

ENVIRONMENTAL MANAGEMENT PROGRAMME

75MW PHOTOVOLTAIC ELECTRICITY GENERATION FACILITY

on

PORTION 8 OF FARM 187 OLYVENKOLK, KENHARDT DISTRICT

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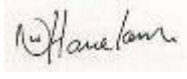

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DEFINITIONS

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 any 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 on 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

DEA:	Department of Environmental Affairs
DWA:	Department of Water Affairs
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
EM:	Environmental Manager
EMP:	Environmental Management Programme
EMS:	Environmental Management System
ER:	Environmental Representative
IAP:	Interested and Affected Party
IEM:	Integrated Environmental Management
IEMF:	Integrated Environmental Management Framework
PM:	Project Manager
PSP:	Professional Service Provider
EA:	Environmental Authorization
SABS:	South African Bureau of Standards
SANS :	South African National Standards

TABLE OF CONTENTS		Page
Chapter 1: Introduction		5
1.1	Environmental Management Programmes	5
1.2	Purpose of EMP and Legal compliance	5
1.3	Who Enforces The EMP?	6
Chapter 2: Organisational Structure: Personnel		7
2.1	Construction Controlling Engineer	7
2.2	Environmental Control Officer or Environmental Representative	7
2.3	Contractors	7
Chapter 3: Applicable Legislation, Policy And Environmental Principles		9
3.1	Applicable Legislation Identified	9
3.2	Published standards	9
Chapter 4: Compliance, Monitoring And Auditing		10
4.1	The Monitoring Procedure	10
4.2	The Auditing Procedure	11
4.3	Retentions and Penalties	11
Chapter 5: Registers		13
5.1	Reporting and Record Keeping	13
Chapter 6: Reporting Requirements		14
6.1	Responsibilities and Functions of the Environmental Control Officer (ECO)	14
6.2	Compliance with other Legislation	14
Chapter 7: Public Communication		15
Chapter 8: Environmental Management During Construction Phase		15
8.1	Qualifications of Contractors	15
	8.1.1 Responsibility of Contractors	15
	8.1.2. Layout Plan Controls	16
	8.1.3. Advertising	16
	8.1.4. Method Statement	16
	8.1.5. Safety	17
	8.1.6. Deliveries to Contractors	17
8.2.	Diesel Fuel and Lubricant Handling Programme	17
8.3.	Services	17
8.4.	Roads	17
8.5.	Dust and Noise Control	17
8.6.	Appropriate use of Machinery	18
8.7.	Anti-erosion measures	18
8.8.	Lights	18
8.9.	Eating, Washing and Resting Areas	18
8.10.	Waste Disposal in terms of IWM	19
8.11.	Construction Material	19
8.12.	Fires	19
8.13.	Rehabilitation and Site Clean Up	19
8.14.	Blasting or use of explosives.	20
Chapter 9: Environmental Management During Operational Phase		21
Goal 1: Roads Maintenance and Erosion Control Measures		23
Goal 2: Fire Management		24
Goal 3: Waste Management		28
Goal 4: Alien plant control and monitoring		29
Goal 5: Impact on surrounding Agricultural Activity Management		30
Goal 6: Visual Impact Management		31
Decommissioning Phase EMP		33
References		34

CHAPTER 1 INTRODUCTION

1.1. Environmental Management Programmes

From the 1960's onwards there has been a growing awareness of the complexity of impacts as a result of development and construction projects upon 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 development project.

The unique environment is our 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. EMP's are the tools that facilitate appropriate environmental input during the construction and operational phases of projects, and thus form a crucial component of the IEM process and the ultimate attainment of sound environmental practice during all phases of the operation.

The environment comprises all living and non-living surroundings such as water, buildings, soil, plants, cars, air, humans and their interrelationships. It is important to realize that people form an integral part of the environment.

1.2. Purpose of EMP and Legal compliance

In 1989, the Department of Environmental Affairs and Tourism promulgated the Environment Conservation Act in order to address potential impacts associated with a development project.

Regulations GNR 385, 386 and 387 were published in 2006 and in 2010 GNR 543, 544 and 545 were published under the the National Environmental Management Act 107 of 1998 ("NEMA") . These regulations identify certain activities that could have a significant detrimental impact on the environment.

This act aims to ensure that developments are undertaken responsibly, and with minimal impacts on the environment. Any project that involves any of the activities specified in the act must pass through the Environmental Impact Assessment (EIA) process and must be approved by the national or provincial authority before a listed activity may commence.

The authorities adjudicate whether or not the project can go ahead and issue an Environmental Authorization ("EA"), in most instances with specific conditions of approval.

NOTE: The implementation of the EMP within the project is not an optional additional or "add on" requirement. The EMP is legally binding, integral to the construction contract and is as important as the engineering aspects of the contract. This EMP meets the new requirements for EMPs as per the requirements of NEMA.

These EMP have been specifically drawn-up with the intent to achieve the set objectives and targets. Responsibilities and timeframes state clearly the intention of the EMP namely to actively manage the objectives and targets.

1.3. Who Enforces The EMP?

A full-time Environmental representative as indicated by the EMP oversees the implementation of the EMP on site. All instructions to the contractors and staff are to be issued through designated managers who have been formally instructed in writing.

CHAPTER 2 ORGANISATIONAL STRUCTURE: PERSONNEL

The following persons will implement the procedures for the control and protection of the environment. The environmental representative and staff will routinely report to the operations manager, who in turn will report to top management.

