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ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR THE

PROPOSED PV SOLAR PLANT & BATTERY ENERGY STORAGE SYSTEMS

FOR

GROOT BRAK WASTEWATER TREATMENT WORKS, SANDHOOGTE AND KLEIN BRAK WATER TREATMENT WORKS LOCATED ON PORTION 23 OF THE FARM WOLVEDANS 129, MOSSEL BAY LOCAL MUNICIPALITY, GARDEN ROUTE, WESTERN CAPE.

APPLICATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998), AS AMENDED, AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014



PREPARED FOR: Mossel Bay Local Municipality DEADP REF NO: TBC SES REF NO: 21/GBSP/EMPR/02/25 DATE: 13 February 2025



Environmental Impact Assessments
 Basic Assessments
 Environmental Management Planning

Environmental Control & Monitoring • Water Use License Applications • Aquatic Assessments

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Appendix 4 of the EIA Regulations 2014 (as amended 2017).

This Environmental Management Programme has been drafted in accordance with Appendix 4 of the Environmental Impact Assessment Regulations 2014 (as amended 2017). The table below shows how the requirements of Appendix 4 have been included within this Environmental Management Programme.

(1) An EMPr must comply with section 24N of the Act and	Section 4
include-	 Appendix A
(a)details of-	1-1
(i)the EAP who prepared the EMPr; and	
(ii) the expertise of that EAP to prepare an EMPr, including a	
_curriculum vitae;	
(b)a detailed description of the aspects of the activity that are	Section 4 – Description and Location of the
covered by the EMPr as identified by the project description;	Activity – Page 3
(c)a map at an appropriate scale which superimposes the	Section 4 - Description and Location of the
proposed activity, its associated structures, and intrastructure on	Activity – Page 3
the environmental sensitivities of the preferred site, indicating any	
dreas that should be avoided, including butters;	Castian O. Freingenerstellere est. Deue OA
(a)a description of the impact management outcomes,	Section 8 - Environmental Impact - Page 24
including management statements, identifying the impacts and	Management: Planning and Design Phase
risks that need to be avoided, managed and mitigated as	Section 9 - Environmental Impact
facilities infough the environmental impact assessment process	Management: Pre-construction Phase – Page
i) planning and design:	2/ Saction 10 Environmental Impact
(i)pioni ing ono design,	Management : Construction Phase Page 21
(iii)construction activities:	Section 11 Environmental Impact
(iv)rehabilitation of the environment after construction and	Management · Post Construction
where applicable post closure; and	Rehabilitation Phase & Operational Phase -
(v)where relevant operation activities:	Page 41
(f)a description of proposed impact management actions.	Section 8 - Environmental Impact - Page 24
identifying the manner in which the impact management	Management: Planning and Design Phase
outcomes contemplated in paragraph (d) will be achieved, and	Section 9 - Environmental Impact
must, where applicable, include actions to —	Management: Pre-construction Phase – Page
(i)avoid, modify, remedy, control or stop any action, activity or	27
process which causes pollution or environmental degradation;	Section 10 - Environmental Impact
(ii)comply with any prescribed environmental management	Management : Construction Phase – Page 31
standards or practices;	Section 11 - Environmental Impact
(iii) comply with any applicable provisions of the Act regarding	Management : Post Construction
closure, where applicable; and	Rehabilitation Phase & Operational Phase –
(iv) comply with any provisions of the Act regarding financial	Page 41
provision for renabilitation, where applicable;	Continue 14 Delan and Development Hilling Development
(g) the method of monitoring the implementation of the impact	Section 14 - Roles and Responsibilities – Page
management actions contemplated in paragraph (1),	47 Section 16 - Monitoring Record Keeping and
	Reporting – Page 51
(h)the frequency of monitoring the implementation of the	Section 14 - Roles and Responsibilities – Page
impact management actions contemplated in paragraph (f);	47
	Section 16 - Monitoring, Record Keeping and
	Reporting – Page 51
(i)an indication of the persons who will be responsible for the	Section 8 - Environmental Impact - Page 24
implementation of the impact management actions;	Management: Planning and Design Phase
	Section 9 - Environmental Impact
	Management: Pre-construction Phase – Page
	27
	Section 10 - Environmental Impact
	Management : Construction Phase – Page 31
	Section 11 - Environmental Impact
	Management : Post Construction

	Rehabilitation Phase & Operational Phase – Page 41 Section 14 - Roles and Responsibilities – Page 47
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 8 - Environmental Impact - Page 24 Management: Planning and Design Phase Section 9 - Environmental Impact Management: Pre-construction Phase - Page 27 Section 10 - Environmental Impact Management : Construction Phase - Page 31 Section 11 - Environmental Impact Management : Post Construction Rehabilitation Phase & Operational Phase - Page 41
(k)the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 14 - Roles and Responsibilities – Page 47 Section 16 - Monitoring, Record Keeping and Reporting – Page 51
(I)a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 8 - Environmental Impact - Page 24 Management: Planning and Design Phase Section 9 - Environmental Impact Management: Pre-construction Phase – Page 27 Section 10 - Environmental Impact Management : Construction Phase – Page 31 Section 11 - Environmental Impact Management : Post Construction Rehabilitation Phase & Operational Phase – Page 41
 (m)an environmental awareness plan describing the manner in which— (i)the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii)risks must be dealt with in order to avoid pollution or the degradation of the environment; and 	Environmental Awareness Training located in Appendix H page 73
(n)any specific information that may be required by the competent authority.	N/A

<u>COMPLIANCE WITH SECTION 24N OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998,</u> <u>AS AMENDED (ACT 107 OF 1998)</u>

(1) The Minister the Minister of Minerals and Energy, an MEC or identified component	This Environmontal
 (1) The Minister, the Minister of Minerals and Energy, an MEC of identified competent authority may require the submission of an environmental management programme before considering an application for an environmental authorisation. (1A) Where environmental impact assessment has been identified as the environmental instrument to be utilised in informing an application for environmental authorisation, or where such application relates to prospecting, mining, exploration, production and related activities on a prospecting, mining, exploration or production area, the Minister, the Minister of Minerals and Energy, an MEC or identified competent authority must require the submission of an environmental management programme before considering an application for an environmental authorisation. 	Management Programme (EMPr) has been circulated to the Decision-making authority and will be updated based on the comments received by the public during the Public Participation Process.
(2) The environmental management programme must contain-	
 (a) information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of- (i) planning and design; (ii) pre-construction and construction activities; (iii) the operation or undertaking of the activity in question; (iv) the rehabilitation of the environment; and (v) closure, if applicable; 	Section 8 - Environmental Impact - Page 24 Management: Planning and Design Phase Section 9 - Environmental Impact Management: Pre-construction Phase - Page 27 Section 10 - Environmental Impact Management : Construction Phase - Page 31 Section 11 - Environmental Impact Management : Post Construction Rehabilitation Phase & Operational Phase - Page 41
 (b) details of- (i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme; 	Section 4 Appendix A
(c) a detailed description of the aspects of the activity that are covered by the environmental management programme;	Section 8 - Environmental Impact - Page 24 Management: Planning and Design Phase Section 9 - Environmental Impact Management: Pre-construction Phase - Page 27 Section 10 - Environmental Impact Management : Construction Phase - Page 31 Section 11 - Environmental Impact Management : Post Construction

	Rehabilitation Phase & Operational Phase – Page 41 Section 14 - Roles and Responsibilities – Page 47
 (d) information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a); (e) information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance; 	Section 14 - Roles and Responsibilities – Page 47 Section 14 - Roles and Responsibilities – Page 47
(f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	Rehabilitation Phase & Operational Phase – Page 41 Section 14 - Roles and Responsibilities – Page 47
(g) a description of the manner in which it intends to- (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) remedy the cause of pollution or degradation and migration of pollutants; and (iii) comply with any prescribed environmental management standards or practices	Section 8 - Environmental Impact - Page 24 Management: Planning and Design Phase Section 9 - Environmental Impact Management: Pre-construction Phase – Page 27 Section 10 - Environmental Impact Management : Construction Phase – Page 31 Section 11 - Environmental Impact Management : Post Construction Rehabilitation Phase & Operational Phase – Page 41 Section 14 - Roles and Responsibilities – Page 47
(3) The environmental management programme must, where appropriate-	
(a) set out time periods within which the measures contemplated in the environmental management programme must be implemented;	Section 16 - Monitoring, Record Keeping and Reporting – Page 51
(b) contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting area or mining area in question; and	Section 16 - Monitoring, Record Keeping and Reporting – Page 51
 (c) develop an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment. 	Section 8 - Environmental Impact - Page 24 Management: Planning and Design Phase Section 9 - Environmental Impact Management: Pre-construction Phase - Page 27 Section 10 - Environmental Impact

	Management : Construction Phase – Page 31 Section 11 – Environmental Impact Management : Post Construction Rehabilitation Phase & Operational Phase – Page 41 Section 14 - Roles and Responsibilities – Page 47 Section 16 - Monitoring, Record Keeping and Reporting – Page 51
(4) The Minister of Minerals and Energy may not grant an environmental authorisation, unless he or she has considered any recommendation by the Regional Mining Development and Environmental Committee	Not applicable to the proposed development
(5) The Minister, the Minister of Minerals and Energy, an MEC or identified competent authority may call for additional information and may direct that the environmental management programme in question must be adjusted in such a way as the Minister, the Minister of Minerals and Energy or the MEC may require.	All comments obtained from the Department of Environmental Affairs & Development Planning has been incorporated into this EMPr.
(6) The Minister, the Minister of Minerals and Energy, an MEC or identified competent authority may at any time after he or she has approved an application for an environmental authorisation approve an amended environmental management programme.	Not applicable to the proposed development at this stage
(7) The holder and any person issued with an environmental authorisation-	
(a) must at all times give effect to the general objectives of integrated environmental management laid down in section 23 (Of the NEMA);	
(b) must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment;	
 (c) must manage all environmental impacts- (i) in accordance with his or her approved environmental management programme, where appropriate; and 	
(ii) as an integral part of the reconnaissance, prospecting or mining, exploration or production operation, unless the Minister of Minerals and Energy directs otherwise;	
(d) must monitor and audit compliance with the requirements of the environmental management programme;	
(e) must, as far as is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	
(f) is responsible for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of his or her prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting or mining area to which such right or permit relates.	

DOCUMENT DETAILS

Project Ref. No:	21/GBSP/EMPR/02/25
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1. Introduction

Sharples Environmental Services cc (SES) has been appointed by Element Consulting Engineers on behalf of the Mossel Bay Local Municipality, to complete the Environmental Management Programme (EMPr) as part of the Solar and Bess Exclusion Norms Process for the Proposed PV Solar Plant and Battery Energy Storage System (BESS) on portion 23 of the farm Wolvedans 129, Groot Brak Rivier, Mossel Bay Local Municipality, Garden Route District Municipality, Western Cape Province.

The proposed development will trigger listed activities in terms of the Amended Environmental Impact Assessment Regulations of 2014 (GN No. R.324 - 327 of 7 April 2017). Through the adoption of the Solar Exclusion Norm and Exclusion of the Development and Expansion of Solar Photovoltaic Facilities from the Requirement to obtain an Environmental Authorisation (GN 4558 of 2024) (hereafter referred to as the Solar Exclusion Norms), specific listed activities particularly relating to the development of solar photovoltaic facilities have been exempt for obtaining Environmental Authorisation. This is subject to the confirmed sensitivity (of the themes highlighted in the Solar Exclusion Norms).

Based on the findings of the specialist assessments, it was confirmed that the project would fall within the ambit of the Solar Exclusion Norms. Therefore, a Registration with the competent authority (Western Cape Department of Environmental Affairs & Development Planning; DEA&DP) in terms of the Solar Exclusion Norms is required before construction can commence.

2. About this EMPr

This document is intended to serve as a guideline to be used by the Mossel Bay Local Municipality (as the Implementing Agent) and any person/s acting on behalf of Mossel Bay Local Municipality, during the pre-construction, construction, post-construction, and rehabilitation phases of the proposed

upgrade and development. This document provides measures that must (where practical and feasible) 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 of 2014, as amended (GN No. R. 326 of 7 April 2017), with reference to the "Guidelines for Environmental Management Programmes" published by the Department of Environmental Affairs and Development Planning (2005), and Section 24N of the National Environmental Management Act, 1998, as amended (Act No. 107 of 1998; NEMLAA (Act 2 of 2022)). Furthermore, the EMPr aims to comply with the provisions of the Solar Exclusion Norm.

In line with the mitigation hierarchy (see Figure 1), the overarching goal of this EMPr is to anticipate and provide measures that must be implemented to ensure that any environmental impact that may be associated with the development is avoided, or where such impacts cannot be avoided entirely, are minimised and mitigated appropriately. The mitigation hierarchy will be considered during the EIA planning process, to appropriately manage environmental impacts.



Figure 1. Mitigation hierarchy

It is important to note that the EMPr is not designed to manage the physical establishment of the development *per se* but should rather be seen 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 *Mossel Bay local Municipality*, 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 Environmental Control Officer (ECO) (see Chapter 14) needs to ensure that all role-players are "on board" with regard to the constraints that the EMPr places on the development and construction team. 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. The Mossel Bay Local Municipality must retain a copy of this EMPr, and another copy of this EMPr 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 the Mossel bay Local Municipality, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction activities are either avoided or reduced. Mossel Bay Local Municipality and any 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 from time to time as 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. Amendments to this EMPr must first be approved by the competent authority, in writing.

4.Description and Location of the activity

The scope of the works for the proposed Solar PV Plant and Battery Energy Storage Systems are located on Portion 23 of the Farm Wolvedans 129. The proposed development will service the Groot Brak Wastewater Treatment Works, and the Sandhoogte- and Klein Brak Water Treatment Works.

The proposed development is located along the Sandhoogte Road, North from the N2. The proposed site has the following co-ordinates: 34° 3'29.30"S; 22°11'12.30"E. See Figure 2 for the locality of the proposed site and associated infrastructure.

The proposed development site is 4.15 ha in extent and will constitute two solar PV array sites (Great Brak, 1.34 ha, and Klein Brak 1.26 ha), a future expansion area (of 1.55 ha), internal road infrastructure, a Medium Voltage stations and a 11 kV line leading from the Solar PV plant to the servicing sites. The extent of the solar PV plant on portion 28 of the Farm Wolwedans 129 will be 5.26 ha. At the respective treatment facilities, a Battery Energy Storage Facility (BESS), a substation and a hybrid system plant will be installed. There will also be associated infrastructure that is required for the transmission and distribution of the generated electricity. This includes the installation of an 11 kV underground power cable extension spanning approximately 5.65 km to supply the hybrid system to the Klein Brak Water Treatment Works facility. There will be a second reticulated underground cable to the North of the proposed solar array site towards the Sandhoogte Water Treatment Works, that spans approximately 0.70 km.

The site development plan, indicating the proposed positions for the new equipment, associated with the hybrid energy solution is included in Figure 3. The main reason for the chosen positions is its central location between all of the different network components that need to be integrated. This ensures optimal cable lengths as well as easy access to all equipment for operation and maintenance purposes.

The proposal will see to the Installation of 2028 x 565Wp Mono-crystalline Solar Panels. Each of the PV Solar array sites will have a Medium Voltage station. See Figure 3 below of the proposed development as well as the associated distribution infrastructure located on the Groot Brak WWTW site.



Figure 2. The site location for the proposed PV Solar Plant, BESS and associated infrastructure (Google Earth, 2024).

The main Project Objectives is to facilitate the Mossel Bay Municipality in upholding service delivery by becoming loadshedding resilient by providing supply to critical industrial economy base during power outages and loadshedding, promoting Renewable Energy Generation by encouraging generated clean, renewable electricity from the sun, reducing carbon footprint. Control Peak Demand Management by mitigating peak demand periods by delivering stored energy during high-load times and reducing stress on the grid.



Figure 3. Proposed site location and associated infrastructure located on the proposed solar array site and opposite the proposed infrastructure (Element Consulting Engineers, 2024).

Groot Brak Wastewater Treatment Works & Sandhoogte Water Treatment Works:



Figure 4. The site locality of Groot Brak WWTW & Sandhoogte WTW localities and plot of land (Indicated in red) where the solar array site will be located on, (Google Earth, 2024).

