Annex H

Environmental Management Programme

DRAFT
ENVIRONMENTAL
MANAGEMENT PROGRAM
(EMP)

GROENWATER SOLAR REF

FEBRUARY 2011

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ACRONYMS AND DEFINITIONS

For the purposes of this document the following acronyms and definitions shall apply:

CEMP Construction Environmental Management Plan

DEA National Department of Environmental Affairs

DENC Northern Cape Department of Environment and Nature Conservation

ECO Environmental Control Officer

ELC Environmental Liaison Committee

SAHRA South African Heritage Resource Agency - the statutory national body responsible for heritage resource management.

OEMP Operational Environmental Management Plan

Bund: Enclosure under / around a storage facility to contain any spillage.

Batch plant: Site for the large-scale mixing and production of concrete or plaster, and associated equipment and materials.

Contractor: The principal persons /company undertaking the construction of the development.

- The main contractor as engaged by the Developer;
- Selected subcontractors; and
- Any other contractor from time to time engaged by the Developer directly in connection with the construction part of the Works.

Contaminated water: Means water contaminated by the Contractor's activities, e.g. concrete water and runoff from plant/ personnel wash areas.

Construction camp: Means the area designated for all temporary site offices, storage sheds and areas, parking areas, maintenance workshops, staff welfare facilities, accommodation, etc.

Construction Environmental Management Plan (CEMP): The construction phase Environmental Management Plan, containing the Environmental Specifications for Civil and Building Works, also forming part of the civils and building contract documentation.

Engineer: A person representing the Developer on site and who is responsible for the technical and contractual implementation of the works to be undertaken. This is usually the engineer, but may be any other person, such as an architect or project manager, authorized by the Developer to fulfil this role.

Environment: Means the surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth;

- micro-organisms, plant and animal life;
- any part or combination of the above and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Education Programme:

An environmental education course for the Contractor's management staff and labour force, which informs them of the requirements of the CEMP. The ECO will present and co-ordinate courses.

Environmental Control Officer (ECO):

The individual or company appointed by the developer to ensure the implementation of the CEMP and suitable environmental management practices on site for the duration of the construction phase of the project.

Environmental Liaison Committee (ELC):

The committee responsible for implementing, amending and monitoring the application of the OEMP. This shall be made up of at representatives of the centre management, tenants and local authority.

Method Statement:

A written submission by the Contractor to the Engineer and ECO in response to the Specifications or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting the Method Statement, in such detail that the Engineer is enabled to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

The Method Statement shall cover applicable details with regard to:

- construction procedures,
- materials and plant to be used,
- getting the plant to and from site,
- how the plant/ material will be moved while on site,
- how and where material will be stored,
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
- timing and location of activities,
- compliance/ non-compliance with the Specifications,
- any other information deemed necessary by the Engineer.

No Go Areas: Areas identified as being environmentally sensitive in some manner and delineated on plan, and on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained prior to entry.

Potentially hazardous substance: Is a substance which, in the reasonable opinion of the Engineer, can have a deleterious effect on the environment.

Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the Engineer after he has consulted with a person, not an employee of the Employer, suitably experienced in "environmental implementation plans" and "environmental management plans" (both as defined in the National Environmental Management Act (No 107,1998)).

Site: The boundary and extent of development works and infrastructure, including any areas off the main site on which works are to be carried out in order to allow the development to proceed successfully.

Solid waste: Means all solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Specification: A technical description of the standards of materials and workmanship that the Contractor is to use in the Works to be executed, the performance of the Works when completed and the manner in which payment is to be made.

Works: The construction operations and all related and incidental works, such as site works, earthworks, installation of services, rehabilitation etc, in connection with the execution and carrying to completion of the development.

Top material: This refers to any surface material in the construction area, whether it be soil, fine material or stones including vegetation.

Topsoil: Means the top 300mm of soil and may include vegetation and rocks.