2.1. Construction Controlling Engineer

The engineer will have the following environmental control responsibilities:

- In conjunction with the Environmental Control Officer (“ECO”) or Environmental Representative (“ER”) will present the environmental education programmes to all persons employed on site.
- Consult with the ECO or ER, landowner and any contractor to resolve all environmental issues.
- Issue all instructions from the ECO or ER to the management team via a formal site instruction book or appropriate management tool used for the purpose.
- Take responsibility for the penalty system. The ECO or ER and landowner recommendations must be considered when deciding whether or not to impose a penalty.
- The Engineer will, via the ECO or ER, be accountable for the overall implementation of the EMP.

2.2. Environmental Control Officer or Environmental Representative

The appointed ECO or ER will periodically be on site from pre-construction and for the duration of the construction phase and regularly inspect and report on the operational aspects once in process.

The duties of the ECO or ER are as below:

- Responsible for the contents and implementation of the education programme for the personnel as nominated by the engineer.
- Ensure correct demarcation, management and protection of sensitive areas.
- The control of the rehabilitation procedure to be followed as required.
- Monitor all activities including conducting of tests, inspecting of works and examining any materials, plant or machinery to ensure that the relevant environmental conditions are adhered to.
- The ECO or ER is allowed access to the site and any of the works at any time.
- All instructions issued by the ECO or ER shall be directed through the engineer via a formal site instruction book or formal mechanism in place to deal with such matters.
- The ECO or ER will be accountable to the owner/landowner for compliance with EA and environmental legislation during the lifetime of the operation, inclusive of decommissioning.

2.3. Contractors

As part of any tender, the contractor must submit a first draft of a contractor's programme, which must include environmental considerations he is to follow.

The appointed contractor's representative will have the following responsibilities:

- Ensure that all staff is familiar with the EMP, which explains the environmental policy for the project.

- Allow for sufficient time between surveying the exact locations where services will be intended and actual construction, for the ECO or ER to facilitate removal of plants, seeds and cuttings if necessary.
- The contractor shall keep his personnel fully aware of environmental issues and ensure they show adequate consideration to all environmental aspects.
- Establish environmental signs to be erected on the construction site at locations identified by the ECO or ER and approved by the engineer.
- Be responsible for the cost of the restoration of any damage caused, in environmentally sensitive areas, as a result of contractor's negligence. This shall be done in accordance with the Engineer / ECO or ER's specifications.
- Take responsibility and active steps to avoid any increase in the fire hazard.
- The contractor shall take responsibility for implementing all the relevant provisions of the EMP, or if he encounters difficulties with the specifications, he must discuss alternative approaches with the ECO or ER and engineer prior to proceeding.
- Failure to comply with the EMP may result in the application of fines (as set out later), and any reported non-compliance may result in the suspension of work or termination of contract by the Engineer.

CHAPTER 3
APPLICABLE LEGISLATION, POLICY AND ENVIRONMENTAL PRINCIPLES

3.1. APPLICABLE LEGISLATION IDENTIFIED

A comprehensive legal register must be developed for the facility.

3.2. Published standards

SANS 1518: 2005

Transport of dangerous goods – Design requirements for road vehicles and portable tanks

SANS 10228:2006

The Identification and classification of dangerous goods for transport

SANS 10231:2006

Transport of dangerous goods - Operational requirements for road vehicles

SANS 10232-1: 2007

Transport of dangerous goods – Emergency information systems

Part 1: Emergency information system for road transport

SANS 10232-2:1997

Transportation of dangerous goods - Emergency information systems

Part 2: Emergency information system for rail transportation

SANS 10232-3: 2007

Transport of dangerous goods – Emergency information systems

Part 3: Emergency response guides

SANS 10232-4: 2007

Transport of dangerous goods - Emergency information systems

Part 4: Transport emergency card

SANS 10248: 2006

Management of chemical waste

SANS 10263-5, 2007

Warehousing of dangerous goods –

Part 5: Storage and handling of oxidizing substances

SANS 10206: 2005

Handling, storage and disposal of pesticides.

SANS 11014-1:1994

Safety data sheet for chemical products

Part 1: Content and order of sections

SANS 10265:1999

Classification and labelling of dangerous substances and preparation for sale and handling.

CHAPTER 4 COMPLIANCE, MONITORING AND AUDITING

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 EMP, is known as monitoring and auditing.

4.1. 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 or ER 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

Monitoring will take place on an on-going basis. Completed monitoring reports will be submitted to the landowner, the contractor, who will attend to issues, and the ER, who will perform audits at appointed intervals. These reports must be kept on record and be made available upon request by the land owner / custodian of the land and any environmental authority or Interested and Affected Party ("I&AP") requesting such.

All persons employed, the contractor or his sub-contractors must abide by the requirements of these performance specifications as they apply to the works. Any employees, the contractor or his sub-contractors found to be in breach of any of the environmental specifications may be ordered to leave the site forthwith or be subject to a disciplinary process. The order may be given orally or in writing by the ER. 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. 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 EA 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 EMP, contract and / or the specification

- There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment
- Has failed to meet with the requirements of the approved schedule.

The contractor and landowner will be informed via 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 instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance
- Non-compliance may lead to the forfeiting of the environmental authorization or being penalised. In more serious cases, the project engineer, ECO or ER may give notice, and then halt operation works until such a time that the upgrade is done and the site comply with the performance specifications
- In prolonged cases of persistent non-compliance, the contractor or staff may be evicted from site after disciplinary process is followed. Only the owner may issue such instruction, retaining any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

4.2. The Auditing Procedure

Environmental auditing is the process of comparing the impacts predicted with those which have actually occurred 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 achieved.