It is important to note that the 11kV feeder, supplying the Groot Brak WWTW minisub, also feeds the Sandhoogte Booster Pump Station, via an 11kV ring-main unit, located in the same mini-substation. The Sandhoogte WTW plant is supplied via a 200kVA ground-mounted transformer (confirmed on site). The

11kV supply to this transformer is also from the Midbrak Substation, via an 11kV overhead line and two ring-main units. The Sandhoogte WTW is located within the following co-ordinates 34° 3'12.02"S; 22°11'0.67"E. The cable route will require a 2-meter working corridor and will be hand-dug, especially within sensitive areas.



Figure 5. Proposed Network Configuration (Groot Brak WWTW & Sandhoogte WTW) – (Element Consulting Engineers, 2024).

In summary, it can be concluded that the proposed re-configuration of the 11kV network at the Sandhoogte WTW will consist of the following:

1. The existing 200kVA ground-mounted transformer, supplying the total Sandhoogte WTW load, is supplied from the Midbrak Substation via an 11kV overhead line and the Sandhoogte Water RMU. This same supply also T's off before the transformer to supply the JJ Holiday transformer (100kVA).

2. It is recommended that the 200kVA transformer, supplying the Sandhoogte WTW, be disconnected from the current 11kV OHL and RMU supply and be supplied directly via a dedicated circuit breaker from the Renewable Energy Plant's 11kV switchboard.

3. A new section of 11kV (1x 3c x 35mm2 Cu) cable will have to be installed from the 200kVA transformer to the Circuit Breaker Feeder on the Renewable Energy Plant's 11kV switchboard. It is recommended that this section of cable be installed directly underneath the existing 11kV overhead line between Midbrak Substation and the Sandhoogte Water RMU, utilising the same servitude.

4. It is important to note that all alternative supplies to the Sandhoogte WTW transformer will have to be disconnected, in order to ensure that another point-of-utility connection is not accidentally created, which will link back to the hybrid solution's switchboard and create out-of-sync connection between sub-systems within the overall distribution network.

There are currently no back-up generators installed at the Groot Brak WWTW or Sandhoogte WTW, which means that the plants cannot be operated during power outages or interruptions and therefore relies on the retention capacity of the plant. This is not an ideal situation and could lead to environmental disasters or water shortages and hence the urgency for the implementation of this project.



Figure 6. The proposed underground Northern cable route along an existing overhead servitude connecting the proposed solar development to the Sandhoogte WTW, (Google Earth, 2024).

Klein Brak Water Treatment Works:

Klein Brak Water Treatment is located directly south of the N2 highway and approximately 1.0km northwest of the village of Klein Brak in the Mossel Bay municipal area. The coordinates of the centre of the works are approximately 34°5' 0.96"S and 22°8' 31.25"E. Access to the facility is obtained from Heyns Street, just off the R102 road on the way to Klein Brak town.

The Klein Brak WTW does not have sufficient land available near the plant for the installation of the PV Solar panels, associated with the proposed hybrid energy solution. It is therefore recommended that the PV panels for the Klein Brak WTW plant, be installed on the same portion of land, which has been identified for the Groot Brak WWTW's PV Solar Array.

The site development plan, indicating the proposed positions for the new equipment, associated with the hybrid energy solution for this plant is indicated in the figure below (Figure 7). The main reason for the chosen positions is its central location between all of the different network components that need to be integrated. This ensures optimal cable lengths as well as easy access to all equipment for operation and maintenance purposes. Furthermore, it should be noted that sufficient free space around the plant is limited, resulting in area being the most ideal location. This "islanded" section of land available has tarred road section all around, which allows for easy access from all directions for installation, maintenance, rigging of heavy equipment and diesel filling.



Figure 7. The proposed development for Klein Brak WTW distribution infrastructure. (Element Consulting Engineers, 2024).



Figure 8. Proposed site location of the energy distribution for Klein Brak WTW. (Element Consulting Engineers, 2024).

The proposed solar development will need to facilitate approximately 5.65km of 11 kV cable route to connect the to the Klein Brak WTW, see the figure below. The planned cable route will cross the N2 highway, along the existing 11kV cables between the Midbrak and Tergniet substations. From the Tergniet substation, it will be installed along the R102 road, all the way to the Klein Brak WTW, where it will terminate at the new 11kV substation. The proposed cable route will have an additional 2 meter working corridor to facilitate the construction of the proposed cable route that will be dug by hand.



Figure 9. The proposed 11 kV Cable Route for the Klein Brak distribution infrastructure. (Element Consulting Engineers, 2024).

The planned cable route will cross the N2 highway, along the existing 11kV cable servitude between the Midbrak and Tergniet substations. From the Tergniet substation, it will be installed along the R102 road, to the Klein Brak WTW, where it will terminate at the new 11kV substation. The proposed cable route will have a 2 meter working corridor to facilitate the construction of the proposed cable route. 11kV, 70mm2, Cu, PILC cable (rated 160 A [ducts], 3 MVA @11kV), which will match the full capacity rating of the MV Station to be installed for the Klein brak PV Solar solution, allowing the maximum amount of PV generation to be exported via this cable to the Klein brak WTW or into the municipal 11kV grid. The full development to be constructed will consist of the following:

Groot Brak WWTW & Sandhoogte WTW:

- a. 1145.82 kWp grid-tied, free-field solar PV installation (requiring ± 13 400m2 installation area).
- b. Installation of 2028 x 565Wp Mono-crystalline Solar Panels, which convert the solar radiation into direct current.
- c. Fixed tilt ground mounting structures, which supports the PV modules.
- d. 3x String inverters, which convert the DC from the solar field to AC.
- e. 1x MV Inverter Station (3.2MVA), which collects the AC output from each of the inverters and incorporates a step-up power transformer, which steps the inverter output voltage up to the 11kV network voltage. The inverter station also has integrated 11kV switchgear to connect to the MV network.

- e. 2293 kWh Battery Energy Storage System (consisting of 1x 2293kWh batteries in containers).
- f. 1x 1.2 MVA Power Conversion System (PCS), which converts the DC battery output to AC power.
- g. 1x 1.6 MVA Isolation transformer, which steps the PCS output up to 11kV.
- h. 2x 400 kVA Backup Diesel Generators (containerised).
- i. 1x 1.0 MVA Step-up transformer, which steps the generator output up to 11kV.
- f. 6x 11kV (25kA) AIS switchgear panels, complete with associated protection, metering and control elements, to be housed in the existing Midbrak substation building.
- g. 1x 11kV Neutral Earthing Resistor (NER), to be installed on the star-point of the generator stepup transformer's MV winding.
- j. DC cables (LV).
- k. AC cables (LV & MV).
- I. Energy Management System.
- m. Communication Network.

Klein Brak Water Treatment Works:

- a. 1145.82 kWp grid-tied, free-field solar PV installation (requiring ± 12 900m2 installation area).
- b. Installation of 2028 x 565Wp Mono-crystalline Solar Panels, which convert the solar radiation into direct current.
- c. Fixed tilt ground mounting structures, which supports the PV modules.
- d. 3x String inverters, which convert the DC from the solar field to AC.
- e. 1x MV Inverter Station (3.2MVA), which collects the AC output from each of the inverters and incorporates a step-up power transformer, which steps the inverter output voltage up to the 11kV network voltage. The inverter station also has integrated 11kV switchgear to connect to the MV network.
- f. 2293 kWh Battery Energy Storage System (consisting of 1x 2293kWh batteries in containers).
- g. 1x 1.2 MVA Power Conversion System (PCS), which converts the DC battery output to AC power.
- h. 1x 1.6 MVA Isolation transformer, which steps the PCS output up to 11kV.
- i. 2x 400 kVA Backup Diesel Generators (containerised).
- j. 1x 1.0 MVA Step-up transformer, which steps the generator output up to 11kV.
- k. 6x 11kV (25kA) AIS switchgear panels, complete with associated protection, metering and control elements, to be housed in the existing Midbrak substation building.
- I. 1x 11kV Neutral Earthing Resistor (NER), to be installed on the star-point of the generator stepup transformer's MV winding.
- m. DC cables (LV).
- n. AC cables (LV & MV).
- o. Energy Management System.
- p. Communication Network.

5. Legal Framework

5.1 Environmental Impact Assessment Regulations (2017)

The following listed activities, in terms of the amended Environmental Impact Assessment Regulations, 2017 (GN No. R. 324 – 327) will be triggered by the proposed development:

Table 1: Listed activities in terms of the amended Environmental Impact Assessment Regulations (2017)

Listed Activity No(s):	Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 1 (GN No. R. 983)
1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where— (i) the electricity output is more than 10 megawatts but less than 20 megawatts; or (ii) the output is 10 megawatts or less, but the total extent of the facility covers an area in excess of 1 hectare;

	excluding where such development of facilities or infrastructure is for photovoltaic					
	installations and occurs—					
	(b) on existing infrastructure.					
	The development of a road—					
	(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or					
24	(ii) with a reserve wider than 13,5 meters, or whereno reserve exists where the road is wider					
	than 8 metres;					
	(a) which is identified and included in activity 27 in Listing Notice 2 of 2014					
	(b) [roads] where the entire road falls within an urban area: or					
	(c) which is 1 kilometre or shorter.					
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in Accordance with a maintenance management					
	plan.					
Listed	Describe the relevant Basic Assessment Activity(ies) in writing as per Listing Notice 3					
Activity No(s):	(GN No. R. 985)					
	The development of a road wider than 4 metres with a reserve less than 13,5 metres					
	Western Cape					
	i. Areas zoned for use as public open space or equivalent zoning;					
	ii. Areas outside urban areas;					
4	(da) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional					
4	zone where no such setback line has been determined; or					
	iii. Inside urban areas:					
	(aa) Areas zoned for conservation use; or					
	(bb) Areas designated for conservation use in Spatial Development Frameworks adopted					
	by the competent authority.					
	The clearance of an area of 300 square metres or more of indigenous vegetation except					
	where such clearance of indigenous vegetation is required for maintenance purposes					
	undertaken in accordance with a maintenance management plan.					
	Western Cane					
	i Within any critically endangered or endangered ecosystem listed in terms of section 52					
	of the NEMBA or prior to the publication of such a list, within an area that has been					
	identified as critically endangered in the National Spatial Biodiversity Assessment 2004;					
12	ii. Within critical biodiversity areas identified in bioregional plans;					
	iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or					
	an estuarine functional zone, whichever distance is the greater, excluding where such					
	removal will occur behind the development setback line on erven in urban areas;					
	IV. On land, where, at the time of the coming into effect of this Notice or thereafter such					
	and was zoned open space, conservation or had an equivalent zoning; or					
	Management Framework adopted in the prescribed manner or a Spatial Dovelopment					
	Framework adopted by the MEC or Minister.					

PLEASE NOTE: Activity 1,24, 27 of Listing Notice 1 and Activity 4 and 12 of Listed Notice 3 falls within the ambit of Condition 3 of the Solar Exclusion Norms and all associated activities towards the realisation of the facility is included. The project is therefore excluded from obtaining an EA; however registration is required.

5.2 Other applicable legislation

Mossel Bay Local Municipality is responsible for ensuring that all contractors, labourers and any other appointed person/entity acting on their behalf, remain compliant with the conditions of the received environmental authorisation and water-use authorisations, as well as the provisions of all other applicable legislation, including *inter alia*:

- National Environmental Management Act (NEMA) (Act No 107 of 1998, as amended);
- National Environmental Management Biodiversity Act (Act 10 of 2004);
- National Water Act (Act 36 of 1998)
- National Environmental Management: Waste Act (Act 59 of 2008);
- National Forest Act (Act No 84 of 1998);
- National Heritage Resources Act (Act No 25 of 1999);
- Occupational Health and Safety Act (Act 85 of 1993);

The above listed legislation has general applicability to most development applications, and it is Mossel Bay Local Municipality 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.

6. 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
- Operational Phase

General environmental management measures that must be applied throughout the project lifecycle (as and where applicable) are described in Chapter 7. Additional management measures that must be implemented to address specific impacts that may arise during each phase are provided in **Chapters 8-11** of this EMPr.

7. 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 must be implemented as and where applicable, reasonable, and practicable during the pre-construction, construction and post-construction and rehabilitation phases of the proposed development.

7.1 Site access (Access Roads) and traffic management

The Groot Brak WWTW site is located directly north of the N2 highway and approximately 2.7km west of the village of Groot Brak in the Mossel Bay municipal area. The coordinates of the centre of the works are approximately 34° 3'34.25"S and 22°11'14.14"E. Access to the facility is obtained from the Sandhoogte gravel road, just off the Tergniet/Friemersheim Road, through a controlled access gate.

Peak hour (morning and afternoon) trip generation from operation and maintenance personnel is estimated at less than 5 trips. The traffic impact of the proposed development will be negligible from a traffic engineering perspective.

In general, all construction vehicles must adhere to traffic laws. 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 must be taken to ensure that the local traffic flow pattern is not too significantly disrupted, and all vehicle operators therefore need to be educated in terms of "best-practice" operation to minimise unnecessary traffic congestion or dangers. Construction vehicles must therefore not unnecessarily obstruct the access point or traffic lanes used to access the site. Construction vehicles also need to consider the load carrying capacity of road surfaces and adhere to all other prescriptive regulations regarding the use of public roads by construction vehicles. Adequate signage that is both informative and cautionary to passing traffic (motorists and pedestrians) warning them of the construction activities. Signage must be clearly visible and need to include, among others, the following:

- o Identifying working area as a construction site;
- Cautioning against relevant construction activities;
- Prohibiting access to construction site;
- Possible indications of time frames attached to the construction activities, and;
- Listings of which contractors are working on the site.

7.2 Accessed restricted areas and areas where no development is permitted

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

7.2.1 Construction working area / Areas where no development is permitted

Prior to the commencement of any construction activities, the outer boundary of the development area must be surveyed and pegged. The demarcation boundary must be tight around the site, typically allowing a working area of no more than 2.5 m around the development footprint. This demarcation boundary is to ensure that 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.

7.2.2 <u>No-go areas</u>

Prior to the commencement of any construction activities, all No-Go areas, must be demarcated and must not be disturbed during the construction phase.

No-go areas must be 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. Construction workers must be informed of the no-go areas, and if necessary appropriate signage and/or temporary fencing (e.g., droppers with danger tape) can be used to enforce the no-go areas.

All areas outside of the development footprint are regarded as No-Go areas.

7.2.3 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 and must be contained within the assessed development footprint area. It is recommended that easily accessible, transformed areas are used for the site camp. Site selection must be done in consultation with the ECO.

7.3 Site camp and associated facilities / Construction Site Establishment

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

Please note: If the site camp is established within the site, it must be established within an area or road footprint to be later developed. Open Spaces and No-Go areas may not be used for the establishment of the site camp or any storage facilities.

7.3.1 Fencing and Gate installations

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 2 m high fence and shade netting or similar.

The outer boundary of the working area should be enclosed with, at least, shade netting, droppers & wire, or similar measures – as is feasible and practical. Access point should be temporarily gated. The fencing should be retained and maintained for the duration of the construction period or up until the conclusion of the rehabilitation phase. If changes to changes are required, such changes can only be applied once the approval of the appointed ECO and Site Engineer has been acquired. Areas to be cleared must be demarcated before any clearing and grubbing commences.

7.3.2 Fire Prevention measures

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.

7.3.3 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 and should be located in such a way that they will present as little visual impact to surrounding road users as possible. Label each waste receptacle for waste separation, and ensure waste is contained either by use of lids or by ensuring waste receptacles are emptied prior to filling up, making them susceptible to wind dispersion. Sufficient signage and awareness should be created to ensure that these bins are properly used.

7.3.4 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. Ensure that when substances are transferred, this is done on an impermeable and/or bunded surface, to contain any spillage. Spillage, should it occur, should be disposed of appropriately.

7.3.5 Water Supply Management

An adequate supply of potable water must be provided to construction workers at the site camp. It is the Contractors duty to ensure that the labourers have adequate access to potable water throughout construction phase, and to monitor weather conditions, to ensure that labour has enough drinking water on hotter days, or construction activity must cease, until conditions are safe to continue.

7.3.6 Prevention of diseases

Construction sites pose significant risks for various occupational diseases due to the hazardous conditions and harmful substance exposure. It is imperative to recognise the common respiratory conditions that

can arise, including COVID-19 and tuberculosis. Additionally, inhaling dust and fibres found on-site can lead to severe conditions like asbestosis and silicosis. Skin disorders, such as dermatitis, often result from exposure to chemicals and irritants. Personal Protective Equipment (PPE), including respirators and gloves, must be utilised without exception. Handwashing should be a standard practice, and anyone feeling unwell must stay home to recover and prevent the spread of illness. Regular health and safety training is essential to uphold a safe working environment. Furthermore, maintaining cleanliness and ensuring proper ventilation are critical responsibilities that cannot be overlooked. Prioritising these measures is vital for the health and well-being of everyone on the construction site.

