SALDANHA SOLAR ENERGY PARK

On
the Remaining Extent of the farm Waschklip 183 and the Remaining Extent of the farm Everts Hope 190
in the Saldanha Bay District

ENVIRONMENTAL MANAGEMENT PROGRAMME

Application for Environmental Authorisation under the National Environment Management Act, 1998 (Act 107 of 1998)

DEA Ref No: 12/12/20/2126 & 12/12/20/2126/1
NEAS Ref No: DEA/EIA/0000492/2011

June 2012

Amended 14 April 2021 for a Part 2 amendment by

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EXECUTIVE SUMMARY

Soventix SA proposes to establish two commercial solar electricity generating facilities namely Soventix SA Saldanha Solar 1 (EA Ref: 12/12/20/2126) and Soventix SA Saldanha 2 (EA Ref: 12/12/20/2126/1). This Environmental Management Programme (EMPr) is developed for both the Saldanha Bay PV Solar Electricity Generation facilities in compliance with Regulation 33 of the Environmental Impact Assessment (EIA) Regulations R.543 of 2010 and compliance with section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA], as amended and contains those requirements prescribed in the EIA Regulations, 2014, including regulation 23, 32 and Appendix 4 of GN No. R. 326 of 7 April 2017, as amended. It is to be read in conjunction with the EIA Report providing detail on the affected environment as well as an impact assessment for the anticipated environmental impacts and the Environmental Authorisation (EA) as to be potentially issued.

The developers propose to establish the project on the Remaining Extent of the farm Everts Hope 190 (SS2) and on the Remaining Extent of the farm Waschklip 183 (SS1) approximately 12 km south-east of the town Saldanha Bay and 5 km east of Langebaan village. The R27 and the Langebaan access road form two borders of the site while the Engen One Stop is situated just south of the site.

The solar facility intends to accommodate a photovoltaic (PV) component and associated infrastructure comprising of:

- Solar panels arranged in units with a total generating capacity of approximately 200 MW to be constructed as two separate yet integrated facilities of 100 MW each. A total footprint of 163 Ha for lease area B (SS1) and 287 Ha for lease area A (SS2) is required totalling approximately 450 ha;
- Each 100 MW facility will have an operations building to be contained within a <10 000 m² (see table below) lay down area for each facility. The facility will include areas used for security management and control room, maintenance and canteen as well as changing facilities; and
- An on-site substation per facility with the necessary infrastructure to feed the electricity generated via a cut and tie-in into the immediately adjacent 132 kV Eskom network.

Activities to be undertaken during the construction, operational and decommissioning phases include:

Construction Phase

- Establish access roads;
- Transport components and equipment to site;
- Site preparation;
- Establishment of laydown areas;
- Establishment of ancillary infrastructure;
- Construction of infrastructure foundations;
- Establishment of PV panels;
- Establishment of containerized generators;
- Establishment of containerized battery storage;
- Establishment of above-ground diesel and/or LNG storage tanks;
- Connection of PV panels to the on site substation;
- Connection of the on site substation to the grid;
- Contouring; and
- Site remediation.

Operational Phase

- Maintenance and repairs of PV and associated equipment inclusive of:
  - Maintenance of roads;
  - Cleaning and maintaining / replacing panels;
  - Maintaining and servicing generators;
  - Delivery of diesel and/or LNG for generators;
  - Maintaining buildings and other infrastructure; and
  - Maintain and repair fencing.
- Environmental remediation inclusive of:
  - Erosion and dust pollution control measures;
  - Fire management;
  - Vegetation management; and
  - Control spread of invasive species.
- Waste management; and
- Health and safety implementations.

Post Operational Phase

The activities during this phase have not been determined yet. Two options currently exist for this phase:

- Replacement of panels that reached the end of their economic life or replacement with new technology. Activities include:
  - Disassembly and replacement of individual panels;
  - Repair, maintenance and / or replacement of the framework structures and other required infrastructure; and
  - Recycling / disposing of replaced parts.

or

- Complete decommissioning can occur should it no longer be economically feasible to continue the project. Activities will include:
  - Site reparation;
  - Disassembly and recycling of existing components; and
  - Rehabilitation of the site.

The implementation of the EMPr within the project is not an optional additional or "add on" requirement. The EMPr is legally binding, integral to the contract and is as important as the engineering aspects of the contract. The EMPr is a working document to be used throughout the life of the project, until such time that closure is achieved.

This EMPr has been amended in compliance with the requirements of Regulation 32 of the EIA Regulations (2014) as amended to include 167MWh of Lithium-Ion battery storage, equating to twenty-two (22) forty-foot (40') containers. Each shipping container is 12.2(l) x 2.43(w) x 2.59(h) in dimensions, with a collective/total footprint of approximately 667m^2. Additionally, nine (9) dual-fuel generators will be required to collectively generate <10MW of backup electricity. Above-ground diesel and/or Liquefied Natural Gas (LNG) storage will be required of less than 30m^3 to provide the generators with fuel. The additional infrastructure of the containerised batteries and generators will only occupy a nominal footprint (<700m^2) in relation to the full development. The generators will only run intermittently and include noise suppressants, to reduce potential nuisance and disturbing noise emissions to people and the receiving environment. The containers will be installed on plinths above-ground, so as to minimise impacts on stormwater runoff as well as allow for monitoring of leaks and potential soil contamination.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

DEFINITIONS

Auditing	A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis based to a (e.g. ISO 19011:2003) standard.
Biodiversity	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Environment	A place where living, non-living and man-made features interact, and where life and diversity is sustained over time.
Evaporation	The change by which a substance (e.g. water) is converted from a liquid state into and carried off as vapour.
Groundwater	Subsurface water in the zone in which permeable rocks, and often the overlaying soil, are saturated under pressure equal to or greater than atmospheric.
Monitoring	A systematic and objective observation of an organisation's activities and services conducted and reported upon regularly.
Natural vegetation	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on a site.
Pollution	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Protected Plants	Plant species officially listed on the Protected Plants List (each province has such a list), and which may not be removed or transported without a permit to do so from the relevant provincial authority.
Red Data Species	Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened.
Rehabilitation	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydro logically stable landscapes that support the natural ecosystem mosaic.

ACRONYMS

BIFSA	Building Industries Federation of South Africa
CARA	Conservation Of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CEO	Chief Executive Officer
CLES	Cape Lowlands Environmental Services
COW	Clerk of Work
DEFF	Department of Environment, Forestry and Fisheries
DAFF	Department of Agriculture Forestry and Fisheries
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning (Western Cape)
DEAT	Department of Environmental Affairs and Tourism
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, 1989 (Act No. 83 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EMS	Environmental Management System
EO	Environmental Officer
FBC	Fuel Bed Combustion
FFFARSRA	Fertilizers, Farm Feeds, Agricultural Remedies And Stock Remedies Act, 1947 (Act No. 36 of 1947)
GN	Government Notice
HWC	Heritage Western Cape

I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IEMF	Integrated Environmental Management Framework
ISO	International Standards of Operation
IWM	Integrated Waste Management
IWMP	Integrated Waste Management Plan
LPG	Liquid Petroleum Gas
MSA	Local Government Municipal Systems Act (Act 32 of 2000)
NBRBSA	National Building Regulations and Building Standards Act, 1977 Act No. 103 of 1977)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources, 1999 (Act No. 25 of 1999)
NVFFA	National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NWMS	National Waste Management Strategy
PC	Project Co-ordinator
PPP	Public-private partnership (one of the MSP's)
SABS	South African Bureau of Standards
SACNASP	South African Council for Natural Scientific Professions
SANS	South African National Standards
SHEQ	Safety Health and Environmental Quality
SS	Senior Supervisor Technical Services Officer

CHAPTER 1: INTRODUCTION AND LEGISLATIVE ASPECTS

This report is compiled in terms of the Regulation 33 of the Environmental Impact Assessment (EIA) Regulations R.543 of 2010 and compliance with section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA], as amended and contains those requirements prescribed in the EIA Regulations, 2014, including regulation 23, 32 and Appendix 4 of GN No. R. 326 of 7 April 2017, as amended. The format of this report is in line with the requirements of the Regulations. Table 1 below provides an indication of which section of this Environmental Management Programme (EMPr) relates to the required information.

Table 1: Information required as per Section 33 of the EIA Regulations R.543, 2010 and Appendix 4 of the EIA Regulations (2014) as amended.

	Requirement	Section in EMPr
a	Details of (i) the person who prepared the environmental management programme; and (ii) the expertise of the person who prepared the environmental management programme.	1.2
b	Information on any proposed management or mitigation measures to be used to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of (i) planning and design; (ii) pre-construction and construction activities; (iii) operation or undertaking of the activity; (iv) rehabilitation of the environment; and (v) closure, where relevant.	Chapter 8
c	A detailed description of the aspects of the activity that are covered by the environmental management programme;	1.1.1
d	An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b)	Chapter 4
e	Proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon;	Chapter 3 & Chapter 5 & Chapter 6
f	As far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including, where appropriate, concurrent or progressive rehabilitation measures;	Chapter 9
g	A description of the manner in which it intends to (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) remedy the cause of pollution or degradation and migration of pollutants; (iii) comply with any prescribed environmental management standards or practices; (iv) comply with any applicable provisions of the Act regarding closure, where applicable; and (v) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.	Chapter 3
h	Time periods within which the measures contemplated in the environmental management programme must be implemented;	Chapter 8
i	The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;	Chapter 8
j	An environmental awareness plan describing the manner in which (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of	Chapter 10

	the environment.	
k	Where appropriate, closure plans, including closure objectives.	8.5

1.1 ENVIRONMENTAL LEGISLATION

A growing awareness of the environment and an increase in the number of environmental laws and regulations, present company management with a daunting task of monitoring, interpreting and implementing systems to produce a workable plan to comply with legal requirements.

The list below was compiled to ensure that the person responsible for construction and maintenance of the facility is aware of their legal responsibilities and liabilities. Complying with these laws and regulations will minimise the risks in terms of legal, financial (esp. potential claims) and rehabilitation costs. Non-compliance to environmental law is a criminal offence and if prosecuted Soventix will be liable for any environmental damage incurred.

Table 2: Environmental Legislation applicable and considered in the EMPr.

Act Name	Act No	Notes / Remarks
National Environmental Management Act	107 of 1998	Protection and management of the environment
National Environmental Management Biodiversity Act	10 of 2004	Aspects related to the protected and indigenous Species
Cape Nature Conservation Ordinance	19 of 1974	• Endangered plants and wild animals • Protected fauna and flora
Conservation of Agricultural Resources Act	43 of 1983	Control of utilisation and protection of wetlands; soil conservation; control and prevention of veld fires; control of weeds and invader plants
National Environmental Management: Waste Act	59 of 2008	Controls for the effective protection and utilisation of the environment, littering, waste disposal, noise and various other activities, which may have a detrimental effect on the environment. • Waste management • Application of waste disposal permit
National Heritage Resources Act	25 of 1999	All aspects relating to Archaeological or palaeontological sites
National Water Act	36 of 1998	All aspects relating to the use and pollution of surface and ground water
Water Services Act	108 of 1997	The use of water and sanitation services of a water services provider
Occupational Health and Safety Act,	Act 85 of 1993	Aspects related to occupational health and safety measures
Health Act	63 of 1977	Littering and causing a nuisance
National Road Traffic Act	93 of 1996	Driving on public roads. Also in particular, the transportation of certain dangerous goods.
National Building Regulations and Building Standards Act	103 of 1977	The erection of new buildings.
Land Use Planning Ordinance	15 of 1985	Rezoning of the site to accommodate the proposed land use
National Environmental Management Air Quality Act	39 of 2004	Control all forms of air pollution. • Smoke control zones • Dust control esp. during construction • Fumes emitted by vehicles • Air pollution from waste
Fencing Act	31 of 1963	Prohibition of damage to a property owner's gates and fences • Climbing or crawling over or through fences without permission • Closing of gates
National Veldt and Forest Fires Act	101 of 1998	• Fire Protection Association membership • Building of fire breaks

Act Name	Act No	Notes / Remarks
Animals Protection Act	71 of 1962	Provides for the protection of animals
Game Theft Act	105 of 1991	Regulates ownership of game, combat theft and unlawful hunting, catching and taking into possession of game
'B' Municipality: Antenna By-law		Erection of antennae or satellite dishes
'B' Municipality: Construction of Buildings By-law		The construction of buildings
'B' & 'C' Municipality: Fire Service By-laws		Storage of combustible materials and gas filled devices
'B' Municipality: Electricity By-law		Electricity generation and consumption
'B' Municipality: Removal of Waste By-law		Generation, transportation, removal and disposal of waste
'B' & 'C' Municipality: Water Supply By-laws		Water supply, discharge of industrial effluent as well as storage and removal of sewage.
'B' Municipality: Advertising By-law		Commercial advertising which may have an environmental impact

CHAPTER 2: PROJECT BACKGROUND

From the 1960's onwards there has been a growing awareness of the complexity of impacts as a result of various activities on the environment. Integrated Environmental Management (IEM) is designed to ensure that the environmental consequences of projects are understood and adequately considered in the planning, implementation and management of development projects. IEM is intended to guide the development process and resolve or lessen any negative environmental impacts and enhance positive impacts of a project.