To these ends, the project and its environmental management system will be audit for effectiveness. The ISO/SANS 19011:2003 will be used.

4.3. 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 at the end of the contract), without creating the misimpression that adherence to the environmental specifications is optional (i.e. persistent non-compliance will not only result in the contractor forfeiting the retention amount, but he will also be fined).

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.

A system of penalties will be introduced to reinforce environmentally sensitive behaviour. The penalties that may be enforced are listed below. The figures shown are the maximum penalty that will be fined. The penalty will be determined by the severity of the offence.

Any defacing or cutting down trees, existing infrastructure, not specified to be removed	R5000 each
Litter resulting from operation	R250 / offence / day
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
Dumping of cement, concrete, fuel or oil in an area or other than that authorised and suitable	R10 000
Failure to use portable / toilets	R100 / observed incident or evidence of human excrement in the veld
Any actions contrary to the environmental policy which continue after an initial penalty	Termination of contract.

In addition to the above, all costs incurred by the client on behalf of the rehabilitation contractor 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.

CHAPTER 5 REGISTERS

5.1. Reporting and Record-Keeping

The owner will undertake “good housekeeping” practices during operation. 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 of construction and operational methods to include the care for and preservation of the environment within which the site is situated.

The ownership will ensure that an electronic filing system, identifying all documentation related to the EMP, 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 EMP
- 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
- EA
- Waste generated and safe disposal certificates
- All method statements from contractors for all phases of the project.

CHAPTER 6 REPORTING REQUIREMENTS

6.1. Responsibilities and Functions of the Environmental Control Officer (ECO)

The ECO or ER will be responsible for monitoring, reviewing and verifying compliance with the EMP and EA by the contractors and management.

The ECO or ER duties in this regard will include the following:

- monitor and verify that the EMP and EA is adhered to at all times and taking action if the specifications are not followed
- monitor and verify that environmental impacts are kept to a minimum
- review and approve construction method statements, with input as appropriate from the ER
- assist the contractor in finding environmentally responsible solutions to problems
- give a report back on the environmental issues at the site meetings and other meetings that may be called regarding environmental matters
- keep records of all activities / incidents concerning the environment on site in the site Diary
- inspect the site and surrounding areas regularly with regard to compliance with the EMP and EA
- keep a register of complaints in the site office and record and deal with any community comments or issues
- monitor the environmental awareness training for all new personnel coming onto site
- Advise management on the removal of person(s) and/or equipment not complying with the specifications, after collaboration advice and recommendations must be recorded in site instruction book
- recommend the issuing of fines for transgressions of site rules by management after collaboration with the ER
- ensure that activities on site comply with legislation of relevance to the environment
- recommend the issuing of penalties for contraventions of the EMP and EA
- keep a photographic record of progress on site from an environmental perspective, and
- Undertake a continual internal review of the EMP and EA and submit a report to the employer and the responsible environmental official at the end of the project.

The ECO or ER 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 EMP and EA together with corrective action taken and penalties issued. This information will be recorded in an appropriate manner by the ECO or ER in a site diary, registers, issues/ warning book, etc. In addition, the ECO or ER is to undertake weekly and monthly checks on site in order to ensure compliance with the EMP and EA.

6.2. Compliance with other Legislation

It is important that staff is aware of other legislation that may relate to the activities taking place on site.

CHAPTER 7 PUBLIC COMMUNICATION

The project owner or designated project manager will be responsible for regulating public access to information and compliance reporting. They alone will respond to third party or public queries and complaints. The project manager will also be responsible for maintaining the compliance register to record complaints received and actions taken.

CHAPTER 8 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION PHASE

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 owner and further subject to legislation as applicable in South Africa from time to time.

The contractor acknowledges that he is working in an environmentally sensitive area and agrees to conform to environmental controls specified from time to time. Strict adherence to these rules in all respects is required and expected at all times.

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

The ECO or ER appointment contract must:

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

8.1. Qualifications of Contractors

Contractors are appointed by the owner. Only solvent contractors with adequate experience and who can satisfy the owner of such prior experience will be appointed. The contractors must investigate and comply with all existing regulations and laws / byelaws, unless the relevant authority grants specific prior written authority waiving compliance with any legislation.

8.1.1 Responsibility of Contractors

Contractors are at all times responsible for sub-contractors, employees, guests, invitees and agents, as well as persons making deliveries to sites within the construction areas for the contractor, the constructor's camp, or along access routes thereto on the property. Any damage caused by any of the above persons or delivery vehicles will make the contractor liable for damage that may occur within the property. Any damages to the property including, but not limited to damaged kerbs, roads, street lights, distribution boxes, plants, irrigation, the environment and/ or damage to private property on the property caused by such persons or equipment is the responsibility of the contractor. In addition the contractor will be responsible for any damage caused to an extent to be determined by the owner.

Pre-conditions

A site meeting between the contractors and the representatives of the owner 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 required toilets and fire-fighting facilities to be 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
- Discuss and agree the demarcation and control of construction and building sites.

Minutes of this site meeting must be kept in the document control system, and are to be distributed to all parties.

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 owner or his representative(s). Any variation to the approved layout plan must be submitted to the owner 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 written permission has been obtained from the owner.