7.3.7 Ablution Facilities / Sanitation

Chemical toilets should be maintained on the site camp for the duration of the construction phase and rehabilitation, 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.

The ablution facilities must not be linked to the watercourses 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. The toilet facilities should be emptied on a weekly basis, by an appropriately registered service provider. Proof of this weekly servicing must be obtained and filed in the Environmental File on site. 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.

- Ablution facilities provided for construction workers must be placed away from the terrace edge.
- Ablutions should be further than 50 m from the identified aquatic areas.

7.3.8 Eating Area & Rest Area

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

7.3.9 Workshop, equipment maintenance and storage

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.

7.3.10 Housekeeping

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.

7.4 Vegetation Clearance

Where vegetation must be cleared the following measures must be implemented where applicable, reasonable, and practical:

- Where feasible vegetation must simply be trimmed to facilitate access/ construction, rather than being completely cleared or removed.
- Vegetation clearing/trimming must be cleared by hand (i.e., brush cut) and stockpiled for use as mulch/ brush-packing during rehabilitation of the site. Any alien vegetation that is cleared must be disposed of in consultation with the ECO, unless the cleared alien vegetation does not contain seeds in which case it may be retained for use in site rehabilitation. Any other vegetation removed can be chipped into pieces and distributed on site for rehabilitation or burned with the approval from the municipal fire chief.

- No bulldozing must be undertaken for the purpose of vegetation clearing.
- Only the areas required to accommodate the construction activities and access to the construction site must be cleared/trimmed of vegetation.
- Vegetation outside of the construction footprint and beyond any No-Go areas must not be cleared.

7.5 Stockpiling and Stockpile Areas

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.
- 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 and at a location where it can be protected from disturbance during construction and where it will not interfere with construction activities.
- Where applicable 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. The ECO must be consulted with regards to the placement of the stockpiles, to ensure that the selected location is in compliance with this EMPr and EA (once granted).
- Ideally, topsoil is to be handled twice only, once to strip and stockpile, and once to replace, level, shape and scarify.
- 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).
- Spoil 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.
- 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.

7.6 Solid Waste Management

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. Waste bins for the different categories of recyclable waste (i.e., paper, plastic, metal) must be provided on site. These bins must be emptied, and the waste must be taken to a registered recycling facility. The receipts from the facility must be kept on file and must be available on request.



10 and Figure 11 show two such systems within a construction site.



Figure 10. Recycling system implemented on a construction site. Skips provided for general waste, plastic, cardboard and metal.



Figure 11. Recycling system implemented on a construction site. Lidded bins provided for general waste, plastic, cardboard, and metal.

The non-recyclable and non-reusable waste (e.g., builder's rubble, etc.) generated on site must be stored and disposed of at a landfill site licensed in terms of the applicable legislation.

7.7 Hazardous substances and fuels management

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.

The following management measures must be applied:

• All hazardous substances must be stored in the designated area within the site camp.

- The area selected for storage of hazardous fuels must be located on a level area, well outside of 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.
- 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 must be prominently displayed at the storage area.
- 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 tank 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.
- 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.
- Firefighting equipment must be located in close proximity to the storage area.

7.8 Cement and concrete batching plants

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

- Cement/ concrete must not be mixed on bare ground.
- Cement/concrete must not be mixed within any identified watercourses.
- 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 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 for disposal.
- Empty cement bags are currently not recycled within the Garden Route and must be disposed of in the un-recyclables waste bins on site.

7.9 Stormwater management, Wastewater management and Erosion control

Appropriate measures must be implemented to control the flow of stormwater across the construction site, to prevent possible flooding, soil loss and dispersion of pollutants. All exposed earth surfaces must also be protected from wind and water erosion. Stripped areas must not remain uncovered for extended periods of time and must be provided with a suitable cover (vegetation, mulch, brush-packing) as soon as possible.

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, storm water control) to the satisfaction of the ECO and consulting engineer.

It may be necessary to implement small-scale erosion protection measures at the construction site, to prevent soil erosion. Such measures may include the use of shade netting, geo-fabric, brush-packing,

logs and stakes or similar barriers in areas susceptible to erosion and along exposed slopes. The netting/fabric is placed directly across the path of flow of stormwater. Poles and logs, staked in along the contours of a slope susceptible to erosion may also be used.

Please refer to Appendix G of this EMPr for the Stormwater Management Plan compiled by Element Consulting Engineers.

7.10 Protection of watercourses and water bodies

According to the specialist, Debbie Fordham of Upstream Consulting, no natural aquatic habitats within the proposed site. There are two artificial wetlands recorded within the site. In the South-westerly direction is a small wetland that was previously used for livestock drinking water and a second seep wetland formed by road runoff/ or leaking pipe located in the North-easterly direction of the proposed site. See Figure 12 below. The two identified artificial wetlands on site are of negligible ecological importance and the loss of these wetlands will not impact aquatic biodiversity.



Figure 12. Aquatic Habitat identified within 500m of the proposed site, (Fordham, 2024).

The specialist suggested that stormwater management should focus on responsible runoff management. Adhering to the stormwater management plan is imperative, which further needs to address the design and erosion control structures. Please refer to Appendix G.

7.11 Excavations and Earthworks

Any major earthworks with 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.

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 by logs (or similar material) in such a manner that any stream flow is directed away from the stockpile, reducing the risk of erosion.

Whenever any excavation is undertaken, the following procedures shall be adhered to:

- Topsoil must be handled as described in this Section 7.5 of this EMPr.
- Excavations must take place only within the approved demarcated site.
- Excavations must follow the contour lines where possible.
- Excavations must be closed overnight, over weekends, holiday periods, and during any other planned site closure periods. Where this is not possible, adequate (as agreed upon by the ECO and engineer) demarcation measures and signage must be made undertaken around any excavation exceed a depth of 500 mm.
- Excavations must be temporarily cordoned off by shade cloth or barrier fencing to obstruct visual impacts and to prevent the harm to animals or unauthorised persons that may fall into excavations.
- The construction site will not be left in any way to deteriorate into an unacceptable state.
- Once excavations have been filled with overburden and coarse natural materials and profiled with acceptable contours (including erosion control measures), the previous stored topsoil shall be returned to its original depth over the area.

The cabling will be installed by hand-digging method with a strict 2-meter working corridor.

7.12 Temporary Site Closure

As the construction project approaches its shutdown phase for the holiday period, it is essential to develop a shutdown plan. This temporary environmental shutdown plan should address critical aspects such as waste disposal, erosion control, water pollution prevention, material storage, and sanitation facilities during the shutdown. The plan must ensure ongoing environmental compliance throughout the break. The Temporary Site Closure plan needs to be attached in the ECO report before shutting down commences. Within the temporary site closure plan there needs to be shut-down period dates, site safety and security, the environmental protection measures, as addressed above and asset and equipment protection. Contacts for standby personnel, as well as emergency numbers.

Unplanned/Planned Shutdown:

- Should site need to be closed, ensure the following is undertaken:
 - Any contaminated soil must be collected and disposed of as hazardous waste.
 - All construction waste, litter and rubble must 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.
 - Temporary access routes must be closed and measures put in place to prevent future use of the access road by any person.
 - Preventative dust pollution mitigation measures must be implemented to control dust during the festive break (when the site is vacant).
 - All construction areas/facilities must be secured, e.g. Where scaffolding is left on site, it must be ensured that no plastics, danger tape or other wastes are allowed to blow off; portable toilets must be secured etc.
 - All construction barriers must be neat and secure.
 - 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).

- Drip trays must be placed beneath all construction vehicles, if kept on site during the construction break. Drip trays must be placed under generators (if used on site) water pumps and any other machinery on site that utilises fuel/ lubricant.
- Where feasible, fuel tanks should be elevated so that leaks are easily detected.
- Contractors must ensure that their site camp and working areas are clear of alien invasive and weed species prior to the construction break.

7.13 Landscaping and Rehabilitation

Upon completion of the construction phase, all disturbed areas, including the working area (disturbance corridor), temporary access roads, 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.
- 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 oil, fuel or other hazardous substance must be collected and disposed of as hazardous waste.
- All construction waste, litter and rubble is to be removed from the site and disposed of at an appropriate facility. Burying or burning of waste or rubble on site is 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.
- 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.
- The disturbed, newly rehabilitated surfaces (particularly steeper slopes and areas recently covered with topsoil) must be protected from wind & water erosion using mulch, brush packing or other appropriate erosion protection measures. Brush-packing/ mulching is done by covering the exposed surface with organic plant material such as branches, plant cuttings and leafy material. Ideally the vegetation removed from site at the start of the construction must be utilised. Brush-packing/ mulching plays a valuable role in erosion control, while also promoting revegetation of the site by retaining moisture in the soil, introducing seeds and/or trapping wind-blown seeds and providing organic material (compost) to promote new plant growth.
- Final rehabilitation of the site must be done to the satisfaction of the ECO, and must adhere to all conditions/ requirements of the Environmental Authorisation.
- If the site camp was located on the footprint of an erf or road, the location of the site camp must then be rehabilitated in accordance with the site development plan.

7.14 Visual Impact.

The proposed development has the potential to cause a visual impact during the construction and operational periods. To minimise the potential visual impact, all working areas, storage facilities, stockpiles, waste bins, elevated tanks and the site camp should be located in such a way that they will present as little visual impact to surrounding residents and road users as possible. Waste must be

managed according to this EMPr. Good housekeeping practices on site must be maintained to ensure the site is kept neat and tidy. The site camp may require visual screening via shade cloth or other suitable material. The use of reflective materials and excessive lighting should be avoided, and construction vehicles must enter and leave the site during working hours (07:30-17:30). Further mitigation measures have been provided in Section 10 of the EMPr.

7.15 Noise Management

Additional noise is expected during the construction period due to construction activities. It is important that noise complaints register should be opened and that all 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. This is to be done by ensuring that all equipment is in good working condition and fitted with mufflers/exhaust silencers in necessary. 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, and all affected parties must be informed of the excessive noise factors.

7.16 Dust Emission Management

Although the generation of dust is synonymous with construction sites, care needs to be taken to prevent excessive dust from impacting the surrounding environment and community. Majority of the dust causing activities will take place during the construction period. Exposed surfaces, such as stockpiles and cleared areas should be provided with a suitable cover as soon as possible or wetted down. Construction vehicles should maintain low speeds of 20-40km/h and must ensure that tarpaulins are used to cover any loads transported. 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, and dust fall rates in non-residential areas may not exceed 1200 600mg/m²/day, measured using reference method ASTM D1739.

A Complaints Register must be available at the site office for inspection by the ECO, in case of complaints, such as those related to dust. This should form a part of your Environmental File.

7.17 Heritage Remains/ Protection of Heritage Remains

In the unlikely event that any heritage resources, including evidence of graves, human remains, archaeological material and paleontological material, are uncovered during construction activities, these must be immediately reported to Heritage Western Cape. Burials must not be disturbed or removed until inspected by a professional archaeologist. In case of the unexpected uncovering of fossil bones in the surficial cover-sands and soil, or buried archaeological material, or unmarked graves, the Protocol for Chance Fossil Find (PCFF) must be followed.

7.18 Finalising Installation of equipment

Pre-Installation: The following steps are required to ensure the finalisation of installation is adhered to:

- There needs to be approved plans and designs for the proposed installation;
- 1. Suitable and approved engineering designs and development footprint
- 2. Costing and permit requirements such as Eskom, government and other organs of state that require approval.
- 3. Following Health and safety standards (SANS requirements where applicable)
- 4. Approved and allocated land clearing and preparations for the installations.

Post-Installation checks:

- 1. Once the adequate documents are obtained, installation needs to be done within the approved timeframes for the proposed project.
- 2. Ensure all methods and equipment to be used is approved and is of suitable quality.
- 3. Ensure installation is properly mounted and aligned with the associated infrastructure to be wired correctly and safely by a suitable and qualified personal.

- 4. Testing to be conducted to ensure functionality and safety of operations.
- 5. Batteries that are located indoors must be stored in a well-ventilated and fire-resistant enclosure designed for battery storage systems. To ensure potential hazards and protects against thermal runaway or other battery-related incidents.
- 6. Fire extinguishers and smoke detectors are required around the batter energy storage system area.
- 7. Implement a monitoring device or system to ensure batteries are working effectively to minimise potential risks and or harm.

After Installation checks:

- 1. Regular checks and inspections to be conducted on the equipment.
- 2. Eskom and the managing engineers to monitor the system and ensure that the energy production data is used adequately and functioning correctly.
- 3. Ensure maintenance and upkeep of the installation is ensured.
- 4. A final rehabilitation and landscaping in accordance with Appendix G Rehabilitation Plan needs to be followed after installation.

8. 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 remains compliant with the received Environmental Authorisation.

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

- Appoint an Environmental Control Officer.
- Update environmental management Programme
- Legislative Compliance.

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

OBJECTIVE 1: APPOINTMENT OF AN ENVIRONMENTAL CONTROL OFFICER

Impact Management Objective: To appoint a suitably qualified and experienced Environmental Control Officer.						
Retential impact to avoid	Failure to appoint an ECO will result in non-compliance with the Environmental Authorisation and the requirements of					
Forential impact to avoid	the EMPr.					
Impact Management Outcome	The conditions of Environmental Authorisation and 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			ible par	ty	Time period	
• A suitably qualified and experienced Environmental Control Officer must be appointed before any			Bay	Local	During design phase	
activities commence on site.			ality			
• The appointed ECO must adhere to the requirements stated in Chapter 14 and 16 of the EMPr 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.				
Performance Indicator A qualified ECO is appointed prior to the commencement of any construction activities (including pre-construction up activities) on site.				

OBJECTIVE 2: UPDATE ENVIRONMENTAL MANAGEMENT PROGRAMME

The Environmental Authorisation issued for the development may require certain amendments to be applied to the EMPr. In addition, the final site layout and detailed design may also necessitate the amendment of the EMPr, in order to ensure that the development is accommodated in the EMPr.

Impact Management Objective: To ensure the EMPr adheres to the requirements of the Environmental Authorisation and makes provision for the final detailed site layout.					
Potential impact to avoid	 Failure to update the EMPr in accordance with conditions specified in the EA may result in non-compliance with the EA. Failure to update the EMPr to accommodate the final detailed site layout may result in non-compliance with the EA. 				
Impact Management Outcome	Impact Management Outcome Good environmental management is promoted on site.				
IMPACT MANAGEMENT ACTIONS					
Mitigation measure		Responsible party		ty	Time period
An independent Environment	al Consultant must be appointed to amend the EMPr.	Mossel	Bay	Local	During design phase
• All amendments to the EMPr specified in the Registration must be applied to the EMPr unless agreed			ality		
otherwise in writing with the Competent Authority.					
Amendments to the EMPr must be approved in writing by the Competent Authority.					
Public participation may be required on the proposed EMPr amendments. The Competent Authority					
must be consulted for clarity on these requirements.					
Porformanco Indicator	An updated EMPr that adheres to the conditions of the EA and that reflects the requirements of the final detailed site				
	layout is approved by the Competent Authority prior to commencing activities on site.				

OBJECTIVE 3: LEGISLATIVE COMPLIANCE

The Environmental Authorisation issued for the development may require certain amendments to be applied to the EMPr. In addition, the final site layout and detailed design may also necessitate the amendment of the EMPr, in order to ensure that the development is accommodated in the EMPr.

