

**PROPOSED 10 MW INNOWIND SOLAR ENERGY FACILITY, PEDDIE,  
EASTERN CAPE PROVINCE OF SOUTH AFRICA**

**ENVIRONMENTAL MANAGEMENT PROGRAMME**

**Prepared for:**



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## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>5</b>
1.2	Background .....	6
1.3	Aim of this Document .....	6
1.5	Status of this document .....	7
1.6	Function of the Environmental Management Programme .....	7
1.7	Summary Of Project Details .....	7
1.8	Timescale FOR CONSTRUCTION, OPERATION AND DECOMMISSIONING .....	9
<b>2</b>	<b>COMMUNICATION/REPORTING PROCEDURES.....</b>	<b>10</b>
<b>3</b>	<b>ENVIRONMENTAL SENSITIVITY AND MITIGATORY MEASURES.....</b>	<b>12</b>
<b>4</b>	<b>PENALTIES AND FINES.....</b>	<b>16</b>
4.1.	MEASUREMENT AND PAYMENT .....	17
<b>5</b>	<b>POST CONSTRUCTION.....</b>	<b>18</b>
5.1	POST-CONSTRUCTION ENVIRONMENTAL AUDIT .....	18
5.2	MANAGEMENT REVIEW AND REVISION OF THE EMPr .....	18
5.3	GENERAL REVIEW OF EMPr .....	18

## LIST OF FIGURES

Figure 1-1:	InnoWind South Africa. Solar Facility Locality Map .....	6
Figure 1-2:	Diagram of the PV array for the proposed development.....	8
Figure 1-3:	An example of the “look” of the proposed PV arrays. ....	8

## LIST OF TABLES

APPENDIX 1:	General site map layout.....	4
APPENDIX 2:	Responsibilities & Authority.....	4
Table 3.1:	Mitigation measures to be implemented as proposed by the various specialist consultants.....	<b>Error!</b>

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<b>APPENDIX 1:</b>	<b>General site map layout</b>
<b>APPENDIX 2:</b>	<b>Responsibilities &amp; Authority</b>
<b>APPENDIX 3:</b>	<b>Pro-Forma: Protection of the Environment</b>
<b>APPENDIX 4:</b>	<b>Environmental Awareness Course</b>

## 1. INTRODUCTION

This Environmental Management Programme (EMPr) has been prepared as part of the basic assessment process to provide specific environmental guidance for the construction, operational and decommissioning phase of the proposed solar energy facility in Peddie.

The competent authority, being the Department of Environmental Affairs (DEA), requires that an environmental management programme (EMPr) be submitted in accordance with Regulation 33 of the regulations published in Government Notice No. R. 543 of 18 June 2010, which should be read with Section 24 N of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended.

According to GN R 543, an EMPr must contain the following:

### **33. A draft environmental management programme must comply with section 24N of the Act and include:**

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

Coastal & Environmental Services (CES) have been appointed by InnoWind South Africa as Environmental Assessment Practitioner (EAP) to conduct the EIA.

## 1.2 BACKGROUND

InnoWind South Africa proposes to develop a solar energy facility with a capacity to produce 10 MW of electricity on 19ha of land in Peddie in the Eastern Cape Province (see Figure 1). The site is located on land zoned for Agricultural purposes and falls under the jurisdiction of Ngqushwa Local Municipality. The development is anticipated to take up an area of approximately 19 ha of installed PV panels.