8.1.4. Method Statement

The contractor shall provide written intent statements, for discussion between the ECO or ER and contractor, and final approval by the property, 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 a methods statement should be included in this budget. Environmentally sensitive aspects of the contract include e.g. excavations, work close to sensitive areas, pipes, culverts crossing sensitive areas, removal of fill from sensitive areas, collection and storage of top soil and vegetation, erosion control, work in limestone deposits, etc. Some of the Method Statement ("MS") content required is listed below. It is important to note that the ECO or ER has the right to request further additions, should it become necessary.

MS must specify the fire drill procedure that will be followed in the event of a fire. MS must state how pollution from e.g. oil will be prevented from entering any environmental system. MS must indicate how the installation of services and roads through sensitive areas will be achieved in an environmentally sensitive manner. MS must indicate how silt in run-off will be prevented from entering the wetlands. MS must indicate the sequence of construction events into sensitive areas, to allow sufficient time for the ECO or ER and rehabilitation contractor to survey the areas and complete mitigation measures.

The Method Statement must include:

- A site plan
- Description of preparatory steps
- Materials available for combating pollution especially oils
- Supervision levels to be accorded such responsibilities.

8.1.5. Safety

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

8.1.6. 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. Diesel Fuel and Lubricant Handling Programme

Servicing of construction vehicles and machinery will also take place at the civil contractor's camp. All vehicles must be in a good condition with no leakages leading to possible contamination of soil or water supplies.

8.3. Services

Care and due cognisance must be taken of existing utilities services, service routes and services restrictions.

8.4. Roads

Only existing access routes on the property will be used during construction work, so as to control the movement of construction vehicles. The contractor shall ensure that access to construction sites and associated infrastructure and equipment, is designated off-limits to the public at all times during construction. Traffic safety measures shall be considered in determining entry or exit to public roads. Mud and sand deposited onto public roads by construction activities shall be cleared regularly. Appropriate traffic warning signs shall be maintained.

8.5. Dust and Noise Control

The contractor shall ensure that the dust level of 0.02 % of 1 / 50 of the occupational limit shall not be exceeded. The contractor is to take appropriate measures to minimise the generation of dust as a result of construction works, to the satisfaction of the owner. Vegetation must be stripped from demarcated construction sites only

shortly before commencing with the construction process. On sandy or very dusty sites, mulched indigenous vegetation, which is to be removed from the site and is suitable, can be used as a method of stabilisation and dust control. Seed bearing invasive vegetation must not be used for stabilization purposes. During high wind conditions, the contractor or his representative will evaluate the situation and make recommendations as to whether dust dumping measures are adequate, or whether to suspend work until wind speeds drop to an acceptable level.

8.6. Appropriate use of Machinery

The contractor shall at all times carefully consider what machinery is appropriate to the task to minimise the extent of environmental damage. No machinery is to operate outside of the demarcated working area. Operators of machinery must be suitably qualified. All machinery and heavy vehicles will be parked overnight at the defined contractor's camp.

8.7. Anti-erosion measures

The contractor shall take all appropriate and active measures to prevent erosion, especially wind and water erosion, resulting from operations and activities, inclusive of storm water control measures, to the satisfaction of the ECO/ER. During construction the contractor shall protect areas susceptible to wind and water erosion, by installing all the necessary temporary and permanent works. Measures can include brush packing, anchovy net stabilisation, etc. Runoff from the site will be reduced to not exceed pre-development runoff by using detention facilities in critical places. Where required erosion protection measures must be installed. Permanent water bodies must be lined with suitable material to ensure water integrity. Aspects normally covered in construction contracts in terms of protection of works are standard and are not to be confused with those under environmental legislation.

8.8. Lights

The contractor shall ensure that any lighting installed on the site for his activities or security purposes does not interfere with road traffic or cause a direct disturbance to residents, the surrounding community or other users of the area.

8.9. Eating, Washing and Resting Areas

The contractor must designate restricted places for personnel to eat, wash and rest, within the specified working areas. The contractor must provide adequate refuse bins with secure, wind and animal proof lids, in all these places. The feeding of, or leaving food for, animals is strictly prohibited. No persons will be permitted to live on site. Only property employed security personnel will be allowed to overnight on site.

The contractor shall insure that drinking water to SABS standard is available for all staff on site. The contractor is responsible for the provision of sufficient and suitably placed chemical toilets. Toilets shall be of a neat construction and shall be provided with doors and locks and shall be secure to prevent wind damage. Entrances to toilets must be adequately screened from public view. Sanitation facilities shall be located within 100m from any point of work, but not closer than 100m to any water body were possible. The contractor shall ensure that toilets are emptied at close of each working week. Waste must be disposed of at a registered waste disposal site. Sanitation provision and servicing shall be to the satisfaction of the owner.

8.10. Waste Disposal in terms of IWM

The contractor will be expected to keep his construction site neat and tidy and free of litter at all times. No on-site burying, burning or dumping of any waste materials, vegetation, litter or refuse shall be allowed. The contractor shall be responsible for the establishment of a refuse minimisation and control system in line with the IWM Policy of the Development. The contractor shall ensure that waste and surplus food, food packaging and organic waste are not disposed by any workers anywhere on the site except in removable refuse bins. Refuse bins shall be weather and animal proof with proper lids. Bins shall not be allowed to become overfull and shall be emptied on a frequent basis by the contractor. The contractor must transport refuse collected from the working areas on site at least once a week. Refuse is deemed to include all discarded construction materials such as wire, nails, tins, and cans, drums, piping, plastic straps, bricks, waste cement or concrete, cement bags, etc. Empty paper cement bags are similarly disposed if the waste recycling vendor is unable to collect. The contractor must make adequate provision for the removal of construction rubble and other excess material. No material or construction rubble may be spoiled on the property. Any solid waste that is not being recycled shall be disposed of at a landfill licensed facility. The contractor must keep a record of all waste generated and the safe disposal certificates of those waste generated.

