placed at strategic point on site where active works is taking place.
- All general waste is stockpiled at a designated area within the site office camp area. The stockpile is covered by a plastic sheet to deter windblown litter from occurring on site.
- Waste is removed to approved and registered municipal landfill sites by <sub-contractor detail>.
- Landfill sites to be used are <Landfill Site> <Registration number.
- A waste log shall be kept of the date, quantity and date of waste removed from site. The Site Agent shall be responsible for signing the waste register as confirmation of collection and disposal.

- Waste shall be separated into hazardous and non-hazardous waste streams.
- Hazardous waste shall be deposited in a dedicated, impermeable hazardous waste bin for later removal to a licensed hazardous waste facility.
- Red bins or red marked bins shall always be used for hazardous waste like oil filters, rags and bags of contaminated soil from cleared up spills.
- Safe disposal certificates shall be obtained for all hazardous waste removed from site.
- The certificates shall be kept on file.
- Employees shall be educated and made aware (toolbox talks) of not littering, waste separation and the importance of a waste management system.
- Waste shall never be buried, burned or dumped in unauthorized areas.

Declarations for Environmental Method Statement for <Activity>

1) ENGINEER / PROJECT MANAGER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

Engineer/PM Approval	Date	Signature

---

2) ENVIRONMENTAL CONTROL OFFICER (ECO)

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

ECO Approval	Date	Signature

---

3) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

Contractor Approval	Date	Signature

ANNEXURE 4B (SAMPLE): METHOD STATEMENT TEMPLATE

Contract No		**Date**		
Contract Name		**Rev**		

ENVIRONMENTAL METHOD STATEMENT

Activity:

SCOPE

*Insert additional pages as required

RELEVANT LEGISLATION, NORMS AND STANDARDS

*Insert additional pages as required

INTRODUCTION

*Insert additional pages as required

WORKS, MANAGEMENT ACTIONS, CONTROLS

*Insert additional pages as required

DECLARATIONS FOR ENVIRONMENTAL METHOD STATEMENT:_____

1) ENGINEER / PROJECT MANAGER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

Engineer/PM Approval **Date** **Signature**

2) ENVIRONMENTAL CONTROL OFFICER (ECO)

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

ECO Approval **Date** **Signature**

3) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

Contractor Approval **Date** **Signature**

ANNEXURE 5 (SAMPLE): ENVIRONMENTAL INCIDENT REGISTER

ENVIRONMENTAL INCIDENT REGISTER					
Date	**Time**	**Location and Nature of Incident**	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Signature**

ANNEXURE 6 (SAMPLE): COMPLAINTS REGISTER

COMPLAINTS REGISTER					
Date	**Time**	**Name & Contact details of lodger of Complaint**	**Location and Nature of Complaint** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Signature**