WHAT IS THE ENVIRONMENT?
The NEMA defines the environment as follows:

The surroundings within which humans exist and what are made up of:
i. the land, water and atmosphere of the earth;
ii. micro-organisms, plant and animal life;
iii. any part or combination of (i) and (ii) and the interrelationship among and between them; and
iv. *the physical chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.*

The unique environment is humankind's greatest asset. For the prosperity and well-being of current and future generations, this asset must be managed in a sustainable manner for, and to the benefit of all.

The IEM guidelines aim to ensure upfront environmental input during planning and construction and subsequent input during operation and maintenance. EMPrs are the tools that facilitate appropriate environmental input during all phases of various projects (from planning through to decommissioning). EMPrs thus form a crucial component of the IEM process and the ultimate attainment of sound environmental practice during all phases of the operation.

2.1 PROJECT DESCRIPTION

The developers propose to establish commercial PV solar electricity generating facilities. It is proposed that two solar electricity generating facilities will be erected – one on each of the farm (title) portions. The solar facility intends to accommodate a photovoltaic (PV) component and associated infrastructure.

The project will be situated on a Portion of the farm Everts Hope 190 and on a Portion of the farm Waschklip 183 approximately 12 km south-east of the town Saldanha Bay and 5 km east of Langebaan village. The R27 and the Langebaan access road form two borders of the site while the Engen One Stop is situated just south of the site.

2.1.1 Aspects of the activity covered in the EMPr

The project is divided into three distinct phases. For a detailed explanation of all the activities to be undertaken during these phases, refer to Section 3.1 of the EIA. The activities for each phase as applies to this EMPr are described below:

2.1.1.1 Construction Phase

- Establish access roads;
- Transport components and equipment to site;
- Site preparation;
- Establishment of laydown areas;
- Establishment of ancillary infrastructure;

- Construction of infrastructure foundations;
- Establishment of PV panels;
- Establishment of containerized dual-fuel generators;
- Establishment of containerized battery storage;
- Establishment of above-ground diesel and/or LNG storage;
- Connection of PV panels to the on site substation;
- Connection of the on site substation to the grid;
- Contouring; and
- Site remediation.

2.1.1.2 Operational Phase

This phase is envisaged for the current lifetime of the panels, which is estimated at approximately 20 to 30 years.

- Maintenance and repairs of PV and associated equipment inclusive of:
  - Maintenance of roads;
  - Cleaning and maintaining / replacing panels;
  - Maintaining and servicing generators;
  - Delivery of diesel and/or LNG for generators;
  - Maintaining buildings and other infrastructure; and
  - Maintain and repair fencing.
- Environmental remediation inclusive of:
  - Erosion and dust pollution control measures;
  - Fire management;
  - Vegetation management; and
  - Control spread of invasive species.
- Waste management; and
- Health and safety implementations.

2.1.1.2 Post Operational Phase

The activities during this phase have not been determined yet. Two options currently exist for this phase:

- Replacement of panels that reached the end of their economic life or replacement with new technology. Activities include:
  - Disassembly and replacement of individual panels;
  - Repair, maintenance and/or replacement of the framework structures and other required infrastructure; and
  - Recycling / disposing of replaced parts.

or

- Complete decommissioning can occur should it no longer be economically feasible to continue the project. Activities will include:
  - Site reparation;
  - Disassemble and recycle existing components; and
  - Rehabilitate the site.

2.2 DETAILS OF THE PERSON WHO COPMPILED THE EMPR

This report has been prepared by Anèl Dannhauser and reviewed by Nicolaas Hanekom, both from Cape Lowlands Environmental Services (CLES). CLES is an environmental consultancy established in 2004, engaged in providing professional services in the field of environmental planning, -systems, -management and –auditing as well as biodiversity assessments. CLES has undertaken numerous Applications in the past which includes the related EMPr.

Ms Dannhauser obtained a post-graduate qualification in environmental management and analysis from the University of Pretoria. She has completed 4 years as an environmental scientist with experience in compilation, revision, coordination and management of Basic Assessment Reports, Scoping Reports, Environmental Impact Assessments, Environmental Management Programmes, Integrated Water Use License Applications, Integrated Water and Waste Management Plans, audit reports and the public participation processes involved.

Mr Hanekom is registered under SACNASP as a Practising Scientist in the Ecological Science field and has postgraduate qualifications in biodiversity assessments and achieved special short courses qualifications in environmental science. He is also a certified Environmental Auditor with the South African Auditor and Training Certification Association (SAATCA) for Environmental Management Systems [EMS] (ISO 14001:2004) with Internal Auditor registration No. IE015.

Mr Hanekom has expertise and experience in many aspects of environmental planning, assessment and management, including:

- Spatial planning and associated environmental assessment;
- Environmental planning and the generation of project proposals;
- Environmental assessment, at both project and strategic levels;
- Environmental impact mitigation and/or enhancement;
- Environmental management systems (ISO 14001:2004), plans and programs;
- Environmental monitoring and evaluation;
- Environmental management;
- Environmental auditing (ISO 19011:2003);
- Scoping and stakeholder participation; and
- Biodiversity (flora and fauna based) assessments.

The part 2 amendment to the approved Environmental Authorisations (EAs) were undertaking by Justin Bowers of Ecoleges Environmental Consultants for which an abbreviated CV is provided below.

Name	Justin Bowers
Date of birth / ID No.	15 October 1972 7210155074089
Nationality	South African
Marital Status	Married with four children
Current Address	P O Box 516, Machadodorp, 1170. ● Redwing Farm, erf. Kaalbooi 368JT, Waterval Boven District, 1195, Mpumalanga, South Africa ● Cell: 082 451-5608 ● e-mail: justin@ecoleges.co.za
Languages	English, Afrikaans and Basic Zulu
Driver's Licence	Code EB, A & C1
Specialisations	Key Fields: Vegetation ecology, rehabilitation plans, environmental/ecological management plans, environmental auditing, Environmental Impact & Basic Assessment.
Qualifications & Courses Attended	**1998 – 2000** NATIONAL DIPLOMA: NATURE CONSERVATION, Technikon Pretoria **2001 – 2002** BACCALAUREUS TECHNOLOGIAE: NATURE CONSERVATION, Technikon Pretoria **2003 – 2007** MAGISTER TECHNOLOGIAE: NATURE CONSERVATION (CUM LAUDE), Tshwane University of

	Technology, Pretoria **2008** Environmental Law elective (MBA Programme), Rhodes University, Grahamstown. **2010 – Present** Certificate in Aquaculture, Department of Genetics & Aquaculture, University of Stellenbosch **2014** Implementing Environmental Management Systems, Centre for Environmental Management, North-West University, Potchefstroom. **2017** Transition ISO 14001 course, Centre for Environmental Management, North-West University, Pretoria locale. **2018** Lead Auditor's Course, Centre for Environmental Management, North-West University, Potchefstroom. **2020** Weed Control Course, Pest Control Industries Training Academy, Centurion, Pretoria.
Latest Publication	Sadie J. Ryan, Paul C. Cross, John Winnie, Craig Hay, Justin Bowers, Wayne M. Getz. 2012. The utility of normalized difference vegetation index for predicting African buffalo forage quality. *Journal of Wildlife Management* DOI: 10.1002/jwmg.407.
Countries worked	South Africa, United Kingdom.
Career Summary	**Jan 1995 – Jul 1997** Head Ranger (Idube Lodge, Sabi-Sands Wildtuin). **Dec 2000 – Dec 2001** Research student, Scientific Services, KNP. **Jan 2001 – Mar 2006** Senior Research Assistant, Mammal Research Institute, University of Pretoria. **Apr 2006 – current** Main Member, Ecoleges Environmental Consultants.

Full Curriculum Vitae available if required

CHAPTER 3: ISSUES RELATING TO THE IMPLEMENTATION OF THE EMPR

3.1 PURPOSE OF AN EMPR AND LEGAL COMPLIANCE

This section of the report is included in compliance with Section 24 N 2 (a) of the NEMA.

In 1989, the then Department of Environmental Affairs and Tourism (DEAT) (now Department of Environmental affairs [DEA]) promulgated the Environment Conservation Act, 1989 (Act No. 83 of 1989) in order to address potential impacts associated with a development project. Subsequently, in 1998, the DEAT promulgated the NEMA in order to better address potential impacts associated with a development project. This Act aims to ensure that developments are undertaken responsibly, and with minimal impacts on the environment.

Section 2 of NEMA describes the principles set out below as apply throughout South Africa to the actions that may significantly affect the environment. Section 28 of NEMA describes the duty of care and remediation of environmental damage. Section 34 of NEMA describes the criminal procedures to follow if an offence is commented.

In 2006, the DEAT published Environmental Impact Assessment (EIA) Regulations under the NEMA. The EIA Regulations identifies certain activities that could have a significant detrimental impact on the environment. In 2010 & 2014, the DEA amended the EIA Regulations in terms of the regulatory requirements and the listed activities.

Any project that involves any of the listed activities specified in the Regulations must pass through the EIA process. The resulting reports must be approved by the relevant competent authority (in the case of this project, the DEA) before construction can start. The DEA adjudicates whether or not the project can go ahead. Upon approving a project, an Environmental Authorisation (EA) is issued with specific conditions attached. These conditions, in conjunction with the EMPr will be used during the life phases of the project to ensure environmental compliance.

NOTE: The implementation of the EMPr within the project is not an optional additional or "add on" requirement. The EMPr is legally binding, integral to the contract and is as important as the engineering aspects of the contract. The EMPr is a working document to be used throughout the life of the project, until such time that closure is achieved.

3.2 APPROACH TO THE EMPR

This section of the report is included in compliance with Section 24 N 2 (c) of the NEMA.

The approach adopted for the EMPr is based on the internationally recognised ISO 14001 standard for environmental management systems (EMS). This standard places strong emphasis on the need for continuous improvement of the system and resultant environmental management performance. This can be achieved through reviewing the EMPr, based on monitoring and auditing results, and through regular refinement of the operating instructions and protocols used by personnel on site.

The implementation of this EMPr is one of several steps taken by the applicant in pursuit of continuous improvement. This EMPr includes environmental goals, objectives, management actions, monitoring requirements, targets/criteria for monitoring, and remedial actions.

3.3 ENFORCEMENT OF THE EMP

An Environmental Control Officer (ECO) should oversee the implementation of the EMPr on site. The role of the ECO is to ensure that the conditions of the EA as well as that of the EMPr are

enforced throughout the lifecycle of the project. Inspections will be conducted as determined in the management and monitoring section below. This frequency will differ from phase to phase.