8.11. Construction Material

Construction material will be stored at the contractor's camp, as well as on the construction site within the demarcated working areas at each construction point. Special permission may be obtained from the ECO/ER to store material on suitable substitute or ancillary locations should the need arise, and as communicated by the project engineer. Loads including, but not limited to sand, shell-grit, stone chip, fine vegetation and refuse, shall have appropriate cover to prevent them spilling from the vehicles during transport. All construction materials are to be prepared at the contractors camp or within the demarcated working area at each construction point. No construction material may be sourced from the property via quarrying or sand mining. Subsoil, calcrete and clay that become available on site during the construction may however be used as construction material on the property. Any imported material (e.g. sand, etc) should be free of plant seeds and be sourced from a registered mining area and declared to the ECO / ESO so that the source could be determined, inspected and approved. No paint products or containers may be disposed of on site. Oil based paints, chemicals additives and cleaners such as thinners and turpentine shall be strictly controlled and correctly disposed of.

8.12. Fires

No open fires will be allowed on site and adequate fire fighting equipment should be available on site in good working order at all times as prescribed by the Fire Management protocols.

8.13. Rehabilitation and Site Clean Up

Stabilisation and rehabilitation must take place immediately after construction operations have been completed. No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been re-vegetated.

The contractors must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during construction activities, are removed

once the project has been completed. The construction sites shall be cleared, and cleaned to the satisfaction of the owner.

8.14. Blasting or use of explosives.

Wherever blasting activities are required on the site the contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives (e.g. Explosives Act No. 15 of 2003). In addition, the contractor shall, prior to any drilling of holes in preparation for blasting, supply the engineer with a locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock.

The plan shall show each dwelling, structure and service within the zones of influence and record all details of the dwellings/ structures/ services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes, etc. The contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent areas, The submission of such a plan shall not in any way absolve the contractor from his responsibilities in this regard. The contractor shall also indicate to the engineer the manner in which he intends to advertise to the adjacent communities and road users the time and delays to be expected for each individual blast occurrence.

The plan further shall show how the contractor will handle and dispose of all excess explosive material. No burning or burying of excess explosives will be allowed and these explosives shall be disposed of in the prescribed manner and at a suitably licensed facility.

CHAPTER 9

ENVIRONMENTAL MANAGEMENT DURING OPERATIONAL PHASE

The management programme is the procedure to achieve its environmental policy and goals.

The management programme has been structured in table format in order to show the links between the over-arching goals and their associated objectives, actions, monitoring requirements and targets.

This programme consists of the following components:

Goals

Over-arching environmental goals for the operational phase.

Objectives

The objectives are in place in order to meet these goals. These take into account the findings from existing studies and monitoring programmes.

Management Actions

The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.

Monitoring

The key actions that are required to check if objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting.

Criteria/ Targets

The criteria or targets indicate the efficacy of the management programme. 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.

Goals

The following 6 are specific goals:

Goal 1: Roads Maintenance and Erosion Control Measures

Goal 2: Fire Management

Goal 3: Waste Management

Goal 4: Alien plant control and monitoring

Goal 5: Impact on surrounding Agricultural Activity Management

Goal 6: Visual Impact Management

Primary Management Objectives

The primary management objectives are:

- To manage and have sustained use of the natural systems within the context of the Region, so as to conserve the biodiversity, ecological quality and value of the surrounding natural environment, also on the farms. The facility intends to preserve the unique natural resources of the farm, such as wetland areas.

- To set guidelines in a management plan for correct management procedures and methods, in a manner such that they may be flexible in as much as situations change, and as new technology and methods become available. For this reason, the EMP is to be updated on a 5 year cycle to provide current dated guidance to managers, which is especially important for continuity during changes in management. The EMP will facilitate the manager's annual planning in terms of allocating human time and financial resources towards management tasks and responsibilities, which are then subject to independent audit.
- To maintain a finite standard and quality of finishing and service delivery at the facility. This requires ongoing maintenance of buildings, surrounds and infrastructure, and the repair of environmental damage caused by usage, via by example erosion or trampling of vegetation.

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.
- 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 wider area.

Management Programme

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

Goal 1: Maintenance of Roads and Erosion Control Measures

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
1] <i>Ensure allocation of sufficient resources) for ongoing erosion control management (e.g. staff, equipment, budget</i>	Erosion of or blocking of storm water systems Also degradation by consistent use of road and yard surfaces.	Areas disturbed during construction must be re-vegetated as soon as possible. Natural vegetated buffer areas in between solar panels must be maintained to reduce water runoff and to prevent erosion. All roads need to be maintained and monitored and visible signs of possible erosion immediately rehabilitated.	Six monthly initial and then annual independent audits of Operations vs EMP and identification of those requirements that are not met. Pre Fire Season Audits. Responsibility: Management	Adequate annual Budgets approved. On-going employment of ECO and maintenance staff	To be determined