Impact Management Objective: To ensure the EMPr adheres to the requirements of the Environmental Authorisation and makes provision for the final detailed site layout						
	Commencement of activities without all relevant permits/perm	Commencement of activities without all relevant permits/permissions/licences/approvals including registered				
Potential impact to avoid	servitudes, permits to remove specific vegetation, etc. as well as commencing without implementation of specialist					
	recommendations, including search and rescue, and compliance	recommendations, including search and rescue, and compliance with EMPr pre-construction activities, can result				
	in penalties, time delays and excessive costs. All stemming from poor planning.					
Impact Management Outcome	All permits, permissions, licences, approvals, and specialist input are	acquired, and the prop	posed development is			
	compliant with the respective conditions.					
IMPACT MANAGEMENT ACTION						
Mitigation measure		Responsible party	Time period			
General		Mossel Bay Local	During design phase			
		Municipality				
Ensure programme of w	orks is planned accordingly and includes recommended measures					
where necessary, such a	s implementing search and rescue activities.					
 Ensure financial allowant 	ces are made for the recommended measures, such as search and					
rescue plans, rehabilitation, etc.						
Ensure all relevant permits/licenses/approvals are in place and are valid prior to commencing						
with works. These include:						
 Environmental A 						
 Servitudes registr 	ations					
 District Municipa 	 District Municipality approval 					
• Permission from <i>I</i>	 Permission from Municipal Roads and Stormwater Department for the temporary closure 					
of municipal roads						
 Permission from p 	rivate landowners for the closure of private access roads during road					
crossings						

 A permit obtained from CapeNature in terms of the Nature Conservation Ordinance (19 						
of 1974, amended 2000) for the search and rescue (removal) of endangered or						
protected plant spe	ecies listed in Schedules 3 or 4.					
 A licence from Fore 	estry Western Cape in terms of the National Forests Act (Act 84 of 1998,					
amended 2009) sho	buld any trees in natural forests be required to be cut, disturbed or					
uprooted. The rema	oval of Milkwood and Cheesewood requires a permit from the					
Department of Fore	estry.					
Ensure that the Contractor	has accepted the approved EMPr and Environmental Authorisation					
(and any other relevant pe	ermits/licenses, etc), as a part of their Tender Document, to ensure that					
they are fully aware of thei	r responsibilities in terms of the implementation of these documents.					
Ensure that the Contractor	provides method statements for activities intended to be undertaken,					
and these are checked an	d approved by the ECO as well as the Engineer.					
 Inform ECO of planned wo 	rks ahead, so as to ensure inductions are undertaken timeously.					
 Involve ECO in selection of 	site camp location.					
 In terms of the National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004) 						
Alien and Invasive Species	List (2016). Category 1b invasive species, such as Rooikrans and					
Lantana, require compulso	bry control as part of an invasive species control programme					
Eurthermore the harbourin	a of Black Wattle (Category 2 invader) on a property is prohibited					
without a permit						
It is important to note that the Exclusion Registration and approved EMPr is a legal and binding						
document, therefore complia	document, therefore compliance with these conditions must be met.					
Derferne en ele la die eter	The project does not incur delays, excessive costs and penalties due to	unobtained permits and	non-compliance with			
renormance indicator	required permits, permissions, licences, and approvals.					

9. 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 inspection.

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	 Insensitive location of working areas and site facilities may resul phase. Failure to accurately demarcate working areas may result in incr Failure to demarcate no-go (open spaces) areas may result in di 	t in environmental impac eased disturbance footp sturbance to these areas	cts during construction rint. 5 during construction.	
Impact Management Outcome	Future construction activities will be restricted to within the designated areas) will be protected from disturbance.	l areas & environmentally	sensitive areas (no-go	
IMPACT MANAGEMENT ACTIONS				
Mitigation measure		Responsible party	Time period	
 The no-go areas must be identified. Demarcation of working area and no-go areas must be done in accordance with Section 7.2 of this EMPr. Site camp facilities must be situated as far away from the No-Go areas as possible. Areas outside the work areas must be declared 'no-go' areas and not be disturbed in any way. The contractor(s) must be made aware of the sensitive surroundings. The renosterveld areas outside the footprint must be declared as 'no-go' areas and not be disturbed in any way. 		Engineer / Contractor	Pre-construction phase (prior to arrival of construction equipment, machinery, or workers on site)	
 Before construction, it is recommend that the development footprint be kept at the provided minimum to minimise disturbance of surrounding natural habitats. In order to maintain functioning of the biodiversity network, it is recommended that the northeastern side of the site be pulled further back from the road by straightening out the boundary. 				
Performance IndicatorNo-go areas, working areas and areas for site camp facilities have been identified and appropriately demarca the satisfaction of the ECO, before construction activities commence on site.			oriately demarcated to	
OBJECTIVE 2: ESTABLISH ENVIRONMENTALLY SOUND SITE CAMP & SITE FACILITIES

Impact Management Objective: To set up and equip the site camp and associated site facilities in a manner that will promote good environmental				
management.	management.			
 Inappropriate siting of site camp facilities may result in impacts to sensitive resources (e.g. contaminated run-off from refuelling area may contaminate soil). 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 7 of this EMPr must be provided on site.	Contractor	Pre-construction	
The site camp and associated site facilities must be set-up and managed in accordance with the general environmental management measures specified in Section 7 of this EMPr. 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.				

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, so that the ECO can 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 will result in non-compliance with the EA. If a pre-commencement ECO inspection is not performed, the Applicant may be held liable for environmental degradation that took place prior to the Contractor commencing work on site. 		
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 Contractor Start of construction			
commence on site so that the ECO can perform a pre-commencement inspection and plan for environmental awareness training of construction workers.			phase
 Use permeable fencing around the development, which will allow the movement of fauna across the site. Restrict all construction activities, such as stockpiling, parking and office infrastructure, to already disturbed areas away from natural vegetation. Specialist Recommendation: 			
Areas outside the work areas must be declared 'no-go' areas and not be disturbed in any way.			
The removal of Milkwood and Cheesewood requires a permit from the Department of Forestry.			
Performance Indicator A pre-commencement site inspection is conducted by the appointed ECO before construction activities commence on site.			

10. 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 outcomes and actions that will prevent the identified potential impacts from arising – or where avoidance is not possible, that will minimise and mitigate the impact – 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 7 of this EMPr as well as any other conditions 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:

- Stormwater Management and erosion prevention
- Limit Visual impact
- Limit impacts on terrestrial biodiversity (Fauna and Flora)
- Limit the impact of the project on flora and SCC
- Socio-economic Impacts
- Socio-economic Benefits
- Limit visual scarring

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

OBJECTIVE 1: STORMWATER MANAGEMENT AND EROSION PREVENTION

Impact Management Objective: To prevent erosion and manage stormwater of the site			
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. Concentration of stormwater Pollution due to incorrect/ no stormwater management plan and poor Erison control structures for the solar array site and powerline corridor. 		
Impact Management Outcome	Soil erosion is kept to a minimum and stormwater is not concentrated, and is managed accordingly.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure	Mitigation measure Responsible party Time period		
 Stormwater generat Sustainable Drainage as possible should b the following measu 	ed on site should, as far as possible, be managed according to e System (SuDS) principles. This requires that as much stormwater be attenuated within the development footprint. In this respect res.	Contractor	Construction phase

0	Use of swales and a	detention ponds to attenuate stormwater runoff, encourage
	infiltration and redu	ce the speed, energy and volumes at which stormwater is
	discharged from the	site;
0	Use of permeable po	aving to encourage infiltration into the soil; and
0	Use of retention por	nds and artificial wetlands to capture stormwater runoff and
	prevent its discharge	from the site.
0	The steep slopes of th	ne property will be vulnerable to erosion during clearance of the
	site and the construc	ction phase. It is therefore important that appropriate erosion
	control measures are	implemented, which include inter alia, the following:
0	Ensure that construct	activities do not cause any preferential flow paths and
	concentratea surtac	e runoff during rainfail events.
0	Clearly demarcate tr	the construction area and ensure that neavy machinery does not
	Poduco transport	for vegeration outside of these demanded dieds.
0	hipdegradable coir l	as placed along a contour below the development footprint
0	The steen slones of th	be property will be vulnerable to erosion during clearance of the
0	site and the constru	ction phase. It is therefore important that appropriate erosion
	control measures are	implemented, which include inter alia, the following:
0	Ensure that construct	tion activities do not cause any preferential flow paths and
-	concentrated surfac	e runoff during rainfall events.
0	Clearly demarcate th	ne construction area and ensure that heavy machinery does not
	compact soil or distu	rb vegetation outside of these demarcated areas.
0	Reduce transport o	f sediment through use of structures such as silt fences or
	biodegradable coir l	ogs placed along a contour below the development footprint.
Performance	Indicator	No erosion occurring on the site or surroundings as a result of construction activities and unmanaged stormwater.

OBJECTIVE 2: LIMIT VISUAL IMPACT

Impact Management Objective: To limit visual scarring as a result of clearing vegetation and earthworks.			
Potential impact to avoid	Visual scarring as a result of clearing vegetation and earthworks		
Impact Management Outcome	No avoidable visual scarring of the construction site		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure Responsible party Time period			
 Minimise disturbance, revegetate edges of site with indigenous shrubs and trees and the PV areas with low growing indigenous lawn grass and groundcovers. 		Contractor/ ECO monitor	Construction phase

Specialist Mitigation measures:			
Create an earth/sand berm	(long earth mound) on the southern and western borders of the		
site, approximately 1 - 1,5m	n high, within the fenced area of the site and plant this with		
indigenous trees typical of th	ne surrounding area, that will get to a height of 3 - 5 meters. The		
selection of the plant specie	es should be made in consultation with the botanist.		
Create more space between	en the Groot Brak and Klein Brak solar PV panels such that an		
earth berm planted with tree	es can be established here, thereby providing screening of the		
upper panels from the south			
 Areas cleared under the po 	anels should be revegetated with lawn so that the stark earth		
colour from site clearing is softened by green shades			
Structures and fencing on the site should be painted recessive colours such as charcoal grey			
and the building materials should also be non - reflective and dark grey colours.			
Performance Indicator	No avoidable visual scarring of the site		

OBJECTIVE 3: TO LIMIT IMPACTS TO TERRESTRIAL BIODIVERSITY

Impact Management Objective: To Limit impacts to terrestrial biodiversity			
Potential impact to avoid	ial impact to avoid Impacts to terrestrial biodiversity Clearing of fallow land Slight impact on the functionality of biodiversity network. Increased opportunity for alien infestation.		
Impact Management Outcome	Impacts to terrestrial biodiversity are limited		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
 Shrubland and Drainage Linshould be excluded from a (this is already implemented) It is recommended that the minimise disturbance of sur should be made to save and that cannot flee of its own of minimise the direct mortality 	he habitats (not located within the proposed facility footprint) hy development planning and considered as a "No-Go" area. I by the preferred layout) e development footprint be kept at the provided minimum to rounding natural habitats on the site. Furthermore, every effort d relocate any mammal, reptile, amphibian, bird, or invertebrate accord, encountered during site preparation (i.e., to avoid and y of faunal species). These animals should be relocated to a	Contractor	Construction phase

	suitable habitat area immediately outside the project footprint, but under no circumstance	
	to an area further away.	
•	Use permeable fencing around the development, which will allow the movement of fauna	
	across the site. Restrict all construction activities such as stockpiling, parking and office	
	infrastructure, to already disturbed areas away from natural vegetation. The contractor(s)	
	must be made aware of the sensitive surroundings. The reposterveld areas outside the	
	footprint must be declared as 'no-ao' areas and not be disturbed in any way	
•	In order to maintain functioning of the biodiversity network, it is recommended that the north-	
	eastern side of the site be pulled further back from the road by straightening out the	
	boundary	
•	Pollutant substances brought onto site must be properly contained	
•	Remove topsoil and/or seed-bearing indigenous plant material from the vegetated areas to	
	be disturbed for use in the rehabilitation of disturbed areas after construction.	
•	Where needed or considered practical, rehabilitate/reveaetate all the disturbed surfaces.	
	Erosion prevention measures may be needed on steep slopes, such as silt fences, loas or	
	netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous	
	renosterveld seed may also be needed.	
Gener	al Management of Faunal Biodiversity	
•	Ensure contact numbers for emergency assistance are available.	
•	Reptiles such as lizards are less mobile compared to mammals, and some mortalities could	
	arise.	
•	A reptile handler must be on call for such circumstances.	
•	Respective permits to be obtained beforehand (if applicable).	
•	No animals are to be harmed or killed during the course of operations.	
•	Workers are NOT allowed to collect any flora or snare any faunal species. All flora and fauna	
	remain the property of the landowner and must not be disturbed, upset or used without their	
	expressed consent.	
•	No domestic animals are permitted within the working areas of the sites.	
•	irees and snrups that are directly attected by the operations may be telled or cleared but	
_	only by the expressed written permission of the ECO.	
•	A sweep of the proposed development tootprint must be done prior to the site establishment	
	in order to ensure that no animals are nurt during site clearance activities.	
•	snould animals wander into the development tootprint, these animals are not to be hunted	
	or killed. In the unlikely event of animals accessing the site, the animals must be captured and	
	released outside of the working areas.	
•	ine site is to be always kept clean and tlay so as to not attract the animals to the site.	

 Notify surrounding farmers of construction works. 	
• Labourers must be made aware of what game may be present within the surrounding farms,	
so as to be able to recognize and report sitings within the construction area.	
• Ensure neighbouring property owners contact details (who own game), are available for the	
site agent, in case of an emergency.	
• Undertake regular checks of demarcations and fence lines to ensure no encroachment	
OCCUrs.	
Specialist Recommendation	
• As a long-term management requirement for the remainder of the property, invasive plant	
species, such as Acacia cyclops (rooikrans), Acacia mearnsii (black wattle) and Lantana	
camara (lantana), must be controlled. In terms of the National Environmental Management:	
Biodiversity Act (NEMBA) (Act 10 of 2004) Alien and Invasive Species List (2016), Category 1b	
invasive species, such as rooikrans and lantana, require compulsory control as part of an	
invasive species control programme. Furthermore, the harbouring of black wattle (Category	
2 invader) on a property is prohibited without a permit.	
 During the construction phase, fence off the construction footprints where it encroaches 	
on Hartenbos Dune Thicket, Groot Brak Dune Strandveld and good quality regrowth.	
Restrict all construction activities, such as stockpiling and parking, to already disturbed or	
transformed areas away from the sensitive areas. The contractor(s) must be made aware	
of the sensitive areas where SCC and protected tree species may be present. These areas	
outside the work areas must be declared 'no-go' areas and not be disturbed in any way.	
The removal of milkwood and cheesewood requires a permit from the Department of	
Forestry.	
All trenching in sensitive areas must be undertaken by hand. No heavy construction plant	
must be allowed inside these areas. An effort must be made to avoid good quality	
indigenous vegetation and protected tree species as far as possible.	
• Search and rescue (S&R) succulents and bulbs from the construction areas for replanting in	
the disturbed or rehabilitation areas after construction. Lopsoil, cuttings and seedbearing	
plant material can also be salvaged for this purpose. Bulbs should be removed along with	
some soil, placed in gel, bagged and then taken to a nursery for temporary storage or	
transplanted directly in the receiving area. S&R should be done at an appropriate time of	
the year, preterably when the soil is wet during the raining season. Please note that a	
CapeNature permit is needed for the removal/relocation of indigenous plant species.	
Kenabilitate/revegetate all the disturbed surfaces. A Search & Rescue and Rehabilitation	
Plan will be needed. Allow at least 24 months for the monitoring of rehabilitation success and	
alien intestation post construction. (See Appendix G)	

 Save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). These animals should be relocated to a suitable habitat area immediately outside the project footprint (preferably to the patch of vegetation to the north), but under no circumstance to an area further away. 		
Performance Indicator	No avoidable impacts to terrestrial biodiversity.	