1. INTRODUCTION

1.1 BACKGROUND TO PROJECT

Intikon Energy appointed Environmental Resources Management Southern Africa Pty Ltd (hereafter referred to as ERM) as independent environmental consultants to undertake the Environmental Impact Assessment (EIA) process for the proposed development of the Groenwater Solar Power Farm at a site located approximately 30 kilometres (km) east of Postmasburg, in the Northern Cape Province. The proposed development includes the installation and operation of solar panels (photovoltaic (PV) arrays) with a projected output of up to 160 megawatts (MW). It is intended that the electricity generated by the proposed facility will feed into the national grid network.

1.2 BACKGROUND TO THE EMP

An Environmental Management Program for the proposed Greonwater Solar farm is required in terms of the following documents:

- Regulations in terms of Chapter 5 of the National Environmental Management Act (1998, as amended).

1.3 OBJECTIVES OF THE EMP

The aim of an EMP is to facilitate appropriate environmental input during all phases of the project. To achieve this, the EMP must make recommendations for the planning and design (pre-construction phase), specify the limitations the contractor must abide by during construction, detail the issues that should be taken cognisance of and indicate specific actions that must be undertaken so as to ensure that the environment is not unnecessarily damaged. The EMP thus specifies the framework within which the contractor must carry out operations. An operational phase is also included to provide environmental guidance for the operational phase of the development.

In addition the EMP provides a clear indication of the environmental management requirements of each of the role players involved during the construction phase of the development. Guidance for the implementation of the EMP is provided including the management of method statements which are required to be implemented to achieve compliance with the Environmental Specifications. Corrective actions and penalties in the event of non-compliance with the EMP are also defined.

No closure or decommissioning EMP is provided since should the applicant decide to decommission the Solar Farm at some future date, the act of decommissioning would likely trigger a requirement to undertake an Environmental Assessment, as would presently be the case in terms of activity 27 of Government Notice 544 of 2010. This Environmental Assessment would assess the impacts and opportunities of decommissioning in far greater detail than is possible at this time, and would likely include a specific decommissioning EMP.

1.4 COMPONENTS OF THE DRAFT EMP

The Draft EMP consists of the following components:

Section 1: Introduction	Provides background information regarding the site, the proposed development and the EMP.
Section 2: Implementation of the EMP	Provides details of the communication and organisational structures within which the EMP will be implemented, responsibilities of key role players, and provides the terms of reference for the ECO.

Section 3:	Environmental Management Specifications for pre-construction phase	Provides environmental specifications for pre-construction phase
Section 4:	Environmental Management Specifications for Construction Phase	Provides all construction phase environmental management requirements applicable to the principal construction contractors, and their subcontractors.
Section 5:	Environmental Management Specifications for Operational Phase	Provides all operational phase environmental management requirements applicable to applicant and any sub-contractors.

2. IMPLEMENTATION OF THE EMP

2.1 INTRODUCTION

This document describes mitigation measures in detail, and is partly prescriptive, identifying specific people or organisations to undertake specific tasks in order to ensure that impacts on the environment are minimised during the lifecycle of this project. The EMP is applicable to all works comprising the pre-construction, construction and operation of the Greonwater Solar Farm development. It is an open-ended document implying that information gained during pre-construction, construction and operational activities and/or monitoring of procedures on site could lead to changes in the EMP.

The appointed ECO (Environmental Control Officer) will monitor compliance with the EMP and other Conditions of Approval as they relate to environmental matters. This EMP gives direction and guidance to all responsible parties. The responsible parties are expected to co-operate closely to minimise or avoid unnecessary environmental impacts.

Non-compliance penalties are described in this EMP and are thus to be included into the official contract documentation. The Contractor is obliged to inform the ECO immediately of events that may cause serious environmental damage or breach the requirements of the EMP. The ECO in turn will immediately inform the Engineer and Developer and, if necessary the Local, Provincial and or National Authority, of such events.

2.2 ROLES AND RESPONSIBILITIES

The key role-players during the construction phase of the development, for the purposes of environmental management on site, include but are not limited to: the Developer, the Engineer, the main Contractors (direct appointments including civil works contractor, building contractor, landscape contractor etc.) the Environmental Control Officer, and representatives of the relevant Authority/ies.