The study site is located on a flat plain. North of the site the topography slopes gently (20m drop in 2km) towards the north. This landscape is typical of the broader region within which the study area is located and the pattern repeats itself up 30 km in any direction. The plains are situated at an elevation of 960m. The site is situated in a very arid part of South Africa. Several drainage lines north of the site drain the water collected on the bigger site towards the north, which eventually feeds into the upper catchment of the Graafwatersrivier, a non-perennial river north of the study area. Water runoff from panels will penetrate the soil and runoff will be reduced by the vegetation cover. Areas disturbed during construction must be re-vegetated as soon as possible. Natural vegetated buffer areas in between solar panels must be maintained to reduce water runoff and to prevent erosion. All roads need to be maintained and monitored and visible signs of possible erosion immediately rehabilitated. Erosion potential is low due to the nature of the soil being dominated by quaternary to recent sands and sandy soil of the Gordonia Formation (Kalahari Group) and Mbizane Formation (Permo-Carboniferous Dwyka Group, Karoo Supergroup) which is stony/rocky

Goal 2: Fire Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
1] <i>Ensure allocations of sufficient resources e.g. staff, equipment, Budget,) for Ongoing fire management</i>	Pollution, fire, property damage and health risks.	<ol style="list-style-type: none"> 1. Ensure sufficient Fire Fighting equipment present on site at all times 2. Yearly pre fire season clearing and maintenance of fire breaks to be maintained. 3. Yearly pre season testing and servicing of fire fighting equipment to be formally reported upon 	<p>Six monthly initial and then annual independent audits of Operations vs EMP and identification of those requirements that are not met. Pre Fire Season Audits.</p> <p>Responsibility: Management</p>	<p>Adequate annual Budgets approved. On-going employment of ECO and maintenance staff</p>	To be determined

Fire Management

Firebreaks

In terms of Section 12 and 14 every landowner must prepare and maintain a firebreak as determined in Section 13. Failure to do so is an offence in terms of section 25(3), unless exempted by the Minister in terms of Section 15.

Fire Fighting Preparedness

There is a further duty on landowners to have equipment, protective clothing and trained personnel available in the eventuality of fire on the property (section 17). Failure to meet this requirement is an offence in terms of section 25(4).

Actions to Fight Fires

Every landowner must do everything in his power to stop the spread of fire from his land onto that of any adjoining land (section 18(1) (b)). Failure to do so is an offence in terms of section 25(5).

Agreements for Mutual Assistance

Section 19 of the Act provides for agreements to be entered into to provide mutual assistance in fighting of fires. These agreements may provide for payment of compensation for the assistance rendered.

Regulations

The Minister may make regulations in terms of section 20 of the Act to deal with *inter alia*:

- any matter that may or must be prescribed in terms of the Act;
- model constitutions of Fire Protection Associations; and
- procedure relating to the registration of fire protection associations and the election of certain fire protection officers.

Regulations promulgated in Government Gazette No. 24870 dated 16 May 2003 regulate Fire Protection Associations.

Penalties

Section 24 of the Act makes provision for the imposition of a fine and/or imprisonment for offences committed in terms of section 25.

Presumption of Negligence

Should any person institute civil proceedings for loss suffered from a veld fire that a defendant caused, or started, or spread from land owned by the defendant, the defendant is **presumed to have been negligent** until the contrary is proven--- unless the defendant is a member of a fire protection association in the area where the fire occurred (section 34).

Thus if the operator is a member of a FPA the presumption of negligence does not arise and the **onus is then on the plaintiff** to prove the operator's negligence.

The plaintiff must prove that any act or omission to act by the defendant was wrongful. Mere negligence is however sufficient to constitute an offence in terms of section 25.

The responsibilities of people who own or control land

The landowner on whose land a fire may start, or from whose land it may spread across boundaries, must have in place:

- Have prepared firebreaks on own side of the farm boundary, if there is a reasonable risk of fire.
- Have available such equipment, protective clothing and trained personnel required to extinguishing such fire as may occur. As prescribed in the regulations. If no regulations are applicable, then only as reasonably required in the circumstances.

- Take all reasonable steps to notify the Fire Protection Officer (FPO) of the local FPA should a fire start.
- Do everything in their reasonable power to stop the spread of the fire.

The Act also requires that should the owner be absent, a known and identified other person responsible needs to be present on or near this land to:

- Extinguish a fire if one breaks out, or assist or instruct others to do so
- Take all reasonable steps to alert the neighbours and the FPO.
- The owner may appoint an agent to act on his or her behalf to perform these duties.

Recommended fire fighting requirements

Where members are required to provide fire-fighting resources as stipulated, the following requirements need be met at all times:

Maintain fire-fighting equipment in good condition, for inspection and testing weekly during the fire season.

Minimum fire fighting equipment for prescribed burns must comply with the conditions of each permit.

Minimum level requirements recommended for fire-fighting equipment:

- | | |
|---------------------------|----|
| • Fire beaters | 10 |
| • 15-liter rucksack pumps | 5 |
| • Drip torches | 1 |
| • Rake hoes | 10 |
| • First Aid kits | 1 |
| • Cell phone | 1 |

Minimum safety equipment and protective clothing recommended for any person involved in fire fighting:

- One 100% cotton overall
- A cotton T-shirt as undershirt
- One pair leather boots
- Helmet fitted with a heat shield visor, or a pair of large goggles.
- Suitable pair of gloves.

