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PRE-CONSTRUCTION, CONSTRUCTION AND POST-CONSTRUCTION PHASE

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

FOR THE

PROPOSED DEVELOPMENT OF A PILOT DEPOLYMERISATION PROCESSING PLANT ON PORTION 21 OF THE REMAINDER OF THE FARM RHEEBOKSFONTEIN NO.142 IN MOSSEL BAY, WESTERN CAPE

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LIST OF ACRONYMS & ABBREVIATIONS	
BA	Basic Assessment
CBA	Critical Biodiversity Area
EA	Waste License
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EO	Environmental Officer (Engineer's Representative)
ESO	Environmental Site Officer (Construction Contractor's Representative)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan (also known as an EMP)
EMPr	Environmental Management Programme
DEA&DP	Department of Environmental Affairs & Development Planning
DWS	Department of Water & Sanitation
GN	Government Notice
NEMA	National Environmental Management Act, Act 107 of 1998, as amended
NEM: AQA	National Environmental Management Air Quality Act, Act No 39 of 2004, as amended
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act, Act 25 of 1999
NWA	National Water Act, Act 36 of 1998
OHSA	Occupational Health & Safety Act, Act No 85 of 1993

DOCUMENT DETAILS

Project Ref. No:	CT12
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Sharples Environmental Services cc Since 1998, SES has been actively engaged in the fields of environmental planning, assessment and management. We advise private, corporate and public enterprises on a variety of differing land use applications ranging from large-scale residential estates and resorts to golf courses, municipal service infrastructure installations and the planning of major arterials. Our consultants have over 20+ years of combined experience and we operate in the Southern, Eastern and Western Cape regions.

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1. Introduction

Sharples Environmental Services cc (SES) was appointed by *Rooikat Recyling* (the proponent) to compile the Environmental Management Programme for the proposed development of a Pilot Depolymerisation Processing Plant on Portion 21 of the Remainder of the Farm Rheeboksfontein No.142 in Mossel Bay.

The proposed development triggers Category A "listed activities" in terms of GN. No 918 published under the National Environmental Management Waste Act (NEM: WA). A Waste License is therefore required from the competent authority (Western Cape Department of Environmental Affairs & Development Planning) before construction can commence.

This EMPr is intended to ensure compliance with the conditions of the Waste License (once issued), the principles of sound Environmental Management and the general "*Duty of Care*" specified in the National Environmental Management Act, so as to avoid or minimize potential negative impacts on the natural environment during the pre-construction, construction and operational phases of the proposed development. This document must therefore be thoroughly understood by all role players, engineers, contractors, sub-contractors, and maintenance employees of the development. It is a legally binding document that must form part of the "construction procedure" and "operating procedure" at the development. The applicant is liable to implement the mitigation measures in order to achieve the described environmental management outcome (as described below).

2. About this EMPr

This document is intended to serve as a guideline to be used by *Rooikat Recycling* (as the Implementing Agent) and any person/s acting on *Rooikat Recycling's* behalf, during the pre-construction, construction, post-construction rehabilitation and operational phases of the proposed development. This document provides measures that must be implemented to ensure that any environmental degradation that may be associated with the development is avoided, or where such impacts cannot be avoided entirely, are minimised and mitigated appropriately.

This EMPr has been prepared in accordance with the requirements of an EMPr as specified in the Environmental Impact Assessment Regulations, 2014 (as amended), and with reference to the "Guidelines for Environmental Management Programmes" published by the Department of Environmental Affairs and Development Planning (2005).

It is important to note that not only is the EMPr designed to manage the physical establishment of the development *per se*, but also as a tool which can be used to manage the environmental *impacts* of the development.

The rehabilitation, mitigation, management and monitoring measures prescribed in this EMPr must be seen as binding to *Rooikat Recycling*, and any person acting on its behalf, including but not limited to agents, employees, associates, guests or any person rendering a service to the development site.

2.1 Important caveat to the report

In the past, some developments have had a devastating impact on the environment even though they have had Environmental Management Programmes in place, while other developments have had a low impact even though no management plans have been compiled.

The Implementing Agent and the attitude of the construction team play an integral role in determining the impact that the development will have on the environment. The ECO needs to ensure that the all role-players are aware of the constraints that the EMPr places on the development and construction team

and are prepared to be actively involved in enforcing these constraints. The end result relies on cooperation and mutual respect and understanding of all parties involved.

3. How to use this document

It is essential that this EMPr be carefully studied, understood, implemented and adhered to as far as reasonably possible, throughout all phases of the proposed development. *Rooikat Recycling* must retain a copy of this EMPr, and an additional copy must be kept on site at all times during the pre-construction, construction and post-construction rehabilitation phases of the development.

This EMPr must be included in all contracts compiled for contractors and subcontractors employed by *Rooikat Recycling*, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction and maintenance activities are either avoided or reduced. Appointed contractors must make adequate financial provision to implement the environmental management measures specified in this document.

This EMPr must be seen as a working document, which may be amended as and when needed, in order to accommodate changing circumstances on site or in the surrounding environment, or in order to accommodate requests/ conditions issued by the competent authority, the Department of Environmental Affairs & Development Planning (DEADP). Amendments to this EMPr must first be approved by the competent authority, in writing, before being implemented.

4. Project Location

The development is proposed to take place on Portion 21 of the Remainder of the Farm Rheeboksfontein No.142, which is located near the residential area of Great Brak, Mossel Bay. The site is located on Sorgfontein Road and is situated 1.3km from the Wolwedans town and 1.7km from the N2. Please refer to Appendix A for the location map.

The approximate centre point of the site location is provided in Table 1 below.

Table 1: *Geographical co-ordinates of the approximate centre point of the site location.*

Latitude (S):			**Longitude (E):**		
34°	2'	44.94"	22°	11'	09.45"

Figure 1: Satellite image showing the site location for the development on Farm Rheeboksfontein 142 Portion 12 (Source: CapeFarmMapper, February 2020)

Access to the site is proposed from the existing site entrance to Mobicast off Sorgfontein Road.

5. Description of the Activity

Rooikat Recycling proposes to construct a Pilot Depolymerisation Processing Plant on Portion 21 of the Remainder of the Farm Rheeboksfontein No.142 in Mossel Bay.

Rooikat Recycling are proposing to develop a robust, fit for purpose thermal depolymerisation technology consisting of depolymerization and separation sections. This technology will allow the treatment of domestic plastic and tyres at a large scale to produce a basket of fuels that can be successfully placed in the existing market.

To demonstrate the technology, it is required to construct a pilot plant to demonstrate and refine the technology. A test/pilot facility that can process 10 to 20 tons a day of either plastic or tyres, or a combination of both, is required. The data collected during the operation of the plant will be used to develop and optimize the technology.

The plastic would not have to be separated into the different types of plastic and typically non-recyclable plastics could now be converted into fuel without adding strain on the environment. The process would be a closed loop system and the generated off gasses would be used internally for energy production. Two products would be produced, heavy fuel oil (HFO) and minimal amounts of carbon black (which is a substitute for coal and can be used as a pigment).

The total extent of Farm 142/12 is approximately 48 800m^2 (4.88ha). The proposed site on Farm142/12 is approximately 2 000m^2 (0.2ha).

The proposed plant layout is shown below. The entire plant will be fenced with separate entrance and exit gates to allow for one way traffic through the facility.

The plant will consist of the following:

- Raw Material temporary storage area – approx. 96m^2
- Dormitory Building – approx. 122m^2
- Office Block – approx. 100m^2
- Processing Plant – approx. 400m^2
- Product storage area for steel wire, heavy fuel oil and carbon black – approx. 135^2

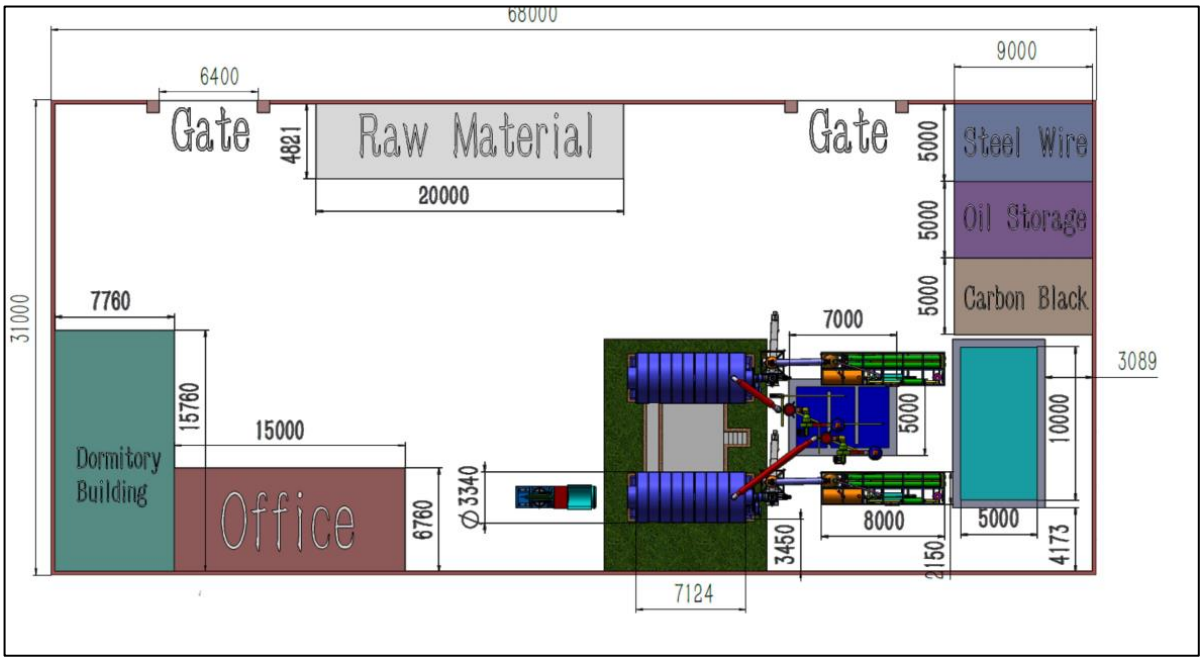

Figure 2: Rooikat Recycling Plastic depolymerization Pilot plant layout

6. Description of Environmental Setting

6.1 Vegetation

The site is in a transformed state, currently used for storage of mobicast stock and vehicles.

The Western Cape Biodiversity Spatial Plan (2017) confirmed the presence of a mapped CBA area to the north east of the property. As such, the development footprint was moved to the south-western corner.

6.2 Freshwater features

There are no watercourses / wetlands present on the proposed site and the development is further than 32m from the nearest watercourse.

7. Legal Framework

7.1 The NEMA, Act No 107 of 1998, as Amended

The National Environmental Management Act (NEMA) (Act 107 of 1998 as amended) establishes principles for decision-making on matters affecting the environment, and establishes a framework for integrating good environmental management into all development activities.

The NEMA Principles state the following:

- Environmental management must place people and their needs at the forefront, and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated & take into account the effects of decisions on all aspects of the environment & all people in the environment by pursuing the best practical environmental option.
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued.
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The polluter must pay for the cost of remedying pollution, environmental degradation and adverse health effects.
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

Section 28 of the NEMA also places a duty of care on all persons requiring them to institute measures to prevent pollution from occurring, or to minimise and rectify the pollution or degradation where it cannot reasonably be avoided.

Duty of Care (NEMA S28):
"Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment"

Section 28 of NEMA also state that any costs incurred to remedy environmental damage must be borne by the person responsible for the damage (the "polluter pays" principle). The owner of the land on which the environmental degradation or pollution arose may also be liable.

7.2 Waste Act & Associated Regulations

The National Environmental Management: Waste Act (NEM: WA) (Act 59 of 2008) regulates waste management in South Africa in order to protect human health, and to prevent pollution and associated environmental degradation. Government Notice 921 of 29 November 2013, published under NEM: WA lists the waste management activities that have had or are likely to have a detrimental effect on the environment, and which require a Waste Management License from the relevant authority.