Details of the responsibilities of each of the key role-players have been provided in sections **2.2.1 to 2.2.5.** Lines of communication and reporting between the various parties are illustrated in **Figure 1** below.

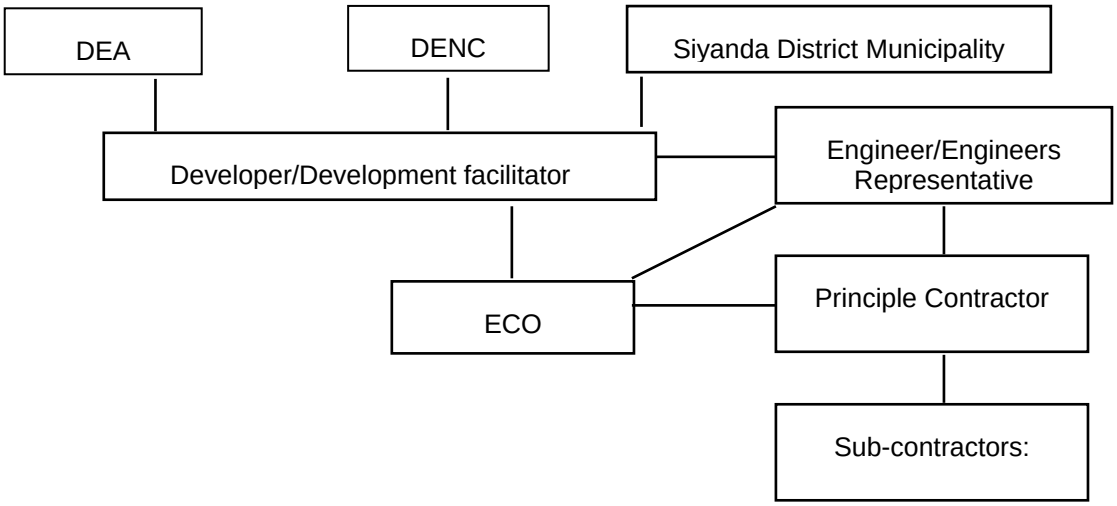

Figure 1: Typical communication and reporting structure

2.2.1 THE DEVELOPER

For the purpose of this document "the Developer" and its appointed facilitators, refers to those whom permission has been granted to proceed with the Greonwater Solar Farm development (i.e. Intikon), and who is thus ultimately responsible for compliance with all conditions of approval of the development or any aspect thereof by any authority.

With respect to the pre-construction phase of the development, the developer is to:

Implement the recommendations outlined in the pre-construction EMP; and

Implement as many recommendations as possible that will lessen the total environmental impact of the proposed development from the design stage, through to construction and ultimately the operational phase.

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

- 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 that the EMP has been approved by DEA prior to the start of construction activities on site;
- Ensure that DEA has been notified of the date on which construction activities will be starting, prior to commencement of the activity;
- Ensure that all conditions of approval have been complied with;
- Appoint all the required specialists to make input into the pre-construction/design phase (refer to section 3.1.2.2); and
- 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.

With respect to the operational phase of the development, the developer is to:

- Ensure that operation of the Solar Farm is undertaken in line with the requirements of the operational phase EMP; and
- Continuously seek to improve any negative environmental impacts which result from the operational phase.

2.2.2 THE ENGINEER

For the purposes of this document, "The Engineer" refers to the engineer for the development, or any other person authorised by the Developer, to be responsible for the technical and contractual implementation of the works to be undertaken.

The responsibilities of the Engineer are to:

- Ensure that the requirements as set out in this EMP and by the relevant Authorities are adhered to and implemented;
- Assist the ECO in ensuring that the conditions of the CEMP are being adhered to and promptly issuing instructions requested by the ECO, to the Contractor. All site instructions relating 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;
- Review and approve construction method statements with input from the ECO;
- Order the removal of person(s) and/or equipment not complying with the specifications (as required by the ECO or otherwise);
- Issue of penalties for transgressions of Environmental Specifications;
- Provide input into the ECO's ongoing internal review of the EMP.