Guidelines Regarding Fire-Belts

Tracer belts for prescribed burn preparation of backfire defences, as well as brush-cut and hoed belts can be used as a management tool where such an aid is considered essential, or indeed deemed preferable to burnt fire belts, or to assist with the containment or spread of a potential fire. Consider terrain features such as roads, footpaths, *kloofs*, rivers or recently burnt areas for control lines as alternatives to hoed belts.

General construction guidelines

Tracer Belts (“Skoffel” Belts) prepared for prescribed burning should be to a minimum width of two and half times the height of the adjacent vegetation *including* further a brush cut shoulder of 1m. Hoed vegetation should be raked and dispersed deep into the area to be burnt –if piled too closed to the tracer’s edge it poses a fire hazard and suppresses vegetation growth if stacked too densely. Where possible avoid steep gradients and the routing of tracer belts perpendicular to steep slopes to prevent soil erosion. Existing cut fire belts on the boundary should be bush cut once a year before the start of the fire season, probably in October month. Special attention to be given to these areas in regards to

erosion, especially wind erosion. Other patrol roads will also serve as firebreaks and be maintained as such.

Brush-Cut and Hoed Belts are wider than tracer belts (5-10m and wider), and are maintained on a regular basis, and should only be routed over less steep terrain to avoid soil erosion. Preferably, a narrower tracer belt to be constructed as an "ignition line" and the greater remain brush cut to reduce the fuel load. Pre-determined fire belts will to be in place before a prescribed burn takes place. A tractor with a bush cutter is to be used for this purpose.

It is important that only the above ground portion of any vegetation is hoed-off, ensuring that the roots of re-sprouting plants can continue to bind the soil and to prevent erosion. No chemical vegetation suppressants to be used in the preparation and maintenance of tracer/hoed belts.

Requirement for firebreaks

The Act does not specify requirements for firebreaks. This is because requirements vary from one situation to the next. Local practice and local issues must determine what these reasonable requirements are. The Act states that the owner must pay attention to weather, climate, terrain and vegetation in deciding on how to prepare the break.

The break must:

- Be wide enough and long enough to have a reasonable chance of stopping runaway fires not be a cause of soil erosion
- Be reasonably free of inflammable material

The Fire Management Audit:

Fire Season Preparedness Audit

Purpose	To measure the state of preparedness as exists to meet the fire challenges of any upcoming fire occurrence/season.
Aspects measured	Baseline data ✓ Documentation available ✓ Administrative tools ✓ Fire fighting equipment ✓ Management equipment ✓ Vehicles ✓ Manpower availability and training levels ✓ Protective equipment ✓ Other personnel equipment ✓ Fire warning ✓ Contact details ✓ Preparedness procedures

Form: - Checklist

Frequency: - Annually

Due date: - 30 September of each year

The focus of this audit is the identification and correction of any shortfalls regarding fire preparedness prior to the fire season.

Self-Assessment

These self-assessment checklists are tools to assist a manager in the planning process, and to ensure compliance with the Fire Management Policy and other legislation.

Goal 3: Waste Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p>1] <i>Ensure allocations of sufficient resources e.g. staff, equipment, Budget,) for Ongoing fire management</i></p>	<p>Pollution, fire, property damage and health risks.</p>	<p>The applicant must ensure that all waste generated during the construction process be removed by a reputable contractor from the construction site and disposed of at an approved landfill facility.</p>	<p>Yearly independent audits of Operations vs EMP and identification of those requirements that are not met. Pre Fire Season Audits. Responsibility: Municipality</p>	<p>Adequate annual Budgets approved. On-going employment of maintenance staff</p>	<p>To be determined</p>

Goal 4: Alien plant control and monitoring

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p>1] Ensure allocations of sufficient resources e.g. staff, equipment, Budget,) for On-going alien plant management</p>	<p>Ecology degradation</p>	<p>The following measures will assist in reducing the potential for the introduction of alien species into new areas and will help to prevent infestation of these areas should the introductions occur: Materials such as sand and stone should, wherever possible, be sourced from areas which are free of alien plants. Wherever possible rehabilitation of disturbed area should be done with seeds collected in the area requiring rehabilitation. An important aspect of ongoing maintenance is the monitoring of the rehabilitated sites and access road verges for alien plant species. Should alien species be identified then these should immediately be removed</p>	<p>Six monthly initial and then annual independent audits of Operations vs EMP and identification of those requirements that are not met. Pre Fire Season Audits. Responsibility: Management</p>	<p>Adequate annual Budgets approved. On-going employment of ECO and maintenance staff</p>	<p>To be determined</p>

The alien plants recorded on site include *Prosopis sp*, *Opuntia sp* and *Agave rigida var. sisalana*. The *Prosopis sp* is mostly restricted to the drainage lines. The *Opuntia sp* and *Agave rigida var. sisalana* are restricted to the disturbed areas next to the farmyard. Environmental gradients (e.g. upland-lowland), biome boundaries, soil interfaces or sand movement corridors on the site or in its vicinity are not present on site. The ecology of the area is not a fire driven system, e.g. fire is not require to maintain ecological functioning.

Goal 5: Impact on Surrounding Agricultural Activity Management.