7.2.1 Waste Management License

The proposed activity will trigger the following listed waste management activity and a Waste Management License is therefore required:

Table 2: *Listed Waste Management Activities applicable to the proposed development on Erf 318 La Motte.*

Category A (GN No R. 921 of 2013) – Basic Assessment		
Activity #	**Listed Activity Description**	**Comment / Applicability of Listed Activity**
Category A Activity 3	The recycling of general waste at a facility that has an operational area in excess of 500m2, excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.	The proposed operational area of the facility where recycling would take place is approximately 400m2. As such, this Activity is Not Applicable
Category A Activity 5	The recovery of waste including the refining, utilisation, or co-processing of waste in excess of 10 tons but less than 100 tons of general waste per day or in excess of 500kg but less than 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.	The proposed development includes the controlled extraction and retrieval of Heavy Fuel Oil and carbon black from waste plastics and tyres, in excess of 10 tons of general waste per day.
Category A Activity 6	The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons.	The proposed Pilot Depolymerisation Processing Plant will be designed to treat 20 tons of waste mixed plastic, tyres or a combination thereof per cycle.
Category A Activity 12	The construction of a facility for a waste management activity listed in Category A of this schedule.	The proposed development is for the construction of a depolymerisation facility which treat general waste.

A person who wishes to commence, undertake or conduct a waste management activity listed under Category A of GN No. R 921 of 2013, must conduct a basic assessment process as set out in the Environmental Impact Assessment Regulations made under section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as part of a waste management license application. This EMPr has been produced in support of a Waste Management License Application for the above listed waste management activities.

7.3 Environmental Impact Assessment Regulations

The proposed development as described in this document will not trigger any listed activities in terms of the Environmental Impact Assessment Regulations, 2014 as amended 07 April 2017 (GN No. R. 324-327). An Environmental Authorisation in terms of these Regulations is therefore not required. However given that a Waste Management License is required, a Basic Environmental Impact Assessment must be undertaken as part of the application for the required waste license. The Basic Assessment must comply with the requirements stated in the EIA Regulations.

7.4 Air Quality Act & Local Air Quality By-Laws

The National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM: AQA) is the primary legislation governing air quality in South Africa.

The following listed activities are applicable in terms of the NEM:AQA:

Activity No(s):	Provide the relevant Listed Activity(ies)	Describe the portion of the proposed development to which the applicable listed activity relates.
Subcategory 3.4 Char, Charcoal and Carbon Black Production (2015)	Description: Production of char, charcoal and the production and use of carbon black Application: All installations producing more than 20 tons of char or charcoal per month. Installations consuming more than 20 tons per month of carbon black in any process	The facility may produce marginal amounts of carbon black as a by-product of their process.
Subcategory 8.1: Thermal Treatment of General and Hazardous Waste	Description: Facilities where general and hazardous waste are treated by the application of heat Application: All installations treating 10kg per day of waste.	The definition of "*thermal treatment*" states the incineration, co-processing and other high temperature treatment of hazardous and general waste. In order for the proposed Pilot Depolymerisation Processing Plant to demonstrate the technology effectively, the applicant is proposing to process 10 to 20 tons per day of either mixed plastic or tyres, or both at temperatures of between 350^0 and 450^0C.

7.5 Other Applicable Legislation & Guidelines

The Applicant is responsible for ensuring that all contractors, employees and any other appointed person/entity acting on the Applicant's behalf, remain compliant with the conditions of the received Waste License as well as the provisions of all other applicable legislation and guidelines.

In addition to that discussed above, other pertinent legislation, policies and guidelines that may be relevant to the management of environmental resources during the proposed development on site include, *inter alia:*

- The Constitution of South Africa (Act No. 108 of 1996).
- National Heritage Resources Act (Act 25 of 1999).
- Water Services Act (Act 108 of 1997).
- Conservation of Agricultural Resources Act (Act 43 of 1983).
- Occupational Health and Safety Act (Act 85 of 1993).
- OHSA Regulations for Hazardous Chemical Substances (GN 1179 of August 1995).
- Hazardous Substances Act No. 15 of 1973.
- National Veld and Forest Fire Act (Act 101 of 1998).

These pieces of legislation have general applicability to the proposed activity, and it is the Applicant's responsibility to ensure that all contractors and employees are aware of their obligations in terms of these Acts. This EMPr does not detract from any other legal requirements.

It is the Applicant's responsibility to ensure that all contractors and employees are aware of their obligations in terms of these Acts. This EMP does not detract from any other legal requirements.

8. Scope of this EMPr

This EMPr describes the measures that must be implemented in order to avoid, minimise, manage and monitor the potential environmental impacts of the development, during all phases of the project life cycle, namely:

- Planning and Design Phase
- Pre-construction Phase
- Construction Phase
- Post-Construction Rehabilitation
- Operational Phase

General environmental management measures that must be applied throughout the project lifecycle (as and where applicable) are described in Chapter 9 below. Additional management measures that must be implemented to address specific impacts that may arise during each phase are provided in **Chapters 9-12** of this EMPr.

9. General Environmental Management

The following general management measures are intended to protect environmental resources from pollution and degradation during all phases of the project life cycle. These measures should be implemented as and where applicable, reasonable and practicable during the pre-construction, construction and post-construction rehabilitation and operational (maintenance) phases of the proposed development.

Code of Conduct
The purpose of the Code of Conduct (CoC) is to minimise the impact of the activities associated with the construction phase on the environment. The rules and regulations prescribed in this CoC are intended to ensure that the impacts on the environment are not prejudiced by the construction activities. Failure to adhere to or any breach of this CoC will result in a fine being levied against the offending or defaulting party / individual.

Labourers during the construction phase should conserve the natural environment, endorsing the principles of sustainable use and minimum impact. They should also be sensitive to the impact of their operation on the environment within which they work and minimise any adverse impacts.

This EMPr forms an integral part of the activities during the construction phase and as such, is legally enforceable. In addition to the restrictions and controls provided for in this EMPr, the environmental controls comprise the following:

Engineers
- Unless otherwise stated by the holder, only a registered engineer must be appointed for the construction phase of the development.
- The engineer shall provide work or services of a quality and scope, and to a level, which are commensurate with accepted standards and practices.
- The engineer shall be impartial in decision-making, provision of advice and judgement.

Contractors and sub-contractors
- Unless otherwise determined, only appropriately registered contractors shall be appointed.
- It shall be the responsibility of the holder / engineer to ensure that the contractors abide by and comply with the rules and regulations of the Code of Conduct.
- Contractors shall at all times be responsible for their sub-contractors and employees whilst they are on the development property.

Rules and Regulations
It is of vital importance that engineers and contractors understand and acknowledge that they are working on an environmentally sensitive development and agree to conform to all environmental controls specified in this EMPr and any additional input by the ECO.

In addition to the EMPr, the environmental controls comprise the following:

- **Building Plan Controls**
    - A copy of the approved and signed building plans must be available on site during the construction phase of the development.
    - Variations of the building plans must be approved by the engineer / holder prior to being implemented.
    - Prior to commencing building, the contractor must remove all topsoil and store it in a berm of not more the 2m high, away from construction activities.

- **Site tidiness**
    - The contractor must keep the appearance of his building site neat and tidy at all times. Building rubble must be removed from site at regular intervals, and litter must be removed from the site on a daily basis. Refuse drums must be available on site which waste can be placed in. The drums must be emptied on a regular basis and the waste taken to a licenced local waste disposal facility.
- **Safety**
    - The contractor shall comply with the Health and Safety Act (Act No. 85 of 1993), as amended, together with such regulations promulgated thereunder.

9.1 Site access and traffic management

Access to the development is proposed along Sorgfontein Road, at the existing entrance to Mobicast.

All construction vehicles need to adhere to traffic laws and regulations. The speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. As far as possible, care should be taken to ensure that the local traffic flow pattern is not significantly disrupted and vehicle operators therefore need to be educated in terms of "best-practice" operation in order to minimise unnecessary traffic congestion or dangers. These practices include, but are not limited to, not unnecessarily obstructing the access point or traffic lanes used to access the site; considering the load carrying capacity of road surfaces and adhering to all other prescriptive regulations regarding the use of public roads by construction vehicles. Delivery trucks should be appropriately covered to deter the spilling of material along the route to the site.

Adequate signage that is both informative and cautionary to passing traffic (motorists and pedestrians) warning them of the construction activities should be implemented. Signage would need to be clearly visible and include, amongst others, the following:

- Identifying working area as a construction site;
- Cautioning against relevant construction activities;
- Prohibiting access to construction site;
- Clearly specifying possible detour routes and / or delay periods;
- Possible indications of time frames attached to the construction activities, and;
- Listings of which contractors are working on the site.

Other mitigation measures include:

- No construction to take place over or during the December holiday period without prior permission from the relevant authorities.
- ECO to do awareness training with the contractor and labourers and to highlight the traffic related risks before construction commences.
- Ensure appropriate behaviour of operators of construction vehicles.

9.2 Site demarcation

The working areas should be clearly demarcated on site during the pre-construction or construction phases of the development, as appropriate.

9.2.1 Construction working area

Prior to the commencement of any land-clearing or construction activities, the outer boundary of the development area must be surveyed and pegged. If practical, the demarcation boundary should typically allow a working area of no more than 2.5m around the development footprint unless otherwise agreed with the ECO. This demarcation boundary is to ensure that land clearing and construction activities are restricted to only that area strictly required for the proposed development, and to prevent unnecessary disturbance of soil surfaces and vegetation outside of the development footprint.

If desired or deemed necessary by the ECO, the outer boundary of the working area can be enclosed with orange barrier netting fencing, shade netting, droppers & wire/ danger tape, or similar – as feasible and practical. The fencing should be retained and maintained for the duration of the construction period, and should not be moved during construction unless agreed otherwise with the ECO.

9.2.2 No-go areas

Prior to the commencement of any land-clearing or construction activities, sensitive areas which must not be disturbed during development must be demarcated as "no-go" areas, under guidance from the appointed ECO. All areas outside of the demarcated working area and the access road should be regarded as no-go areas. In particular, the adjacent CBA vegetated area located on the eastern boundary of the site.

It may not be necessary to formally demarcate, sign-post or fence off all the no-go areas, as this would not be practical in some of the circumstances. However, all construction workers must be informed that no-go areas must be protected from disturbance and are off-limits to all construction workers, vehicles and machinery during all phases of the development. No vegetation may be cleared from within the no-go areas, and no dumping of any material (waste, topsoil, subsoil etc.) may occur in these areas. The construction contractor must enforce this.

9.2.3 Demarcation of the site camp

The area chosen for the site camp and associated facilities must be the minimum area reasonably required to accommodate the site camp facilities, and which will involve the least disturbance to the environment. It is recommended that easily accessible, transformed areas must be used for the site camp, at least 100m away from any no-go areas. Site selection must be done in consultation with the ECO.

9.3 Site camp and associated facilities

The following general management measures pertaining to the set-up, operation and closure of a site camp should be applied where appropriate, reasonable and practicable:

9.3.1 Fencing & Security

The site camp area must be secured to prevent any un-authorised individuals from entering the site camp and possibly getting injured or posing a safety and/or security risk. Adequate signage must be displayed, designating the site office / camp as a restricted area to non-personnel. If required, the site camp and associated areas may be fenced off along the demarcated boundaries of these areas, preferably with 2m high fence and shade netting or similar.

9.3.2 Fire Fighting Equipment

No less than 2 fire extinguishers must be present in the site camp. The extinguishers must be in a working condition and within their service period. A fire extinguisher must always be present wherever any "hot works" (e.g. welding, grinding etc.) are taking place. It is recommended that all construction workers receive basic training in fire prevention and basic fire-fighting techniques, and are informed of the emergency procedure to follow in the event of accidental fires. No open fires may be made on the

construction site during any phase of the project. Construction workers may make small contained fires (e.g. for warming or cooking purposes), within the site camp provided the small fire is encircled by a corrugated iron structure, drum or similar, to prevent wind-blown cinders from causing fires elsewhere. Such fires may not be left unattended and must be thoroughly extinguished after use. No smoking must be allowed on the construction site. In the case of accidental fires the contractor must (if required) alert the Local Authority's Fire Department as soon as a fire starts prior to the fire becoming uncontrollable.

9.3.3 Waste Storage Area

Sufficient bins for the temporary storage of construction related waste must be provided inside the site camp and/or at the working area. Sufficient signage and awareness should be created to ensure that these bins are properly used.

9.3.4 Hazardous Substances Storage Area

Fuels, chemicals, lubricants and other hazardous substances must be stored in a demarcated, secured and clearly sign-posted area within the site camp away from the watercourses on site. Sufficient signage and awareness should be created to ensure that these bins are properly used.