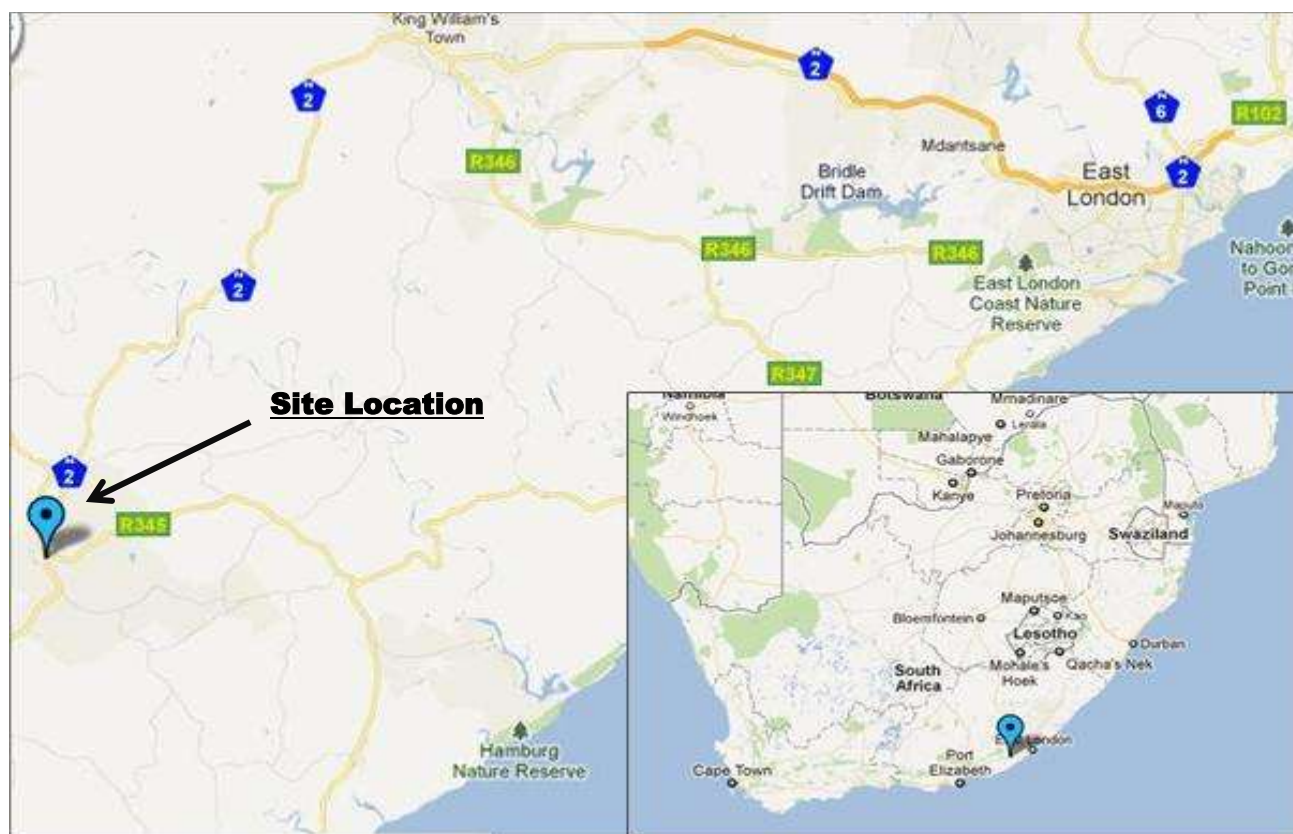


Figure 1-1: InnoWind South Africa Solar Facility Locality Map

## 1.3 AIM OF THIS DOCUMENT

An Environmental Management Programme (EMPr) can be defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced”. The purpose of this EMPr is therefore to ensure that the aforementioned impacts of the project on the environment are kept to a minimum. This includes ensuring that the mitigation measures described in the Specialists Reports and the Basic Assessment Report (BAR) are implemented, to ensure continued monitoring of the construction and operational phases.

The broad objectives of the EMPr are to ensure that:

- All environmental safeguards are carried out correctly
- Site activities are well-managed
- Adverse impacts on the environment are minimised
- The biodiversity of the site is conserved or enhanced
- All relevant legislation is complied with, and
- The project is monitored for environmental impact.

## **1.5 STATUS OF THIS DOCUMENT**

This Environmental Management Programme forms part of the Contract Document. As such, the acceptance of this draft EMPr by the Department of Environmental Affairs will confer a legal obligation on the developer to comply with the specifications stated herein. This EMPr includes all relevant documentation contained or referred to within it, along with any amendments or annexures to this document. Any substantial changes, updates or upgrades to this EMPr must be brought to the attention of the client/client's representative and Environmental Control Officer (ECO) and must be communicated to DEA.

## **1.6 FUNCTION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME**

The Environmental Management Programme (EMPr) has been devised as a tool to be used to minimise the impacts of the proposed development on the immediate and surrounding environment, both during and after construction. Potential impacts or "nuisance effects" during construction may include such aspects as noise, dust, pollution, litter, traffic and safety and impacts on flora and fauna. Potential impacts during the operation phase of the project may include noise, visual impacts and also impacts on flora and fauna from maintenance activities.

A number of specific management recommendations have been made in this document; however these should be used as a guide only. It should be noted that other types of impacts are possible and that these should be identified during the activities on site. Additional mitigatory systems and procedures may be required, and these should be included on an ad hoc basis to improve this overall document.

It is recommended that a copy of the Authorisation document from the Department of Environmental Affairs (DEA), and the EMPr be included in the contract document during tender negotiations for the project implementation. The contents of this documentation should be made known to all parties involved at the site and a copy of the EMPr should be available on site at all times. The implementation of mitigation measures identified in this document will be the responsibility of the Contactor and who will be managed by the Engineer in consultation with the ECO (see appendix 2 for responsibilities).

The general guidelines for executing this EMPr include that:

- Responsibilities for the environmental performance of the proposed development are known by the construction staff,
- Communications channels to report on environmental performance, problems and priorities are in place,
- A monitoring schedule is established to identify potential negative environmental impacts associated with the construction and operation of the proposed construction;
- Method Statements (mitigation measures) are implemented to avoid or minimise the identified negative environmental impacts (e.g. consider rehabilitation of eroded areas; bush clearings; complaints from property owners) as well as to enhance the positive impact on the environment (e.g. employment; support of conservation efforts) and,
- Monitoring programme or schedule is developed to track the plans that have been implemented so as to ensure the effectiveness of the plan.

## **1.7 SUMMARY OF PROJECT DETAILS**

The proposed development in Peddie will be built in a single phase which can take up to six months. The power generation facility will be made up of photovoltaic modules laid out in rows, in an array. Each array will be raised above the ground and fixed to frames to slope at an angle to the horizontal. Each of the arrays will be placed in a series with a gap of about 5m between each row.

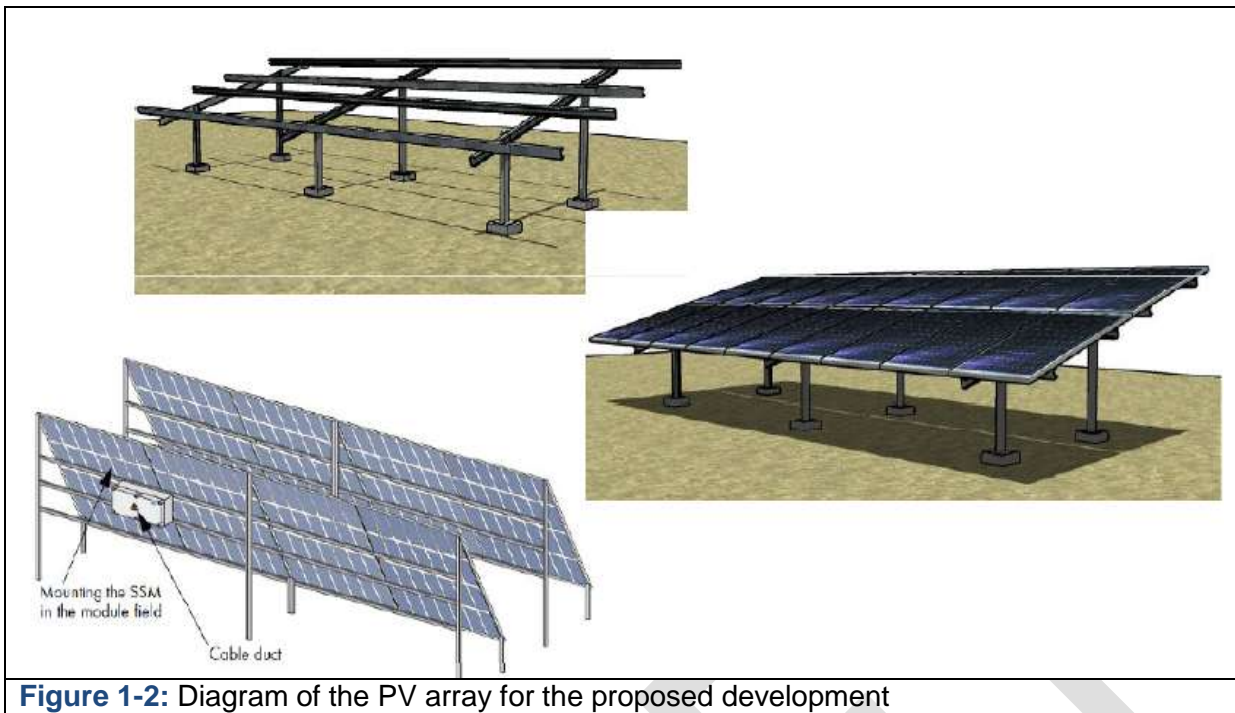


Figure 1-3: An example of the “look” of the proposed PV arrays.