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<i>1] Ensure allocations of sufficient resources e.g. staff, equipment, Budget,) for ongoing management</i>	Negative impacts on surrounding agricultural activities	Demarcate all areas where no impacts will be allowed, clearly marking these areas with high visibility signs, inform all contractors and construction workers to refrain from entering / affecting these areas The camp fences must be realigned to exclude the PV facility from the surrounding agricultural activities.	Six monthly initial and then annual independent audits of Operations vs EMP and identification of those requirements that are not met. Pre Fire Season Audits. Responsibility: Management	Adequate annual Budgets approved. On-going employment of ECO and maintenance staff	To be determined

The agricultural sector in the area is the main economic sector with the largest potential for economic growth. The area is also ideal for small stock farming and the area around Kenhardt is known as the capital of Dorper sheep farming. The area has a carrying capacity to the order of 1 small stock unit per 6ha. The proposed facility site is situated in the south western corner of the cadastre and camp. The camp fence will have to be realigned.

Goal 6: Visual Impacts.

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
<p><i>1] Ensure allocations of sufficient resources e.g. staff, equipment, Budget,) for ongoing management</i></p>	<p>Negative impacts on surrounding visual landscape and sense of place</p>	<p>Refer to below text</p>	<p>Six monthly initial and then annual independent audits of Operations vs EMP and identification of those requirements that are not met. Pre Fire Season Audits. Responsibility: Management</p>	<p>Adequate annual Budgets approved. On-going employment of ECO and maintenance staff</p>	<p>To be determined</p>

These general principles inform the mitigation measures in the sections below, but have also been included to cover any unforeseen situations over the life of the facility which cannot be known at present but may have visual implications at a later stage in the life of the facility.

- The visual impact must always be taken into account when contemplating any activities or development on the site. Concern for visual issues must become part of the overall ethos of managing the site over the long-term.
- All development and activities on site must seek to mimic the agricultural aesthetic of the local environment. (See for example mitigation measures for fencing below.)
- The treatment of any visual issues must be seen as being long-term so as to avoid incremental visual degradation of the site over time.
- The ability to leave the site as close to its present state as possible should the facility be decommissioned must form part of all planning, construction and operational criteria.

Design Phase

- A photographic record of the site and its immediate surrounding area must be kept as part of the EMP to serve as a baseline for measurement of all future visual impacts and as an aid to the full rehabilitation of the site should the facility be decommissioned in future.
- The architectural character of the housing, maintenance, storage and management structures as represented in the architectural images is seen as being only moderately appropriate. This facility, with its visitor's component, will be seen by many as a symbol of South Africa, and Africa's attempts to come to terms with the challenges associated with global warming. The architectural style should therefore more appropriately reflect an African aesthetic rather than the generic adobe aesthetic of the present designs. To this end it is suggested that the style of the buildings reflect the aesthetic of the North and West African mud buildings. This would entail only relatively minor changes to the existing plans but would be an important visual cue to our African heritage.
- All structures are to be kept as low as possible in the landscape.
- All colours and finishes used should be specifically chosen for their ability to blend into the surrounding landscape.
- Excavation on the site is to be kept to the absolute minimum required for the successful implementation of the project.
- The fencing design is to imitate the agricultural fencing in the area while at the same time providing the security that is necessary. It is to be visually permeable. No barbed wire is to be used with preference being given to a visually acceptable electronic means of security which has a lower visual impact.
- Any necessary lighting must be shielded in such a way that no direct light is allowed to escape into the surrounding terrain or up into the sky. Only the areas that are necessary to be lit must be lit with the surrounding terrain being protected from any light pollution. (See Addendum 2 for the general principles involved.)

Operational Phase

- Littering is to be strictly controlled over the entire life of the project.
- All waste is to be regularly removed from facility to a recognized dumping site. Waste, in any form, should not be allowed to collect on the site.
- The use of any cleaning materials or defoliants to aid in the control of vegetation is to be strictly monitored so that their long-term use does not cause future problems should the site be decommissioned.
- The use of lighting is to be monitored over the entire life of the project so as to minimise light pollution.
- A strict fire prevention policy must be implemented and monitored.

Decommissioning Phase EMP

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 of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased.

Examples of potential residual impacts and risks include contamination of soil and groundwater, stock that has been abandoned (e.g. oil drums, scrap equipment, old chemicals) and old (unserviceable) structures. The decommissioning phase EMP provides specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project. The decommissioning phase EMPs are typically encountered within extractive industries such as minerals mining and oil and gas exploration and extraction.

Closure and decommissioning impacts are likely to be similar to the construction phase impacts. The management actions and control under the Construction Phase EMP need to be implemented to mitigate the negative impacts on the environment and to restore the property to its natural state. It is highly unlikely that the development will be decommissioned and closed in the foreseeable future.

A decommissioning phase is where a structure is removed or otherwise modified to make it incapable for re use for the original design purpose. Bear in mind that this is a housing development. Houses will always be required and the natural veld not developed will remain private open space, which makes the impact decommissioning most improbable.

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:

- Management Principles
 - Develop monitoring procedures in accordance with standard protocols and the requirements of the Environmental legislation.
 - Undertake environmental monitoring during the decommission phase as shown below.
 - 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.
 - Send all samples to a SABS registered laboratory for analysis.

Environmental monitoring during the decommission phase will include:

- Groundwater Quality and Quantity
- Surface Water Surface Water Quality
- Terrestrial Flora Rehabilitation monitoring

Updating/adapting of the EMP

Although care has been taken to address all known relevant environmental issues for the development, it will become necessary to add or amend certain procedures or instructions to improve the efficiency of the EMP. Only those additions to, or amendments of, this EMP that will either improve environmental protection or can be proven not to have any negative effects would be considered by the owner.

REFERENCES

City of Cape Town (2002) Environmental Management Programme (Version 5) for Civil Engineering Construction Activities.

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Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Specifications: Construction Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.