9.3.5 Potable Water

An adequate supply of potable water must be provided to construction workers at the site camp.

9.3.6 Ablution Facilities

Chemical toilets should be kept at the site camp, on a level surface and secured from blowing over and located in such a way that the toilets will not cause any form of pollution. As per the SANS10400 requirement, one ablution facility for every 8 male workers and 2 ablution facilities for every 8 female workers will be provided.

Chemical toilets should be kept at the site camp, on a level surface and secured from blowing over. The chemical toilets must be regularly emptied and the waste disposed of at an appropriate waste water disposal/ treatment site. The ablution facilities must not be linked to the river system in any way. Toilets must be serviced regularly and kept in an orderly state. The contractor must ensure that no spillage occurs when the toilets are cleaned, serviced or moved. Performing ablutions outside of the provided toilet facilities is strictly prohibited and the ECO would need to regularly inspect the state of the chemical toilets to ensure compliance.

9.3.7 Eating Area & Rest Area

A dedicated area within which construction workers can rest and eat during breaks must be provided within the site camp. Seating and shade should be provided.

9.3.8 Vehicle & Equipment Maintenance Yard

Where possible, construction vehicles and equipment that require repair must be removed from site and taken to a workshop for servicing. If emergency repairs and/or basic maintenance of construction vehicles or equipment are necessary on site, such repair work must be undertaken within the designated maintenance yard area away from any watercourses. Repairs must be conducted on an impermeable surface, and/or a tarpaulin and/or drip trays must be laid down prior to emergency repairs taking place, in order to prevent any fuel, oil, lubricant or other spillages from contaminating the surrounding environment.

9.3.9 House-keeping

The site camp and related site camp facilities must be kept neat and orderly at all times, in order to prevent potential safety risks and to reduce the visual impact of the site during construction.

9.4 Topsoil and subsoil management

It is recommended that topsoil be removed from any area where physical disturbance of the surface will occur, including within the footprint of the development site (working area) and possibly within the site camp, ablution area, vehicle maintenance yard, refuelling area and temporary waste storage area. Topsoil removal and stockpiling must be undertaken only after consultation with the ECO.

- Removed topsoil and subsoil must be stockpiled for the duration of the active construction period, and utilised for the final landscaping and rehabilitation of disturbed areas on site.
- The removed topsoil must be stockpiled in a berm, in a demarcated area as agreed with the ECO.
- The topsoil berm may be a few meters wide but must ideally not be more than 2m high to allow light and air penetration.
- Removed subsoil must be stockpiled separately from topsoil.
- The topsoil & subsoil storage area must be located on a level area outside of any surface drainage channels outside the riparian zone, and at a location where it can be protected from disturbance and river flow/floods during construction and where it will not interfere with construction activities.
- Topsoil and subsoil stockpiles must be adequately protected from being blown away or eroded by storm water. If necessary, shade cloth or other suitable measures must be used to stabilise and protect the stockpile from wind/water erosion. Topsoil stockpiles must not be covered with tarpaulin, as this may smother and decrease the virility of topsoil.
- Handling of topsoil must be minimised as much as possible, and the location of the topsoil berm must be chosen carefully to avoid needing to relocate the topsoil berm at a later date.
- Ideally, topsoil is to be handled twice only, once to strip and stockpile, and once to replace, level, shape and scarify.
- Stockpiles must not be located within 50 metres of watercourses. The furthest threshold must be adhered to.
- If soil stockpiles will be stored for an extended period of time, the stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding, (or application of herbicides if agreed with the ECO).
- Soil material that will not be re-utilised on site may be removed from site and taken to an appropriate site for re-use or disposal.
- Topsoil removed from fynbos areas to be reused in rehabilitation areas, e.g. open space areas. Where possible, topsoil from fynbos areas, containing indigenous plant seeds, should be transferred immediately to rehabilitation areas rather than being stockpiled, as stockpiling kills important fungi, microbes, seeds and soil fauna. Topsoil stockpiles of this kind must not exceed 0.5 m in height and must not be compacted.
- Note that the topsoil must be the final layer applied to a rehabilitated/ re-landscaped site, after subsoil/ spoil material has been placed and shaped on the site.

9.5 Integrated waste management approach

It is recommended that an integrated waste management system is adopted on site. The system must be based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Weather and animal proof waste bins for the different categories of recyclable waste (i.e. paper, plastic, metal). These bins must be emptied and the waste taken to a registered recycling facility. The receipts from the facility must be kept on file and must be available on request.

The non-recyclable and non-reusable waste (e.g. builder's rubble, etc.) generated on site must be stored in animal and weather proof bins and disposed of at a landfill site licensed in terms of the applicable legislation. The receipts from the facility must be kept on file and must be available on request.

9.6 Hazardous substances and fuels

If hazardous substances and fuels such as diesel, oil, lubricant, detergents etc. are to be stored on site for construction purposes, a designated area must be set aside for this within the site camp.

- All hazardous substances must be stored in the designated area within the site camp in animal and weather proof bins/ storage units.
- The area selected for storage of hazardous fuels must be located on a level area, at least 100m from any water courses, water bodies or surface drainage channels.
- The designated area must be clearly demarcated and secured by use of fencing and/or cages, to prevent access by un-authorised persons and/or animals.
- Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste.
- Access to the hazardous material storage area must be restricted to authorised personnel only and must be treated as a no-go zone to unauthorised personnel.
- Appropriate hazard signage indicating the nature of the stored materials shall be prominently displayed at the storage area.
- Spoil or waste material should not be dumped within 50 m of natural areas, it should be discarded at a licensed dump site.
- Those persons tasked with handling any hazardous substances must be equipped with the knowledge, equipment and safety gear necessary to handle the substance/s safely.
- Material Safety Data Sheets (MSDSs) must be available on site for all hazardous chemicals and hazardous substances to be used on site. Where possible and available, MSDSs must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.
- Storage vessels of hazardous substances must be situated in an impermeable bunded area large enough to accommodate at least 110% of the capacity of the vessel in question. If plastic sheeting is used to line the bunded area, care must be taken to ensure it is not punctured in any way during the course of the construction period.
- All waste, hazardous as well as general, which result from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF).
- Fuel tanks must ideally be elevated so that leaks can easily be detected.
- No smoking may be permitted at or surrounding the area where fuels and hazardous substances are stored.
- Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks.
- Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips.
- Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage.
- Firefighting equipment must be located in close proximity to the storage area.

9.7 Cement and concrete batching

Cement and concrete batching will be permitted on site, but may only take place on designated impermeable, bunded surfaces, as agreed with the ECO.

- Cement/ concrete may not be mixed on bare ground.
- The impermeable/ bunded area must be established in such a way that cement slurry, runoff and cement water will be contained and will not flow into the surrounding environment, the river/ riparian zone or contaminate the soil.

- Cement run-off and excess cement slurry must be collected in the designated impermeable area, allowed to dry and then disposed of at an appropriate facility. Alternately, the contaminated water can be collected in sealed tanks and transported to an appropriate disposal site.
- Unused cement bags must be stored in such a way that they will be protected from rain.
- Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location.
- Empty cement bags must be disposed of in the hazardous waste bins on site.

9.8 Erosion control and stormwater management

Appropriate measures must be implemented to control the flow of stormwater across the construction site, in order to prevent possible flooding, soil loss and dispersion of pollutants. All exposed earth surfaces must also be protected from wind and water erosion during the construction and operational phases.

The scale and nature of the erosion and stormwater control measures implemented on site must be appropriate to the conditions on site, and sufficient to achieve the desired outcomes (soil preservation, prevention of flooding, stormwater control) to the satisfaction of the ECO and consulting engineer.

- **Small-scale control measures:** This may include the use of shade netting, geo-fabric or similar barriers in areas susceptible to erosion and on exposed slopes or stockpiles. The netting/fabric is placed directly across the path of flow of storm water. Poles and logs, staked in along the contours of a slope susceptible to erosion may also be used.
- **Medium-scale control measures:** This may entail the establishment of small berms and benches cut into affected slopes, as well as the placement of poles and logs along the contours of the slope. Berms can be created to divert storm water run-off into surrounding vegetated areas, rather than flowing directly onto exposed work area.
- **Large-scale control measures:** This may entail the establishment of temporary (or permanent) retention pond and large berms (unlikely to be required).

The following general storm water and erosion control measures are applicable, regardless of the scale of the control measures required on site:

- Effective storm water management should be achieved via an integrated system, and not a collection of ad hoc interventions.
- Existing storm water infrastructure at the site should be used as far as possible.
- The diversion of established flow routes should be avoided where ever possible.
- Removal of existing grass cover on site should be limited to only that strictly required to accommodate activities on site.
- Stripped areas should not remain uncovered for extended periods of time.

The storm water management plan compiled for the preferred site must be adequately implemented for the proposed development.

9.9 Excavations and Earthworks

Any major earthworks with bulldozers and heavy machinery must be under constant supervision and operators are to be aware of all the environmental obligations, as there is always the potential to inflict damage to the sensitive areas. Any unnecessary or excessive heavy machinery movement must be kept to a minimum i.e. only what is absolutely necessary. Areas to be excavated must be clearly demarcated. Areas, which have already been excavated and entail fairly significant earthworks, must be similarly demarcated to avoid the spreading of construction activities into more sensitive areas.

All excavated material must be stored on a flat surface away from any drainage line or area susceptible to erosion. The location must be decided upon in consultation with the ECO. Stored material must be

protected from wind and water erosion and this may entail covering the material with suitable shade cloth material or similar (if and when necessary). The shade cloth may need to be weighed down in such a manner that any stream flow is directed away from the stockpile, reducing the risk of erosion.

In the event that any heritage resources (human remains, grave stones, stone tools, artefacts, old coins and pottery, fossil shell middens, rock art and engravings, remains of old built structures etc.) are encountered during construction, the finding should be protected from further disturbance (ideally left in situ) and the ECO and relevant Heritage Authority should be notified. The finding should be handled and/or removed from site as per instructions issued by the Heritage Authority or delegated heritage specialist.

9.10 Heritage Resources

Should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities, all works must be stopped immediately and Heritage Western Cape must be notified without delay.

Heritage Western Cape:
T: 021 483 5059
E: hwc.hwc@westerncape.gov.za

9.11 Site closure and rehabilitation

Upon completion of the construction phase, all disturbed areas, including the working area (disturbance corridor), temporary access road, and all areas utilised for the site camp and associated site camp facilities will require rehabilitation as follows:

- On completion of the construction operations, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material.
- All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities must be scarified or ripped to improve filtration and reduce run-off.
- Alien plants must be removed from the site as per NEMBA requirements.
- A suitable weed management strategy to be implemented in construction and operation phases to eradicate and control regeneration.
- All demarcation fencing, including all droppers, wires, netting and barrier tape must be removed from site and taken to an appropriate site for re-use or disposal.
- Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO. Any soil contaminated with hydrocarbons (oil, fuel, etc) or other hazardous substance must be collected and disposed of as hazardous waste to a licenced disposal facility.
- All construction waste is to be removed from the site and disposed of at an appropriate facility. Burying or burning of waste or rubble on site is strictly prohibited.
- Topsoil that was removed and stockpiled before construction, must be replaced by spreading it evenly over the areas from which it was removed. This topsoil (and the seedbank it contains) will facilitate the re-vegetation of the site, where required.
- Disturbed areas, especially areas where excavations have taken place, must be shaped as appropriate (original topography must be restored where possible), and covered with a layer of stockpiled topsoil as soon as possible.
- Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and disposed of at an appropriate disposal site.
- Final landscaping and rehabilitation of the site must be done to the satisfaction of the ECO, and must adhere to all conditions/ requirements of the Environmental Authorisation.

- Erosion features that have developed due to construction within the aquatic habitat due to the project are required to be stabilised. This may also include the need to deactivate any erosion headcuts/rills/gullies that may have developed.

10. Environmental Impact Management: Planning and Design Phase

No direct environmental impacts are associated with the planning and design phase. However, poor planning or inappropriate design decisions in this phase may result in environmental impacts arising during subsequent phases of the project.

Planning and design activities must therefore take into account the environmental constraints and opportunities identified during the Environmental Impact Assessment process, in order to avoid or minimise the potential future impacts of the development. Proper planning is also essential to ensure that adequate provision is made to implement the environmental requirements of this EMPr, and to ensure that the development is compliant with an additional conditions which may be included in the Environmental Authorisation.