Reports will be compiled after each site visit indicating the degree of compliance. The reports will be used to determine whether the contractor/ other implementing agents are compliant with the conditions. Should it be determined that the project is non-compliant, the reports will be used to determine whether compliance has improved or not. Reports will also contain recommendations as to the steps to be taken to rectify any non-compliance.

Reports will be kept on site (see record keeping below) and will be made available to the relevant competent authority for inspection as and when required.

All ECO instructions to the contractors and staff are to be issued through designated managers who have been formally instructed in writing to such extent.

3.4 EMP AVAILABILITY ON SITE

The manager must ensure that a copy of the signed and approved EMPr is available on site at all times for inspection by the authorities or their empowered representative(s). Any variation to the approved EMPr must be submitted to the department for signed approval and may only be implemented once the approved variation is available to management and available and displayed on site.

3.5 METHOD STATEMENTS

For each site, certain activities require method statements that have to be approved by the ECO and landowner prior to that activity commencing on site. The purpose of method statements is to provide a system for the proper conduct of each activity. This will ensure that activities impact as little as possible on the environment.

A method statement example format is provided in Appendix 2. A method statement for each type of activity must be developed and completed by all contractors operating on site. Such method statements are to be formally approved by the proponent and the ECO.

Contractors shall provide written statements for discussion with the Engineer, ECO and Contractor, and for final approval by the Engineer on environmentally sensitive aspects of the contract. Environmentally sensitive aspects include for example, erosion control, etc. It is important to note that the ECO may request further methods specification, if it is deemed necessary in his view.

3.6 FINES

Failure to adhere fully to the conditions and specifications of the EA and EMPr may result in spot fines being issued to workers *and* contractors via the site engineer by the ECO. These fines are to be deducted from the monthly payment certificates. Thereafter, it is the responsibility of management to collect the fines from the guilty individuals or owners and for use in enhancing community environmental and conservation standards within the greater general area

If the EMPr is still not being fully adhered to, guilty individuals may be suspended off site and the Environmental Permitting Authority may issue a stop work order to the operation in worst case scenarios.

CHAPTER 4: ISSUES RELATING TO THE IMPLEMENTATION OF THE EMPR

This section of the report is included in compliance with Section 24 N 2 (d) of the NEMA.

According to the International Organisation of Standardization (ISO) 14001, the organisation shall ensure that any person/s working for it or on its behalf is/are aware of the following:

- The importance of conformity with the Safety Health and Environment (SHE) policy, procedures and with the requirements of an environmental management system (EMS);
- The significant environmental aspects and related actual or potential impact associated with their work, and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformity with the requirements of an EMS; and
- The potential consequences of departure from specified procedures.

4.1 PROJECT CO-ORDINATOR

The Project Co-ordinator ("PC") (sometimes also referred to as the Project Engineer) is the person who will take overall responsibility for the implementation of the EMPr when the ECO is not on site. The PC has the authority to stop works if, in his / her opinion, there is a serious threat to, or impact on, the environment caused directly from the any activity taking place on the site during construction and operation. The PC should work in close conjunction with the ECO. Responsibilities of the PC include:

- Assume overall responsibility for the effective implementation and administration of the EMPr when the ECO is not on site;
- Ensure that the EMPr is included in the 'Contractors' Pack';
- Ensure that the EA and EMPr are given to the applicable Construction Supervisor and the Contractors (if utilized);
- In conjunction with the Clerk of Work ("COW"), undertake regular inspections of the Contractor's site as well as the construction works in order to check for compliance with the EMPr in terms of the specifications outlined in this document. The audits are conducted in regular intervals when the ECO is not on site;
- Enforce implementation of recommendations of possible audits;
- Report to the ECO any problems related to conformance with this document to be solved in co-operation with the Contractor(s);
- Undertake environmental awareness training;
- Inform the ECO of the date of construction at least three weeks in advance, so that the DEA can be notified timeously; and
- Ensure construction staff is trained in accordance with requirements of the EMPr.

4.2 CLERK OF WORK

The COW is the person who will take overall responsibility for the implementation of the EMPr when both the PC and the ECO are not on site. The COW has the authority to stop works if, in his / her opinion, there is a serious threat to, or impact on, the environment caused directly from the any activity taking place on the site during construction and operation. The COW should work in close conjunction with both the ECO and the PC. Responsibilities of the COW include:

- Assume overall responsibility for the effective implementation and administration of the EMPr when both the ECO and the PC are not on site; and
- In conjunction with the PC, undertake regular inspections of the Contractor's site as well as the construction works in order to check for compliance with the EMPr in terms of the

specifications outlined in this document. The audits are conducted in regular intervals when the ECO is not on site.

4.3 ENVIRONMENTAL CONTROL OFFICER

The ECO is the person who will take overall responsibility for the implementation of the EMPr. The ECO has the authority to stop works if, in his / her opinion, there is a serious threat to, or impact on, the environment caused directly from the any activity taking place on the site during construction and operation. The ECO should work in close conjunction with both the PC and the COW. Responsibilities of the ECO include:

- Assume overall responsibility for the effective implementation and administration of the EMPr;
- Ensure that the EMPr is included in the 'Contractors' Pack';
- Ensure that the EA and EMPr are given to the applicable Construction Supervisor and the Contractors (if utilized); as well as the Senior Supervisor Technical Services Officer ("SS");
- Undertake regular inspections of the Contractor's site as well as the construction works in order to check for compliance with the EMPr in terms of the specifications outlined in this document. Site audits shall be conducted regularly and copies of the monitoring checklist will be kept on file;
- Keep a register of all incidents (spills, injuries, complaints, legal transgressions, etc.) and other documentation related to the EMPr;
- Report to the PC any problems related to conformance with this document to be solved in co-operation with the Contractor(s);
- Assist the PC with the presentation of the environmental awareness training;
- Enforce implementation of recommendations of possible audits; and
- Ensure construction staff is trained in accordance with requirements of the EMPr.

The ECO appointment contract must:

- Describe the level and type of competency required of the ECO;
- Define and allocate the roles and responsibilities of the ECO;
- Determine the frequency of site visits; and
- Be included in all contract documentation for the construction phase of the development.

4.4 CONSTRUCTION CONTRACTOR

Responsibilities of the construction Contractor are listed below:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Report progress towards implementation of and any non-conformances with this document at site meetings with the PC;
- Ensure that suitable records are kept and that the appropriate documentation is available to the PC;
- Advise the PC of any incidents or emergencies on site, together with a record of action taken; and
- Report and record all accidents and incidents resulting in injury or death.

- Notify both the Department of Forestry, Fisheries and the Environment and the Western Cape Environmental Affairs and Development Planning immediately of any incident in terms of section 30 of the NEMA.

4.5 SENIOR SUPERVISOR

Responsibilities of the SS are listed below:

- Ensure that the areas that are of specific environmental importance like the 'no-go' areas are conserved and kept as they are during the operational phase of the project;
- The EMPr with specific conditions or aspects shall be made available to the SS by the EAP; and
- All relevant conditions of the EA and EMPr shall be adhered to during the operational period.

4.6 LAND OWNER / CUSTODIAN OF THE LAND

The land owner or Custodian of the Land is the person or organization with final decision making capacity for the land in question, and thus ultimately accountable for what takes place on that land.

4.7 DEVELOPER OR IMPLEMENTING AGENT

The person or organisation who will fund, and or be responsible for the implementation of the project or activity, is the Implementing Agent.

Ultimately the liability associated with environmental compliance rests with the land owner via the Implementing Agent. Hence, the Implementing Agent must ensure that the entire requirement for Environmental Compliance is clearly defined in the Terms of Reference for the Contractor and all staff.

4.8 ENVIRONMENTAL ASSESSMENT PRACTIONER

The EAP investigates and produces assessment of the environmental impacts in relation to the project. The following are the responsibilities of the EAP:

- Draft and submit the relevant environmental impact assessment and supporting documents to relevant Government Departments;
- Implement a thorough public participation process; and
- Compile the draft EMPr and submit to the DEA.

4.9 AUTHORISING DEPARTMENT

The purpose of the authorising department is to assess the available information and impact determinations to make an informed decision regarding the project. Should the project be approved, the authorising department (DEA) will provide a comprehensive Environmental Authorisation (EA) with practical conditions on the application lodged for the proposed energy centre.

CHAPTER 5: MONITORING AND AUDITING

This section of the report is included in compliance with Section 24 N 2 (e) of the NEMA.

In keeping with current environmental and associated legislation, all environmental management procedures and actions must be reviewed and refined on an on-going basis. This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light. The process of review and refinement, built into the requirements of the EMPr, is known as Monitoring and Auditing.

5.1 THE MONITORING PROCEDURE

Environmental Monitoring is the continuous evaluation of the status and condition of environmental elements. Its purpose is to detect change that takes place in the environment over time and involves the measuring and recording of physical, social and economic variables associated with development impacts. To these ends, the ECO will monitor the site for compliance (i.e. Compliance Monitoring) with the Performance Specifications.

Many techniques for Environmental Monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the ultimate aim is that each environmental management specification be checked by means of a system in which a score may be allocated for:

- Full compliance;
- Satisfactory performance;
- Unsatisfactory performance; and
- No action taken.

Monitoring should take place at least monthly during construction and decommissioning. It is recommended that monitoring during the operational phase should take place annually.

Completed Monitoring Reports will be submitted to the Project Engineer and landowner, the Contractor, who will attend to issues, and the ECO who will ensure that audits are performed at designated intervals. These reports must be kept on file and be made available upon request by the Land Owner / Custodian of the Land and any Environmental Authority or any Interested and Affected Party requesting such.

- All persons employed, all Contractors and sub-contractors must abide by the requirements of these Performance Specifications as they apply to the Works;
- Any employees, Contractors and sub-contractors found to be in breach of any of the Environmental Specifications may be ordered to vacate the site forthwith or be subject to a disciplinary process. The order may be given orally or in writing by the ECO. Confirmation of an oral order will be given as soon as practicable, but lack of confirmation in writing shall not be a cause for the offender to remain on site, or not be subject to a disciplinary process; and
- Supervisory staff, the Contractor or his sub-contractor may not direct any person to undertake any activities which would place such person in contravention of the Environmental Authorisation and Specifications.

The Contractor and staff are deemed not to have complied with the Performance Specifications if:

- There is evidence of wilful or accidental contravention of any specification included in the Specification;
- There is evidence of the contractor carrying out activities not permitted in terms of the EMPr, Contract and / or the Specification;
- There is evidence of environmental negligence and / or mismanagement resulting in negative

impacts on the environment; and
- There is failure to meet with the requirements of the approved schedule.

The Contractor and landowner will be informed via ECO Monitoring and Auditing Reports as well as by means of direct instruction as to what corrective actions are required in terms of Environmental Compliance:

- Disregard for an instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance;
- Non-compliance may lead to the forfeit of the Environmental Authorisation or being penalised. In more serious cases, the Project Engineer or ECO may give notice, and then halt operation works until such a time that the upgrade is done and the site complies with the Performance Specifications; and
- In cases of persistent non-compliance, the Contractor or staff may be ejected from site after disciplinary process is followed. Only the Land owner or the Implementing agent may issue such instruction, retaining any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

5.1.1 EMPr – Monitoring Structure

Table 3: Example of an EMPr monitoring structure sheet

Person responsible is:		
Name:		
Designation:		
Reporting of environmental performance, problems and priorities are as follows		
Environmental monitoring is according to the following schedule:		
The following negative environmental impacts have been identified:		
In order to solve (mitigate) the above identified negative environmental impacts, the following plan of action is to be implemented:		
Problem	**Solution**	**Date to be Completed**
Monitoring (follow-up) plan of implemented remedial action:		
Person responsible for environmental monitoring (follow-up) is:		
Name:		
Designation:		
Facility Name:		
Monitoring Date:		
Problem	**Solution as implemented**	**Has the solution worked, if not, what actions are still to be taken?**

5.1.2 Responsible persons

Individuals responsible for various management, environmental activities, hazard prevention, etc. will be determined prior to commencement of the construction phase. A list with the designation, names and contact details of these persons will be available on site at a central and visible location at all times. The list will also be provided to contractors as part of their 'Contractor's Pack'.