OBJECTIVE 4: LIMIT IMPACT OF THE PROJECT ON FLORA AND SCC

Impact Management Objective: To limit impact of the project on flora and SCC			
Potential impact to avoid	Avoidable disturbances to and loss of flora and SCC		
Impact Management Outcome	No avoidable disturbance to flora and SCC		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
 As a duty of care meas development footprint is rea after construction. Topsoil, a for this purpose. Geophytes and then taken to a nursery area. Ideally, bulbs should b <u>Specialist Recommendation:</u> Vegetation clearing procee naturally into the habitats to Fence off the construction for Brak Dune Strandveld and g Restrict all construction act transformed areas away fro The contractor(s) must be m species may be present. These areas outside the wor any way. For the powerline corridor, o No heavy construction plan 	ure, search and rescue of succulents and bulbs from the commended. These can be replanting in the rehabilitation areas cuttings and seedbearing plant material can also be salvaged should be removed along with some soil, placed in gel, bagged of for temporary storage or transplanted directly in the receiving e salvaged during leaf fall, but before or after flowering. ed from the south towards the north to allow for fauna to move the north of the project footprint. potprints where it encroaches on Hartenbos Dune Thicket, Groot good quality regrowth. vities, such as stockpiling and parking, to already disturbed or m the sensitive areas. ade aware of the sensitive areas where SCC and protected tree k areas must be declared 'no-go' areas and not be disturbed in all trenching in sensitive areas must be undertaken by hand. t must be allowed inside these areas.	Contractor/ECO	Construction phase

 Avoid good quality indigend 	ous vegetation and protect tree species as far as possible.	
• Trenching for the proposed 11kV cables proceed by hand so as to minimise possible impacts		
to, and disturbance of the re	esident fauna and small remaining habitat patches along these	
routes.		
• Trenches should be in-filled	with removed topsoil as soon as possible to not allow smaller	
species to become trapped	l.	
Monitor the powerline route	s for erosion. Where needed, rehabilitate/revegetate disturbed	
surfaces. Erosion preventior	n measures may be needed on steep slopes, such as logs or	
netting, to slow down runof	f and potential erosion. Mulching and seeding with indigenous	
dune thicket/strandveld see	d may also be needed.	
 As a long-term maintenanc 	e requirement, engage in alien clearing, focussing on invasive	
species such as port jackson, black wattle, rooikrans and lantana. These species are		
category 1b and 2 invaders that require compulsory control as part of an invasive species		
control programme.		
Performance Indicator	No avoidable disturbances to flora and SCC	

OBJECTIVE 5: Limit Visual Scarring

Impact Management Objective: To limit visual scarring as a result of clearing vegetation and earthworks.			
Potential impact to avoid	Visual scarring as a result of clearing vegetation and earthworks		
Impact Management Outcome	No avoidable visual scarring of the construction site		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
 Minimise disturbance, reveget areas with low growing indiger 	ate edges of site with indigenous shrubs and trees and the PV nous lawn grass and groundcovers.	Contractor/ ECO monitor	Construction phase
 Specialist Mitigation measures: Create an earth/sand berm (long earth mound) on the southern and western borders of the site, approximately 1 - 1,5m high, within the fenced area of the site and plant this with indigenous trees typical of the surrounding area, that will get to a height of 3 - 5 meters. The selection of the plant species should be made in consultation with the botanist. 			

٠	Create more space betwee	en the Groot Brak and Klein Brak solar PV panels such that an	
	earth berm planted with tree	es can be established here, thereby providing screening of the	
	upper panels from the south		
• Areas cleared under the panels should be revegetated with lawn so that the stark earth			
colour from site clearing is softened by green shades			
• Structures and fencing on the site should be painted recessive colours such as charcoal grey			
and the building materials should also be non - reflective and dark grey colours.			
Performance Indicator No avoidable visual scarring of the site		·	

OBJECTIVE 6: Socio-Economic Impacts

Impact Management Objective: Lin	nit impact on the socio-economic perspective		
	Presence of construction workers and potential impacts		
Potential impact to avoid	 Combating security concerns and vandalism 		
	Increased risk of grass fires		
Impact Management Outcome	Avoided socio-economic impacts in the construction phase.		
IMPACT MANAGEMENT ACTIONS			
Promotion measure		Responsible party	Time period
 The proponent and contract 	tor should develop a Code of Conduct (CoC) for construction	Contractor/ ECO monitor	Construction phase
workers. The code should	identify which types of behaviour and activities are not		
acceptable. Construction w	orkers in breach of the code should be subject to appropriate		
disciplinary action and/or di	smissed.		
 Appointment should be made 	de as far as reasonably possible to the local community		
 Where feasible, training and prior to the initiation of the c 	d skills development programmes for locals should be initiated onstruction phase.		
• The recruitment selection	process should seek to promote gender equality and the		
employment of women whe	rever possible.		
 No construction workers, except for security personnel, should be permitted to stay over- night on the site. 			
 Contractors appointed by the 	he proponent must ensure that all workers are informed at the		
outset of the construction (phase of the conditions contained in the Code of Conduct,		
specifically consequences o	f stock theft and trespassing on adjacent farms.		

٠	Contractor should ensure that open fires on the site for cooking or heating are not allowed	
	except in designated areas.	
٠	Smoking on site should be confined to designated areas.	
٠	Contractor should ensure that construction-related activities that pose a potential fire risk,	
	such as welding, are properly managed and are confined to areas where the risk of fires has	
	been reduced.	
•	Measures to reduce the risk of fires include avoiding working in high wind conditions when	
	the risk of fires is greater. In this regard special care should be taken during the high-risk dry,	
	windy winter months.	
•	Contractor should provide adequate fire-fighting equipment on-site.	
٠	Contractor should provide fire-fighting training to selected construction staff.	
٠	The movement of construction vehicles on the site should be confined to agreed access	
	road/s.	
•	The movement of heavy vehicles associated with the construction phase should be timed	
	to avoid times days of the week, such as weekends, when the volume of traffic travelling	
	along the access roads may be higher.	
٠	Dust suppression measures should be implemented, such as wetting on a regular basis and	
	ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins	
	or covers.	
•	All vehicles must be road worthy, and drivers must be qualified and made aware of the	
	potential road safety issues and need for strict speed limits.	
٠	Existing internal roads should be used where possible. If new roads are required, these roads	
	should be rehabilitated on completion of the construction phase.	
٠	The footprint associated with the construction-related activities (access roads, construction	
	camps, workshop etc.) should be minimised.	
٠	All areas disturbed by construction related activities, such as access roads on the site,	
	construction camps etc., should be rehabilitated at the end of the construction phase.	
•	Site access is controlled and restricted by security personnel.	
٠	At night ensure materials and equipment are covered and obstructed from view.	
٠	Ensure a complaints registry is held on site for any theft incidences to be rectified by the	
	Contractor.	

• Ensure health and safety is upheld by making sure there is the correct PPE, washing of hands			
and hand sanitizer is present	and hand sanitizer is present to avoid diseases.		
Fire management plan com	plied by contractor.		
 Noise impacts to be avoided 	d by vehicle noise buffering		
• Ensuring equipment is well m	aintained to avoid unnecessary noise.		
 To manage complaints relati developed. 	 To manage complaints relation to impacts on the nearby communities, a dust register will be developed. 		
 If required, water spray vehicles will be used to control wind cause by strong winds during activities on the works. 			
 Wind screens should be used 	to reduce wind and dust in open areas.		
formance Indicator A substantial proportion of the construction team is from the local community, with preference given to historical disadvantaged individuals and, where appropriate, unskilled labourers. Skills transfer from experienced to be experienced workers is actively encouraged on-site. Limited negative impacts) to the social impacts of the construction phase.			ence given to historically om experienced to less- e social impacts of the

OBJECTIVE 6: Socio-Economic Benefits

Impact Management Objective: Benefits from a socio-economic perspective			
Potential impact to promoted	 A number of temporary job opportunities for skilled and unskilled labour will be created during the construction phase of the development. Potential transfer of skills from more experienced workers to less experienced workers. Increase in business for local businesses within the construction industry. 		
Impact Management Outcome	Social benefits from the employment opportunities created during the construction phase.		
IMPACT MANAGEMENT ACTIONS			
Promotion measure		Responsible party	Time period
 Positive, therefore no mitiga It should be noted that this is unemployment within the labourers, although tempore The applicant is recomment well as utilise local materials 	tion necessary. mpact will benefit the local community and address the issue of Western Cape, and South Africa, particularly for unskilled ary. ded to source local labour, contractors and sub-contractors, as and suppliers.	Contractor/ ECO monitor	Construction phase

	A substantial proportion of the construction team is from the local community, with preference given to historically
Performance Indicator	disadvantaged individuals and, where appropriate, unskilled labourers. Skills transfer from experienced to less
	experienced workers is actively encouraged on site.

11. Environmental impact management post-construction rehabilitation and operational 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. All temporary access roads constructed must rehabilitated and access must be restricted from the public.

The environmental management objective (goal) for this phase is to:

- Stormwater Management and erosion
- Mitigate Visual impacts from the developed site
- Limit impacts to terrestrial biodiversity, flora and SCC
- Boost Local Revenue & Local Economy

OBJECTIVE 1: STORMWATER MANAGEMENT AND EROSION PREVENTION

Impact Management Objective: To prevent erosion and manage stormwater of the site			
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. Concentration of stormwater 		
Impact Management Outcome	Soil erosion is kept to a minimum and stormwater is not concentrated		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure Responsible party Time period			Time period
 Stormwater generated on site should, as far as possible, be managed according to Sustainable Drainage System (SuDS) principles. This requires that as much stormwater as possible should be attenuated within the development footprint. 		Contractor/ Mossel Bay Local Municpaility	Construction phase
 Specialist Recommended Monitor the powerline routes surfaces. 	s for erosion. Where needed, rehabilitate/revegetate disturbed		

Erosion prevention measures may be needed on steep slopes, such as logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous dune thicket/strandveld seed may also be needed.		
Performance Indicator	No erosion occurring on the site or surroundings as a result of construction activities and unmanaged stormwater.	

OBJECTIVE 2: LIMIT VISUAL IMPACTS

Impact Management Objective: LIMIT VISUAL IMPACTS FROM THE SITE				
Retential impact to avoid	Avoidable Visual impacts from the site			
r orennarimpact to avoid	 Visibility from the Receptors namely the N2 scenic route an 	Visibility from the Receptors namely the N2 scenic route and Tagniet community.		
Impact Management Outcome	No avoidable impacts emanate from the site			
IMPACT MANAGEMENT ACTIONS				
Mitigation measure Responsible party Time period			Time period	
Monitor the proposed recommended mitigation of the Earth berms and trees and grass that have Contractor Post-Construction			Post-Construction	
been planted, allow at least 12 months of monitoring. phase			phase	
Performance Indicator	The visual impact of the facility is reduced			

OBJECTIVE 3: TO LIMIT IMPACTS TO TERRESTRIAL BIODIVERSITY

Impact Management Objective: To	Impact Management Objective: To Limit impacts to terrestrial biodiversity, flora and SCC			
Potential impact to avoid	Impacts to terrestrial biodiversity			
	Increased opportunity for alien intestation.	the sector sector set		
Impact Management Outcome	Impacts to terrestrial biodiversity are limited and no dilen intesto	tion is noted		
IMPACT MANAGEMENT ACTIONS				
Mitigation measure		Responsible party	Time period	
 Pollutant substances brough Remove topsoil and/or seed be disturbed for use in the re Where needed or considere Erosion prevention measure netting, to slow down runoff renosterveld seed may also be 	t onto site must be properly contained. bearing indigenous plant material from the vegetated areas to habilitation of disturbed areas after construction. ed practical, rehabilitate/revegetate all the disturbed surfaces. s may be needed on steep slopes, such as silt fences, logs or and potential erosion. Mulching and seeding with indigenous be needed.	Contractor	Construction phase	
Specialist Recommendation				
 See Specialist mitigations une As a long-term maintenance species such as port jacks category 1b and 2 invaders control programme. 	der 'Objective 2'. e requirement, engage in alien clearing, focussing on invasive on, black wattle, rooikrans and lantana. These species are that require compulsory control as part of an invasive species			

 Allow at least 12 months for t construction. Repair erosion bitter apple are category 1k species control programme 2 invader) on a property is p maintenance concern, keep It is recommended that a stu during the operational phas 	he monitoring of rehabilitation success and alien infestation post damage where needed. Rooikrans, prickly pear and silver-leaf o invaders that require compulsory control as part of an invasive for the entire property. The harbouring of black wattle (category prohibited without a permit. Therefore, as an operational phase to the site and immediate adjacent area clear of invasive aliens. rip of at least 10 m wide around the site be monitored for aliens e.	
Performance Indicator	No avoidable impacts to terrestrial biodiversity.	

OBJECTIVE 4: Climate change impacts

Impact Management Objective: Ensure all adaption and mitigation measures are integrated and are in good order.			
	Strain on services, as temperatures increase.		
	Strain on water resources.		
	• The need to capture and store rainwater during periods of rainfall, will become a priority.		
	Will impact negatively on groundwater capacity and availability.		
Potential impact to avoid	• Fires can be started by negligent labour activity. Which in turn can affect private properties, homes, and livelihoods (farms), etc.		
	• Based on the variety of vegetation intended to be traversed by this proposal, drier periods may see fire hazards occurring beyond the control of the contractor or farmers, which can put lives and infrastructure at risk.		
	• Potential for the storm event to damage infrastructure, at water crossings, and at extraction points, as well as at exposed infrastructure (ie. reservoirs and pump stations).		
	• Potential for storm events to impact on electricity supply, which will strain the functioning of pumps and other electrical devices, designed to ensure that the treatment and supply of water is undertaken correctly.		
Impact Management Outcome	Low climate impact as a result of the construction activities		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure Responsible party Time period			Time period
General:	Contractor	Operational phase	
 Implement all adaption and mitigation measures found to be feasible and reasonable. 			

Monitor efficiency of all ad	aption and mitigation measures, during operational phase.		
Performance Indicator	Local climate remains unchanged as a result of development	- no occurrence of field fire	es, no additional strain on
	water resources.		

OBJECTIVE 5: Boost Local Revenue & Local Economy

Impact Management Objective: Boosting local revenue and local economy			
Potential impact(s) to be promoted.	 Positive impacts Local economic growth, due to reliability of essential services. 		
Impact Management Outcome	Impact Management Outcome Businesses, especially those in the tourism sector are more efficiently supported, as this essential service is upgraded.		
IMPACT MANAGEMENT ACTIONS			
Mitigation measure		Responsible party	Time period
No mitigation proposed. As businesses grow and become mo to:	pre stable, they are able to employ more people, this can lead	Developer/ Mossel Bay Municipality	Operational phase
 Sourcing local employees of various skill levels. Employees are able to earn a living to improve the lives, health and safety of their family members and households. Employees are able to afford to educate their children. Employees are able to provide food and shelter for themselves and their families. Employment created with the development will have a positive influence on members in the community previously unemployed. Employees will source goods from the local community, contributing to the local economy. Opportunity for skills transfer and growth for employees. 			
Performance Indicator	Local economic growth, due to reliability of essential services.		

12.1 Emergency response procedures

The potential environmental risks that may arise as a result of construction activities 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, sewage spills, spills of hazardous chemicals, snake bites etc.

• The construction contractor is responsible for ensuring that the requirements of the Occupational Health & Safety Act (OHSA) are adhered to during the construction phase. The Applicant is responsible for ensuring compliance with the OHSA during the undertaking of construction activities.

12.2 Emergency preparedness

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

- All workers on site during the construction and maintenance phase 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 must be held if needed.
- All workers must ideally be given basic fire-awareness training and advised on basic firefighting and safety techniques. Fire-fighting equipment must be available on-site during construction activities (see section 7.3).
- All workers must be trained on how to respond in the event of a spill of a hazardous substance (fuel, chemicals etc.), if hazardous substances are to be used on site.
- A spill kit for containing and/or neutralising spills of hazardous substances (e.g., hydrocarbons) must be available on site at all times, when hazardous substances are present.
- Any incidents of pollution or spillage of hazardous materials during construction must be reported to the ECO as soon as possible. The ECO must then (depending on the nature of the spill) notify the relevant authorities, if needed. 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. 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 must be used to inform future emergency preparedness planning, and to avoid prevent similar incidents from arising again.

13. Method statements

The Competent Authority and/or the ECO may require the Applicant or Construction Contractor to submit Method Statements for one or more construction-related activities, 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. The ECO will comment and check whether the method statement complies with the EMPr and EA, before the activity concerned is undertaken.

The ECO and / or Competent Authority have the authority to request method statements for other 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.
- Hydrocarbon spill management.
- Storage of fuels and hazardous chemicals and emergency contingencies.
- Waste management system.
- Storm water management and control.
- Alien invasive plant species management.
- Fire Control & Fire Emergency Plan.
- Emergency preparedness plan/emergency response procedure (see Chapter 12).
- Post-construction landscaping.
- Erosion Control Measures.
- Faunal management
- Heritage management

14. Monitoring Compliance

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

The Applicant 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".

14.1 Duties and Responsibilities of the Applicant

The Applicant 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 phase of the proposed development.

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

The Applicant or appointed consultant is responsible for identifying emergency situations that may arise during operational activities undertaken by the Applicant and must formulate appropriate emergency response procedures for these emergency scenarios.

14.2 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 preconstruction, construction and post-construction rehabilitation phases, unless agreed otherwise with the Applicant. 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 (see Chapter 12).
- 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 (see Chapter 15).
- 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 (Chapter 13).
- 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.