The environmental management objectives (goals) during this phase are to:

- Appoint an Environmental Control Officer.
- Complete the detailed design of the structures and detailed site layout plan.
- Update the EMPr (if necessary).

These environmental management objectives, as well as the management actions that must be implemented in order to achieve the desired objective and avoid/minimise potential impacts are discussed in more detail below.

10.1 OBJECTIVE 1: APPOINTMENT OF AN ENVIRONMENTAL CONTROL OFFICER

***Impact Management Objective:* To appoint a suitably qualified and experienced Environmental Control Officer.**		
Potential impact to avoid	Failure to appoint an ECO will result in non-compliance with the requirements of the EMPr.	
Impact Management Outcome	The requirements of the EMPr are implemented and monitored during all phases of the development, which will promote sound environmental management on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• A suitably qualified and experienced Environmental Control Officer must be appointed before any activities commence on site. • The appointed ECO must adhere to the requirements stated in Chapter 15 and any other requirements specified in the Environmental Authorisation. • The appointed ECO must be advised of the construction start date, before any activities commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training of construction workers.	Rooikat Recycling	During design phase

Performance Indicator	A qualified ECO is appointed prior to the commencement of any construction activities (including pre-construction set-up activities) on site.

10.2 OBJECTIVE 2: DETAILED DESIGN AND SITE LAYOUT PLAN

***Impact Management Objective:* To compile a detailed design and site layout plan that adheres to the recommendations of the EIA Report and any additional conditions which may be included in the Environmental Authorisation.**			
Potential impact to avoid	Substantial deviation from the conceptual layout plan may result in: • Non-compliance with the Environmental Authorisation during construction. • Triggering of additional listed activities not authorised in the Environmental Authorisation. • An increase in the severity of the impacts identified and assessed in the EIA or may result in new impacts not previously assessed and not provided for in the EMPr, resulting in environmental degradation.		
Impact Management Outcome	Development is compliant with recommendations of the EIA and the EMPr.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
• The final detailed design & layout must adhere to the conceptual layout assessed in the Environmental Impact Assessment (EIA) process. • The final detailed design & layout must adhere to any conditions of the Environmental Authorisation (EA). • If the final detailed design differs significantly from that assessed during the EIA, the revised layout must be assessed by an Environmental Consultant and the received EA must be amended by the Competent Authority before proceeding. • Interested & Affected Parties may need to be provided with an opportunity to comment on any proposed amendment to the EA depending on the significance of the changes.		Rooikat Recycling / Consulting Engineer	During design phase
Performance Indicator	Detailed designs and site layout plans that adhere to the conditions of the EA and EMPr are finalised prior to the commencement of construction.		

11. Environmental Impact Management: Pre-construction Phase

Proper set-up during the pre-construction phase can set the foundation for good environmental management during the active construction phase to follow, and can avoid potential impacts from arising at a later date.

The Impact Management Objectives for this phase of the project relate to:

- Demarcation of no-go areas and working areas.
- Establishment of site camp and associated site facilities.
- Pre-construction ECO visit.
- Traffic Management

11.1 OBJECTIVE 1: IDENTIFY & DEMARCATE NO-GO AND WORKING AREAS

Impact Management Objective: ***Identify and demarcate no-go areas, working areas and site facilities.***			
Potential impact to avoid	• No-Go areas include CBA are to the east to remain natural. • Insensitive location of working areas and site facilities may result in environmental impacts during the construction phase. • Failure to accurately demarcate working areas may result in an increased disturbance footprint. • Failure to demarcate no-go areas may result in disturbances to these areas during construction.		
Impact Management Outcome	Future construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
• The environmentally sensitive areas must be identified and be designated as no-go areas. • Demarcation of working area and no-go areas must be done in accordance with Section 8.2 of this EMPr. • Site camp facilities must be situated as far away from the No-Go areas as possible.		Contractor	Pre-construction phase (prior to arrival of construction equipment, machinery, or workers on site)
Performance Indicator	No-go areas, working areas and areas for site camp facilities have been identified and appropriately demarcated to the satisfaction of the ECO, before construction activities commences on site.		

11.2 OBJECTIVE 2: ESTABLISH ENVIRONMENTALLY SENSITIVE SITE CAMP & SITE FACILITES

Impact Management Objective: ***To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.***		
Potential impact to avoid	• Inappropriate siting of site camp facilities may result in impacts to sensitive resources • Failure to properly demarcate and set up site facilities may result in disorganised construction activities and unnecessary disturbance to the site. • Failure to provide the necessary site facilities and/or failure to equip these facilities with the necessary equipment/materials may impede good environmental management & compromise ability to respond to emergencies.	
Impact Management Outcome	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The site camp and site facilities described in Section 8.3 of this EMPr must be provided on site. • The site camp and associated site facilities must be set-up and managed in accordance with the general environmental management measures specified in Chapter 8 of this EMPr. • The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • The contractor shall plan his activities so that materials excavated, in so far as possible, can be transported direct to and placed at the point where it is to be used. • Top soil and other top material such as boulders must be stored at a stockpile location agreed to by the ECO. Ensure the stock pile does not exceed the maximum height agreed upon.	Contractor / Developer	Pre-construction phase (prior to start of construction activities)
Performance Indicator	Appropriate, well organised and properly equipped site facilities are available on site prior to commencement of construction activities. The location and set up of the facilities does not impact on the natural resources.	

11.3 OBJECTIVE 3: PRE-CONSTRUCTION ECO INSPECTION

It is essential that the appointed ECO be advised of the intended construction start date before construction activities commence on site, in order for the ECO to conduct an initial site inspection to assess the pre-commencement condition of the site. The ECO can also advise on the appropriate siting and demarcation of the site facilities, and the identification and demarcation of the no-go areas. The ECO may also conduct the first round of environmental awareness training at this stage, if the construction workers are present on site.

Impact Management Objective: ***Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site.***	
Potential impact to avoid	• Failure to appoint ECO or to notify ECO of commencement prior to commencement may result in non-compliance with the EA.

	• If a pre-commencement ECO inspection is not performed, the Construction Contractor may be held liable for environmental degradation that took place prior to the Contractor commencing work on site. • Failure to demarcate the NO-GO zones prior to activities commencing, could result in removal and damage to sensitive areas as a result of vehicle and pedestrian movement		
Impact Management Outcome	• Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases. • Site facilities are appropriately located on site. • Construction workers receive environmental awareness training before commencing work on site.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
• The appointed ECO must be advised of the construction start date, before any activities commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training of construction workers.		Contractor / Applicant	Start of construction phase
Performance Indicator	A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site. The site camp is appropriately located and the NO-GO areas are appropriately demarcated.		

11.4 OBJECTIVE 3: TRAFFIC MANAGEMENT & ROAD SAFETY

Impact Management Objective: ***To have minimal impact to other road users, including pedestrian and vehicular traffic when transporting construction equipment, machinery, materials & workers to site.***			
Potential impact to avoid	• Increase in volumes of vehicles and construction machinery entering & exiting the site may impact other road users especially at the entrance to the site off Sorgfontein Road which carries a moderate volume of foot- and vehicle-traffic.		
Impact Management Outcome	Other road users are not significantly impacted by the movement of construction vehicles, equipment, machinery or workers to/from the site.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
• All construction vehicles must adhere to traffic laws when travelling to and from the site. • All drivers and machinery operators must be sensitised to the fact that they are working in an area with a potentially high volume of foot and vehicle traffic, and must exercise due caution when entering/ exiting the site. • The contractor must ensure that existing traffic flow is accommodated, so as to cause as little disruption/ congestion as possible • Appropriate signage should be erected to warn other road users about the presence of construction vehicles, particularly at the point where construction vehicles enter/ exit the site. • If needed, appropriate traffic management measures and/ or points men (traffic marshals) should be utilised to assist vehicles entering/ exiting the site, particularly where vehicles must cross the path of oncoming traffic. • Speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. • Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles. • The Contractor must ensure that any large or abnormal loads (including hazardous materials) that must be transported to/ from the site are routed appropriately, and that appropriate safety precautions are taken during transport to prevent road accidents. • Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times. • Where possible, heavy machinery should be parked at the site overnight, within a secure demarcated area, instead of moving the machinery to and from the site each day.		Contractor	Ongoing during site set-up, construction and site closure phases.
Performance Indicator	• Other road users are not significantly impacted by the movement of construction vehicles, equipment, machinery or workers to/from the site.		

	• No complaints regarding traffic are received. • Construction vehicles are not involved in any traffic incidents (of their causing) in the vicinity of the site. The site camp is appropriately located and the NO-GO areas are appropriately demarcated.

12. Environmental Impact Management: Construction Phase

A number of potential environmental impacts may arise during the construction phase of the development. These impacts have been identified and assessed during the Environmental Impact Assessment process. Environmental Management objectives and actions that will prevent the identified potential impacts from arising – or where avoidance is not possible, that will minimise and mitigate the impacts – are provided in this section.

The environmental management actions and mitigation measures prescribed in this section must be implemented throughout the construction phase, and must be implemented in conjunction with the general management measures specified in Chapter 8 of this EMPr, as well as any other conditions which may be stated in the Environmental Authorisation. The Environmental Control Officer must monitor and enforce the implementation of the relevant environmental management measures, and may provide guidance on the implementation of these environmental management measures as and when required.

The environmental management objectives (goals) for the Construction phase are:

- Prevent soil erosion
- Prevent pollution and contamination
- Job creation
- Noise impact management
- Visual impact management
- Dust impact management
- Traffic & Safety management
- Fire risk management

The environmental management actions that must be implemented in order to achieve the desired objectives and avoid/minimise potential impacts are discussed in more detail in the sections below.

12.1 OBJECTIVE 1: PREVENT SOIL EROSION

Impact Management Objective: ***To prevent soil loss on site and prevent increased turbidity / sediment load in watercourses.***	
Potential impact to avoid	• Areas disturbed and/or cleared of vegetation (work corridor) during construction may be vulnerable to increased water and wind erosion. • Stockpiles of soil (topsoil/subsoil) at the site may be vulnerable to wind/water erosion.

Impact Management Outcome	Soil erosion at the water courses are kept to a minimum and the aquatic systems are not impacted significantly as a result of soil erosion.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Designated areas for stockpiling of raw materials must be identified before material is brought onto site. No stockpiling is to occur on or near slopes. All stockpiling areas must be approved by the ECO before stockpiling occurs. • Stockpiles must not be located within 50 metres of watercourses. The furthest threshold must be adhered to. • Stockpiles should not be placed in vegetated areas that will not be cleared. • It is advised that an Environmental Control Officer visit the construction site before construction occurs within any of the watercourses and possibly during construction within the watercourses. • Soil surfaces must not be left open for lengthy periods to prevent erosion. • The working area and site camp must be clearly demarcated during the pre-construction phase. Land clearing and construction activities must be restricted to within the demarcated working area to prevent unnecessary disturbance, exposure or compacting of surrounding areas. • Only the area required to accommodate construction activities within the working area should be cleared of surface covering. Unnecessary clearing/ disturbance of land and exposure of soil must be avoided. • Land clearing, earth moving and construction activities should not take place during heavy rains, or windy conditions. • Cleared areas and any other area susceptible to erosion should be provided with a suitable cover and stabilised as soon as possible via the implementation of appropriate erosion control measures. This may include use of cut-off drains, temporary/permanent drainage channels, brush-packing, mulching, planting or sodding, use of environmentally benign soil binders, use of geo-textile or other coverings. The appropriate measures should be selected by the contractor in consultation with the Engineer & ECO. • Stockpiles of topsoil & spoil material must be protected from wind & water erosion. • Stockpiles of earth material may not be located within any storm-water drainage pathways and must be outside of the reach of potential flood waters. • Any erosion runnels/ gulleys/ channels that form on site must be infilled with appropriate material, compacted, rehabilitated as needed and appropriate erosion control measures put in place to prevent recurrent erosion at that site. Rehabilitation of erosion channels should be ongoing during the construction phase and not left until the end of the construction period.	Contractor	Construction phase

Performance Indicator	Surrounding areas are not significantly impacted as a result of soil erosion.