It is expected that connection of power onto the Ngqushwa Local Municipality electricity grid will be done via a NLM Substation, which lies near to the site.

Underground transmission lines will be used to connect power from the substation onto the municipal grid system for distribution to the end users/consumers on the existing power lines.



### **1.8 TIMESCALE FOR CONSTRUCTION, OPERATION AND DECOMMISSIONING**

The proposed works has been assessed to have an approximate construction period of 6 months, of which 1 month will consist of laying the foundation and mounting frames, and the remainder of the time will be spent connecting the PV panels to the mounting brackets and completing the connection to the Buffalo City electrical grid. This is on the assumption that the works will be undertaken in a single construction phase.

The proposed solar energy facility is expected to have an operational lifespan of 30 – 40 years during which it will require frequent maintenance and cleaning of the PV panels.

The decommissioning of the solar energy facility is expected to last not more than 3 months. This process will also include rehabilitation of the decommissioned site.

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## 2 COMMUNICATION/REPORTING PROCEDURES

- 2.1 An Environmental Control Officer (ECO) - will be appointed and remunerated by the developer prior to commencement of operations to ensure that the EMPr is being adhered to. Should modifications to this document be required these should be agreed to by all parties concerned, namely the engineer, the contractor and the ECO.
- 2.2 ECO Visits - the ECO should visit the site at least twice per week for the first twelve weeks and thereafter once per week until the end of the construction period. Depending on the performance of the contractor, the frequency of the site visits may be altered. If required, the Engineer may introduce some form of penalty system in the incidence that compliance with the EMPr proves problematic.
- 2.3 The duties of the ECO - are listed in Appendix 2. The Engineer (the term Engineer in this case will be used to refer to either a Project Engineer or Project Manager or Client Representative) must be recognised as the senior authority on site and all communications and instructions between the ECO and the contractor should occur via the engineer.
- 2.4 Problematic Issues – should problematic issues arise, the ECO has the authority to call a special meeting with the Engineer, and if necessary work can be stopped.
- 2.5 Environmental register - an environmental register (can be recorded in the site instruction book) should be kept on site in which incidents related to actual impacts are recorded. This may include information related to such aspects as mismanaged rescue programme for extant vegetation on the site, dust generation and complaints from adjacent neighbours. It should also contain information relating to action taken. Any party on site may complete the register, however, it is envisaged that the Engineer, the contractor and the ECO will be the main contributors, and who will also be the main parties involved in mitigatory action.
- 2.6 Method Statements – these will be required for activities which may result in significant impacts/nuisance effects. The Contractor shall provide Method Statements for approval by the ECO and the Engineer prior to work commencing on aspects of the project deemed or identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the EMPr, when called upon to do so by the Engineer or ECO.

Method statements are written submissions for mitigating environmental impacts by the Contractor in response to requirements of this EMPr or to a request by the ECO. This is submitted to the ECO and Engineer and, where practical and deemed necessary, should be endorsed as being acceptable by the environmental representative of the Relevant Authority.

Method statements must be submitted at least five (5) days prior to the date on which approval is required (start of the activity). Failure to submit a method statement may result in suspension of the activity concerned until such time the method statement has been submitted and approved.

An approved method statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract. However, any damage caused to the environment through activities undertaken without an approved method statement shall be rehabilitated at the contractor's cost.

The method statements shall cover relevant details with regard to:

- Construction procedures and location of the construction site.
- Start date and duration of the procedure.
- Materials, equipment and labour to be used.

- How materials, equipment and labour would be moved to and from the site as well as on site during construction.
- Storage, removal and subsequent handling of all materials, excess materials and waste materials of the procedure.
- Emergency procedures in case of any reasonably potential accident / incident which could occur during the procedure.
- Compliance / non-compliance with the EMPr Specification and motivation if non-compliant.

2.7 Environmental Education Programme – The Contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EMPr.

As a minimum, training should include:

- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the specifics of this EMPr and its specification (no-go areas, etc.)
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.

The contractor's general staff members on site are to attend an initial presentation of approximately one hour. Approximately half an hour a month thereafter for the duration of the contract shall be allowed for employees to attend any follow-up lectures, should such follow-up lectures be deemed necessary by the ECO. In addition, all new staff and sub-contractor's employees that spend more than one day a week or four days in a month on site are to attend the environmental education program within 1 (one) week of commencement of work. The Contractor shall supply the ECO with a monthly report indicating the number of employees that will be present on site during the following month and any changes in this number that may occur during the month.

No more than 20 people shall attend each course and the cost, venue and logistics for this / these course(s) shall be the Contractor's responsibility. In addition the cost of environmental signage the ECO may require to be erected in the main contractor's construction camp and any handouts given to site staff during initial environmental awareness training presentations will be the responsibility of the contractor. The ECO shall keep a register of all personnel attending the Environmental Education Program.

The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

### 3 ENVIRONMENTAL SENSITIVITY AND MITIGATORY MEASURES

A variety of potential impacts are associated with the construction activities for this project. These impacts can be categorised as general construction related impacts as well as construction impacts specifically related to this site. General best practice rules to construction should be followed at all times. In addition to this the specific mitigation measures and recommendations as highlighted by the various specialists for this specific site is highlighted in [Table 3.1](#) below.