5.2 THE AUDITING PROCEDURE

Environmental Auditing is the process of comparing the impacts predicted with those which actually occur during implementation. An Environmental Performance Audit examines and assesses practices and procedures which, in the event of failure, would cause an environmental impact or result in an environmental risk. During each of the lifecycle phases, various issues will be monitored. The Performance Audit will ensure that the monitoring was correctly undertaken and that compliance was best achieved. To these ends the project will be audited on its EMPr for effectiveness against the SANS 19011:2003 standard.

Audits will routinely be undertaken at 6 months intervals during construction and decommissioning phases, or as required in the Environmental Authorisation. Audit reports will be submitted to the Chief Executive Officer (CEO), who will attend to issues. These reports must be kept on record and be made available upon request by the Landowner, Custodian of the Land and any Environmental Authority or Interested and Affected Party requesting such.

5.3 RETENTIONS AND PENALTIES

It is recommended that a retention system be combined with a penalty system to both motivate and compel the contractor and management to adhere to the environmental Performance Specifications for the duration of the contract.

In this way incentives may be created to perform (i.e. in the form of the retention amounts that will be paid to the contractor only at the end of the contract), without creating the misimpression that adherence to the environmental Performance Specifications is optional.

Persistent non-compliance will not only result in the contractor forfeiting any retention amounts, but he will also be fined and such funds be applied in the general area and community to the benefit of conservation and the environment.

Of importance is that the Contract specifies exactly how the penalty and retention system will operate, as well as how any funds resultant from retentions and penalties will be utilised. All such funds must be used to improve environmental conditions on the site in general and not accrue to the Implementing Agent or Developer.

5.3.1 The Retention System

For this system, a percentage value for each of the sections priced for in the Environmental Bill of Quantities is retained until the completion of the Contract Works. If the Monitoring process reveals persistent and/or wilful non-compliance with any aspect of the environmental Performance Specifications, then the full retention associated with that particular item will be withheld.

The Project Coordinator may then utilise these retained funds to rectify the problem on site making use of (other) resources at his disposal.

At the end of the Contract or action, all remaining environmental retention amounts will be paid out to the contractor or staff pending approval by the ECO, having confirmed compliance with the relevant Performance and Rehabilitation Specifications.

5.3.2 Penalty System

A system of penalties will be introduced to reinforce environmentally sensitive behaviour, especially in cases of repeated or serious contraventions. The penalties are listed below. The figures shown are the maximum penalty per incident. The penalty will be influenced by the severity of the offence and the willingness of the entity/person to correct and proper compliant behaviour in future.

Table 4: Environmental reinforcement penalties

Non-compliance	Penalty
Any defacing or cutting down trees or major shrubs, existing infrastructure, not specified to be removed	R5000 p each
Disturbance to natural veld and wetlands	R1000 / m^2
Catching or harming any wild animals	R3000 + SAPS charges
Litter resulting from operation	R250 / offence / day
Entering a no-go area on foot	R500
Entering a no-go area in a vehicle	R5000
Making a fire outside an approved fireplace	R20 000
Disposal of any litter or construction material in a no-go or non specified area	R1000 / m^2 footprint
Dumping of cement, concrete, fuel or oil in an area or other than that authorised and suitable	R10 000 p each
Any damage to plant life in a no-go area	R1000
Failure to use portable / toilets	R100 / observed incident/ evidence of excrement in veld
Any actions contrary to the Environmental Policy which continue after an initial penalty	Termination of contract.

Note: In addition to the above, all costs incurred by the client on behalf of the rehabilitation contract to remedy any damage, will be the responsibility of the offender.

Should the Monitoring process reveal acts of persistent and/or wilful non-compliance with the environmental Performance Specifications, then the Contractor or staff member will be fined according to the specified value of that item.

Basal bird studies to cover all the annual cycle of seasons must be conducted before construction commences.

CHAPTER 6: REGISTERS

This section of the report is included in compliance with Section 24 N 2 (e) of the NEMA.

6.1. RECORD KEEPING

The ECO/ Project Engineer will keep a record of all activities relating to environmental matters on site, including meetings attended, method statements received and approved, issues arising on site, cases of non-compliance with the EMPr and EA together with corrective action taken and penalties issued.

This information will be recorded in an appropriate manner by the ECO/ Project Engineer in a site diary, registers, issues/ warning book, etc. In addition, the ECO and Project Engineer are to undertake monthly checks on site in order to ensure compliance with the EMPr and EA.

6.2. INTERNAL REVIEW

An internal review procedure will be established by the ECO and Land owner to monitor the progress and implementation of the EMPr and EA. Any modifications to the EMPr and EA will be issued as variation orders via the Site Instruction Book and registered in the records, usually upon completion of the mandatory six monthly audits.

6.3 COMPLIANCE WITH OTHER LEGISLATION

It is important that staff is aware of other legislation that may relate to the activities taking place on site. A detailed Legal Register to ISO standards is to be compiled. Also see Table 2.

6.4 REPORTING AND RECORD-KEEPING

6.4.1 Good Housekeeping

The Land owner will maintain “good housekeeping” practices during operations. This will help avoid disputes regarding responsibility and will allow for the smooth running of the operation as a whole. Good housekeeping extends beyond the wise practice in construction and operational methods are to include the care for and preservation of the environment within which the site is situated.

6.4.2 Record-Keeping

The Land owner will ensure that an electronic filing system, identifying all documentation related to the EMPr, is established.

A list of reports likely to be generated during further phases of the Project is set out below; all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Approved EMPr;
- Final design documents and diagrams issued;
- All communications detailing changes of design/ scope that may have environmental implications;
- Daily, weekly and monthly site monitoring reports;
- Occupational Health and Safety reports;
- Complaints register;
- Medical reports;
- Training manual;

- Training attendance registers;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- Permits and legal documents, including letters authorising specific personnel of their duties as Occupational Health and Safety representatives or as part of emergency preparedness teams e.g. fire teams, etc.;
- Crisis communication manual;
- Disciplinary procedures;
- Monthly site meeting minutes during construction;
- All relevant permits;
- Environmental Authorisation; and
- All Method Statements for all phases of the project.

6.4.3 Document Control

The Land owner will be responsible for establishing a procedure for electronic document control. The document control procedure must comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person;
- Every document must identify the person and their positions, responsible for drafting and compiling the document, for reviewing and recommending approval, and final approval of the document for distribution;

All documents must be dated, provided with a revision number and reference number, filed systematically, and retained for a specified period.

The owner will ensure that documents are periodically reviewed and revised where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents will be made available to the external auditor. All spills will need to be documented and reported to DWA, DEA and other relevant authorities upon request.

6.4.4 Reporting Requirements

The ECO shall be responsible for monitoring compliance with the EMPr and EA. All advice and recommendations made by the ECO shall with the Project Engineer/ Engineers' compliance be recorded on site in the Site Instruction Book/ suitable register for his attention. The purpose of this document is therefore to:

- Detail the role of the ECO and the Engineer's Representative (ER) with respect to the implementation of the EMPrs and EA; and
- Provide additional information and checklists.

The ER and/or the ECO must read and understand the contents of the Guideline Document for the Contractor as well as the EMPr and EA specifications in the Contract Document to ensure that the requirements of the EMPr and EA are met.

CHAPTER 7: PUBLIC COMMUNICATION PROTOCOLS

This section of the report is included in compliance with Section 24 N 2 (e) of the NEMA.

NOTE:

The Implementing Agent shall be responsible for regulating public access to information and compliance reporting.

The Implementing Agent shall further be responsible for regulating and scheduling the Local Affected Parties / Neighbours committee with the input of the ECO.

The Implementing Agent alone shall respond to third party or public queries and complaints.

The Implementing Agent shall also be responsible for maintaining the Compliance Register to record complaints received and action taken.

CHAPTER 8: ENVIRONMENTAL MANAGEMENT PROGRAMME

This section of the report is included in compliance with Section 24 N 2(d-g) and 3(a-b) of the NEMA.

The focus of this section is on the management and mitigation measures proposed for the project, based upon the impacts identified. This management plan focusses mainly on the construction and operational phases. However, measures for management during the planning and design phase as well as the decommissioning phase are also provided.

The management program is the procedure applied to achieve set environmental policy and goals and consists of the following components:

Goals: Over-arching environmental goals for the management phase.
Objectives: The objectives are in place in order to meet such goals. These objectives take into account the findings from existing studies and monitoring programmes.
Management Actions: Such actions are needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
Monitoring: Key actions are to verify objectives that are being achieved, taking into consideration responsibility, frequency, methods, and reporting.
Criteria & Targets: The criteria or targets indicate the efficacy of the management program. The targets should be readily measurable, understandable to the layperson, cost-effective to monitor, and meet legal requirements.
Remedial Actions: Specifies actions needed to be taken if the targets are not met; or if there is an unforeseen event

For the construction and operational phases, the management program has been structured in a tabulated format in order to show the links between the over-arching goals and associated objectives, actions, monitoring requirements, and targets.

8.1 PLANNING AND DESIGN PHASE

8.1.1 Pre-conditions

The following pre-conditions shall be fully met before any construction activities may commence:

In order to maintain aesthetics, standards, general appearance, security arrangements and greening processes it is necessary that Contractors adhere to rules and regulations as determined by the Developer and further subject to legislation as applicable in South Africa from time to time.

The applicant must appoint a suitable, experienced and qualified ECO before commencement of any land clearing or construction activities to ensure compliance with the provisions of this EMPr.

A site meeting between the Contractors and the representatives of the Developer must take place at least 5 days prior to commencement of construction work to:

- Demarcate micro construction sites, services routes, access routes, working boundaries and no-go areas;
- Discuss methods of stockpiling (vegetation, topsoil, sub-soil, shell-grit, etc.);
- Check that required toilets and fire-fighting facilities are in place;
- Discuss and agree restricted access to construction site;
- Sign the Declaration of Understanding (Contractors);
- Discuss and agree communication channels including contact details;
- Discuss and agree areas of responsibility; and

- Discuss and agree the demarcation and control of construction and building sites.
- The applicant shall be guilty of an offence and upon conviction liable to a fine and / or imprisonment if the expanded scope commences without an approved Part 2 amended EA, issued by the DEFF.
- The generator/s design capacity may not exceed 10MW.
- The above-ground fuel storage facility may not exceed 30m^3 in capacity and as the site is located within an Identified Geographical Area (IGA) in Listing Notice 3 of the EIA Regulations (2014) as amended.
- Ensure the specification of the GENSETs includes noise dampeners to reduce noise emissions.
- Endeavour to ensure that the design of the Battery containers are suitably bunded to effectively contain any accidental leakages.
- Compile and adhere to a procedure for the safe handling of battery cells, including but not limited to a battery management systems (containment, automatic alarms and shut-off systems) to monitor and protect cells from overcharging or damaging conditions, such as temperature extremes.

Minutes of this site meeting must be kept, and are to be distributed to all parties. The following equipment must be on every micro or sub site before any construction work is due to start:

- Sufficient and suitable chemical toilet facilities;
- Sufficient refuse bins, which are weather and wind proof, with proper lids; and
- At least 1 x type ABC (all purpose) 12.5 kg fire extinguisher at both the construction camp site and the solar panel installation site.

8.1.2 Layout Plan Controls

The Contractor must ensure that a copy of the signed approved layout plan is available at the office on site at all times for inspection by the Developer or its representative(s). Any variation to the approved layout plan must be submitted to the Developer for signed approval and may only be implemented once the approved variation is available to the Contractor and available on site at the office.