12.2 OBJECTIVE 2: PREVENT POLLUTION AND CONTAMINATION

***Impact Management Objective:* To prevent environmental pollution and contamination of soil and water resources**		
Potential impact to avoid	• Fuel, oil, lubricants and other pollutants may leak from vehicles/ machinery and contaminate the soil. Pollution and soil contamination could also occur from chemical toilets, cement mixing directly on the soil and stormwater runoff may flow over the site camp area and carry contaminants off-site. • Improper disposal or re-use of waste generated during construction may result in environmental contamination/ pollution. • Improper storage of hazardous waste may result in environmental contamination / pollution. • Cement batching may take place on site. Cement water/ slurry are highly alkaline and may negatively impact soil quality.	
Impact Management Outcome	The environment (including soil, surface water and groundwater) is not contaminated.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
General management measures relating to the management of waste and hazardous substances stated in Chapter 9 of this EMP must be implemented as and where applicable In addition: **General Pollution Management:** • No pollution of surface water or ground water resources may occur due to any activity on the site. • No storm water runoff from any premises containing waste, or water containing waste emanating from construction activities may be discharged into the environment. Polluted stormwater must be contained on the site. • Cement batching / mixing may not take place directly on the soil surface, it must be done on an impervious lining that will prevent cement particles from contaminating the soil. **General Waste Management:** • Dedicated waste bins or skips must be provided on site and kept in a demarcated area on an impermeable surface. • Separate waste bins/skips must be provided for recyclable waste, general waste and hazardous waste. Recovered builder's rubble & green waste may be stockpiled on the ground within the site camp, or in separate skips until removal. • Waste must be placed in the appropriate waste bins/skips/ stockpiles.	Contractor	Construction phase

• Hazardous waste bins must be kept on an impermeable bunded surface capable of holding at least 110% of the volume of the bins. • Skips/ bins must be provided with secure lids or covering that will prevent scavenging and windblown waste or dust. • Waste bins/skips must be regularly emptied and must not be allowed to overflow. • Construction workers must be instructed not to litter and to place all waste in the appropriate waste bins provided on site. • The Contractor must ensure that all workers on site are familiar with the correct waste disposal procedures to be followed. • Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN No. R. 634 of August 2013). • Disposal of waste to landfill must be undertaken in accordance with the National Environmental Management: Waste Act – National Norms and Standard for the Assessment of Waste for Landfill Disposal (GN No. R. 635 of August 2013). • All waste, hazardous as well as general, resulting from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF). **Pollution Management – hydrocarbons (oil, fuel etc.)** • Vehicles and machinery must be in good working order and must be regularly inspected for leaks. • If a vehicle or machinery is leaking pollutants it must, as soon as possible, be taken to an appropriate location for repair. The ECO has the authority to request that any vehicle or piece of equipment that is contaminating the environment be removed from the site until it has been satisfactorily repaired. • Repairs to vehicles/ machinery may take place on site, within a designated maintenance area at the site camp. Drip trays, tarpaulin or other impermeable layer must be laid down prior to undertaking repairs. • Refuelling of vehicles/ machinery may only take place at the site camp or vehicle maintenance yard. Where refuelling must occur, drip trays should be utilised to catch potential spills/ drips. • Drip trays must be utilised during decanting of hazardous substances and when refilling chemical/ fuel storage tanks. • Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant, or where there is risk of leakage/spillage. • Where feasible, fuel tanks should be elevated so that leaks are easily detected.		

• A spill kit to neutralise/treat spills of fuel/ oil/ lubricants must be available on site, and workers must be educated on how to utilise the spill kit. • Soil contaminated by hazardous substances must be excavated and disposed of as hazardous waste. • Spoil or waste material should not be dumped within 50 m of natural areas, it should be discareded at a licensed dump site. **Pollution Management – Ablution facilities** • Chemical toilets must be kept at the site camp, on a level surface and secured from blowing over. • Toilets must be located well outside of any storm water drainage lines ,and may not be linked to the storm water drainage system in any way. • Chemical toilets must be regularly emptied and the waste disposed of at an appropriate waste water disposal/ treatment site. Care must be taken to prevent spillages when moving or servicing chemical toilets. **Pollution Management – Hazardous Substances** • Any hazardous substances (materials, fuels, other chemicals etc.) that may be required on site must be stored according to the manufacturers' product-storage requirements, which may include a covered, waterproof bunded housing structure. • Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases. • Hazardous chemicals and fuels should be stored on bunded, impermeable surfaces with sufficient capacity to hold at least 110% of the capacity of the storage tanks. **Cement Batching** • Cement batching must take place on an impermeable surface large enough to retain any slurry or cement water run-off. If necessary, plastic/ bidem lined detention ponds (or similar) should be constructed to catch the run-off from batching areas. Once the water content of the cement water/ slurry has evaporated the dried cement should be scraped out of the detention pond and disposed of at an appropriate disposal facility authorised to deal with such waste • Cement batching should take place on already transformed areas within the footprint of the facility.		

• Unused cement bags must be stored in such a way that they will be protected from rain. Empty cement bags must not be left lying on the ground and must be disposed of in the appropriate waste bin. • Washing of excess cement/concrete into the ground is not allowed. All excess concrete/ cement must be removed from site and disposed of at an appropriate location. • Construction works must preferably take place in drier months of the year when runoff from the construction site will be minimal, to limit potential dispersal of pollutants.		
Performance Indicator	• The environment is not polluted or contaminated as a result construction activities. • The environment is not polluted as a result of improper hazardous waste storage. • Spillage incidents do not lead to soil contamination. • Waste is reduced, reused and recycled where possible.	

12.3 OBJECTIVE 3: JOB CREATION

Impact Management Objective: ***To create employment opportunities with potential for skills transfer, for members of the local community.***		
Potential impact to be promoted	• A number of job opportunities will be created during the construction phase of the development. • There may be opportunities to transfer skills from more experienced workers to less experienced workers.	
Impact Management Outcome	The local community benefits from the employment opportunities created during the construction phase.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• No mitigation required for this positive benefit, however certain enhancements are recommended. • The applicant should inform local community leaders, organizations and councillors of the project and the potential job opportunities for local builders and contractors. • The Applicant in consultation with the appointed contractor/s should seek to ensure that a percentage of the labour required for the construction phase is sourced from local area in order to maximize opportunities for members from the local HD communities. • Ideally locally produced or occurring building materials will be identified and sourced.	Rooikat Recycling / Contractor	Construction phase
Performance Indicator	The majority of the construction team is from the local community, with preference given to historically disadvantaged individuals. Skills transfer from experienced to less experienced workers is actively encouraged on site.	

12.4 OBJECTIVE 4: NOISE IMPACT MANAGEMENT

Impact Management Objective: ***To control avoidable noise impacts to the surrounding areas***	
Potential impact to avoid	Avoidable noise generated during the undertaking of construction activities, which may present a nuisance to surrounding community.
Impact Management Outcome	Avoidable noise impacts are managed efficiently.

IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• A noise complaints register should be opened. • Excavations and earth-moving activities must be restricted to normal construction working hours (7:30 – 17:30) as far as possible. • Work on site must be well-planned and should proceed efficiently so as to limit the duration of the disturbance. • Vehicles and equipment must be kept in good working condition. If deemed necessary, machinery and equipment should be fitted with mufflers/ exhaust silencers. No unnecessary disturbances should be allowed to emanate from the construction site. • Workers should be educated on how to control noise-generating activities that have the potential to become disturbances, particularly over an extended period of time. • Noise levels must comply with the relevant health & safety regulations and SANS codes and should be monitored by the Health & Safety Officer as necessary and appropriate. • Affected parties must be informed of the excessive noise factors. • The noise management and monitoring measures prescribed in the EMPr must be adhered to. • The appointed Environmental Control Officer (ECO) must undertake a site inspection once per week, for the duration of the construction phase, and to produce a short monthly ECO monitoring audit report, auditing on the compliance of the property developer with the conditions of the Environmental Authorisation and the approved EMP.	Contractor	Construction phase
Performance Indicator	Noise levels on site remain within acceptable standards. No valid noise complaints are received.	

12.5 OBJECTIVE 5: VISUAL IMPACT MANAGEMENT

***Impact Management Objective:* To prevent the site from presenting an unnecessary visual impact to the surrounding public.**		
Potential impact to avoid	During construction the site may appear disturbed or disorganised and may present visual impact to observers of the site.	
Impact Management Outcome	The site does not present a significant visual impact.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Consult with the ECO when determining the appropriate site for the site camp. • The site camp must be kept neat and tidy and free of litter at all times. • Waste must be managed according to this EMPr and the mitigation measures listed above in terms of waste management. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy.	Contractor	Construction phase

• The site camp, storage facilities, stockpiles, waste bins, and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • Work on site must be well-planned and well-managed so that work proceeds quickly and efficiently, thus minimizing the disturbance time. • The site camp, storage facilities, stockpiles, waste bins, elevated tanks and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • The site camp may require visual screening via shade cloth or other suitable material. • Special attention should be given to the screening of highly reflective material. • Use of lighting (if required) should take into account surrounding residents and land users and should present little or no nuisance. Downward facing, spill-off type lighting is recommended. • Construction vehicles must enter and leave the site during working hours. • Delivery trucks should be appropriately covered to deter the spilling of material along the route to the site. • Working areas, storage facilities, stockpiles, waste bins, elevated tanks and any other temporary structures on site should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. • No clearing of land to take place outside the demarcated footprint. • No workers are allowed to be housed on the site.		
Performance Indicator	• Good "housekeeping" is evident on site. • The site does not pose a visual impact to surrounding community.	

12.6 OBJECTIVE 6: DUST IMPACT MANAGEMENT

***Impact Management Objective:* To prevent the generation of significant dust.**		
Potential impact to avoid	• Dust and wind-blown sand may arise from site during earth-moving and other construction activities. • Dust may be generated from cement batching activities. • Dust may be generated from stockpiles of earth material. • Dust may smother surrounding vegetation, and may pose a nuisance to nearby land occupants or land users.	
Impact Management Outcome	The surrounding environment, land users, residents do not experience significant dust-related impacts.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period

• Land clearing and earthmoving activities should not be undertaken during strong winds, where possible. • Cleared areas should be provided with a suitable cover as soon as possible, and not left exposed for extended periods of time. • Stockpiles of topsoil, spoil material and other material that may generate dust must be protected from wind erosion (e.g. covered with netting, tarpaulin or other appropriate measures. Note that topsoil should not be covered with tarpaulin as this may kill the seedbank). • The location of stockpiles must take into account the prevailing wind direction and should be situated so as to have the least possible dust impact to surrounding residents, road-users and other land-users. • Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution. • The speed limit should be set at 20-40km/h. • Dust must be suppressed on access roads and the construction site during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of excessive run off. • Dust suppression measures such as the wetting down of sand heaps as well as exposed areas around the site must be implemented especially on windy days. • If dust appears to be a continuous problem the option of using shade cloth to cover open areas may be necessary or the erecting of shade netting above the fenced off are may need to be explored. • All vehicles transporting sand need to have tarpaulins covering their loads which will assist in any windblown sand occurring off the trucks. • Work on site must be well-planned and should proceed efficiently so as to minimise the handling of dust generating material. • Dust levels specified in the National Dust Control Regulations (GN 827 of November 2013) may not be exceeded. i.e. dust fall in residential areas may not exceed 600mg/m2/day, measured using reference method ASTM D1739; • A Complaints Register must be available at the site office for inspection by the ECO of dust complaints that may have been received.	Contractor	Construction phase
Performance Indicator	• Excessive dust does not arise from the site. • No dust complaints are received from any member of the public. • There is no evidence that vegetation surrounding the site is being smothered by dust.	

12.7 OBJECTIVE 7: TARFFIC IMPACT MANAGEMENT

***Impact Management Objective:* To have minimal impact to other road users, existing traffic conditions, road network, including pedestrian and vehicular traffic when transporting construction equipment, machinery, materials & workers to site.**	
Potential impact to avoid	• Increase in volumes of vehicles and construction machinery entering & exiting the site may impact other road users. Entrance to the site is from Sorgfontein Road. • Construction vehicles may impact on the existing road conditions (road capacity and congestion). • Construction vehicles may impact on road safety conditions due to an increase in construction phase vehicles entering and exiting the site. • Construction vehicles may impact on the condition of the existing road network by causing damage, for example, to pavement structure/condition and edge breaks.
Impact Management Outcome	• Other road users are not significantly impacted by the movement of construction vehicles, equipment, machinery or workers to/from the site. • The safety of the other road users is not compromised as a result of construction traffic. • The condition of the existing road (Sorgfontein Road) is in the same condition after construction that is was before.

IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• Construction vehicles must adhere to the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles. • Where possible, construction traffic that may obstruct traffic flow on the surrounding roads should be scheduled for outside of peak traffic times. • Drivers of heavy construction vehicles should attend a road safety and driving course to sensitise them to the impact they have on driving conditions for other drivers on the roads. • All construction vehicles must adhere to traffic laws when travelling to and from the site. • The speed of construction vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions to other road users. • Appropriate signage must be erected to warn other road users about the presence of construction vehicles, particularly at the point where construction vehicles enter and exit the access point at the site entrance. • Any damage caused by construction vehicles to the surrounding public road network (to be monitored) must be repaired to the Roads Authority standards. • A standard operating procedure must be developed for all construction vehicle drivers to identify and report pot holes and edge breaks to the operations manager who in turn should report it to the roads authority.	Contractor	Construction phase

Performance Indicator	• No complaints regarding traffic are received. • Construction vehicles are not involved in any traffic incidents (of their causing) in the vicinity of the site. • The condition Sorgfontein Road is the same after construction as it was before.

12.8 OBJECTIVE 6: FIRE RISK MANAGEMENT

Impact Management Objective: ***To prevent unplanned fires arising on the site which may spread to surrounding land which could cause damage to infrastructure, people and the environment and to ensure appropriate firefighting equipment and processes are in place to react to fires, should a fire break out on site.***		
Potential impact to avoid	• Construction activities may lead to accidental fires on site, which may spread to surrounding land (particularly the pine tree plantation south-east of the site). • "Hot works" such as welding & angle grinding may lead to wind blow sparks that may cause fires.	
Impact Management Outcome	No unplanned, out of control fires arise on the site.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• No open fires are permitted on site. • Hot works that may generate sparks should be properly contained within the site camp area. • Fire-fighting equipment, in good working order must be available on site at all times. A fire extinguisher should be present wherever any hot works are occurring. • All staff should be given basic fire-prevention and fire-fighting awareness training, and must be made aware of the procedure to follow in the event of an accidental fire and / or an emergency. • In the event of an unplanned fire, the property developer or contractor must notify the local fire-fighting department as soon as possible and should not wait until the fire can no longer be controlled before notifying the authorities. • A fire-fighting team must be designated and appropriately trained on how to act in the case of an emergency fire.	Contractor	Construction phase
Performance Indicator	• No unplanned or out of control fires have occurred on site. • If a fire does occur it is immediately extinguished and controlled	

13. Environmental Impact Management: Post Construction Rehabilitation Phase

After all construction activities have ceased, the sites must be cleared of all construction related equipment, materials, facilities and waste. In addition all disturbed surfaces – including disturbed areas around the structures and all areas utilised for site facilities – must be stabilised, rehabilitated and provided with a suitable cover. If any damage to the existing road network has occurred (pavement damage, potholes etc) it must be fixed.

The environmental management objectives (goals) for this phase are:

- Rehabilitate & stabilise disturbed areas, and ensure environmentally sensitive closure of the construction sites.

13.1 OBJECTIVE 1: SITE CLOSURE & REHABILITION

Impact Management Objective: ***To remove all construction-related waste, materials, equipment and facilities from site; stabilise disturbed surfaces; to remediate and rehabilitate any degraded/polluted areas and to close the construction site in an environmentally sensitive manner. If any damage to the existing road network has occurred (pavement damage, potholes etc) it must be fixed.***	
Potential impact to avoid	• Failure to remove all construction related waste and materials may result in environmental pollution. • Failure to remove all construction related equipment, machinery and site facilities may pose an impact to the natural environment specifically the watercourses. • Failure to stabilise disturbed surfaces may result in soil erosion and increased storm water run-off, which may limit successful revegetation of the site. • Damage to the surrounding road network as a result of construction vehicles.
Impact Management Outcome	• The site is neat and tidy and all exposed surfaces are suitably covered/ stabilised. • There is no construction-related waste or pollution remaining on site. • All disturbed areas are adequately rehabilitated. • All damages to the surrounding road network are rehabilitated (if any occur).

IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• On completion of the construction operations, the site camp area must be cleared of all site camp facilities, ablution facilities, fencing, signage, waste and surplus material. • Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the ECO. • Any contaminated soil must be collected and disposed of as hazardous waste. • All construction waste, litter and rubble are to be removed from the site and re-used elsewhere, or recycled/disposed of at an appropriate facility. • Burying or burning of waste or rubble on site is prohibited. • All areas within the working area and site camp that have become devoid of vegetation or where soils have been compacted due to construction activities should be scarified or ripped. • Topsoil removed during the establishment of the site camp and the working area must be spread evenly over the entire site camp area and all other disturbed/ exposed areas after those areas have been ripped, scarified, shaped and contoured (as required).	Contractor / Rooikat Recycling	Rehabilitation phase

• Any topsoil, subsoil or other excavated material that cannot be utilised during site rehabilitation must be removed from the site and reused elsewhere on the property or disposed of at an appropriate disposal site. • Disturbed soils must be revegetated with the local indigenous vegetation such as that which occurs at the site ,or provided with other suitable cover. • Any damage caused by the vehicles to the surrounding public road network must be repaired to the Roads Authority Standards by the Stellenbosch Municipality.		
Performance Indicator	• All construction-related materials, equipment, facilities, waste and contaminated soils have been removed from the site. • Compacted soils have been scarified/ ripped and stabilised. • All disturbed/exposed surfaces have been provided with a suitable covering and/or stabilised. • Any damage caused to roads is repaired.	

14. Environmental Impact Management: Operational Phase

The correct and efficient operation, maintenance and monitoring of the completed facility is critical to ensure that the proposed development does not cause significant visual, traffic, noise and pollution impacts and to ensure that the positive socio-economic impacts envisaged take place.

The Applicant is responsible for environmental impact management during the operational phase of the development.

The environmental management objectives (goals) of the operational phase relate to:

- Promote Job creation
- Avoid Contamination & Pollution
- Visual impact management
- Noise impact management
- Traffic & Safety impact management
- Air emissions Impact Management

These environmental management objectives, as well as the management actions that should be implemented in order to achieve the desired objective and avoid/minimize potential impacts are discussed in more detail below.

14.1 OBJECTIVE 1: PROMOTE JOB CREATION

Impact Management Objective: ***To create employment opportunities with potential for skills transfer, for members of the local community.***	
Potential impact to avoid	• Operational job opportunities are made available to the local residents of the area. • Employment opportunities to previously disadvantaged individuals.

Impact Management Outcome	The local community benefits from the employment opportunities created during the operational phase (operation of the Pilot Depolymerisation Facility).	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• No mitigation required for this positive benefit. However preference should be given to previously disadvantaged individuals from the local community when appointing staff.	Rooikat Recycling	Operational phase
Performance Indicator	The majority of the operational phase employees are from the local community, with preference given to historically disadvantaged individuals. Skills development and skills transfer from experienced to less experienced employees is actively encouraged.	

14.2 OBJECTIVE 2: AVOID CONTAMINATION & POLLUTION

Impact Management Objective: Prevent operational activities from contaminating the soil on site or in the surrounding environment.		
Potential impact to avoid	• Stormwater runoff ("clean" rain water) may flow across the site thereby causing the water to be contaminated as a result of the waste management activity on site if the "dirty" stormwater flows off site. • The improper undertaking of operational activities (waste treatment) may result in environmental contamination/ pollution. • Windblown litter pollution during the transportation of skips (containing waste) to the facility by service providers. • Improper storage of hazardous waste may result in environmental contamination / pollution	
Impact Management Outcome	• The environment (including soil, air and surface storm water) is not contaminated. • The surrounding environment is not polluted as a result of windblown litter. • Hazardous waste is stored in line with the standards outlined below.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
The appointed environmental consultant is responsible for undertaking one site inspection per year during the facilities operational phase and to produce an Environmental Audit Report that is in line with the required content of an Audit, as described in Appendix 7 of GN 326 (April 2017) published under the 2014 EIA Regulations. General management measures relating to the management of waste and hazardous substances stated in Chapter 9 of this EMP must be implemented as and where applicable In addition: **General Pollution Management:**	Facility Management/Service Providers	Operational phase

• **A permanent storm water management system that will accommodate predicted run-off from the site must be compiled by an appropriately qualified engineer, prior to the start of the operation phase.** • The storm water management system should adhere to the principles of sound storm water management as described in the EMPr. The storm water system may include cut-off drains, detention ponds, channels and other structures. • The storm water management system must be installed on site, to the engineer's satisfaction. • The permanent storm water management system must be properly monitored and maintained throughout the operational phase. Blockages in the system must be cleared timeously. • No pollution of surface water or ground water resources may occur due to any operational activity on the site. • No storm water runoff from the facility containing waste, or water containing waste emanating from operational activities may be discharged into the environment. Polluted stormwater must be contained on the site. • All skips (containing waste) that are transported to the facility by external service providers must be adequately covered with tarpaulin to prevent windblown pollution from occurring. **General Waste Management:** • Waste generated on site must be classified and managed in accordance with the National Environmental Management: Waste Act – Waste Classification and Management Regulations (GN No. R. 634 of August 2013). • Disposal of waste to landfill must be undertaken in accordance with the National Environmental Management: Waste Act – National *Norms and Standard for the Assessment of Waste for Landfill Disposal (GN No. R. 635 of August 2013).* • All waste, hazardous as well as general, which result from the proposed activities must be disposed of appropriately at a licensed Waste Disposal Facility (WDF). **Pollution Management – hydrocarbons (oil, fuel etc.)**		

• A spill kit to neutralise/treat spills of fuel/ oil/ lubricants must be available on site, and facility staff must be educated on how to utilise the spill kit. • Soil contaminated by hazardous substances must be removed and disposed of as hazardous waste. **Pollution Management – Hazardous Substances** • The waste material storage area on site must be well maintained to ensure that waste is well contained. The condition of the storage area must be monitored by facility management. • Any hazardous substances (materials, fuels, other chemicals etc.) that may be required on site must be stored according to the manufacturers' product-storage requirements, which may include a covered, waterproof bunded housing structure. • Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases. • Hazardous chemicals and fuels should be stored on bunded, impermeable surfaces with sufficient capacity to hold at least 110% of the capacity of the storage tanks. **Pollution Management – Air Emissions** • The Plastic Depolymerisation plant must be designed with safety precautions, such as safety valves and Carbon monoxide (CO) sensors and alarm systems for personnel working on the plant. • Heating will initially be by LP Gas or heavy fuel oil until the depolymerization process generates its own gas and fuel oil. This gas and oil will then be piped to the heating chamber and used as heating fuel. • Due to the heat, steam would be formed that will be released. • All off gas will pass through a water operated scrubber system to be cleaned prior to release. • In the condenser, the gasses will be turned back to liquid to form oil. • The system will not use flare-off to rid the system of unwanted gasses as the gasses will be used internally for heating of the reactor however in case of emergency the off gasses will be burned. • Any flue gas generated will be scrubbed. The scrubber will remove the particulate matter. • Monitoring equipment will be installed and acceptable techniques used in order to accurately monitor any emissions from the plant.		

• Further mitigations will be employed in consultation with the local Air Emissions Authority should these be found to be required. • The oil storage tanks must be designed in accordance with SANS 10089-1:2008 (The Petroleum Industry Part 1: Storage and distribution of petroleum products in above-ground bulk installations).		
Performance Indicator	• The environment is not polluted or contaminated as a result of operational activities. • The environment is not polluted as a result of improper aste storage. • Spillage incidents do not lead to soil contamination.	