**Table 3.1:** Mitigation measures to be implemented as proposed by the various specialist consultants

IMPACT	MITIGATION
<b>Ecology</b>	<p>Identified species of special concern should be transplanted into an onsite nursery which will be used for replanting post-construction.</p> <p>During site preparation and construction, an Environmental Control Officer with botanical knowledge, must be present to recover and transplant all bulbs, and collect all seeds for reseeded the site post-construction.</p>
<b>Heritage</b>	<p>It is possible that heritage resources could be uncovered during the construction phase. Monitoring for heritage resources must take place and should any significant heritage/ archaeological/ palaeontological resources be exposed or uncovered during excavations and earthworks for the proposed project, these should immediately be reported to the South African Heritage Resources Agency. Burial remains should not be disturbed or removed until inspected by the archaeologist.</p> <p>A desktop heritage study indicated that no known archaeological sites exist in the study area. Although there are ruins present in the study area, the initial desktop assessment did not raise any red flags. Identified heritage resources will be verified through a field survey prior to construction works and before any further recommendations are made.</p>

#### 3.1 DESIGN AND PLANNING PHASE

##### Compliance

- The planning and design of the PV must comply with all relevant legislation and policies, e.g.:
  - o Local and District Spatial Development Frameworks
  - o Eastern Cape Biodiversity Conservation Plan (ECBCP)
  - o NLM Environmental Management Plan
  - o NLM By-laws pertaining to waste management, etc.
- In addition, planning for the construction and operation of the proposed solar energy facility should take into account and consider any available best practice guidelines. See Appendix J for solar assessment.

##### Water courses

- There must be no development within 32m of any watercourse.

##### Internal roads

- Internal roads must as far as possible, comprise strip roads to maintain ecosystem integrity as much as possible. Strip roads should not be tarred and should make appropriate use of permeable concrete blocks.
- The number of strip roads must be limited on site to minimise the overall internal road footprint.

##### Visual intrusion

- The PV facility must be designed to minimise visual intrusion.
- PV panels must be non-reflective

#### Storm water management

- A Storm Water Management Plan must be developed and implemented. The plan should also include management mitigation measures for water pollution, waste water management and the management of surface erosion e.g. by considering the applicability of contouring, etc.

#### Sanitation

- Toilet facilities and other building infrastructure should be located close to existing bulk service infrastructure such as water sewage pipes and storm water drainage pipes.

#### Waste management

- All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.
- The developer must designate appropriate areas for the storage of hazardous substances.
- A waste management plan must be developed and implement for handling on site waste.
- An appropriate area must be designated where waste can be stored before disposal.

#### Traffic control

- Project planning should include a plan for traffic control that will be implemented, especially during the construction phase of the development.

#### Transmission lines

- Planning and design of the transmission lines should consider best management practices and relevant standards, including possible use of underground cables to link the PV facility to the NLM substation thereby avoiding the need for constructing overhead transmission lines.

#### Noise

- Measures should be put in place to mitigate the impacts of noise during the operational phase of the project (e.g. Consider housing the equipment in enclosed structures).

### 3.2 CONSTRUCTION PHASE

#### Environmental Control Office

- An ECO must be appointed for the duration of the Construction Phase

#### Dust control

- Fugitive/nuisance dust must be reduced by implementing the following:
  - o Damping down of un-surfaced and un-vegetated areas;
  - o Retention of vegetation where possible;
- Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor.

#### Site preparation

- An ECO must assist in sighting of structures and supervise any vegetation clearing (although this is not anticipated) for the construction camp.
- The construction camp must be fenced to avoid sprawl.
- There must be no unnecessary disturbance of natural vegetation
- Vegetation clearing must be restricted to the identified sites for the construction camp, cement mixing circle, ancillary infrastructure lay down areas, underground power cable route, control cabin and other activities on site that have been identified as necessary for development of the project.
- Where unavoidable, all disturbed areas must be rehabilitated.
- A worker environmental education program must be implemented.
- Construction vehicles and machinery must only access the site using the existing tarred roads that lie on the eastern and southern boundaries of the site to minimise disturbance on the receiving environment.

- Alien plants must be removed from the site through appropriate methods e.g. hand pulling, chemical, cutting etc. under supervision from the ECO.
- Disturbed areas must be rehabilitated.
- There must be no burning of construction waste or debris onsite.
- Should substantial archaeological and paleontological remains be exposed during construction, the ECO must alert SAHRA so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional archaeologist and/or palaeontologist.
- Machinery that causes noise must only be operated at appropriate times (during the day and at normal working hours).
- An environmental management programme incorporating waste management issues during the construction phase of the project must be developed and implemented.
- All excess waste must be disposed of at an appropriately licensed landfill site.
- All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.
- No storage of fuels and hazardous materials must be permitted near sensitive water resources.
- All hazardous substances (e.g. diesel, oil drums etc.) must be stored in a bunded area.
- Adequate storm water control measures must be implemented during construction.
- Littering must be avoided and litter bins must be made available at various strategic points on site.
- Refuse from the construction site must be collected on a regular basis and deposited at an appropriate landfill.
- There must be no earthworks are to occur within 32 m of the drainage line so as to avoid contamination of water sources.
- The recommendations of the storm water management plan must be implemented to avoid soil erosion and siltation of drainage line.

### 3.3 OPERATIONAL PHASE

- Night lighting impacts must be reduced by using shaded lighting and using lights at low levels.
- The architecture of the control room building should complement the surrounding environment.
- Replacement panels must be non-reflective.
- Access within the site must be restricted to the tracks established during the construction phase.
- All hazardous substances must be stored in appropriately bunded locations.
- Panel washing activities must be limited to daytime and within normal working hours.
- Lower noise emission levels from inverters and transformers must be achieved by housing them in enclosed structures.
- Vegetation must be maintained where possible to avoid soil erosion.
- Damaged and used PV cells must be characterised and disposed of at hazardous waste sites as necessary.
- A waste management plan incorporating recycling and waste minimization must be developed and implemented.
- A worker education plan for environmental and waste management matters must be developed and implemented.

### 3.4 DECOMMISSIONING PHASE

- Deconstruction vehicles and machinery must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.
- An alien management plan for the decommissioned site must be developed.
- Machinery that causes noise must only to be operated at appropriate times (during the day and at normal working hours)
- There must be no unnecessary disturbance of vegetation.
- After the removal of all PV-related structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion.
- There must be continued monitoring of the rehabilitation after site decommissioning

- All excess waste must be disposed of in the licensed landfill site.
- There must be no burying or burning of construction waste or debris onsite
- All hazardous waste must be classified and disposed of at an appropriate landfill site.