8.1.3 Advertising

The Contractors may place no advertising material on the property unless prior formal written permission has been obtained from the Land Owner and is compliant to the EA conditions.

8.1.4 Method Statement

The Contractor shall provide written intent statements, for discussion between the ER, ECO and Contractor, and final approval by the land owner, on all environmentally sensitive aspects of the contract. This will be done prior to commencing any construction work. The Contractor should note that the time and costs for the compilation and implementation of method statements should be included in this budget. Environmentally sensitive aspects of the contract include e.g. erosion control, inclusive wind erosion, etc.

The Method Statement must include:

(1) A site plan;
(2) Description of preparatory steps;
(3) Materials available for combating pollution especially oils; and
(4) Supervision levels to be accorded such responsibilities.

8.2 CONSTRUCTION PHASE

This section provides general management measures to be taken into account throughout the construction phase. A table providing management and mitigation measures specific to each

proposed activity has also been compiled. It is the intention of this table to form part of the list of conditions to be considered during monitoring and auditing to determine compliance.

8.2.1 Working Hours

Public working hours as opposed to private time hours:

Contractors may only be present on the Civil & Construction Sites during the following public time hours:

Mondays to Fridays	06h00 –19h00
Saturdays & Public Holidays	06h00 – 17h00

Private time hours are 19H00 – 06H00 on weekdays, and after 17h00 Saturdays, on all of Sundays, as well as any Building Industries Federation of South Africa (BIFSA) builder's holidays as prescribed annually to members. Should the need arise to amend these times; this must be done with 7 days' notice via the ECO and developer to the land owner for prior sanction thereto.

8.2.2 Safety

Telephone numbers of emergency services, including the local fire fighting services, shall be posted conspicuously in the Contractor's office and near the telephone. No firearms are permitted on the construction site, other than those authorised by the Developer for the property security service provider if needed. Notices should be displayed at all public entrances to the property, warning visitors that they are entering a construction site.

8.2.3 Deliveries to Contractors

Contractors will at all times be responsible for compliance by their delivery service providers as engaged. Delivery times will be limited to public times as defined in this document. Contractors have the responsibility of advising the property Security staff of deliveries expected and to be executed. Contractors shall further ensure that drivers of service providers are informed of all procedures and restrictions e.g. which access road to use, speed limits, no-go areas, demarcated construction areas, and maximum allowed vehicle mass etc., as applicable before their first visit to site. Washing of service provider delivery vehicles and equipment will not be allowed on the property and must be carried out elsewhere.

8.2.4 Management and Mitigation Measures

Management and mitigation measures for the various construction activities are provided below in Table 5. Monitoring by an ECO for all activities should be scheduled once a month for the whole of the construction phase.

Table 5: Construction phase management and mitigation measures

Aspect	Impact / Risk	Management Measure	Frequency	Responsibility	Monitoring	Objectives & Targets	Remedial Action
General: It is important that activities are conducted within a limited area to facilitate control and to minimize impacts on the natural environment. For this reason the working areas and 'no-go' areas must be identified and clearly demarcated. Working areas are defined as those areas required by the Contractor to undertake construction. The Contractor shall ensure that all labour and materials remain within the boundaries of the working area.							
All	Overall degradation of bio-physical environmental aspects	• From the outset of construction the working area must be well demarcated with either fencing, danger tape or other appropriate method where possible • All staff, vehicles and construction material are to be restricted to the working area • Vehicles, if parked on site, must have a clearly demarcated area • Accommodation must be made to treat immediately oil leaks that may occur from e.g. any vehicle sumps. This can be achieved by providing a sump or a drip tray for each vehicle that is later removed to be disposed of at a licensed hazardous disposal site • Demarcate areas for vehicle servicing, maintenance and parking • Any machinery or stockpiles that may present a source of pollution during construction activities should be placed on an impermeable surface to prevent the run-off of the spillages into the water-courses • All hazardous material must be stored in a secured area that is fenced and has restricted entry. If there is mixing of these two waste streams, the entire portion of waste will be considered hazardous. • The stockpiling of materials needs to take place within the working area and not be allowed to spill over into vegetation • Construction activities and materials, vehicles and staff to remain within the working areas	Site rehabilitation to be completed within three months of construction or by an alternative date stipulated by the ECO	Contractor	ECO compliance monitoring on a monthly basis throughout the construction phase	• Minimize the impact of construction activities on the surrounding environment. • Restore any degradation caused by the construction activities. • Rehabilitate the disturbed and degraded areas to sustain a bio-diverse ecosystem. • Limit the potential of site pollution and the accumulation of waste materials on site.	See activities in sections below
Activity: Establish access roads: • Clearing of the route (new access routes only) • Broadening and upgrading existing roads where necessary • Compacting soil & placing gravel **Objective:** • Provide quality access roads that will not deteriorate and cause damage to the road sides • Prevent damage to the vegetation surrounding the demarcated road areas							
Soil	Erosion	• All construction activities to be undertaken within the working area • Strict erosion control measures are to be taken during and after construction to ensure no erosion of roads take place • Clear only necessary areas of vegetation and leave as much cover as possible to still allow construction activities to be undertaken unhampered	Throughout construction	Contractor	ECO compliance monitoring on a monthly basis	No or minimal erosion	Repair eroded areas
Soil	Contamination / pollution due to hydrocarbon / oil spills	• Fuels, oils, hydraulic fluids, etc. must be stored in properly contained areas so as to minimize accidental spillage • Accommodation must be made for oil leaks that may occur from vehicle sumps. This can be achieved by providing a sump or drip tray for each vehicle that is later removed from site to be disposed of at a licensed hazardous disposal site • Demarcate areas for vehicle servicing, maintenance and parking • All spills must be reported to the environmental department within 24 hours of the spill via a flash report • No hazardous or toxic chemicals or substances should be stored where there could be accidental leakage into subterranean water supplies • The contractor should be in possession of a mobile oil spill kit and/ or a wheely bin should be available on site • A waste management procedure needs to be developed and implemented at all times	Cleaning of spillages immediately Removal of contaminated soil – as and when needed Reporting of spillages – within 24 hours of the spill	Contractor	ECO compliance monitoring on a monthly basis	No / minimal spillages during the construction phase	Clean and remove contaminated soil immediately
Soil	Compaction	• Avoid all areas not demarcated for construction activities • Demarcate areas for vehicle parking • Undertake clearing of vegetation and topsoil only where necessary	Throughout construction	Contractor	ECO compliance monitoring on a monthly basis	Minimal compaction	• Avoid all areas not demarcated for construction vehicles • Rehabilitate sections after construction
Vegetation	The proposed development will be on agricultural land	• Contamination of the perennial crops due to dust pollution must be avoided at all times • When working in farming areas the farmers' land, animals, wheat, crops etc. must be treated with respect and avoided where possible	Vegetation management throughout construction phase	Contractor	ECO compliance monitoring on a monthly basis	To minimize the impact on the surrounding environment and vegetation (wheat)	• Clear all alien vegetation when found • Rehabilitate

Aspect	Impact / Risk	Management Measure	Frequency	Responsibility	Monitoring	Objectives & Targets	Remedial Action
	and therefore, no sensitive vegetation has been envisaged. A list of species with conservation concern must however be present on site at all times.	• All staff, vehicles and construction material are to be restricted to the working area • In areas where there are no evident roads, great care must be taken not to create more tracks than are absolutely necessary. The general rule is one track in and one track out • The stockpiling of materials needs to take place within the working area and not spill over into vegetation • Vegetation clearing, if required, must be done under the supervision of the ECO. Vegetation clearance must be carefully managed and minimized as far as possible to ensure the long-term retention of the agricultural potential and zoning of the property and consideration that the site falls within an Endangered Ecosystem namely; the Saldanha Flats Strandveld. • All bush cuttings, if of no use to the farmers must be removed from the site and disposed of at a licensed landfill site • Invasive plants must be controlled (invasive plants and weeds must be identified and controlled in such a manner that it is not introduced to the area and prevented from spreading) • Small to medium sized alien plants should be hand-pulled. Loppers should be used to cut plants that cannot be pulled out by hand to below ground level. This needs to be done in order to prevent re-sprouting • Stump treatments (only a certified Pest Control Officer may be appointed) should be applied to larger sized trees where necessary • The use of herbicides must be done according to the SABS standard for the safe use of pesticides and herbicides • Herbicide spraying of re- sprouting species should be undertaken immediately to minimize regrowth • *Echium plantigeum* is now an invasive alien pest on the West Coast and the ECO of the project must be trained to identify and remove plants immediately from the site. • All vehicles coming onto the site with gravel, sand or soil must ensure they originate from an *Echium plantigeum* free source. • Should any protected trees be affected by the proposed activity, a permit application must be submitted to the Department of Agriculture Forestry and Fisheries (DAFF) prior to removing the trees • No open fires are permitted on site as there is a major threat of fire occurring, especially in the summer months • No driving through watercourses, sensitive vegetation, etc.	as and when necessary Fires on site – Never				areas after completion of work • Refrain from entering sensitive areas or farmlands outside the servitude area
Surface Water	Water quality	• Undertake construction during dry season where possible • See above measures for preventing soil pollution due to vehicle maintenance and management • Prevent over-utilizing open areas next to roads in order to prevent inclusion of dust particles in sheet flow (water erosion causing sedimentation) • Any machinery or stockpiles that may present a source of pollution during construction activities should be placed on an impermeable surface to prevent the run-off of the spillages into the water-courses • Vegetate immediately upon completion of a section	Throughout construction	Contractor	ECO compliance monitoring on a monthly basis	Prevent surface water deterioration	• Vegetate open areas where possible • Utilize diversion measures such as trenching
Archaeological, Paleontological & Heritage Features	Loss of resources	If any archaeological material (e.g. fossils, bones, artifacts etc.) is found during vegetation clearance, the contractor shall stop work immediately. The ECO shall inform Heritage Western Cape (HWC) and arrange for a paleontologist/ archaeologist to inspect, and if necessary excavate, the material, subject to acquiring approval from HWC. The Contractor shall not recommence working in that area until written permission has been received from the ECO.	Upon discovery of archaeological resources	Contractor	As and when required	• Prevent / minimize destruction of any archaeological • Manage archaeological resources	No remediation possible if resources are destroyed
Air quality	Dust and air pollution	• Undertake dust suppression (wetting of gravel roads, etc.) to ensure that dust generated during the various phases of the proposed development comply with the National Dust Control Regulation (GN No. R. 827 of 1 November 2013), promulgated in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (“NEM: AQA”) • Maintain construction vehicles to prevent undue emissions (see additional measures regarding maintaining of trucks above)	As per requirements of the Regulations	Contractor/ Specialised service provider	Implement a dust monitoring programme/ fugitive dust control plan, inclusive of dust suppression/		