14.3 OBJECTIVE 3: VISUAL IMPACT MANAGEMENT

Impact Management Objective: To prevent the proposed development from having a significant visual impact.		
Potential impact to avoid	The proposed activity may pose a visual impact to surrounding residents and / or road users due to the nature of the activity being waste (waste plastic and tyres) stored on site awaiting processing. The aesthetics, litter management and housekeeping of the site may cause visual impacts to the "sense of place" of the area if not managed correctly. The lighting used at a facility may also pose a visual impact.	
Impact Management Outcome	The site does not present a significant visual impact.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The appointed environmental consultant is responsible for undertaking one site inspection per year during the facilities operational phase and to produce an Environmental Audit Report that is in line with the required content of an Audit, as described in Appendix 7 of GN 326 (April 2017) published under the 2014 EIA Regulations. • The site must be kept neat and tidy at all time and litter must be collected all the time from the perimeter fencing. • Only the waste tyres are allowed to be stored uncovered as these materials will not blow away. All plastics are only allowed to be stored and sorted inside the storage area which will prevent wind-blown litter occurring. • The operational manager must ensure good housekeeping practises on site by keeping the facility, clean, neat and tidy at all times.	Developer / consulting engineer	Operational phase

Lighting • External lights will increase the visual impact of the project at night therefore attention will be given to their selection for the specific function. • All lighting therefore will be carefully considered with regard to the extent of illumination, the intensity and colour of lights and the luminaire. • Light fittings will have shields to eliminate sight of the light source; • Down lighting of areas is preferred to up lighting; • Any perimeter lights are to be directed downwards and inwards to the development; • Emitted light colour will be a softer light than sodium (yellow) or mercury halide (blue-white). • The use of flood lights to illuminate structures, large areas or features will not be considered. Rather incorporate concealed lights to shine downwards. Darker areas on the building elevations will provide a less visually noticeable structure; • No light fittings will spill light upwards or be directed upwards from a distance towards the area or building to be illuminated; • Security lights will not flood the area with light continuously but should be activated by a motion sensor; • It is now accepted practice that lighting of new projects should be subdued and energy efficient.		
Performance Indicator	• The proposed development does not pose a significant visual impact to the road users and adjacent community or other sensitive receptors.	

14.4 OBJECTIVE 4: TRAFFIC MANAGEMENT

Impact Management Objective: To have minimal impact to other road users, including pedestrian and vehicular traffic during the operational phase of the Pilot Depolymerisation Processing Plant.		
Potential impact to avoid	Impacts are expected to occur to the traffic in the area due to increased traffic (trucks delivering plastic and tyres to the facility and trucks removing Heavy Fuel Oil) expected during the operational phase. Vehicles may impact on the existing road conditions (road capacity and congestion). Vehicles may impact on road safety conditions due to an increase in vehicles entering and exiting the site and they may impact on the condition of the existing road network by causing damage, for example, to pavement structure/condition and edge breaks.	
Impact Management Outcome	• Other road users are not significantly impacted by the marginal increase in traffic. The condition of the road is not impacted upon. • The safety of the community is not at risk.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period

• Truck trips to/from the site should be restricted to normal working hours or daylight hours as far as possible. • All vehicles using the site must adhere to traffic laws when travelling to and from the site. • Drivers of heavy waste vehicles should attend a road safety and driving course to sensitise them to the impact they have on driving conditions. • All vehicles must adhere to traffic laws when driving to and from the site. • Speed of vehicles and other heavy vehicles must be strictly controlled to avoid dangerous conditions for other road users. • Any damage caused by the heavy vehicles to the surrounding public road network must be repaired to the Roads Authority Standards by the Mossel Bay Municipality. • A Standard Operating Procedure will be developed for all heavy / waste vehicle drivers to identify and report potholes and edge breaks to the operations manager who in turn will report it to the road authority. • All vehicles using the site must adhere to traffic laws when travelling to and from the site.	Facility Management	Operational phase
Performance Indicator	• Other road users are not significantly impacted by the operational activities of the facility. • No complaint's regarding traffic is brought to the attention of the facility management. • Any damages caused to the road network are repaired and the SOP to identify damages is implemented.	

14.5 OBJECTIVE 5: AIR EMISSIONS IMPACT MANAGEMENT

Impact Management Objective: To have minimal impact on the surrounding land users during the operational phase of the Pilot Depolymerisation Processing Plant.		
Potential impact to avoid	Increased air pollution due to emissions from the Pilot Depolymerisation Processing Plant.	
Impact Management Outcome	• Minimal air emissions during operations, all within the allowable legal limits. • The safety of the community is not at risk.	
IMPACT MANAGEMENT ACTIONS		
Mitigation measure	Responsible party	Time period
• The Plastic Depolymerisation plant must be designed with safety precautions, such as safety valves and Carbon monoxide (CO) sensors and alarm systems for personnel working on the plant.	Facility Management	Operational phase

• Heating will initially be by LP Gas or heavy fuel oil until the depolymerization process generates its own gas and fuel oil. This gas and oil will then be piped to the heating chamber and used as heating fuel. • Due to the heat, steam would be formed that will be released. • All off gas will pass through a water operated scrubber system to be cleaned prior to release. • In the condenser, the gasses will be turned back to liquid to form oil. • The system will not use flare-off to rid the system of unwanted gasses as the gasses will be used internally for heating of the reactor however in case of emergency the off gasses will be burned. • Any flue gas generated will be scrubbed. The scrubber will remove the particulate matter. • Monitoring equipment will be installed and acceptable techniques used in order to accurately monitor any emissions from the plant. • It is recommend that a comprehensive CEM system is not stipulated for the pilot plant stage, but rather a system that monitors the key components that are indicative of the efficiency of the process, e.g. CO, VOCs, etc. Other compounds, e.g. SO2, NO2, etc., can be measured manually at regularly intervals. • Further mitigations will be employed in consultation with the local Air Emissions Authority should these be found to be required. • The oil storage tanks must be designed in accordance with SANS 10089- 1:2008 (The Petroleum Industry Part 1: Storage and distribution of petroleum products in above-ground bulk installations).		
Performance Indicator	• Other adjacent users are not significantly impacted by the operational activities of the facility. • No complaint's regarding air emissions are brought to the attention of the facility management.	

15. Emergency Preparedness

15.1 Emergency response procedures

The potential environmental risks that may arise as a result of construction activities, or during the maintenance of the structures must be identified, and appropriate emergency response procedures must be compiled for each emergency scenario. Potential environmental emergencies that require an emergency response include, but are not limited to, unplanned fires.

- The facility management is responsible for identifying the environmental risks that may arise during the operational phase of the development, and must formulate emergency response procedures for these potential incidents. Appropriate early warning systems should be installed where feasible.
- The facility management is responsible for ensuring that all employees are aware of the emergency procedures, and are properly trained on how to identify and respond to an emergency incident during operation of the Pilot Depolymerisation Processing Plant.
- An emergency procedure must clearly indicate who will take charge during an emergency, and the roles and responsibilities of workers and authorities during an emergency.

15.2 Emergency preparedness

The following measures must be implemented, as appropriate, to ensure effective responses to emergencies:

- All workers on site must be properly educated about possible emergency incidents that may arise, how to avoid such incidents and how to respond in the event of an incident. "Refresher" training sessions on emergency procedures should be held at least annually.
- All workers should ideally be given basic fire-awareness training, and advised on basic fire-fighting and safety techniques.
- Fire-fighting equipment must be available on site.
- All workers must be trained on how to respond in the event of a spill of a hazardous substance (s, fuel, chemicals etc.).
- A spill kit for containing and/or neutralizing spills of hazardous substances (e.g. hydrocarbons paint) should be available on site at all times.
- During the operational phase of the Pilot Depolymerisation Processing Plant, the facility management is responsible for notifying the relevant authorities of any pollution incidents that arise as a result of operational activities.
- A first aid kit must be available on site at all times.
- Emergency contact numbers (including the fire department, police and ambulance) must be prominently displayed on site at all times and regularly updated.
- All emergency incidents must be recorded in a site incident log which must be kept at the administration office. The cause of the incident, the measures taken in response to the incident and the efficacy of those measures must also be recorded. This information should be used to inform future emergency preparedness planning, and to avoid similar incidents from arising again.

16. Method statements

The Competent Authority and/or the ECO may require the Holder or Construction Contractor to submit Method Statements for one or more construction-related activity, or any aspect of the management of the site, before the activity is undertaken or during the performance of the activity, if the activity is causing or may cause significant environmental damage, or pose a health and safety risk.

Method Statements need not be complex and lengthy, but must clearly state **how**, **when** and **where** the activity concerned will be undertaken, and must specify **who** will be responsible for undertaking each component of that activity. Method Statements must be prepared by the Construction Contractor and submitted to the ECO for approval before undertaking the activity concerned.

The ECO and / or Competent Authority have the authority to request method statements for activities, including but not limited to:

- Establishment of site camp and stockpile area.
- Cement/ concrete batching, disposal and emergency contingencies.
- Topsoil and sub-soil storage/ stockpiling.
- Storage of fuels and hazardous chemicals and emergency contingencies.
- Waste management system.
- Storm water management and control.
- Fire Control & Fire Emergency Plan.
- Emergency preparedness plan / emergency response procedure (see Chapter 14).
- Post-construction rehabilitation.

The ECO has the authority to prevent activities from being undertaken until such time as a satisfactory Method Statement has been submitted to the ECO and approved by the ECO.

17. Roles and Responsibilities

This EMPr, once approved by the competent authority (DEA&DP), must be seen as binding to the Holder, and any person acting on the Holder's behalf, including but not limited to agents, employees, associates, contractors and service providers.

The Holder and all other persons who may be directly involved in the development are also bound by their general Duty of Care, as stated in Section 28 of the National Environmental Management Act, 1998:

> ***Duty of Care:***
> *"Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment"*

17.1 Duties and Responsibilities of the Holder

The Holder is ultimately responsible for ensuring that the environmental management measures specified in this EMPr, as well as any other conditions specified by the competent authority, are implemented and adhered to during the construction and operational phase (maintenance activities) of the proposed development.

The Holder or delegated party is responsible for monitoring and maintenance during the operational phase. The Holder must ensure that all appointed service providers, contractors and maintenance workers are capable of complying with all statutory requirements of this EMPr and the conditions of the Environmental Authorisation. The Holder is responsible for ensuring that this EMPr and the conditions of the Environmental Authorisation are implemented and adhered to during construction.

The Holder or appointed consultant is responsible for identifying emergency situations that may arise during operational and maintenance activities, and must formulate appropriate emergency response procedures for these emergency scenarios.

The applicant is responsible for ensuring that the facility is audited internally (monitored in terms of its operation being in line with the Waste License and this EMPR) every year at least.

17.2 Duties and Responsibilities of the Contractor

The "Construction Contractor" is the entity responsible for undertaking the physical construction of the residential development. The construction contractor is responsible for ensuring that all environmental management measures specified in this EMPr and in the EA are implemented during the pre-construction, construction and post-construction rehabilitation phases, unless agreed otherwise with the Holder. The contractor will be responsible for all costs incurred in the rehabilitation of the site and for ensuring effective environmental management during construction. The contractor must therefore make adequate financial provision for the implementation of all prescribed measures.

It is strongly recommended that the Construction Contractor appoint an Environmental Site Officer (ESO), who will act as the Contractor's representative to monitor and enforce compliance with the conditions of this EMPr, throughout all phases of construction.

In addition to the above, the Construction Contractor is responsible for the following:

- Identify emergency situations that may arise as a result of construction activities, and formulate appropriate emergency response procedures.
- Ensure that all construction workers, including sub-consultants and service providers, undergo environmental awareness training prior to commencing work on site, or as soon as possible thereafter.
- Compile the required method statements, which must be to the satisfaction of the ECO, before commencing with the activity to be governed by the method statement.
- Respond to concerns or issues identified by the ECO, as relates to environmental management, and implement the appropriate management or remediation measures, at the Contractor's own expense (unless agreed otherwise)
- Should third parties be called to the site to perform clean up and rehabilitation procedures, the Construction Contractor will be responsible for all associated costs.

Note that failure to comply with the requirements and conditions of this EMPr and the Environmental Authorisation may result in fines or other penalties being levied against the Construction Contractor by the Competent Authority.

17.3 Duties and Responsibilities of the ECO

The appointed Environmental Control Officer (ECO) is responsible for undertaking regular site visits to monitor and report on the implementation of the EMPr and adherence to the conditions of the Environmental Authorisation during the pre-construction, construction and post-construction rehabilitation phases. The ECO cannot monitor the site during the operational (maintenance) phase of the development, as this needs to be done by an Independent environmental consultant.

17.3.1 Competency of the ECO

The ECO must be independent of the Holder, Engineer, Construction Contractor and their service providers. The appointed ECO must be suitably qualified and experienced, and must be able to demonstrate that he / she is of sufficient competency to undertake the required task. The ECO must preferably be a resident in close proximity to the development area to ensure quick response if required.

The ECO must work in close co-operation with the Construction Contractor, resident engineer or ESO (where applicable) and all contractors in order to identify potential problems before they occur, and provide suitable guidance as to how the identified problems (environmental impacts) can be avoided.