14.3 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 is not required to monitor the site during the operational phase of the development.

Competency of the ECO

The ECO must be independent of the Applicant, 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 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.

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) and determine whether faunal search-and-rescue is required;
- Conduct environmental awareness training (see Chapter 15);
- 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 (see section below regarding frequency of ECO visits).
- Evaluate the achievement of the performance indicators associated with each impact management outcome specified in this EMPr (Chapters 8-11)
- 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 advise the Applicant and contractor in remaining compliant with these measures;
- Assist in finding environmentally acceptable solutions to construction problems;
- Examine method statements;
- Keep detailed records of all site activities that may pertain to the environment, and produce compliance-monitoring reports (ECO Reports) for submission to the Applicant, and the Competent Authority at regular intervals during the construction phase;
- All ECO Reports and Inspection Reports must be submitted to the Applicant and Competent Authority.

Frequency of ECO visits

The ECO must conduct **weekly** site visits during the initial bulk earthworks (civils), to ensure compliance with the conditions of the Exclusion Registration and mitigation measures and recommendations of this EMPr. 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. After the initial bulk earthworks, the ECO must conduct **monthly** site visits for the remainder of the construction phase.

Authority of the ECO

Should any action being undertaken on site that does not comply with the environmental requirements, and where such actions pose a serious threat to any element of the surrounding environment, the ECO will note this in the monthly monitoring reports and recall these events.

Should verbal and written instructions and/or warnings be ignored from the Applicant. The Applicant can ask the ECO for recommendations on fines and penalties that could be issued.

Auditing by Environmental Auditor

An environmental auditor is to be appointed by the Applicant/EA Holder. As per Section 34 of the EIA

Regulations (GN R326 of 2017), the duty of an Environmental Auditor is to be independent and is responsible for:

• Ensuring compliance with the conditions of the environmental authorisation and the EMPr; and

• Submit an environmental audit report to the relevant competent authority, which provides

- verifiable findings, in a structured and systematic manner, as per Appendix 7 of GN R326.
- Any amendments to the EMPr, which must be recorded in.

The Environmental auditor must undertake an audit as per Appendix 7 of GN R326 at the following stages; • Construction phase:

o Every 6 months for the duration of the construction activities (as counted from the recommencement site visit to be conducted by the ECO). at practical completion of the construction period.

• Operational phase:

o 3 months after practical completion of the construction period.

o Annually, for the life of the operational phase in order to ensure compliance with the monitoring requirements of the operational phase associated with this EMPr and the EA.

15. Environmental Awareness Plan

Environmental Awareness Training must be conducted prior to the commencement of construction activities. It is the applicant's responsibility to familiarise himself/herself with the content and requirements of this EMPr. The applicant 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 Applicant's environmental representative (where available) who must be on site at all times.
- 5. The ECO to do frequent site visits, as recommended in Section 14.3 of the EMPr.
- 6. Monthly monitoring reports to be compiled by the ECO. These reports will be circulated to all parties involved (including the applicant, 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. An Environmental Awareness Guideline has been compiled and is included in Appendix F of the EMPr.

16. Monitoring, Record Keeping and Reporting

16.1 Environmental Auditing

In accordance with the requirements of the Amended Environmental Impact Assessment Regulations of 2014 (GN No. R.327 of 7 April 2017), the holder of the Environmental Authorisation (i.e. the Applicant) 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 appointed auditor must undertake environmental audits within 6 months after the completion of the rehabilitation measures. Following each audit, the environmental auditor must submit an audit report to the Competent Authority (in this instance the DEA&DP). The Auditor must be independent from the EAP and ECO.

- Environmental auditing and environmental audit reports must adhere to the requirements of the 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.

16.2 Construction phase monitoring, reporting and record keeping.

The appointed Environmental Control Officer (ECO) is responsible for auditing the site at regular intervals during the construction phase, in order to report on the level of compliance with this EMPr and the Environmental Authorisation.

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 Applicant, and to the Competent Authority as requested by the DEADP in the EA. The ECO inspection reports must include both photographic and written records.

ECO Inspections - Photographic Records

The condition of the surrounding natural environment must be monitored regularly in order to report 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 should be taken at these sites during each ECO inspection. Where necessary, the entire working area should be well documented and photographed.

ECO Inspections - Written Records

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

- The ECO should complete an ECO Checklist after each ECO site visit.
- The ECO must compile an ECO monitoring report and submit this to the Applicant, 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 by the Applicant 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 should 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 should be clearly documented and filed on a master file off-site for safe keeping.
- It is recommended that a site register (incident register) should 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 should also be recorded.
- A complaints register should be kept on site in which complaints by any member of the public should be logged.
- The ECO must compile a final post-construction audit report, within 6 months of completion of each construction phase. The audit report should 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.

Auditing by Environmental Auditor

- An environmental auditor is to be appointed by the Applicant/EA Holder. As per Section 34 of the EIA Regulations (GN R326 of 2017), the duty of an Environmental Auditor is to be independent and is responsible for:
- Ensuring compliance with the conditions of the environmental authorisation and the EMPr; and Submit an environmental audit report to the relevant competent authority, which provides verifiable findings, in a structured and systematic manner, as per Appendix 7 of GN R326.
- Any amendments to the EMPr, which must be recorded in.

- The Environmental auditor must undertake an audit as per Appendix 7 of GN R326 at the following stages;
- Construction phase:
 - Every 6 months for the duration of the construction activities (as counted from the recommencement site visit to be conducted by the ECO).
 - At practical completion of the construction period.
- Operational phase:
 - 3 months after practical completion of the construction period.
- Annually, for the life of the operational phase in order to ensure compliance with the monitoring requirements of the operational phase associated with this EMPr and the EA.

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 Applicant for a period of at least 5 years and must be provided to the Competent Authority upon request.

16.3 Corrective Action Procedure

Correction actions need to be followed in the event where there is non-compliance with a condition of the EA and any recommendation and mitigation measure as stipulated in this EMPr in order to rectify the non-compliance and to prevent reoccurrence.

The ECO will be responsible for reporting non-compliance with any condition of the EA and the recommendations and mitigation measures as included in this EMPr. The ECO will also be responsible for the compilation of non-compliance reports and identifying steps to correct the non-compliance.

The ECO must report all non-compliance issues to the contractor whose responsibility it is to correct. A timeframe for the completion of the corrective actions must be agreed to the ECO. Once the corrective actions have implemented the contractor must notify the ECO. The ECO must review the effectiveness of the corrective actions and if it is found to be inadequate, additional measures must be implemented. Only once the corrective actions have been completed to the satisfaction of the ECO will the matter be considered as closed.

In instances where there are repeated instances where the requirements and conditions of this EMPr and the Environmental Authorisation 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 the table below. Penalties may be issued at the Engineer's discretion, and/or upon the request/recommendation of the ECO or Competent Authority.

Depending on the nature of transgression, the Engineer and/or ECO may issue one or more warnings to the Contractor prior to the issuing of a fine. Warnings may be given in writing or orally, but oral warnings must be followed up with written confirmation of the warning within 48 hours of the oral warning. The Engineer has the discretion to issue a fine <u>without</u> first issuing a warning, if the severity of the transgression is judged by the Engineer and/or ECO and/or Competent Authority to warrant such action.

The Engineer must ensure that the levying of fines/penalties forms part of the contract between the Construction Contractor and the Engineer and is subject to the provisions of South African contract law.

The table below specifies the transgressions for which the Construction Contractor may incur financial penalties, and the amount of the fines that may be levied. Levying of fines/ penalties is subject to alignment with South African Contractual Law. For repeat offences of the same/ similar transgression by the same party, the value of the fine shall be doubled for each subsequent repeat offence to a maximum value of **R50 000.00** per offence.

Note: "Provisions", as stated in the table below, relates to the requirements specified in this EMPr and any requirements or conditions specified in the EA, as well as any other requirements governing the environmental management aspects of the development, which the Contractor is responsible for implementing.

#	Finable Transgression	Min Fine	Max Fine
1	Failure to notify the ECO of the commencement of construction or pre- construction activities, prior to the commencement of such activities	R1 000	R2 000
2	Failure to comply with the provisions relating to the demarcation of the working area, site camp and associated facilities, and the maintenance of the demarcated boundaries.	R1 000	R5 000
3	Failure to comply with the provisions relating to the demarcation of all "no-go" areas, and the maintenance of the demarcated boundaries.	R2 000	R5 000
4	Failure to provide secured ablution facilities (1:30 ratio) on site.	R500	R15 000
5	Failure to comply with the provisions relating to the clearance of vegetation on site.	R2 000	R5 000
6	Clearance of indigenous vegetation (regardless of the density of alien vegetation present) outside of the demarcated boundaries of the working area and site camp.	R2 500	R15 000
7	Damage to indigenous vegetation in the surrounding areas within No-Go areas	R2 000	R10 000
8	Failure to apply herbicide to alien vegetation when required to do so.	R500	R2 000
9	Failure to adhere to designated access routes and/or the driving of vehicles through undeveloped vegetation outside of the demarcated working area or site camp.	R1 000	R5 000
10	Movement of vehicles and/or construction workers in no-go areas;	R1 000	R10 000
11	Empty cement bags found on site or surrounding vegetation. Open cement bags on site with cement blowing from the bag	R2 500	R15 000
12	Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, within designated "no-go" areas.	R1 000	R10 000
13	Parking or storage of vehicles, machinery, tools and other materials or equipment related to the Contractors operations, outside of the areas demarcated for such parking/storage.	R500	R5 000
14	Failure to comply with the provisions relating to the management of topsoil and subsoil.	R1 000	R5 000
15	Excessive excavation of material in areas not depicted for such purpose / activity on the approved design plans.	R2 500	R10 000
16	Failure to comply with the provisions relating to waste management on site i.e. recycling of waste	R500	R5 000
17	Failure to comply with the provisions relating to the storage, use and management of hazardous substances and fuels on site and/or the spillage of hydrocarbons or hazardous substances on site.	R1 000	R10 000
18	Mixing cement or concrete on bare ground and/or failure to comply with any other provision regarding cement/ concrete batching	R1 000	R5 000
19	Failure to provide adequate fire-fighting equipment (in working order) on site at all times and/or failure to comply with the provisions relating to fire prevention and/or the occurrence of unattended or out of control fires.	R500	R5 000
20	Refuelling of vehicles, machinery or equipment outside of the designated refuelling area.	R500	R2 000

21	Maintenance of vehicles, machinery or equipment outside of the designated maintenance yard, except in emergencies	R500	R2 000
22	Failure to undertake refuelling or repairs over a drip tray or other impermeable bunded surface to collect spilled hydrocarbons (fuels, lubricants, oils etc.) and other hazardous substances; failure to provide drip trays under fuel burning equipment (including pumps and generators) where there is a risk of hydrocarbon leakage.	R500	R2 000
23	Storing / placing fuel containing equipment (i.e. bowsers and other fuel containers) within a drainage line.	R2 500	R10 000
24	Failure to produce a required method statement/s to the engineer's and ECO's satisfaction prior to undertaking the activity concerned and/or failure to adhere to an approved method statement	R1 000	R5 000
25	Waste found to be buried or burnt on site	R5 000	R15 000

17. 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.

Appendix A - CURRICULUM VITAES OF EAPS

CURRICULUM VITAE

BETSY-JANE DITCHAM

PERSONAL

Profession: Director & Environmental Assessment Practitioner

Nationality: South African

Languages: English (read, write and speak) & Afrikaans (read, write and speak)

Drivers License: Code B

EAPASA Registration: No. 1480

Betsy has a Bachelor of Science Honours Degree in Wildlife Management from the University of Pretoria and a Bachelor of Science Degree (Zoology and Ecology) obtained from the University of Cape Town in 2005. She has 11 years' experience in the environmental field, including environmental assessments, legal compliance, on-site compliance monitoring, cleaner production and business greening and sustainability (carbon and environmental footprinting). In her time as a consultant, she has compiled a number of environment assessments and management plans for both private and governmental clients. Betsy is a co-owner of SES and is Registered with EAPASA (**Reg No. 1480**).

WORK EXPERIENCE

March 2020 - Present: Sharples Environmental Services cc, Cape Town, WC
Co-Owner and Cape Town Office Manager: Principal Environmental Assessment Practitioner
Project Management / Client Liaison
Environmental Authorisation
Environmental Management Programmes
Public Participation
Legal Compliance
On-site compliance auditing

2018 - Feb 2020: Sharples Environmental Services cc, Cape Town, WC

Cape Town Office Manager: Principal Environmental Assessment Practitioner Environmental Authorisation Environmental Management Programmes Public Participation Legal Compliance On-site compliance auditing

August 2017 - December 2017: WSP, Cape Town, WC

Assistant Consultant Environmental Authorisation Legal compliance

Air quality monitoring Public participation

October 2009 to October 2015: Jeffares & Green Engineering & Environmental Consultants,

Pinelands, WC Environmental Scientist On-site compliance auditing

Environmental footprinting (carbon, water, waste)

Business greening & sustainability

Environmental authorisations

In-house newsletter

July 2009 to September 2009: Freelance, Cape Town, WC

Environmental Control Officer

Environmental auditing of construction related projects.

TERTIARY EDUCATION

2005 University of Cape Town
Bachelor of Science Degree specialising in Zoology and Ecology
2006 University of Pretoria
Bachelor of Science Honours Degree in Wildlife Management

KEY PROJECTS

BAR: Upgrade of Trunk Road 11/1 (N7) from Potsdam to the Melkbos Interchange.

EIA: Proposed University Precinct Development at the Garden Route Dam and Associated Infrastructure on a Portion of Remainder Farm 464, George, Western Cape.

EA Amendment: Bulk Water Pipeline along Baden Powell Drive, Khayelitsha, WC.

CURRICULUM VITAE

JESSICA GOSSMAN

PERSONAL

Profession: Candidate Environmental Assessment Practitioner, Sharples Environmental Services cc, Cape Town.

Nationality: South African

Date of Birth: 16 April 1992

Languages: English & Afrikaans

Drivers' License: Code B

EAPASA Registration: No. 6154

WORK EXPERIENCE

September 2023 - Present: Sharples Environmental Services cc, Cape Town, WC

Candidate Environmental Assessment Practitioner

Basic Assessments Reports;

Environmental Impact Assessments;

Environmental Management Programmes;

Legislative documentation;

Administration.

Environmental Control Officer

Stakeholder Engagement

Reporting

Environmental Management Plans

Project Management

Rehabilitation and Monitoring Plans

Administration

TERTIARY EDUCATION

2020 University of South Africa

Bachelors Degree in Environmental Management

2022 University of South Africa

Bachelor of Science Honours Degree in Geography

Professionally registered EAPASA registration number: 2022/6154 & Registered IAIAsa

KEY PROJECTS

BAR: Road & Culvert Project Garden Route (Mossel bay, Bitou and George).

Construction of N7 Weighbridge (Morningstar)

Checklist & EMPr: Membrane Bioreactor Reactor Plan (Bonnievale).

Sunset Beach Subdivision Checklist

EMPr: Construction of the N7 Weighbridge (Western Cape)

ECO: N7 Road & Culvert Project (Morningstar) Ankerlig Transmission Second Supply Project (Atlantis)
Assisted – EMPr: Green Valley Housing Project (Bitou)
EMPr: Koeberg Nuclear Power Station
(NEMA) Amendments: Maalgate (Part 1 Amendment)

Ebenhaeser (Part 1 Amendment)

Appendix B - PROTOCOL FOR CHANCE FOSSIL FINDS

Responsible Heritage Resources Agency	HERITAGE WESTERN CAPE (Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za)
ECO protocol	 Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (N.B. safety first!), safeguard site with security tape / fence / sand bags if necessary.
2. Record key data while fossil remains are stil	l in situ:
Accurate geographic location – describe an	d mark on site map / 1: 50 000 map / satellite image / aerial photo
Context – describe position of fossils within stro	atigraphy (rock layering), depth below surface
Photograph fossil(s) in situ with scale, from diff	erent angles, including images showing context (e.g. rock layering)
3. If feasible to leave fossils in situ:	3. If not feasible to leave fossils in situ (emergency procedure only):
Alert Heritage Resources Agency and project palaeontologist (if any) who will	Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock)
advise on any necessary mitigation	Photograph fossils against a plain, level background, with scale
Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume	Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags
	Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist
	Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
4. If required by Heritage Resources Agency, as soon as possible by the developer.	ensure that a suitably-qualified specialist palaeontologist is appointed

Appendix C - EMPR REVIEW AND AMENDMENT REGISTER

Review Date	Description of Review and/or Amendment	Signature

Appendix D- ALIEN INVASIVE MANAGEMENT PROGRAMME

Invasive alien plants have a significant negative impact on the environment by causing direct habitat destruction, increasing the risk and intensity of wildfires, and reducing surface and sub-surface water. Landowners are under legal obligation to control alien plants occurring on their properties. Alien Invasive Plants require removal according to the Conservation of Agricultural Resources Act 43 of 1983 (CARA) and the National Environmental Management: Biodiversity Act (10 of 2004; NEMBA): Alien and Invasive Species Lists (GN R598 and GN R599 of 2014).