### **Compliance and monitoring**

Monitoring should include visual checks by the ECO on at regular intervals, checks on particular requirements for site activities by the ECO, as well as a review of site documentation.

The ECO shall complete the performance record at the end of each monitoring visit as well as a record of transgressions or problems experienced on site, and how they were dealt with.

### **Documentation and record keeping**

A document handling system must be established to ensure accurate updating of the EMPr, and availability of all documents required for the effective functioning of the EMPr. The document handling system must be developed by the Developer and agreed upon by all key parties. Responsibilities must be assigned to relevant personnel for ensuring that the EMPr documentation system is maintained and that document control is ensured through access by and distribution to identified personnel.

The requirements in terms of training and environmental awareness for all maintenance staff and other project personnel should be specified to ensure that the actions specified in the EMPr are implemented effectively and efficiently. The document handling and control system that is to be followed for all EMPr documentation should be stipulated.

Supplementary EMPr documentation could include:

- Emergency preparedness and response procedures;
- Incident reports;
- Training records;
- Inspection reports;
- Monitoring reports;
- Auditing reports; and
- Complaints received.

Records must be kept of the following:

- Routine implementation and maintenance schedules, budgets and costs
- Monitoring Reports
- Complaints received and responses made
- Training requirements
- Minutes of meetings
- Audit reports and reviews of the EMPr

Minutes of meetings held on site must reflect environmental queries, complaints, actions agreed upon, dates of eventual compliance and must form part of the official environmental site record.

In addition to the summary report, the ECO shall keep a monthly photographic record of issues on site and an ad hoc record of incidents or events on site, especially in the case of transgressions from EMPr specifications.

## 4 PENALTIES AND FINES

Where the Contractor inflicts damage upon the environment or fails to comply with any of the environmental specifications contained within this EMPr, he/she shall be liable to pay a penalty for breach of the conditions of the environmental specifications which form part of the works contract. Where environmental damage is caused by a pollution incident, the developer and/or contractor shall also be liable.

The Contractor is deemed NOT to have complied with this Specification if: within the boundaries of the site, site extensions and haul / access roads there is evidence of the following contraventions;

- environmental damage ensues due to negligence;
- the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time;
- the Contractor fails to respond adequately to complaints from the public;
- during the construction phase, construction activities take place outside the defined boundaries of the site.

It is recommended that light penalties be instituted by the Engineer for the following offences (including any others determined during the course of work) which may be deemed to be less serious violations:

- Littering on site.
- Lighting of illegal fires on site.
- Persistent or un-repaired fuel and oil leaks.
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "no-go" areas.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on site.
- Any vehicles being driven in excess of designated speed limits.
- Removal and/or damage to fauna, flora or cultural or heritage objects on site.
- Urination and defecation anywhere except at designated facilities.

The following violations, and any others determined during the course of work, should also be penalised where applicable:

- Hazardous chemical/oil spill and/or dumping in non-approved sites.
- Damage to sensitive environments.
- Damage to cultural and historical sites.
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas.
- Uncontrolled/unmanaged erosion.
- Unauthorised blasting activities (if applicable).
- Pollution of water sources.
- Unnecessary removal or damage to trees.

Penalties shall be issued per incident and per individual for the Contractor's responsibility at the discretion of the Engineer in consultation with the ECO. The amount of the penalty shall be determined by the Engineer, in consultation with the ECO. The Engineer shall inform the Contractor of the contravention and the amount of the penalty, and will deduct the amount from monies due under the Contract. Payment of any penalties in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

Penalties shall be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications. Penalties shall also be confirmed by the Engineer prior to construction works and imposed by the Engineer on the Contractor for contraventions of the environmental specifications by individuals or operators employed by the Contractor and/or his



sub-contractors. Where there are ranges, the amount shall depend on the severity and extent of the damage done to the environment:

All monies collected through penalties shall be held by the Developer and be accounted for. A summary page is to be included with the monthly payment certificates as a record of penalties issued to date. A portion of these funds may be used for token monetary bonuses to individual site staff members that have shown exceptional diligence in applying good environmental practice on the site. The remaining funds shall be allocated a committee consisting of the Developer, ECO, Engineer and possibly the local authority, to make a final decision regarding the precise allocation of all penalty funds.

#### **4.1. MEASUREMENT AND PAYMENT**

All aspects covered in this document shall be deemed to be included as a sum in the Preliminaries tendered by the Contractor in the Schedule of Quantities.

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## **5 POST CONSTRUCTION**

Final site cleaning - the contractor shall clear and clean the site and ensure that everything not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.

Rehabilitation - the contractor (landscape architect/horticulturist) shall be responsible for rehabilitating and re-vegetating all areas disturbed/areas earmarked for conservation during construction to the satisfaction of the engineer and ECO.

### **5.1 POST-CONSTRUCTION ENVIRONMENTAL AUDIT**

A post-construction environmental audit must be carried out and submitted to DEA at the expense of the developer so as to fulfil conditions of the Environmental Authorisation granted. Objectives should be to audit compliances with the key components of the EMPr, to identify main areas requiring attention and recommend priority actions. The audit should be undertaken annually and should cover a cross section of issues, including implementation of environmental controls, environmental management and environmental monitoring.

Results of the audits should inform changes required to the specifications of the EMPr or additional specifications to deal with any environmental issues which arise on site and have not been dealt with in the current document.

### **5.2 MANAGEMENT REVIEW AND REVISION OF THE EMPr**

The EMPr is to be reviewed annually for the first three years and then once every five years thereafter, by an independent environmental consultant, unless otherwise specified by the authorities. The auditor is to highlight issues to be addressed in the EMPr or changes required during the annual audit. These points are to be included as an annexure to the EMPr and to be considered during the review process. Recommended changes to the EMPr must be forwarded to DEA for approval and comment, before subsequently being incorporated into the EMPr.

### **5.3 GENERAL REVIEW OF EMPr**

The EMPr will be reviewed by the ECO on an on-going basis. Based on observations during site inspections and issues raised at site meetings, the ECO will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site.

Any such changes or updates will be registered in the ECO's record, as well as being included as an annexure to this document. Annexure of this nature must be distributed to all relevant parties.