Aspect	Impact / Risk	Management Measure	Frequency	Responsibility	Monitoring	Objectives & Targets	Remedial Action
					collection methods		
Noise	Noise Pollution/ Vibration	• The contractor must use equipment that falls within the allowable noise/ vibration limits. Noise generated from the installation and operation of the various activities (e.g. air filters, gas compressors, electricity generators, electricity transformers, etc.) must comply with the Western Cape Noise Control Regulations (Provincial Notice 200/2013). • Service all equipment and vehicles regularly • All noise/ vibration generating activities must be scheduled between 7am – 7pm Mondays to Fridays and weekends as required and with the permission of the landowner • Any complaints pertaining to noise must be reported to the ECO and addressed	Use of quiet equipment – where possible Adherence to work times – always Complaints – as and when necessary	Contractor	ECO compliance monitoring on a monthly basis	Avoid disturbing the local community and surrounding land users / owners	Service equipment
Socio - economic	Existing farm roads to be used will be upgraded, benefitting the farmers – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
	Job creation will occur – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
	Damage to property	• Pastures and crop must not be trampled by driving of construction vehicles • In areas where there are no evident roads, great care must be taken not to create more tracks than are absolutely necessary. The general rule is one track in and one track out	Throughout construction	Contractor	ECO compliance monitoring on a monthly basis	Prevent minimize / property damage	Restore property, crops and / or livestock to pre-damaged state
	Visual disturbances	• Keep to demarcated areas as far as possible • Establish site camp in a visually sheltered are where possible	Throughout construction	Contractor	ECO compliance monitoring on a monthly basis	Minimize visual impact on surrounding land users / owners and passers-by	N/A
Activity: Transport components and equipment to site **Objective:** • Prevent degradation of roads (both provincial and access roads) • Prevent breakage & financial losses							
Socio - economic	Degradation of existing tar and farm roads	• Keep to speed limits • Do not drive on the verge of the road • Maintain the access roads currently used • Ensure that property owners have unrestricted access to their properties • Should additional access tracks be required, the access must be agreed upon with the relevant property owner in conjunction with the contractor. A written agreement must be in place, prior to any construction of the said access route • If roads are damaged due to construction activities, it will be the responsibility of the responsible construction contractor to rehabilitate the roads to a state they were before construction • For security and safety reasons the speed limit on the property for all Contractors' vehicles is 30 km per hour. The Contractor is responsible for ensuring that all his employees, subcontractors and delivery vehicles adhere to this rule • Vehicles of developers, contractors and subcontractors should where possible be registered with the Saldanha Bay Municipality Traffic Departments, so that portions of the fees can be used for road infrastructure maintenance.	Throughout construction	Contractor	• ECO compliance monitoring on a monthly basis • Upon lodging of complaints	Prevent degradation to roads	• Upgrade roads if and where necessary

Aspect	Impact / Risk	Management Measure	Frequency	Responsibility	Monitoring	Objectives & Targets	Remedial Action
Activity: Site preparation including: • Clearance of vegetation • Establishment of laydown areas (construction camp) **Objective:** • Prevent environmental degradation • Prevent accidents							
Activity: Construction of buildings and other infrastructure: • Place fencing • Construct facilities as per the activity description and site development plans **Objective:** • Prevent visual impacts • Prevent environmental degradation							
Activity: Establishment of PV panels • Construction of infrastructure foundations • Connection of PV panels to the substation • Establishment of containerized generators • Establishment of containerized battery storage • Establishment of above-ground diesel and/or LNG storage tanks • Connection of the on site substation to the grid via cut and tie-in to the nearby Eskom 132 kV lines **Objective:** • Prevent environmental degradation • Minimize visual impact • Maximize productivity							
Geology	Destruction of substrata	• Drill only into substrata where necessary	During construction of buildings	Contractor	ECO compliance monitoring on a monthly basis	Prevent destruction of resources	No remediation possible if resources are destroyed
• Soil • Vegetation • Fauna • Surface Water • Visual • Socio-economic	Waste / littering – general environmental degradation	• Solid waste must be managed in accordance with the requirements of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) • The main contractor is responsible for cleaning-up at the end of construction • The Contractor shall not dispose of any waste and/ or construction debris by burning or burying • The use of waste bins, refuse bags and/or skips is recommended • The bins shall be provided with lids to prevent contents blowing out • The Contractor shall ensure that all waste is deposited in the waste bins for removal to an approved Municipal waste site • Bins shall not be used for any purposes other than waste collection and shall be emptied on a regular basis • All waste shall be disposed of off-site at a licensed landfill site • No waste and/ or refuse are to be stored on site for longer than 2 months • All waste must be removed off site and dispose of at a licensed landfill site • Temporary ablution facilities (i.e. Chemical toilets) must be made available and used. A minimum of one chemical toilet must be provided per 15 persons • Chemical toilets utilized during construction to be properly located such that they do not pose risk of water resource pollution and its contents must be disposed of at an authorized facility • Abluting anywhere other than in the toilet facilities available shall not be permitted (i.e. no abluting in the veld) • Servicing and cleaning of vehicles is strictly prohibited in the access roads, working areas and in the veld • The foundational footings provided for the BESS & GENSETS containers must allow for unimpeded stormwater runoff e.g. containers to be positioned on concrete plinths. • The vegetation beneath the containerised batteries and generators will likely die back due to shading, exposing the soil to potential runoff induced erosion. Suitable measures must be installed to stabilise the affected soil and suitably remediate any sign of erosion at its onset.	Throughout construction	Contractor	ECO compliance monitoring on a monthly basis	• Prevent contamination, degradation and destruction of natural resources • Prevent / minimize the impact on humans	Clean up all littering and spillages
Soil	Contamination / pollution due to cement mixing and usage	The Contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein:	Cleaning of spillages immediately	Contractor	ECO compliance monitoring on a monthly basis	Prevent contamination of soil due to contact with cement and concrete	Clean up all spillages

Aspect	Impact / Risk	Management Measure	Frequency	Responsibility	Monitoring	Objectives & Targets	Remedial Action
		• Concrete shall be mixed on mortar boards, and not directly on the ground • The visible remains of the batch plant and concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste in a registered landfill site • Washing the visible signs into the ground is not acceptable • All aggregate and cement bags shall also be removed and stored in a demarcated are until such time as it can be safely disposed of at a registered landfill site	Removal of contaminated soil – as and when needed Removal of cement bags - daily				
Soil	Contamination / pollution due to hydrocarbon / oil spills	• Fuels, oils, hydraulic fluids, etc. must be stored in properly contained areas so as to minimize accidental spillage • No hazardous or toxic chemicals or substances should be stored where there could be accidental leakage into subterranean water supplies. • Fuel and oil storage area to be hardened and bunded in order to minimize pollution of the environment • Accommodation must be made for oil leaks that may occur from vehicle sumps. This can be achieved by providing a sump or drip tray for each vehicle that is later removed from site to be disposed of at a licensed hazardous disposal site • All spills must be cleaned within 24 hours of the spill. All polluted material should be placed in a separate marked bin for removal to a licensed hazardous landfill site • The contractor should be in possession of a mobile oil spill kit and/ or a wheely bin should be available on site. A mobile kit can be acquired from Drizit at Tel. No. 021 425 5187 • Oil Spill Clean-up and Rehabilitation needs to be implemented and the area rehabilitated to the satisfaction of the ECO and relevant Departments (Water and Environmental Affairs and the Local Authority)	Cleaning of spillages immediately Removal of contaminated soil – as and when needed Reporting of spillages - within 24 hours of the spill	Contractor	ECO compliance monitoring on a monthly basis	Prevent potential oil spills during the construction of the proposed facility.	Clean all spills when and where necessary
Fauna	• Habitat destruction • Theft of farm animals • Killing of wild animals from fear or for food	• All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962) • Environmental induction training and awareness must include aspects dealing in safety with wild animals on site. Focus on animals such as snakes and other reptiles that often generate fear by telling workers how to move safely away and to whom to report the sighting. Workers should also be informed where snakes most often hide so that they can be vigilant when lifting stones etc. • All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake a specialist must be called in to safely relocate the animal if the ECO is not able to • Employees and contractors alike should be sensitized that ALL fauna and flora must be treated with respect and avoided where possible • Any tortoises or other reptiles found should be relocated to places of safety and not harmed in any way. If work is done in summer, tortoises are very evident and can easily be caught and relocated elsewhere • When working in farming areas, the farmers' animals must be treated with respect • No farm animals may be taken – security should be present on site at all times to prevent livestock theft • To avoid injury to birds, cables must be buried as far as possible • Glass windows should be 'frosted' or shuttered so that birds cannot see through or reflections of themselves	Induction and sensitization - prior to construction Other measures to be implemented as and when necessary	Contractor ECO	ECO compliance monitoring on a monthly basis	• Prevent and minimize impact on fauna including birds. • Prevent injury and harm to birds and animals (including farm animals)	• Engage a specialist when necessary

Aspect	Impact / Risk	Management Measure	Frequency	Responsibility	Monitoring	Objectives & Targets	Remedial Action
Water courses	No water courses identified on site during specialist investigations. Thus it is not anticipated that any water courses will be impacted upon. Management measures provided for best practice.	• Storm water management must be addressed both in terms of flooding and pollution potential and a plan put in place • Fuels, oils, hydraulic fluids, cement etc. must be stored in properly contained areas so as to minimize accidental spillage. Special care should be taken near seasonal watercourses • No pollution in the form of effluent, chemicals, or waste products should be allowed to run into any seasonal streams/ vlei's. • No structures to be placed within 32 m from a riverbed, a floodplain, wetland or seasonal streams without Environmental Authorisation • Any water use activity that is not Schedule 1 water use must be registered and authorized by DWA • All guidelines from the Department of Water Affairs should be adhered to • No littering, waste disposal or other pollution of watercourses is allowed • No fishing or bathing in watercourses • No driving in the watercourses / water features	Prevention / mitigation measures to be implemented at all times. Obtaining of licenses prior to undertaking activities within buffer areas of watercourses	Contractor	ECO compliance monitoring on a monthly basis	• No pollution and detrimental environmental impact to watercourses. • Strict erosion control measures are to be taken during and after construction to ensure no erosion of the bed or banks of a watercourse takes place.	Clean all possible pollution as and when necessary
Archaeology	Loss of resources	If any archaeological material (e.g. fossils, bones, artifacts etc.) is found during vegetation clearance, the contractor shall stop work immediately. The ECO shall inform Heritage Western Cape (HWC) and arrange for a paleontologist/ archaeologist to inspect, and if necessary excavate, the material, subject to acquiring approval from HWC. The Contractor shall not recommence working in that area until written permission has been received from the ECO.	Upon discovery of archaeological resources	Contractor	As and when required	• Prevent / minimize destruction of any archaeological features • Manage archaeological resources	No remediation possible if resources are destroyed
Visual	Changes to the existing landscape (tourists and land users / owners)	• Implement the use of visual buffers such as retaining existing vegetation where possible and planting additional vegetation of a similar nature to screen the infrastructure on site • Keep to the current design which incorporates visual mitigation such as staying behind dunes which serves as a buffer • Paint building in colour that blends into the surrounding environment, except in high-risk bird impact areas (and which is not visually impactful beyond the boundary of the development footprint), buildings can be painted red or yellow because birds see these colours better than black and white • Plant vegetation around and under the established panels • Keep heights of panels below 2 m and building heights not more than 1.5 storeys	During construction and implementation	Contractor and engineer	ECO compliance monitoring on a monthly basis until infrastructure is fully established	Prevent / minimize visual impact	Implement prescribed measures
Socio-economic	Existing farm roads to be used will be upgraded, benefitting the farmers – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
	Job creation will occur – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
	Employee health and safety	• The security contractor shall provide water and/ or washing facilities at the camp for personnel • The security camp shall be kept neat and tidy and free of litter • The security contractor shall provide the necessary ablution facilities for all his personnel. Chemical toilets shall be used • The toilets must be secured to prevent them from blowing over, and shall be provided with an external closing mechanism to prevent toilet paper from being blown out. Toilet paper shall be provided in all toilets • The security contractor shall ensure that chemicals and/ or waste from toilet-cleaning operations are not spilled on the ground at any time • Toilets may not be closer than 100m from a water feature • Abluting anywhere other than in the toilets shall not be permitted • No fires shall be permitted on site, either for cooking or other purposes. The major fire threat is in summer. Much of the surrounding pasturelands and exotic stumps of trees will burn during the dry summer months • Care should be taken near all flammable sources such as near vehicles, fuel storage area, vegetation etc. • All recommendations made by an ECO must be adhered to • All construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work • No discarded materials of any nature shall be buried on the site or on any other land within the site	Throughout construction	Contractor	ECO compliance monitoring on a monthly basis until infrastructure is fully established	• Prevent health and safety issues (injuries, etc.) • Ensure awareness of health, safety and environmental aspects • Prevent environmental degradation	• Implement stricter health and safety protocols • Maintain all pollution prevention measures • Plant vegetation where necessary

Aspect	Impact / Risk	Management Measure	Frequency	Responsibility	Monitoring	Objectives & Targets	Remedial Action
Activity: Site remediation • Contouring • Planting of vegetation • Rehabilitation **Objective:** Re-establishing natural processes where possible to prevent environmental degradation							
Soil	Improve soil conditions – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
Flora	Establish vegetation and increase in species diversity – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
Fauna	Provide habitats – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
Surface Water	Improve surface water quality – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
Air quality	Improve air quality – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
Visual	Partly reverse visual disturbance – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
Socio-economic	Job creation as part of construction phase – no mitigation necessary		N/A	N/A	N/A	N/A	N/A

8.3 OPERATIONAL PHASE

8.3.1 Primary Management Objectives

The primary management objectives the proposed solar PV plant is:

- To manage and have sustained use of the natural systems within the context of the region, to conserve the biodiversity, ecological quality and value of the surrounding natural environment and farms. The solar plant layout proposes to retain natural features such as the low lying dunes and natural vegetation as far as possible; and
- To maintain a finite standard and quality of finishing and service delivery at the facility. This requires on-going maintenance of buildings, surrounds and infrastructure, and the repair of environmental damage caused by usage, via by example erosion or trampling of vegetation.