Category 1a and 1b listed invasive species must be controlled and eradicated. Category 2 plants may only be grown if a permit is obtained, and the property owner ensures that the invasive species do not spread beyond his or her property. The growing of Category 3 species is subject to various exemptions and prohibitions. Some invasive plants are categorised differently in different provinces. For example: the Spanish Broom plant is categorised as a category 1b (harmful) invasive plant in Eastern Cape and Western Cape, but it is a category 3 (less harmful) invasive plant in the other seven provinces.

Alien control programmes are long-term management projects and a clearing plan, which includes follow up actions for rehabilitation of the cleared area, is essential. This will save time, money and significant effort. Collective management and planning with neighbours allow for more cost-effective clearing and maintenance considering aliens seeds as easily dispersed across boundaries by wind or water courses. All clearing actions should be monitored and documented to keep track of which areas are due for follow-up clearing. A general rule of thumb is to first target lightly infested areas before tackling densely invaded areas and prioritize sensitive areas such as riverbanks and wetlands. Alien grasses are among the worst invaders in lowland ecosystems adjacent to farms but are often the most difficult to detect and control.

Several exotic invasive and other weed species were noted within the site, ranging from a few scattered individuals to dense infestations, in particular Black Wattle, Blackwood & Port Jackson Willow trees are common and abundant. The dense localised infestations of these tree species have a noticeable and definite impact to the habitat present and are a significant source of degradation. A weed management programme, as part of the construction contract including an after-care period will be required, until such time as natural vegetation has become adequately re-established. A two year after-care period is recommended.

Invasive plant species, such as Acacia cyclops (rooikrans), A. mearnsii (black wattle) and Lantana camara (lantana), must be controlled. In terms of the National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004) Alien and Invasive Species List (2016), Category 1b invasive species, such as rooikrans and lantana, require compulsory control as part of an invasive species control programme. Furthermore, the harbouring of black wattle (Category 2 invader) on a property is prohibited without a permit. The presence of these species is not problematic yet but requires attention to curb future problems.

Invasive alien and weed species within the demarcated working corridor must be removed in accordance with the regulations contained in the National Environmental Management: Biodiversity Act (NEM:BA, Act 10 of 2004), the Invasive Species Regulations (October 2014), the Conservation of Agricultural Resources Act (CARA, Act 43 of 1983) and the Duty of Care principle contained in NEMA,

Section 28. Removal of species should take place throughout the construction, operational, and maintenance phases, in accordance with the following:

In consultation with the ECO, the Contractor must control the establishment of alien invasive species along the working corridor on an ongoing basis during construction and follow-up clearance to be conducted for a 2-year period.

The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas.

In consultation with relevant authorities, the Engineer may order the removal of alien plants (when necessary) within the confines of the site are to be included.

In consultation with the ECO, any alien vegetation (including brushwood and seed-bearing material) that is cleared must be disposed of at an appropriately registered waste disposal facility.

Removal of alien vegetation are to be done according to the Working for Water Guidelines.

The following control measures may be used to ensure that the introduction and spread of alien invasive vegetation is minimised:

- Seedlings and saplings can be removed through hand pulling and hoeing, treated with herbicide through a foliar spray or basal stem treatments.
- Mature trees can be felled or ring barked or treated with herbicide by means of frilling or cut stump treatment.
- Herbicide should not be applied in wet or windy conditions.
- Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used;
- Footprint areas should be kept as small as possible when removing alien plant species; and
- No vehicles should be allowed to drive through designated sensitive watercourse areas during the eradication of alien and weed species.
- After clearing is completed, an appropriate cover crop may be applied as provided in Rehabilitation Programme, should natural re-establishment of indigenous vegetation not take place in a timely manner.

Appendix E - GENERAL SEARCH AND RESCUE PROGRAMME

SEARCH AND RESCUE PROGRAMME

The Search and Rescue Programme must be undertaken by an appropriately qualified specialist (e.g. botanist). The appointed specialist, in consultation with the ECO, must develop a detailed search and rescue plan during the design phase of the proposed development. This plan must be implemented prior to the commencement of any pre-construction clearance and site establishment activities.

This Section of the EMPr provides guidance for the Search and Rescue Plan which is to be compiled by the appointed specialist for search and rescue, in consultation with the ECO. On completion of the Search and Rescue Plan, it must be appended to this EMPr.

Objective of Search and Rescue

The overall objective of Search and Rescue programmes is to identify, remove, and where possible, rescue or relocate indigenous flora species of concern (threatened, protected or conservation worthy) to mitigate the development's impact on terrestrial biodiversity.

Compilation of the Search and Rescue Plan

A suitably qualified specialist is to be appointed to compile the Search and Rescue Plan based on the viability of indigenous, salvageable, good quality vegetation at the time of rescue. The specialist must ensure that the Search and Rescue Plan include the following as a minimum:

- Details on the salvageable plant material, including the species names and approximate quantities that can be salvaged,
- Detailed methodology for safe removal, transportation, and delivery of each species, if applicable.
- Confirm the location of the temporary storage of transplanted material, to be maintained, until the re-establishment on site.
- Details of maintenance activities.

The stripping and stockpiling of topsoil containing indigenous seed banks should form part of the Search and Rescue operations and should lay the groundwork for rehabilitation activities as provided in the Rehabilitation Programme (Appendix M of this EMPr).

Topsoil and seed salvaging must be avoided from previously heavy alien infested areas. Seed-bearing plant material can also be collected for placement on previously disturbed areas to be rehabilitated.

Where necessary, the specialist must compile permit applications in terms of Section 62 and 71 of the Nature Conservation Ordinance (19 of 1974, as amended 2000), for the search and rescue (removal) of endangered or protected plant species listed in Schedules 3 or 4, and issue these applications to CapeNature for approval, prior to the implementation of the Search and Rescue Plan.

This plan must be issued to DEA&DP for approval and once approved, it must be appended to this EMPr for implementation on site.

Implementation of Search and Rescue

No clearance of vegetation may occur until the Search and Rescue Plan, as approved by DEA&DP and appended to this EMPr, is implemented and removal activities have concluded, for the relevant construction phase. Areas which have not been searched and rescued (as confirmed by the
specialist/ECO), must be considered temporary no-go areas, until this activity is completed. Prior to the commencement of any land-clearing or construction activities, the following steps must be taken by the appointed specialist (as a bare minimum):

- The area to be cleared of vegetation is to be surveyed prior to search and rescue (by the ECO and Specialist), this is to confirm the quantity and type of vegetation to be removed and record this information (for the intended phase). This must take into account all areas intended to be utilized at that point in time (ie: for permanent structures, hardened surfaces, and temporary site camp, etc.)
- Prior to the implementation of the Search and Rescue Plan for the specific phase, the specialist must identify whether any of the indigenous plant species identified to be salvaged are listed as endangered or protected species in Schedule 3 or Schedule 4 of the Nature Conservation Ordinance (19 of 1974, as amended 2000).
- Transplant rescued plant material into temporary storage area and maintain until reestablishment is necessary.

The appointed specialist is to confirm that conditions are ideal for removal of plant material (ie. soil is moist, etc.) and inform the contractor of when this activity will be undertaken.

If the appointed specialist intends to utilise the contractors labour to remove the plant material, the specialist is to ensure that they are made aware of what vegetation is intended to be removed, and what the recommended and correct methodology is to be followed for removal.

The appointed specialist is to conduct the search and rescue and monitor the labour during implementation.

Written confirmation from the Specialist/ECO must be issued to the Contractor and construction team (ie. engineers and applicant), notifying them that all search and rescue for the intended phase has been fulfilled. Therefore, the Contractor may proceed with demarcation and construction activities.

Appendix F - REHABILITATION PROGRAMME

REHABILITATION PROGRAMME

Rehabilitation Objective

The overall objective of the rehabilitation plan is to minimize adverse environmental impacts associated with the activity whilst maximizing the future utilization of the site. Significant aspects to be borne in mind in this regard is, revegetation of undeveloped footprint and stability and environmental risk. The depression and immediate area of the working area must also be free of alien vegetation. Additional broad rehabilitation strategies / objectives include the following:

Rehabilitating the worked-out areas to take place concurrently within prescribed framework established in the EMPr.

All infrastructure, equipment, plant and other items used during the construction period will be removed from the site.

Waste material of any description, including scrap, rubble and tyres, will be removed entirely from the site and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on site.

Final rehabilitation shall be completed within a period specified by the Regional Manager.

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.

Topsoil and Subsoil Replacement

Topsoil and subsoil will be stripped and stockpiled separately and only used in rehabilitation work towards the end of the operation. This is in contract to the gravel activity where rehabilitation and topsoil replacement was earmarked at the completion of each phase.

Stripped overburden will be backfilled into the worked-out areas where needed. Stripped topsoil will be spread over the re-profiled areas to an adequate depth to encourage plant regrowth. The vegetative cover will be stripped with the thin topsoil layer to provide organic matter to the relayed material and to ensure that the seed store contained in the topsoil is not diminished. Reseeding may be required should the stockpiles stand for too long and be considered barren from a seed bank point of view. Stockpiles should ideally be stored for no longer than a year.

The topsoil and overburden will be keyed into the reprofiled surfaces to ensure that they are not eroded or washed away. The topsoiled surface will be left fairly rough to enhance seedling establishment, reduce water runoff and increase infiltration.

Revegetation

All prepared surfaces will be seeded with suitable grass species to provide an initial ground cover and stabilize the soil surface. The following grass seed that is commonly available and suitable.

The overall revegetation plan will, therefore, be as follows:

- Ameliorate the aesthetic impact of the site
- Stabilise disturbed soil and rock faces
- Minimize surface erosion and consequent siltation of natural water course located on site
- Control wind-blown dust problems

- Enhance the physical properties of the soil
- Re-establish nutrient cycling
- Re-establish a stable ecological system

Every effort must be made to avoid unnecessary disturbance of the natural vegetation during operations.

Visual Impacts Amelioration

The overall visual impact of the proposed activities will be minimised by the following mitigating measures:

- Confining the footprint to an area as small as possible
- Re-topsoiling and vegetating all disturbed areas

Monitoring and Reporting

Adequate management, maintenance and monitoring of rehabilitation success will be carried out annually for at least 2 years by the EA Holder to ensure successful rehabilitation of the property until a closure certificate is obtained.

To minimise adverse environmental impacts associated with operations it is intended to adopt a progressive rehabilitation programme, which will entail carrying out the proposed rehabilitation procedures concurrently with activity.

Appendix G - STORM WATER MANAGEMENT PLAN

Stormwater management plan

A stormwater management plan is presented in this chapter.

Design background

Stormwater technical design on this development is relatively uncomplicated due to the development being situated on a single gentle side slope of approximately 7 - 9% and hence only a single and simply defined drainage zone. Stormwater from the single drainage zone will drain into the existing stormwater channel along Sandhoogte Road, a gravel divisional road on the southern boundary of the site.

Design Considerations

Environmental design will make use of Sustainable Drainage Systems (SuDs) to manage stormwater drainage. SuDs will assist in preventing and reduce the risk of erosion. SuDs vegetated with indigenous species can assist with water polishing, trapping hydrocarbons from stormwater runoff from the development area.

Although the proposed development does not propose to concentrate stormwater in any manner, notwithstanding, wherever stormwater is concentrated during the implementation phase, energy dissipation shall be performed as standard practice with gabion mattresses where required.

Consideration shall be given during the detail design stage to using materials with high roughness in order to further assist with energy dissipation. This will further prevent erosion and improve habitat provision.

Freshwater Habitat Compliance

Freshwater compliance concepts are discussed in this chapter and, where relevant, imported into the stormwater management plan.

Introduction

The mitigation of negative impacts on biodiversity and ecosystems is a legal requirement. Its application is intended to strive to first avoid disturbance of ecosystems and loss of biodiversity, and where this cannot be avoided altogether, to minimize, rehabilitate, and finally offset any remaining significant residual negative impacts on biodiversity.

Any potential risks must be managed and mitigated to ensure that no deterioration to the water resource takes place. Management measures should be implemented to ensure that no activities result in a decline in water resource quality.

Monitoring for compliance must be done on a daily basis by the contractors. Photographic records of all incidents and non-compliances must be retained. Monitoring should especially focus on preventing water pollution and determining the success of the stormwater management plan.

Evidence of wetland, drainage line or watercourse

The site was inspected for evidence of a wetland, drainage line, or any other watercourse. The development area is in a disturbed state, vegetated by a selection of grasses and other low growth vegetation. The site is defined by a single gentle side slope of between 7 and 9%. Due to the flat gradient on the site with no catchment area, there is little opportunity for significant runoff to accumulate or flow paths to form on the site. No evidence of a wetland can be observed.

External drainage lines

The study area is drained by means of surface run-off (i.e.: sheetwash), with storm water following the

topography of the site, i.e. the side slope. All sheetwash drains into an existing channel along the Sandhoogte Road, a gravel divisional road on the southern boundary of the site. No riparian vegetation can be observed in the channel.

Buffer zones

Aquatic buffer zones are provided to act as barriers between human activities and sensitive water resources in order to protect them from adverse negative impacts. Buffer zones associated with water resources have been shown to perform a wide range of functions and have therefore been adopted as a standard measure to protect water resources and associated biodiversity. An aquatic buffer zone is defined as a zone of vegetated land designed and managed so that sediment and pollutant transport carried from source areas via diffuse surface runoff is reduced to acceptable levels. The development site is not located close to any watercourse or other sensitive area and a buffer zone is hence not required or defined for this project.

Stormwater design considerations

Designs must provide due consideration to the appropriate ecological input and be based on Sustainable Drainage Systems (SuDs). Permeable infrastructure must be considered where practical. This may include items such as permeable concrete block pavers, stone, gravel and grass cover. Soft and porous infiltration layers must be provided and will contribute to slowing surface flows. This may include a.o. gabion matrasses where required. Gradients of such infrastructure, e.g. gabion mattresses to be designed as flat as possible. This will provide filtration, removal of urban pollutants (e.g. hydrocarbons), provide attenuation, and dissipate energy of storm water flows through increased roughness. Stormwater accumulation shall be prevented as far as possible. Stormwater infrastructure, such as gabion mattresses, must be located within the development footprint. Stormwater systems must trap any additional suspended solids and pollutants originating from the development.

Post-construction rehabilitation phase

Post construction rehabilitation activities to all disturbed areas shall include the following:

- The area must be maintained through alien invasive plant species removal and the establishment of indigenous vegetation cover to filter run-off before it exists the site.
- All post-construction building material and waste must be cleared and disposed of in a suitable manner and areas rehabilitated.
- Removal of vegetation must only occur where required for the project and disturbance to the adjoining natural vegetation cover or soils is not allowed.
- Erosion features that have developed are to be stabilized and rehabilitated.
- A monitoring programme shall be in place to monitor any post-construction environmental issues and impacts such as increased surface runoff.
- All disturbed areas shall be rehabilitated and maintained.

Operational Phase

Any evidence of erosion from the stormwater system must be rehabilitated and the volume/velocity of the water reduced through further structures and/or energy dissipaters. These structures must be incorporated within the layout area.

Site layout considerations

Stormwater technical design on this development is relatively uncomplicated due to the development being situated on a single gentle side slope of approximately 7 - 9% and hence only a single and simply defined drainage zone.

The study area is drained by means of surface run-off (i.e.: sheetwash), with storm water following the topography of the site, i.e. the side slope. Stormwater from the single drainage zone will drain into the existing stormwater channel along Sandhoogte Road, a gravel divisional road on the southern boundary of the site.

No stormwater accumulation and concentration will be performed or allowed on the proposed development footprint.

The designated drainage zone as identified above are indicated diagrammatically on the figure below:



Figure 13. Single Stormwater Drainage zone (Zone A), (Element Consulting Engineers, 2024).