EMPR APPENDIX 1: GENERAL SITE MAP LAYOUT

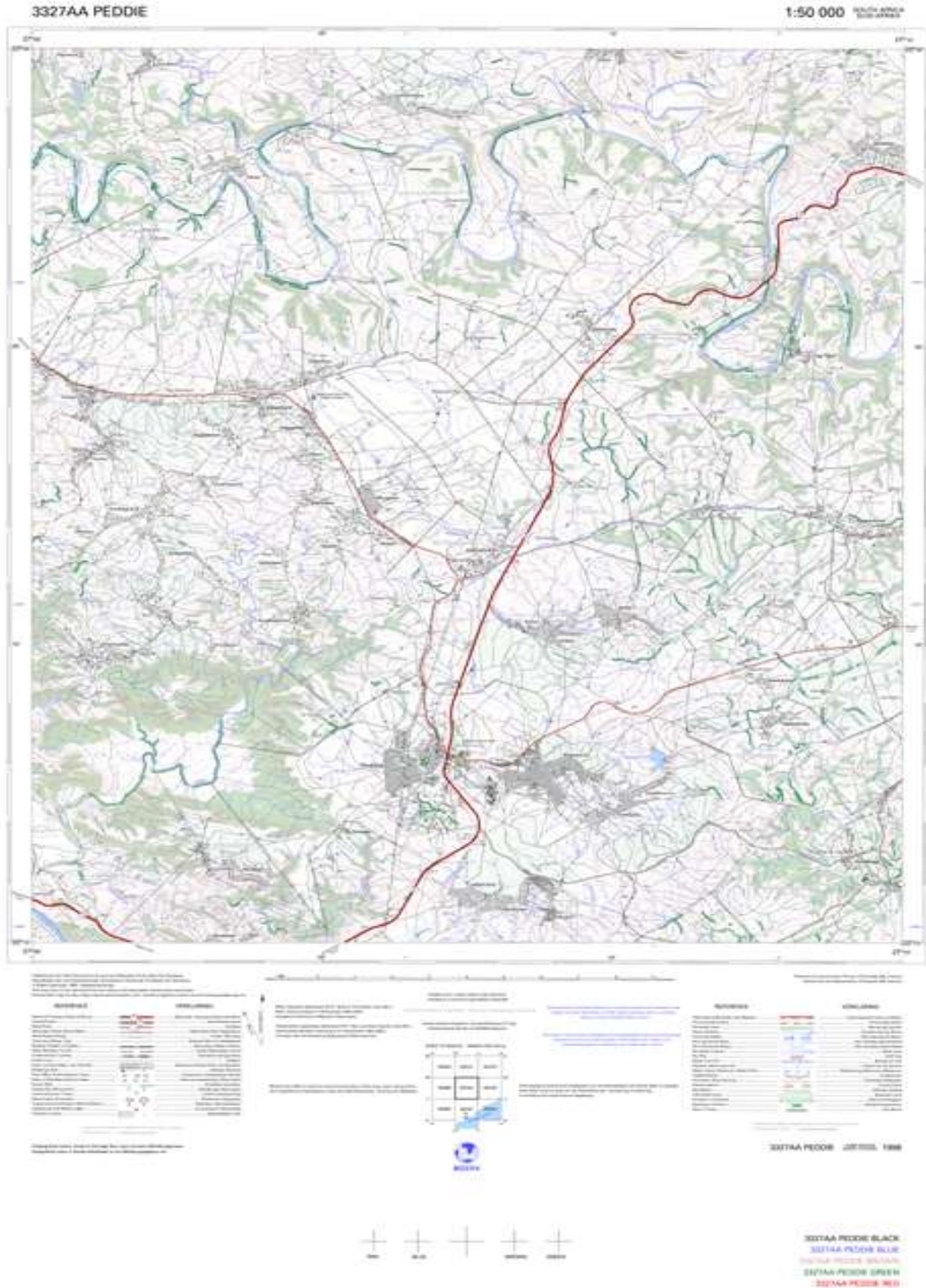


Figure A-1: 1:50 000 map of the study area (REF: 3327AA PEDDIE)