17.3.2 Duties of the ECO

The duties of the ECO include, but are not limited to:

- Conduct a pre-construction site inspection to ascertain the pre-commencement condition of the site (i.e. the status quo);
- Conduct environmental awareness training;
- Undertake regular site visits to monitor compliance with all mitigation, monitoring and management measures contained in the EMPr and the Environmental Authorisation, during the pre-construction, construction and rehabilitation phases of the development;
- Evaluate the achievement of the performance indicators associated with each impact management objective specified in this EMPr;
- Liaise with site contractors, engineers and other members of the development team with regard to the requirements of the EMPr;
- Provide guidance as and when required regarding the implementation of the environmental management measures contained in the EMPr and EA, so as to assist the Holder and contractor in remaining compliant with these measures;
- Assist in finding environmentally acceptable solutions to construction problems;
- Ensure that the working areas, site camp facilities, access roads and no-go areas are properly demarcated;
- Ensure that proper topsoil management practices are adhered to on site;
- Ensure that proper waste management & pollution prevention strategies are practised on site;
- Examine method statements, where required;
- Recommend additional environmental protection measures, should this be necessary;
- Furnish contractors with verbal warnings in case of contravention of the EMPr;
- Recommend that the competent authority furnish errant contractors with predetermined fines, when verbal and / or written warnings are ignored;
- Ensure satisfactory rehabilitation of disturbed areas on site, after construction is complete;
- Keep detailed records of all site activities that may pertain to the environment, and produce compliance-monitoring reports (ECO Reports) for submission to the Holder, and the Competent Authority at regular intervals during the construction phase;
- Submit a final post-construction inspection report, within 6 months of completion of the construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.
- All ECO Reports and Inspection Reports must be submitted to the Holder and Competent Authority.

17.3.3 Frequency of ECO visits

The ECO must conduct site visits twice per month during the construction phase, in addition to the start-up and closure inspections.

The ECO has the discretion to undertake additional visits if he / she feels this is justified due to the actions of the contractors, and to make *ad hoc* visits in order to ensure compliance.

The ECO must also undertake a final inspection (audit) 6 months after completion of construction activities. The purpose of this final inspection is to ensure that the rehabilitation measures applied at the conclusion of the construction phase have been sufficient to promote the successful rehabilitation of the site, and to identify any further issues that require attention or follow-up.

17.3.4 Authority of the ECO

The ECO has the authority to recommend to the authorities that they suspend all works (or part thereof) occurring on site, should any action being undertaken on site not comply with the environmental requirements, and where such actions pose a serious threat to any element of the surrounding environment.

The ECO has the authority to issue instructions to the Construction Contractor and/or Holder, regarding measures that must be implemented on site in order to ensure compliance with the EMPr and Environmental Authorisation, and/or to prevent environmental degradation or pollution from occurring.

The ECO has the authority to issue verbal and written warnings to contractors. Should verbal and written instructions and/or warnings be ignored, the ECO has the authority to request the Competent Authority to issue pre-determined fines or other penalties.

The ECO has the authority to report incidents of non-compliance to the Competent Authority at any time.

18. Environmental Awareness Plan

Environmental Awareness Training must be conducted prior to the commencement of construction activities. It is the holder's responsibility to familiarise himself/herself with the content and requirements of this EMPr. The holder is also responsible to ensure that the contractor and all labourers working on site during the construction phase are familiar with the content of this EMPr.

The following actions must be taken to ensure that all relevant parties are aware of their environmental role and duties:

1. This EMPr must be kept on site at all times.
2. The provisions of this EMPr and the conditions of the Environmental Authorisation must be explained in detail to all staff during Awareness Training.
3. Training booklets will be handed out to all labourers and must be explained to them.
4. Weekly checks to be done by the Holder's environmental representative who must be on site at all times.
5. The ECO to conduct frequent site visits.
6. Monthly monitoring reports to be compiled by the ECO. These reports will be circulated to all parties involved (including the holder, contractor and the competent authority).

The Construction Contractor must make allowance for all construction site staff, including all subcontractors that will be working at the site, to attend environmental awareness training sessions (undertaken by the ECO) before commencing any work on site. During this training, the ECO will explain the EMPr and the conditions contained therein. Attention will be given to the construction process and how the EMPr fits into this process. Other items relating to sound environmental management which must be discussed and explained during the environmental awareness training sessions include:

- The demarcated "No-Go" areas;
- General do's and don'ts of the site;

- Making of fires;
- Waste management, use of waste receptacles and littering;
- Use of the toilets provided;
- Use and control of construction materials and equipment etc.;
- Control, maintenance and refuelling of vehicles;
- Methods for cleaning up any spillage;
- Access and road safety;
- Emergency procedures (e.g. in case of fire, spillage etc.)
- General "best practice" principles, with regards to the protection of environmental resources.

Environmental awareness training and education must be ongoing throughout the construction phase, and must be undertaken regularly if deemed necessary (especially if it becomes apparent that there are repeat contraventions of the conditions of the EMPr), or as new workers come to site. Translators must be utilised where needed.

19. Monitoring, Record Keeping and Reporting

19.1 Environmental Auditing

In accordance with the requirements of the Environmental Impact Assessment Regulations, 2014 (as amended), the holder of the Environmental Authorisation must, for the period that the Environmental Authorisation is valid, appoint a suitably qualified independent person to conduct an environmental audit to audit compliance with the conditions of the Environmental Authorisation and the EMPr.

The holder is responsible for appointing, managing and remunerating the appointed auditor. The auditor may not be the appointed Environmental Control Officer (ECO.

The appointed auditor must undertake yearly environmental audits. Following each audit the environmental auditor must submit an audit report to the Competent Authority (in this instance the DEA&DP).

- Environmental auditing and environmental audit reports must adhere to the requirements of the amended 2014 Environmental Impact Assessment Regulations, in particular Section 34 (*Auditing of Compliance with Environmental Authorisation, Environmental Management Programme*) and Appendix 7 (*Objective and Content of Environmental Audit Report*)
- The audit report must provide verifiable findings on the level of compliance with the provisions/ conditions of the Environmental Authorisation and the EMPr, and must also comment on the ability of the measures contained in this EMPr to sufficiently avoid, manage and mitigate environmental impacts.
- Where the findings of the audit report indicate that the impact management measures stated in the EMPr are insufficient to adequately address environmental impacts, recommendations as to how the EMPr must be amended so as to address the identified shortcomings must be made and submitted to the competent authority together with the audit report.

19.2 Construction phase monitoring, reporting and record keeping

The appointed Environmental Control Officer (ECO) is responsible for monitoring the site at regular intervals during the construction phase, in order to ensure that the provisions of this EMPr and the Environmental Authorisation are adhered to and that sound environmental management is ensuing on site.

The ECO must compile a monthly ECO report detailing the ECO's observations on site, any instances of non-compliance and any issues or aspects that require attention, follow-up or remedial action. The ECO

reports must be submitted to the Holder and to the Competent Authority is so requested by that authority. The ECO inspection reports must include both photographic and written records.

19.2.1 ECO Inspections - Photographic Records

The condition of the surrounding natural environment must be monitored regularly in order to ensure that construction and management activities are not impacting negatively on the condition of the landscape and any sensitive ecosystems. The most effective way to achieve this is by means of a detailed photographic record. In this way, a record of any shift in ecosystem condition can be maintained and potential impacts be detected at an early stage. It is thus recommended that fixed-point photo-monitoring sites could be set up, and photographs must be taken at these sites during each ECO inspection. Where necessary, the entire working area must be well documented and photographed.

19.2.2 ECO Inspections - Written Records

The following record-keeping during the pre-construction, construction and rehabilitation phases of the development is recommended:

- The ECO must complete an ECO Checklist after each ECO site visit.
- The ECO must compile an ECO monitoring report and submit this to the Holder, the Contractor and the Competent Authority (the latter only if required by the Competent Authority). The monthly reports must be a summary of the ECO inspections from the preceding month, and must highlight the key concerns/ issues on site, instances of non- compliance with the EA and EMPr, all instructions issued to the contractor, actions taken and aspects that still require attention.
- All ECO reports and ECO instructions must be retained on file at least for the duration of the construction period (retaining reports for a period of at least 5 years is recommended, in the event that the Competent Authority must request information).
- A record (minutes) of construction site meetings, liaison site meetings between the ECO and resident engineer or contractor, monitoring reports, ECO instructions and ECO observations must be clearly documented and filed on a master file off-site for safe keeping.
- It is recommended that a site register (incident register) be kept on site at the site office for the recording of any environmental incidents (e.g. fires, spills etc.), observations which are contrary to the stipulations within the EMPr and any other contravention deemed necessary for the attention of the resident engineer. Actions taken to remedy the incidents must also be recorded.
- A complaints register must be kept on site in which complaints by any member of the public must be logged.
- The ECO must compile a final post-construction audit report, within 6 months of completion of each construction phase. The audit report must detail the rehabilitation measures undertaken, describe all major incidents or issues of non-compliance and any issues or aspects that require attention or follow-up.

19.2.3 Construction Phase Record Keeping

A copy of the approved EMPr, the Environmental Authorisation and any relevant construction method statements must be kept on site at all times during pre-construction, construction and rehabilitation activities. The ECO Reports must be retained by the Holder for a period of at least 5 years, and must be provided to the Competent Authority upon request.

20. Penalties, Claims and Damages

In instances where the requirements and conditions of this EMPr and the Waste License are contravened or not fully complied with, the Construction Contractor may be liable for financial penalties. Penalties shall be issued by the Engineer, in accordance with the Schedule of Fines contained in this EMPr. Penalties may be issued at the Engineer's discretion, and/or upon the request/ recommendation of the ECO or Competent Authority.

Penalties could be imposed In terms of Chapter 11 of the Western Cape Bill on Planning and Development as published in the Extraordinary Provincial Gazette No 5183, 3 October 1997, and would be applicable for any action which leads to damage to the natural environment. Please note that the payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

In cases where severe environmental damage occurs, the competent authority law enforcement division may take legal action against the responsible parties. The reasons for this could include, among others:

- Not implementing the conditions of the EMPr;
- Spillage that result in environmental damage;
- Incorrect handling and storage of construction materials and chemicals;
- Sensitive areas that are not clearly demarcated;
- Performing ablutions in areas other than facilities provided for such actions; and
- Occurrence of unattended and out of control fire.

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ECO to issue the contractor with penalty / fine as described in the following section.

The following fine structure shall apply:

Any vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a "no-go" area	**R 1,000.00**
Any vehicle being driven, and items of plant or materials being parked or store outside the demarcated boundaries of the site	**R 1,000.00**
Persons walking outside the demarcated boundaries of the site	**R 100.00**
Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refuelling such as the use of a funnel rather than a pump	**R 1,000.00**
Littering of site by individuals	**R 250.00**
Deliberate lighting of illegal fires on site	**R 1,000.00**
The eating of meals on site outside the defined eating area. Individual not making use of the site ablution facilities	**R 250.00**
No on-site implementation of waste management system.	**R 1000.00**
Waste not collected and contained immediately.	**R 1000.00**
No recycling of waste.	**R 1000.00**
Burning, burying or disposing of waste other than as prescribed.	**R 1000.00**
Waste not disposed of at an approved landfill.	**R 1000.00**
Chemicals and / or waste spilled on ground.	**R 250.00**
Use of other areas for toilet purposes and / or disposal of chemicals / waste.	**R 250.00**
Stockpiling of soil in an unspecified area.	**R 2500.00**

Stockpiles not located and aligned so as to minimise impacts.	**R 2500.00**
Spilling of soil or construction material into water body or stream.	**R 1000.00**

The above does not absolve the transgressor from being prosecuted in terms of the ***National Environmental Management Act (Act 107 of 1998)*** which may result in further penalties and other actions by State Departments.

21. Conclusion

The recommendations and mitigation measures prescribed in this EMPr have been formulated with the intention of addressing potential pre-construction, construction and operational phase impacts on the environment. It is likely that if the conditions, requirements and recommendations of the above EMPr are implemented as described and the relevant stakeholders adhere to the various mitigation measures, then the project will be completed without unforeseen negative environmental impacts.

Familiarity with the contents of this EMPr by the contractors and other individuals involved in the development project will assist in achieving "environmental best-practice", which ultimately ensures that the project arrives at a sustainable outcome.