Stormwater technical design

Stormwater technical design on this development is relatively uncomplicated due to the development being situated on a single gentle side slope of approximately 7 - 9% and hence only a single and simply defined drainage zone. The study area is drained by means of surface run-off (i.e.: sheetwash), with stormwater following the topography of the site, i.e. the side slope. Stormwater from the single drainage zone will drain into the existing stormwater channel along Sandhoogte Road, a gravel divisional road on the southern boundary of the site. No stormwater accumulation and concentration will be performed on the proposed development footprint.

Drainage zone A

Approximately 100% of the site drains towards a general south-western direction. This area is designated as Zone A as depicted above. Zone A has an area of approximately 2.5ha with an estimated 1:2 year peak flow of 0.162m3/s and 1:50 year peak flow of 0.462m3/s and will be routed via unconcentrated sheetwash (surface run-off) into the existing stormwater channel along Sandhoogte Road, a gravel divisional road on the southern boundary of the site. No stormwater accumulation and concentration will be performed on the proposed development footprint.

Energy dissipation

Energy dissipation shall be performed throughout the site with grass cover throughout, and porous materials wherever required. The site shall be covered with an indigenous grass mix and all post construction erosion or disturbed areas shall be sown with such a mix accordingly.

General design criteria

In accordance with all the design philosophies discussed above, the following general design criteria shall be utilized for this proposed development:

- No obstruction or concentration allowed on site.
- Perimeter road layout to be designed to line up with NGL.
- Perimeter road cross-section to be designed to tie into NGL.

- No obstruction or concentration allowed on fencing design, stormwater shall be allowed to pass
- through fence without any concentration.
- No obstruction or concentration allowed on pile-driven or other supports.

Stormwater design drawings

The diagrams below indicate the stormwater design drawings and the external drainage routes on the proposed development as discussed above.



Figure 14. No stormwater obstruction or concentration on site, roads to be designed to line up with NGL. (Single Stormwater Drainage zone (Zone A), (Element Consulting Engineers, 2024).

Perimeter and internal roads

Design of perimeter and internal roads is intertwined with stormwater design and from an engineering perspective, are considered a part of stormwater design. Internal standards and design criteria for internal street design, relevant to the stormwater management plan, are specified as follows:

- Gravel wearing course.
- Longitudinal alignment to align with NGL.
- Crossfall to align with NGL on both sides.
- No kerbing, or non-protruding concrete edging, to allow for cross section drainage.



Figure 15. No obstruction or concentration on road cross-section – to be designed to tie into NGL, (Element Consulting Engineers, 2024).

Other design standards and criteria

- Kerbs, channels, pipes or cut-off drains to be utilized as little as possible
- Where kerbs or concrete is inevitable, non-protruding designs shall be utilized.
- Gabion (reno) mattresses to be provided wherever required for energy dissipation and erosion
- protection.
- All infrastructure on the project to be non-erosive and non-concentrating.
- All stormwater infrastructure to be designed on SuDs principles.
- Soft and porous infiltration media to be provided throughout the site.

Final designs

All final design for stormwater systems and structures on this project to be designed by a professional engineer in accordance with this stormwater management plan.

Foundations and Structures

This chapter will discuss the preliminary design of the foundations and structures for the PV Solar array as well as the buildings for the project.

Foundations: PV Solar Array

The foundations of the PV Solar Array will be any one or combination of the following and will be determined during the detail design from the geotechnical investigation:

- Concrete plinths
- Drilled foundations
- Rammed-in foundations

Appendix H - ENVIRONMENTAL AWARENESS TRAINING



GEORGE

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ENVIRONMENTAL AWARENESS TRAINING BOOKLET



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Environmental Monitor's Forward

SES is here to ensure that everyone complies with the conditions of "Duty to Care". If these conditions are not complied with the project can be stopped and fines can be issued.

We hope that with your co-operation the project won't be stopped and fines won't be issued, and a successful project can be finished on time.

Notes:

- Workers working on this project must undergo environmental training.
- The information contained in this document should be used during day-to-day activities.



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HOW IS THIS PROJECT IMPLEMENTING ENVIRONMENTAL MANAGEMENT?

This project is implementing Environmental Management on an ongoing basis throughout the duration of the project. The following aspects would be implemented to achieve the above stated:

- A dedicated Environmental Manager or Environmental Control Officer appointment to the project to implement and monitor Environmental Management.
- Regular environmental inspection on the site.
- Regular environmental training for workers
- Environmental audits on a regular basis.

WASTE TREATMENT

Refuse:

- Refuse waste includes: waste food, food containers, packaging materials, cans, bottles, newspapers and magazines.
- Day to day household waste should always be disposed of in the containers provided on site by the company.
- No dumping of waste anywhere other than in the bins provided.
- No burning of refuse.
- If there are not enough refuse containers on site, the ECO or supervisor needs to be informed.

Construction Waste:

- Construction waste includes: concrete, steel, cement, rock, pre-coated chips, wood, plastic, empty bags and rubble.
- Construction waste must be discarded in skips located in strategic areas for removal.
- Construction waste must not be discarded in holes or burned on site.



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- Small amounts of construction waste should be collected and not discarded into vegetation or down fill slopes.
- Material should only be spoiled if a rehabilitation plan has been designed for the area.

Liquid waste:

- Liquid waste includes: concrete, paint, thinners, diesel, hydraulic fluids, cooking oil, chemicals, other fuel and sewage.
- Use facilities provided for waste.
- The liquid waste should be recycled as far as possible.
- Use chemical toilets and ablution facilities.

INFORM THE ENVIRONMENTAL CONTROL OFFICER (ECO) IMMEDIATELY OF ANY IMMEDIATE OR POTENTIAL ENVIRONMENTAL INCIDENT.



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SPECIFIC ENVIRONMENTAL ISSUES

SPESIFIEKE OMGEWINGSKWESSIES IMIBA ETHILE YEZOBUME BEMEKO YENDALO

The basic Do's and Don'ts towards environmental awareness are as follows:

Die basiese Moets en Moenies van omgewingsbesinning is as volg:

Oondoqo bo mawukwenze no mawungakwenzi kwilinge lezobume be meko yendalo bume ngoluhlobo:

ToiletFacilities:ToiletFasiliteite:IzindluZangasese:

DO:

USE THE TOILET FACILITIES PROVIDED - REPORT FULL FACILITIES **MOET:**

GEBRUIK MAAK VAN TOILET FASILITEITE WAT VOORSIEN WORD – RAPPORTEER AS FASILITEITE VOL IS

OMAWUKWENZE: SEBENZISA IZINDLU ZANGASESE EZIBONELELWEYO- NIKA INGXELO NGAMALUNGISELELO AGCWELEYO.

DO NOT: USE THE BUSH *MOENIE: DIE BOS GEBRUIK NIE* **OMAWUNGAKWENZI:** UKUSEBENZISA ITYHOLO.



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Vehicles operation and maintenance: Voertuig werking en onderhoud: Ulawulo nophatho lezithuthi:

DO:

ENSURE THAT VEHICLES AND MACHINERY DO NOT LEAK FUEL OR OILS. REFUELLING, MAINTENANCE, SERVICING OR WASHING MUST BE DONE WITHIN THE DESIGNATED AREA IN THE CONSTRUCTION CAMP AREA ONLY.

MOET:

VERSEKER DAT VOERTUIE EN MASJINERIE NIE OLIES OF BRANDSTOF LEK NIE. VOLMAAK, ONDERHOUD, DIENS OF SKOONMAAK VAN VOERTUIE MOET SLEGS IN AANGEWYSTE AREAS IN DIE KONSTRUKSIE KAMP GESKIED.

OMAWUKWENZE: QINISEKISA IZITHUTHI NOMATSHINI ABAVUZI MAFUTHA OKANYE I OYILE, UKUGALELA, UKUPHATHA, UKULUNGISA OKANYE UKUHLAMBA KUFUNEKA KWENZIWE KUMMANDLA OTYUNJIWEYO KWINKAMPI YOLWAKHIWO KUPHELA NGOKUKHAWULEZILEYO.

DO:

REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY & STOP THE SPILL CONTINUING.

MOET:

RAPPORTEER ENIGE BRANDSTOF OF OLIE STORTE & VERHOED DAT DIE STORT AANHOU.

OMAWUKWENZE: NIKA INGXELO NGE OLI NAMAFUTHA ACHITHEKILEYO, UZE UNQANDE UCHITHEKO LUNGAQHUBEKI.

DO:

PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS.

MOET:

VERHOED DIE KONTAMINASIE EN BESOEDELING VAN STROME & WATERKANALE.

OMAWUKWENZE : NQANDA USULELEKO OKANYE UNGCOLISEKO LWEMILAMBO NEMISELE YAMANZI.



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DO NOT:

ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO THE STREAM

MOENIE:

TOELAAT DAT AFVALPRODUKTE, GEMORS, OLIES OF VREEMDE MATERIALE IN STROME BELAND NIE.

OMAWUNGAKWENZI: MUSA UKUVUMELA INCITHO, ULAHLO, IOYILE OKANYE EZINYE IZINTO EMILANJENI.











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Fire Control: *Vuur Beheer:* Ulawulo Lemililo:

DO:

DISPOSE OF CIGARETTES AND MATCHES CAREFULLY. (Littering is an offence.)

MOET:

GOOI SIGARETTE & VUURHOUTJIES OP GEPASTE MANIER WEG WEG (rommelstrooi is 'n oortreding)

OMAWUKWENZE: LAHLA ISIGARETE NOOMATSHISI NGONONOPHELO (ukulahla lityala).

DO:

ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY "HOT WORK" IS UNDERTAKEN e.g. welding, grinding, gas cutting etc.

MOET:

VERSEKER DAT 'N WERKENDE BRANDBLUSSER BYDERHAND IS INDIEN "WARM WERK" GEDOEN WORD bv. Sweiswerk.

OMAWUKWENZE: QINISEKISA ISICIMA-MLILO ESISEBENZAYO SISESANDLENI UKUBA KUKHO UMSEBENZI "OTSHISAYO" OWENZIWAYO, umz. ukuwelda, ugubo, ukuqhawula ugesi, nji.

DO NOT:

MAKE ANY FIRES **MOENIE:** ENIGE VURE MAAK OF ENIGEIETS VERBRAND NIE **OMAWUNGAKWENZI:** UKWENZA IMILILO OKANYE UTSHISE NOKUBA YINTONI.











Fencing and Restricted Areas: *Omheining en Beperkte Areas:* Ubiyelo Nemimanndla Engavumelekanga:

DO:

CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA.

MOET:

BEPERK ALLE WERK EN STOOR VAN GEREEDSKAP TOT IN DIE GEGEWE WERKAREA.

OMAWUKWENZE:GCINA UMSEBENZI NEZIXHOBO ZOKUSEBENZA NGAKUMMANDLA OKUSETYENZELWA KUWO.

DO NOT:

ENTER ANY FENCED OFF OR MARKED AREA. SUCH AREAS HAVE BEEN MARKED WITH "NO-GO AREA" SIGNS AND SHOULD BE ADHERED TO.

MOENIE:

ENIGE OMHEINDE OF GEMERKTE AREAS BINNEGAAN NIE. SULKE AREAS IS MET "NO-GO AREA" TEKENS GEMERK EN MOET GEHOORSAAM WORD.

OMAWUNGAKWENZI: MUSA UKUNGENA KWI NDAWO EBIYIWEYO OKANYE EPHAWULWEYO. IMIMANDLA ENJALO IPHAWULWE NGAMAGAMA ATHI **'NO-GO AREA** "





NO-GO AREA



Safety: *Veiligheid:* Ukhuseleko:

DO:

USE ALL SAFETY EQUIPMENT AND COMPLY WITH ALL SAFETY PROCEDURES.

MOET:

GEBRUIK ALLE VEILIGHEIDSGEREEDSKAP EN VOLDOEN AAN ALLE VEILIGHEIDS PROSEDURES.

OMAWUKWENZE: SEBENZISA ZONKE IZIXHOBO ZOKHUSELEKO, UZE UTHOBELE YONKE IMIGAQO YOKHUSELO.



Driving and Dust: *Bestuur en Stof:* Uqhubo Nothuli:

DO:

DRIVE ON DESIGNATED ROUTES ONLY. **MOET:** NET OP AANGEWYSTE ROETES BESTUUR. **OMAWUKWENZE:** QHUBA KWIMIMANDLA EPHAWULWEYO KUPHELA.

DO NOT:

SPEED OR DRIVE RECKLESSLY **MOENIE:** JAAG OF ROEKELOOS BESTUUR NIE. **OMAWUNGAKWENZI:** SUKUQHUBA NGESANTYA ESIPHEZULU OKANYE NGOKUNGAKHATHALI.

DO NOT:

ALLOW CEMENT TO BLOW AROUND. **MOENIE;** TOELAAT DAT SEMENT WEGWAAI NIE. **OMAWUNGAKWENZI:** MUSUKUVUMELA ISAMENTE ISASAZWE.

DO NOT: CAUSE EXCESSIVE DUST MOENIE: OORDREWE STOF VEROORSAAK NIE.



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SERVICE

Vegetation protection: *Plantegroei Beskerming:* Ukhuselo Lwezityalo:

DO NOT:

DAMAGE OR REMOVE ANY VEGETATION WITHOUT DIRECT INSTRUCTION.

MOENIE:

ENIGE PLANTEGROEI SONDER DIREKTE INSTRUKSIE BESKADIG OF VERWYDER NIE.

OMAWUNGAKWENZI: MUSA UKUTSHABALALISA OKANYE USUSE NASIPHINA ISITYALO NGAPHANDLE KOMYALELO.





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Animals: *Diere:* Izilwanyana:

DO NOT:

INJURE, CAPTURE/SNARE, FEED OR CHASE ANIMALS – this includes birds, frogs, snakes, lizards, tortoises, etc.

MOENIE:

ENIGE DIERE BESEER, VANG, VOER OF JAAG NIE – dit sluit in: voëls, paddas, slange akkedisse, skilpaaie ens.

OMAWUNGAKWENZI: MUSA UKWENZAKALISA, UKUBAMBA, UKONDLA OKANYE UKULEQA IZILWANYANA- okuquka iintaka, amasele, iinyoka, amacilikishe, izikolopati.

DO:

REPORT ANY INJURY OF AN ANIMAL. MOET: DIE BESERING VAN 'N DIER RAPPORTEER. OMAWUKWENZE: XELA NASIPHI ISENZAKALO SESILWANYANA.



Preventing Pollution: Voorkoming van Besoedeling: Ukhuselo Longcoliseko:

DO:

CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBLE AT THE END OF EACH DAY – use the waste bins provided and ensure that litter will not blow away.

MOET:

RUIM NA ELKE DAG DIE WERK AREA OP EN GOOI ENIGE ROMMEL WEG IN DIE GEGEWE HOUERS – maak seker dat rommel nie kan wegwaai nie.

OMAWUKWENZE: COCA INDAWO OSEBENZA KUYO, IZINTO EZILAHLIWEYO NENKUNKUMA YOKWAKHA QHO EKUPHELENI KWEMINI-sebenzisa imiggomo yenkunkuma uze uginiseke ukuba

KWEMINI-sebenzisa imigqomo yenkunkuma uze uqiniseke ukuba inkunkuma ayivuthuzwa ngumoya.

DO NOT:

ALLOW WASTE BINS TO OVERFLOW OR WASTE TO BLOWAROUND. *MOENIE:*

TOELAAT DAT ROMMELHOUERS OORVLOEI OF DAT ROMMEL ROND WAAI NIE.

OMAWUNGAKWENZI: MUSA UKUVUMELA IMIGQOMO YENKUNKUMA IGCWALE KAKHULU OKANYE INKUNKUMA ISASAZEKE.

DO NOT:

LITTER OR LEAVE FOOD LAYING AROUND

MOENIE:

ROMMEL OF KOS LAAT RONDLÊ NIE.

OMAWUNGAKWENZI: MUSA UKUNGCOLISA OKANYE USHIYE UKUTYA KULELE INDAWO YONKE.

DO NOT:

BURY ANY LITTER OR WASTE IN THE GROUND. **MOENIE:** ENIGE ROMMEL OF GEMORS IN DIE GROND BEGRAWE NIE. **OMAWUNGAKWENZI:** MUSA UKUNGCWABA INKUNKUMA EMHLABENI.



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