8.3.2 Secondary Management Objectives

- Appropriate management of land uses to attain the objectives based on predicted impacts, particularly of people and the facility operation, whilst focusing on the sustainable use of the natural environment; and
- To promote an ethos of environmental education and awareness to all who live on or visit the facility, focusing on the environmental management also of the greater area.

8.3.3 Management Program

This following section defines the management programme in terms of the activities during the operational phase. The programme is presented in the form of a table, which includes the components described.

Table 6: Management and mitigation measures during the operational phase.

Aspect	Impact / Risk	Management Measures	Frequency	Responsibility	Monitoring	Performance indicator / targets	Remedial Actions
Activity: Maintenance and repairs of PV and associated equipment inclusive of: • Maintenance of roads • Cleaning and maintaining/ replacing panels • Maintaining and servicing generators • Delivery of diesel and/or LNG for generators • Maintaining buildings and other infrastructure • Maintain and repair fencing **Objective:** • Prevent degradation of equipment • Prevent/ mitigate visual impacts							
Soil	Erosion	• On-going management and maintenance of roads, roadways, and areas susceptible to erosion • Ensure suitable vegetation cover on non-hardened surfaces • Manage runoff of storm water to prevent soil erosion as result of blockages • No pollution of any surface water permitted • Battery housing must adequately contain any accidental leakages and not allow for leakage onto the ground beneath. • Supply and delivery of diesel and/or LNG into the above-ground storage tanks must be governed by an SOP that ensures the safe transfer of the product including minimising & remediation of spillages.	Throughout operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	No erosion	Immediate rehabilitation of erosion signs
Soil	Change in soil type / structure – this is a neutral impact and cannot be mitigated		N/A	N/A	N/A	N/A	N/A
Vegetation	Alien invasive	• Clear all alien plants on property • Ensure sufficient ground cover is established in order to prevent growth of aliens • All bush cuttings, if of no use to the farmers must be removed from the site and disposed of at a licensed landfill site • Invasive plants must be controlled (invasive plants and weeds must be identified and controlled in such a manner that it is not introduced to the area and prevented from spreading) • Small to medium sized alien plants should be hand-pulled. Loppers should be used to cut plants that cannot be pulled out by hand to below ground level. This needs to be done in order to prevent re-sprouting • Stump treatments (only a certified Pest Control Officer may be appointed) should be applied to larger sized trees where necessary • The use of herbicides must be done according to the SABS standard for the safe use of pesticides and herbicides. Herbicide spraying of re- sprouting species should be undertaken immediately to minimize regrowth • No open fires are permitted on site as there is a major threat of fire occurring, especially in the summer months	Throughout operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	Prevent presence and spread of alien invasives	Remove invasive species whenever found
Vegetation	Natural vegetation will re-establish and grow during this period – no mitigation necessary		N/A	N/A	N/A	N/A	N/A
Fauna	Fauna will re-establish in the area to some extent during this phase	• All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962) • Environmental induction training and awareness must include aspects dealing in safety with wild animals on site. Focus on animals such as snakes and other reptiles that often generate fear by telling workers how to move safely away and to whom to report the sighting. Workers should also be informed where snakes most often hide so that they can be vigilant when lifting stones etc. • No intentional killing of any animal is permitted as faunal species are a benefit to society. • Poaching is illegal and it must be a condition of employment that any employee caught poaching will be immediately dismissed. Ongoing incidents must be addressed with CapeNature and a suitable strategy implemented. • Employees must be trained on how to deal with fauna species as	Throughout operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	Prevent killing / unnecessary disturbance of animals	• Implement awareness training • Disciplinary actions

Aspect	Impact / Risk	Management Measures	Frequency	Responsibility	Monitoring	Performance indicator / targets	Remedial Actions
		intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake a specialist must be called in to safely relocate the animal if the ECO is not able to • Employees and contractors alike should be sensitized that ALL fauna and flora must be treated with respect • No farm animals may be taken – security should be present on site at all times to prevent livestock theft • Problem animal control must be implemented, especially feral cats which are well known killers of birds.					
Surface water	• Water quality deterioration • Blocking of storm water systems	• On-going erosion control management • Cleaning and maintenance of stormwater systems • Cleaning of areas with hardened surfaces to prevent accumulation of blocking material • The above-ground storage of diesel and/or LNG must be suitably bunded to 110% of its content and covered with a roof to avoid rainwater ingress.	Throughout operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	• Prevent / minimize water quality impacts • Prevent erosion	Immediate rehabilitation of erosion signs
Visual	Maintenance activities visible to surrounding land users / owners and	• Undertake maintenance only when necessary to avoid disturbance to surrounding land users / owners and passers by • Schedule all or at least as many as possible maintenance activities at one time (e.g. bi-annually) • The above-ground storage of fuel may require a permit from the local fire chief in accordance with local bylaws.	Throughout operational phase, as and when necessary	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	Minimize obstructions / disturbances	N/A
Visual	Visibility of panels and buildings	• Visibility of panels cannot be further mitigated. All planting of vegetation buffers as implemented during the construction phase and specified in application to be maintained • Undertake upkeep on buildings and other infrastructure including painting of surfaces • External lighting should be motion activated with beam directed downwards and preferably yellow LED, so as not to attract night flying insects and night feeding bird species	As and when necessary	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	Minimize visibility of permanent infrastructure	Undertake upkeep of buildings and vegetation cover
Air quality	Decline in generator exhaust emissions quality from inadequate maintenance and repairs.	• Generators are serviced under a maintenance program • Daily pre-start checks for any necessary repairs or servicing • Maintenance records keep updated • Staff are competent and qualified to operate turbines • Ensure that noise emissions from the operation of the GENSETs are monitored and remain within acceptable limits. • For road tanker loading / offloading all liquid products shall be loaded using bottom loading, or equivalent, with the venting pipe connected to a vapour balancing system. Where vapour balancing and / or bottom loading is not possible, a recovery system utilizing adsorption, absorption, condensation or incineration of the remaining VOC's, with a collection efficiency of at least 95%, shall be fitted. • In terms of section 35(2) of the NEM: AQA, the occupier of the premises must take all reasonable steps to prevent the emission of any offensive odour (diesel fumes, etc.) caused by any activity on such premises. It should be noted that all offensive odour complaints must be recorded, reported and investigated, should it be required.	In line with manufacturers specifications for servicing and maintenance guidelines	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	Maintain the manufacturers exhaust emission standards throughout operational life	Undertake servicing of turbines and complete a maintenance program.
Socio-economic	Job creation – no mitigation necessary Note: job losses will occur between the construction and operational phases. Approximately 80 workers will still be employed for maintenance activities throughout the operational phase.		N/A	N/A	N/A	N/A	N/A
Activity: Environmental management and remediation inclusive of • Erosion and dust pollution control measures • Fire management (for a detailed fire management procedure, refer to Appendix 4) • Vegetation management • Control spread of invasive species **Objective:** Prevent / minimize environmental degradation							
Soil	Erosion of or degradation by constant use of road and yard surfaces	• On-going management and maintenance of roads, roadways and areas susceptible to erosion • Ensure suitable vegetation cover on non hardened surfaces	Throughout operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent	No erosion	Immediate rehabilitation of erosion signs

Aspect	Impact / Risk	Management Measures	Frequency	Responsibility	Monitoring	Performance indicator / targets	Remedial Actions
		• Manage runoff of storm water to prevent soil erosion as result of blockages • No pollution of any surface water permitted			audits of Operations vs. EMPr and identification of those requirements that are not met		
Surface water	• Water quality deterioration • Blocking of storm water systems	• On-going erosion control management • Cleaning and maintenance of stormwater systems • Cleaning of areas with hardened surfaces to prevent accumulation of blocking material	Throughout operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	• Prevent / minimize water quality impacts • Prevent erosion	Immediate rehabilitation of erosion signs
Soil Vegetation Fauna Safety of surrounding humans	Pollution, fire, property damage and health risks	• Ensure sufficient Fire Fighting Equipment (FFE) present on site at all times • Yearly pre fire season clearing • Establish and maintain fire breaks • Yearly pre-season testing and servicing of fire fighting equipment to be formally reported upon • Prevent site from collecting too much dry material that may catch fire • Suitable measures must be implemented to mitigate the potential fire risk associated with Lithium-ion battery storage on site	Throughout operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met	Prevent / minimize fire risks	• Check and if necessary, replace FFE • Establish fire breaks • Water necessary sections of the site
Alien Plant Management	Degradation of property and increased fire risk.	• Clear all alien plants on property • Ensure sufficient ground cover is established in order to prevent growth of aliens • All bush cuttings, if of no use to the farmers must be removed from the site and disposed of at a licensed landfill site • Invasive plants must be controlled (invasive plants and weeds must be identified and controlled in such a manner that it is not introduced to the area and prevented from spreading) • Small to medium sized alien plants should be hand-pulled. Loppers should be used to cut plants that cannot be pulled out by hand to below ground level. This needs to be done in order to prevent re-sprouting • Stump treatments (only a certified Pest Control Officer may be appointed) should be applied to larger sized trees where necessary • The use of herbicides must be done according to SABS standard for the safe use of pesticides and herbicides. Herbicide spraying of re-sprouting species should be undertaken immediately to minimize regrowth • No open fires are permitted on site as there is a major threat of fire occurring, especially in the summer months • If labour is required for alien species control, there are teams trained by local NGOs, for example Cape West Coast Biosphere Reserve Co. that can be approached for already trained staff	Annually throughout the operational phase	Applicant / service provider	ECO audit actions: Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met		1) Implementation of audit findings.
Activity: Waste management **Objective:** • Prevent pollution of natural resources • Prevent health impacts							
Vegetation	Vegetation may catch waste items causing the environment to become unsightly	<u>*Solid Waste*</u> • Solid waste must be managed in accordance with the requirements of the relevant legislation, inclusive European Union return to source policy as given in application process • No waste shall be disposed of by burning or burying on site • All waste will be deposited in waste containers for removal to an approved Municipal waste site • Marked waste bins/ skips shall be provided	Throughout operational phase	Applicant / service provider	Six monthly initial and then annual independent audits of Operations vs. EMPr and identification of those requirements that are not met.	• No waste on site outside demarcated areas • No pollution of natural resources • Healthy environment	Implementation of audit findings
Fauna	Animals in contact with solid waste may become trapped or asphyxiate.						
Surface water	Surface water contamination may occur						