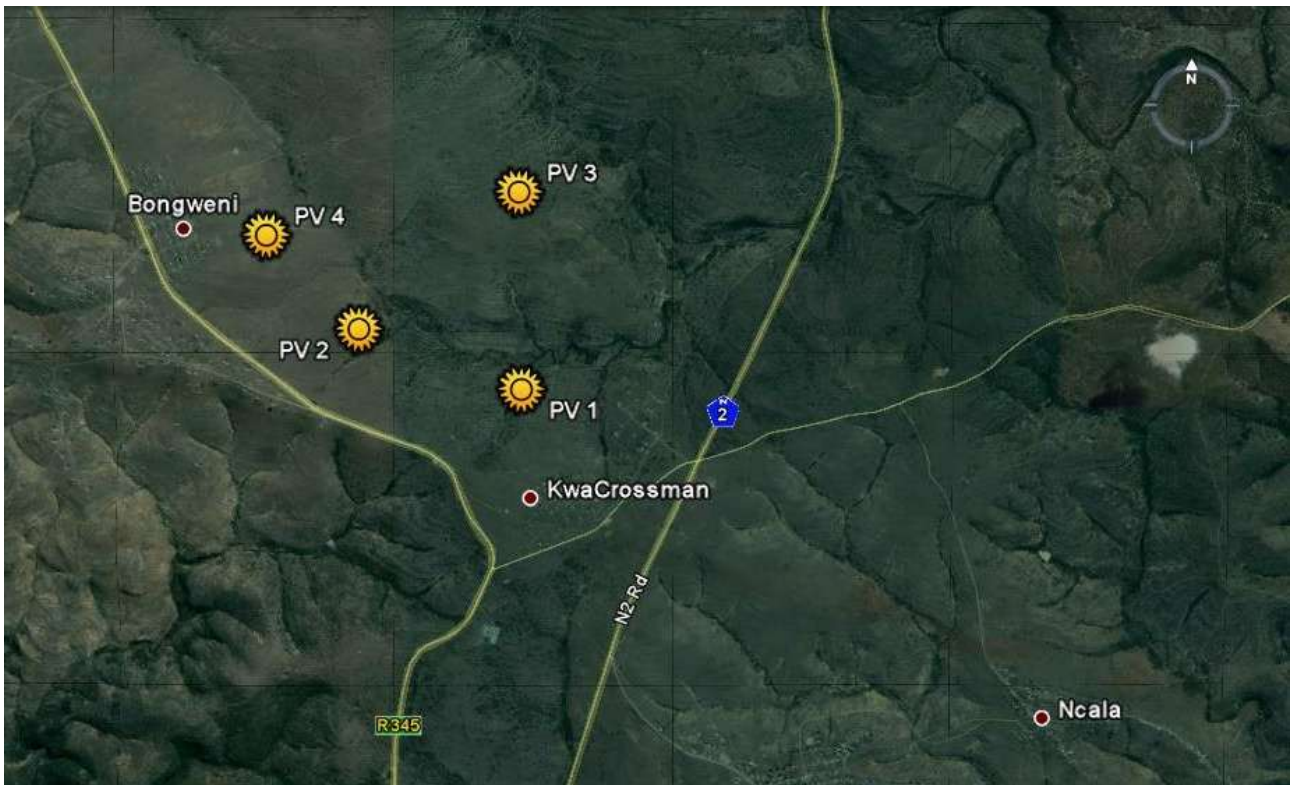


Figure A-2: Google Earth overview of the proposed site alternatives (in yellow).

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## EMPR APPENDIX 2: RESPONSIBILITIES AND AUTHORITY

### A) ADMINISTRATION OF EMPr

Copies of this EMPr shall be kept at the site office and will be distributed to all senior contract personnel. All senior personnel shall be required to familiarise themselves with the contents of this document.

### B) ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management especially during the construction phase.

#### 1. THE DEVELOPER

The Developer refers to InnoWind South Africa who is ultimately responsible for compliance with all conditions of approval of the development or any aspect thereof by any authority.

With respect to the construction phase of the Development, the Developer is to:

- Ensure that all relevant approvals and permits have been obtained prior to the start of construction activities on site;
- Ensure, via CES, that the EMPr has been approved by DEA prior to the start of construction activities on site;
- Appoint a suitably qualified or experienced Environmental Control Officer prior to the start of construction activities on site, and for the duration of the construction phase;
- Provide all principal contractors working on the project with a copy of this EMPr as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts.

With respect to the operation phase of the development, the Developer is to:

- Ensure that all relevant approvals and permits are in place for any of the activities on site;
- Appoint a suitably qualified or experienced Environmental Control Officer for the duration of the operation and where necessary, the decommissioning phase;
- Provide all owners and tenants with a copy of this EMPr as part of lease agreements or Home Owners Contract (whichever is applicable).

#### 2. THE ENGINEER

For the purposes of this document “The Engineer” refers to the engineer for the development, or any other person (such as the architect/project manager/principal agent) authorised by the Developer, to be in charge of the overall implementation of the works.

The responsibilities of the Engineer are to:

- Ensure that the requirements as set out in this EMPr and by the relevant Authorities are adhered to and implemented;
- Assist the ECO in ensuring that the conditions of the EMPr are being adhered to and promptly issuing instructions requested by the ECO, to the Contractor. All site instructions pertaining to environmental matters issued by the Engineer are to be copied to the ECO;
- Assist the ECO in making decisions and finding solutions to environmental problems that may arise during the construction phase;
- Reviewing and approving construction method statements with input from the ECO;
- Ordering the removal of person(s) and/or equipment not complying with the specifications or issuing a stop works order (as required by the ECO or otherwise);

- Issuing of penalties for transgressions of environmental site specifications;
- Providing input into the ECO's on-going internal review of the EMPr.

### 3. THE CONTRACTOR

For the purposes of this document "The Contractor" refers to any directly appointed (by the Developer) company or individual undertaking the implementation of the works.

The Contractor is to:

- Ensure implementation of all applicable Environmental Management Specifications, including all additional requirements related with approved method statements, during all works on site, failing which penalties, as outlined in the environmental management specifications may be imposed by the ECO;
- Ensure that all of its sub-contractors, employees, suppliers or agents etc. are fully aware of the environmental management requirements detailed in the Environmental Management Specifications;
- Liaise closely with the Engineer and the ECO and ensure that the works on site are conducted in an environmentally sensitive manner;
- Inform the Engineer as well as the ECO should environmental issues on site go wrong, e.g. dumping, pollution, littering;
- Carry out instructions issued by the Engineer, on request of the ECO, required to fulfil his/her compliance with the EMPr.

### 4. ENVIRONMENTAL CONTROL OFFICER'S DUTIES

The ECO's duties, inter alia, must be to ensure compliance with the EMPr through monitoring and proactive and open communication channels with the project/site management and, when necessary, enforce the environmental requirements

The ECO's responsibilities should include the following:

- Monitoring and verifying that the EMPr is adhered to at all times and taking action if the specifications are not followed;
- To environmentally educate and raise the awareness of the Contractor and his staff as to the sensitivity of the Site and to facilitate the spread of the correct attitude during works on site;
- Ensure that educational information is displayed in strategic positions;
- Take immediate action on site where clearly defined and agreed no go areas are violated, or in danger of being violated, and to inform the Engineer/Landscape Architect/Developer of the occurrence and action taken;
- Monitoring and verifying that environmental impacts are kept to a minimum;
- Reviewing and approving construction/landscape method statements together with the Engineer/Landscape Architect/Developer;
- Assisting the Contractor in finding environmentally responsible solutions to problems;
- keeping records of all activities/ incidents on site in a Site Diary concerning the environment;
- Inspecting the site and surrounding areas regularly (minimum weekly) with regard to compliance with the EMPr;
- Keeping a register of complaints and report these first to the Engineer/Landscape Architect/Developer for action / follow-up;
- Requesting the removal of person(s) and/or equipment not complying with the specifications (done via the Engineer/Landscape Architect/Developer);
- Recommending the issuing of penalties for transgressions of environmental site specifications to the Engineer/Landscape Architect/Developer;
- Completing start-up, monthly and site closure checklists;

- keeping a photographic record of progress on site from an environmental perspective;
- Undertaking a continual internal review of the EMPr and making recommendations to the Engineer/Landscape Architect/Developer.

The ECO has the authority to recommend to the Engineer/Principal Agent that works be stopped, if in his/her opinion serious harm to, or impact on, the environment is imminent, is likely to occur or has occurred and such actual or potential harm or impact is in contravention of this EMPr, and which is, or may be, caused by construction, or related works. All “stop works” orders to the Contractor are, as normal, to be issued through the Engineer or Principal Agent. However, should the PA not be readily available in an emergency case or be in dispute with the ECO regarding work stoppage, then the ECO shall, in these exceptional circumstances, have the authority to recommend to InnoWind South Africa that works be stopped.

Upon failure by the Contractor or Contractor’s employee to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Engineer and the project management team to have the Contractor’s representative or any employee(s) removed from the site or have work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the Contractor.

The ECO will be responsible for the compilation of a final closure checklist for the project, completed when all works related to the project have been completed and the site has been cleared of all construction related debris, materials or equipment not forming part of the permanent works. This checklist will audit the Contractor’s compliance with the EMPr throughout the duration of the construction phase and this checklist, together with a final written report will be submitted to InnoWind South Africa in order to achieve “environmental closure” of the site.

During the operation phase of the project, the responsibilities of the ECO must be to ensure compliance with the EMPr through monitoring and proactive and open communication channels with the project/site management, and when necessary, enforce the environmental requirements.

During the operation phase of the project, the ECO’s responsibilities should include the following:

- Monitoring and verifying that the operational aspects of the EMPr are adhered to at all times and taking action if the specifications are not followed;
- To environmentally educate and raise the awareness owners, tenants and employees as to the sensitivity of the site
- Ensure that educational information is displayed in strategic positions;
- Take immediate action on site where clearly defined and agreed no-go areas are violated, or in danger of being violated during project operation, and to inform the/Developer of the occurrence and action taken;
- Monitoring and verifying that environmental impacts from operation of the project are kept to a minimum;
- Monitor and approve any remedial action undertaken on site;
- Find environmentally responsible solutions to problems;
- Keeping records of all activities/ incidents on site in a Site Diary concerning the environment;
- Inspecting the site and surrounding areas regularly (minimum weekly) with regard to compliance with the operational aspects of the EMPr;
- Keeping a register of complaints and report these first to the Developer for action / follow-up;
- Requesting the removal of person(s) not complying with the specifications of the EMPr (done via the Developer);
- Recommending the issuing of penalties for transgressions of environmental site specifications to the Developer;

- Completing start-up, monthly and site closure checklists;
- Keeping a photographic record of incidents and progress on site from an environmental perspective;
- Undertaking a continual internal review of the EMPr and making recommendations to the Developer.

#### 5. HORTICULTURAL/LANDSCAPE CONTRACTOR

A Horticultural/Landscape Contractor will need to be employed to undertake the rehabilitation for the project where disturbed sites will not be developed. The Horticultural/Landscape Contractor must be qualified to set up and manage an on-site nursery (if necessary), to propagate required plant material and to rehabilitate disturbed areas. The Horticultural/Landscape Contractor will need to be instructed by the specialist Botanist who will compile a Rescue and Translocation programme for removal of species of special concern (SSC), where necessary.

#### 6. TRAFFIC SAFETY OFFICER (Where applicable)

The developer shall nominate knowledgeable members of staff on site who shall be the responsible persons for the arrangement and maintenance of all traffic accommodation measures required for the duration of the contract. The Traffic Safety Officer shall liaise with the ECO in order to ensure adequate and appropriate traffic arrangements.

#### 7. COMMUNITY LIASON OFFICER

The Community Liaison Officer ("CLO") is responsible for:

- Liaison with the local police force to co-ordinate security measures.
- Continue public liaison to ensure Interested and Affected Parties are kept up to date on the project.



**APPENDIX 3: PRO-FORMA: PROTECTION OF THE ENVIRONMENT  
(To be signed by the Applicant)**

**PRO FORMA**

Employer \_\_\_\_\_  
Contract No \_\_\_\_\_  
Contract title \_\_\_\_\_

**PROTECTION OF THE ENVIRONMENT**

I/ we \_\_\_\_\_ (Applicant) record as follows:

1. I/ we, the undersigned, do hereby declare that I/ we am/ are aware of the increasing requirement by society that activities shall be carried out with due regard to their impact on the environment.
2. In view of this requirement of society and a corresponding requirement by the Employer with regard to this Contract, I/ we will, in addition to complying with the letter of the terms of the Contract dealing with protection of the environment, also take into consideration the spirit of such requirements and will, in selecting appropriate employees, plant, materials and methods of operation, in so far as I/ we have the choice, include in the analysis not only the technical and economic (both financial and with regard to time) aspects but also the impact on the environment of the options. In this regard, I/ we recognise and accept the need to abide by the “precautionary principle” which aims to ensure the protection of the environment by the adoption of the most environmentally sensitive approach in the face of uncertainty with regard to the environmental implications of this development.
3. I/ we acknowledge and accept the right of \_\_\_\_\_ to deduct, should they so wish, from any amounts due to me/us, such amounts (hereinafter referred to as fines) as the Environmental Control Officer shall certify as being warranted in view of my/ our failure to comply with the terms of the Contract dealing with protection of the environment, subject to the following:
  - 3.1 The Environmental Officer, in determining the amount of such fine, shall take into account *inter alia*, the nature of the offence, the seriousness of its impact on the environment, the degree of prior compliance/non-compliance, the extent of the Applicant’s overall compliance with environmental protection requirements and, in particular, the extent to which he considers it necessary to impose a sanction in order to eliminate/reduce future occurrences.
  - 3.2 The Environmental Officer shall, with respect to any fine imposed, provide me/ us with a written statement giving details of the offence, the facts on which the Environmental Officer has based his assessment and the terms of the Contract (by reference to the specific clause) which has been contravened.

Signed \_\_\_\_\_  
APPLICANT

Date \_\_\_\_\_

APPENDIX 4: ENVIRONMENTAL AWARENESS COURSE

# WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses



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## WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A contract has been signed
- Disciplinary action (e.g. construction could stop or fines issued)

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## HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP



## WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times



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## RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream



## ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site



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## TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers



## SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission



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## PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed



## DUST

Try to avoid producing dust -  
Use water to make ground &  
soil wet



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## NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles



## TOILETS

- Use the toilets provided
- Report full or leaking toilets



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## EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins





## RUBBISH

- Do not litter – put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly



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## TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers – check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill



## EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance:
- Fire:
- Police:

Buffalo City Municipality:



## FINES AND PENALTIES

- Spot fines of between

To be confirmed by Engineer

- Your company may be fined
- Removal from site
- Construction may be stopped



## PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!



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