Aspect	Impact / Risk	Management Measures	Frequency	Responsibility	Monitoring	Performance indicator / targets	Remedial Actions
Visual impacts	Waste lying around outside demarcated areas will be unsightly to passersby and immediate/ surrounding land users/ owners	• All bins shall have lids to prevent the contents from blowing out • No waste and/ or refuse are to be stored on site for longer than 2 months • Bins shall not be used for any purposes other than waste collection and shall be emptied on a regular basis • Depleted or malfunctioning batteries must be suitably disposed of. The applicant must comply with all regulatory requirements governing the storage, transport and disposal of batteries. Additionally, where an industry battery management best practice is in place, the associated initiatives and practices must be followed and implemented including but not limited to the South African E-Waste Industry Waste Management Plan (V.1) 2019-2024. *Sewage Waste* • Sewage will be removed to an approved sewage treatment plant as and when necessary *Liquid Waste* • Servicing and cleaning of vehicles is strictly prohibited in the access roads, working areas and in the veldt • Drip trays will be provided for all vehicles during parking and maintenance activities					
Socio-economic	Health & safety impacts may occur dependent on the availability and spread of the waste						
Activity: Health and safety implementations **Objective:** • Prevent health impacts on site workers and surrounding land users/ owners • Ensure safety measures are adhered to at all times to prevent injuries and death							
Socio-economic	Impacts on health and safety of employees on site Health and safety impacts to immediate and surrounding land users/ owners	• Adhere to all health and safety legislation and the health and safety protocols, policies and standard operating procedures • All employees should attend an environmental, health and safety awareness training procedure prior to undertaking operations on site • Maintenance equipment, including chemicals, lubricants, coolants etc. must be stored in accordance with the Occupational Health & Safety Act and be suitably contained/bunded that they pose no risk of leakage and contamination of the receiving environment.	Bi-yearly	Applicant / service provider	Health and Safety Representative audit actions as per the health and safety policies and plans	• No deaths • No/minimal work related illness or incidents	Implementation of audit findings

8.5 DECOMMISSIONING PHASE

As mentioned, final decommissioning activities will consist of

- Disassemble and recycle existing components;
- Site reparation; and
- Rehabilitate the site.

Full decommissioning of the solar PV plant will include removal of all solar panels and related structures. Removal of the maintenance and facility will be dependent upon the end land use agreement. Should it be necessary, these buildings will be removed and the area completely rehabilitated to as close as possible to its original state or to the level needed as per the end land use agreement.

Having found the commitment for the take back and recycling of photovoltaic modules by the solar industry too lax, the European Union (EU") Parliament, on January 18, in Strasbourg, France, officially voted for the collection of 85 % of all end-of-life photovoltaic modules in Europe. Of those, 80 % must be recycled. As such, modules are now included under the WEEE Directive's category four (Consumer Equipment and Photovoltaic Panels).

All EU member states are required to implement the directive. Although South Africa is not an EU member state, it is clear that the DEA could support the same principles (see Appendix C to the EIR) to be implemented in South Africa. Since Soventix is an EU based company, they commit to subscribe to the above policy in South Africa and Soventix SA will adhere to the conditions of that policy.

The module supplier JA Solar belongs to PV Cycle. This is a company that collects and recycles solar modules as per the EU policy. However, PV Cycle only operates in the EU. Soventix SA will obtain a letter from the module supplier, committing to the recycling of the modules. This would be an undertaking whereby the modules are either shipped back to China or the EU for recycling, unless a suitable and nationally acceptable method for recycling can be developed here in South Africa.

Should the Electronic Waste Association of South African (e-WASA) establish a more stringent protocol regarding the recycling and handling of solar panels, which becomes broadly accepted, Soventix undertakes to adhere to such a protocol and relevant procedures.

A decommissioning and rehabilitation policy and any financial guarantees for such are specifically related to the local authority authorisations under the LUPO application process and are currently being negotiated. The recycling of the solar modules will also be dealt with under such policy.

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature and lifetime of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased.

Upon decommissioning occurring, impacts are likely to be similar to the construction phase impacts. The management actions and control under the Construction Phase EMPr need to be implemented to mitigate the negative impacts on the environment and to restore the property to its natural state.

The results of environmental monitoring during the decommissioning phase will be used to assess the impact of the decommissioning on the surrounding environment and demonstrate compliance with regulatory requirements.

The actual scope of the decommissioning environmental monitoring will be established following consultation with the regulatory authorities. The format of decommission management strategy will probably be similar to that of earlier development phases and consist of the following:

- Develop monitoring procedures in accordance with standard protocols and the requirements of the environmental legislation;
- Undertake environmental monitoring during the decommission phase for:
  - Surface water quality; and
  - Terrestrial flora rehabilitation.
- Calibrate and maintain all equipment used for environmental monitoring;
- Maintain records of the calibration and maintenance for each piece of monitoring equipment held on site; and
- Send all samples to a SABS registered laboratory for analysis.

Exact decommissioning activities, methods and procedures can only be accurately determined closer to the time as technologies and methods will change. The most effective methods and technologies of the day will be used during decommissioning. A decommissioning plan will be developed prior to the commencement of this phase.

In order to ensure that decommissioning and the relevant site remediation is provided for, Soventix must negotiate a suitable financial instrument as guarantee to satisfy the needs of the local community and authority. Such a financial guarantee can be achieved through various mechanisms. Discussions with the SBM in this regard will occur prior to the project construction initiation and as further be informed by the LUPO process.

Rehabilitation activities will be similar to those undertaken at the end of the construction phase, albeit to a larger scale. See Section 9 below.

CHAPTER 9: REHABILITATION PLAN

9.1 CONSTRUCTION PHASE

Various construction activities, such as establishing construction camp and waste collection area, construction of access roads as well as bush clearing and levelling could cause environmental damages leading to erosion. These environmental damages include disruption and disturbance of protected / endangered vegetation, damage to topsoil and compacting of ground.

In order to ensure reversal of the abovementioned impacts, the environment wll be rehabilitated. Rehabilitation will occur subsequent to completion of construction. Throughout construction phase the management and mitigation measures prescribed in section 8.2 must be implemented. This will ensure not only that the environment is minimally damaged, but also that rehabilitation activities will be more effective.

- The Contractor shall take all appropriate and active measures to prevent erosion, especially wind and water erosion, during the rehabilitation of the construction phase. Any erosion caused on site during the construction phase as a result of runoff needs to be rehabilitated;
- Temporary erosion protection measures must be kept in place until permanent preventative measures (such as establishment of vegetation) is concluded;
- Areas where disturbance and loss of topsoil, scarring of the soil surface and land features have occurred (such as at the construction camp) must be filled with rehabilitated topsoil;
    - Topsoil removed during construction must be conserved and stockpiled (no more than 2 m in height) for rehabilitation use; and
    - All spills must be removed and disposed of at an approved dumping site and rehabilitated immediately.
- Compacted ground shall be rehabilitated by ripping to a minimum depth of 600mm
    - Ripping will increase the soil's water storage capacity;
    - stop soil erosion;
    - alleviate the re-compaction; and
    - Allow deep root growth and water infiltration.
- Topsoil of at least 20 cm should be placed on top of the ripped soil. Following topsoil, the affected area should be re- vegetated;
- Areas prone to erosion caused by the removal of vegetation (such as around the bases of the panel foot pieces) must be rehabilitated with topsoil and the area re-vegetated:
    - Re- vegetation must include the use of only indigenous vegetation and plants similar to that of the natural surrounding areas;
    - A Contractor appointed by the developer and Engineer shall be tasked to ensure that all weeds and alien/invasive species are removed as instructed and approved by the ECO;
    - No on-site burying, dumping or stockpiling of any weeds and aliens or invasive species may occur. Such should be removed from the site to a suitable dumping site from which seed cannot escape;
    - Site rehabilitation requires a well- designed planting program to be developed prior to re-vegetation; and
    - No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been re-vegetated.
- There must be no vegetation interfering with structures and statutory safety requirements upon completion of the contract;
- On completion of works, the contractor shall clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish and temporary works of every kind. The construction sites shall be cleared, and cleaned to the satisfaction of the Developer and the ECO; and
- Perimeter fencing must be removed at the end of construction in order to ensure that they do not deteriorate and result in an aesthetically unpleasing development.

Topsoil removed during the construction phase should not be stockpiled for use during the decommissioning phase, as the end of life of operations is unknown at this stage. Should topsoil be stored indefinitely, it will lose viability. All topsoil must thus be used during construction phase rehabilitation.

9.2 OPERATIONAL PHASE

No rehabilitation will be necessary during this phase. Refer to maintenance procedure above.

9.3 DECOMMISSIONING PHASE

Decommissioning of this development is not foreseen in the near future. Due to the changes in technology anticipated to occur, decommissioning phase specific rehabilitation measures will not be provided at this stage.

Prior to undertaking any decommissioning activities, impacts will be determined and management, mitigation and rehabilitation measures determined. A rehabilitation plan will also be developed prior to undertaking any decommissioning activities.

CHAPTER 10: ENVIRONMENTAL AWARENESS PLAN

This section of the report is included in compliance with Section 24 N 3 (c) of the NEMA and structured as per the requirements of Regulation 33 of the EIA Regulations R543 under NEMA – the EMPr needs to include, inter alia:

(j) An environmental awareness plan describing the manner in which-
(i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
(ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment;

While this EMPr mainly focusses on the construction phase, it is best practice to take into account the cyclical process of continual improvement, which is mainly applicable to the operational phase. As part of the continual improvement, environmental as well as health and safety awareness training should be provided to all employees in order to promote the effective implementation of the EMPr actions[1].

This section of the report focusses on the environmental awareness training. It provides a guideline as to the possible environmental risks that may be experienced as part of the project as well as way to avoid the risks and subsequent environmental degradation. The aim is to provide a guide to developing a comprehensive yet easily understandable awareness plan to present to employees of all education and skill levels which should be presented to the employees at least one week prior to commencement of construction. The following pointers are given for the environmental awareness training course:

- Environmental awareness training should be undertaken by the environmental and/or health and safety representative of Soventix with the input of an EAP or ECO if required;
- Environmental awareness reminders should be undertaken at least bi-annually to ensure that employees and Contractors are kept aware of the risks and management thereof;
- It is recommended that awareness posters be developed and placed on site in highly visible areas to provide the required information when it needs to be referred to as well as reminding employees of their obligations with regard to environmental protection;
- A slideshow can also be developed for initial awareness induction and for use as a reminder of the environmental risks and responsibilities at the site or induction of future Contractors; and
- Throughout the presentations (posters, meetings, slideshows, etc.), it is recommended that visual aids be used to explain the potential risks and management thereof as thoroughly as possible.

Should any new personnel be contracted or arrive on site during the construction period, they should attend the environmental awareness course. The environmental awareness training should be provided to all labourers, technical staff and any other Contractor appointed.[2]

The awareness training forms part of this EMPr and should be implemented as part of the conditions of environmental management and risk prevention. Refer to the management measures in Tables 6 and 7 above for proposed management and mitigation actions to be undertaken in order to prevent or minimise the risks described below. Attention should be focussed on the following areas of sensitivity during the construction phase:

- Removal of vegetation during site clearance;
- Animal habitat disturbance due to vegetation clearance;
- Soil erosion and pollution;
- Soil compaction;
- Health and safety;

[1] DEA&DP Guideline for Environmental Management Plans, June 2005
[2] City of Cape Town: Environmental Management Programme, March 2007

- Degradation of roads; and
- Fire risks.

Other elements to be taken into consideration by the employees during both the construction and operational phases include:

- The presence of animals on site;
- Disturbances to neighbours due to noise and traffic;
- The positive impacts, of the greener technology being implemented, on the biophysical and socio-economic environments; and
- Although unlikely to occur, awareness should be raised regarding the possible occurrence of sensitive plant and animal species and heritage features.

The awareness training for this project should aim to prevent, and where prevention is not possible, mitigate detrimental environmental impacts. It should promote awareness of environmental risks and management thereof. It should furthermore promote green thinking and provide information on alternative energy sources and energy consumption reduction.

CHAPTER 11: REFERENCES

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APPENDICES