2.2.3 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 Specifications, including all additional requirements related with approved method statements, during all works on site, failing which penalties, as outlined in the Environmental Specifications may be imposed by the ECO via the Engineer;
- Ensure that all of its sub-contractors', employees, suppliers, agents or servants etc. are fully aware of the environmental requirements detailed in the Environmental 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 and damage to vegetation;
- Carry out instructions issued by the Engineer, on request of the ECO, required to fulfil his/her compliance with the CEMP.

2.2.4 ENVIRONMENTAL CONTROL OFFICER

During the construction phase of the project, the ECO is to:

- Ensure that the Contractor has a copy of the CEMP and all agreed method statements;
- Undertake weekly site inspections (frequency may change as required) to audit compliance of all parties with the requirements of the CEMP;
- Advise/recommend on actions or issues impacting on the environment to the Engineer, who shall issue any required Site Instructions to the Contractor;
- 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;
- Review and approve construction/landscape method statements together with the Engineer/Landscape Architect;
- Assist the Contractor in finding environmentally responsible solutions to problems;
- Recommend to the Engineer the issuing of a penalty for any environmental damage caused on site, or non-compliance with the Environmental Specifications;
- Recommend to the Engineer the removal of person(s) and/or equipment not complying with the Specifications;
- Undertake photographic monitoring of the construction site;
- Keep records of all activities/ incidents on Site in a Site Diary concerning the environment;
- Complete temporary and permanent site closure checklists;
- Take immediate action on Site to stop works where significant and irreparable damage is being inflicted on the environment, and to inform the Engineer immediately of the occurrence and action taken;
- Undertake a continual internal review of the EMP and make recommendations to the Engineer and Developer.

The ECO has the authority to recommend to DEA 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 the EMP, and which is, or may be, caused by construction, or related works.

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 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 shall keep a site diary in which events and concerns of environmental significance are to be recorded. The ECO will compile a monthly report of such events, concerns and general compliance of the Contractor with

the construction phase of the EMP. This report will be submitted to the Engineer and if required, to DEA, DENC and the Siyanda District Municipality. The ECO is also required to attend regular site meetings of the project management team to report on environmental issues and minute requirements.

The ECO will be responsible for the compilation of a final completion checklist for the project, completed when all construction 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 construction phase of the EMP throughout the duration of the construction phase and this checklist, together with a final written report will be submitted to the DEA, DENC and the Siyanda District Municipality in order to achieve "environmental closure" for the construction phase of the project

2.3 COMMUNICATION STRUCTURES ON SITE

2.3.1 SITE MEETINGS DURING CONSTRUCTION PHASE

The ECO is required to attend regular site meetings of the project management team to facilitate the transfer of information and to update all parties on the environmental compliance of the project as a whole, and minute requirements.

The ECO will present a summary report outlining the main construction activities that relate to the environment, at this meeting.

The minutes of these meetings will form part of the construction phase of the EMP records. These minutes will reflect environmental queries, agreed actions and dates of eventual compliance by the Contractor.

The following people should attend these meetings:

- Developer's Representative;
- Engineer;
- Landscape Architect (when applicable)
- The ECO;
- Contractor(s) representative

2.3.2 ENVIRONMENTAL EDUCATION PROGRAMME

The Contractor in consultation with the ECO shall arrange for a presentation to site staff to familiarise them with the environmental aspects of the construction phase of the EMP within seven days from the commencement date of construction. This presentation should take cognizance of the level of education, designation and language preferences of the staff. General site staff would commonly receive a basic environmental awareness course highlighting general environmental "do's and don'ts" and how they relate to the site. Management on site e.g. site agents and foremen, who require more detailed knowledge about the environmental sensitivities on site and the contents and application of the construction phase of the EMP document itself, will benefit from a separate presentation dealing with these issues. The ECO may call upon the services of a specialist environmental education translator should this be required. Please note that Appendix 2 of this EMP contains a template Environmental Awareness Poster.

2.3.3 METHOD STATEMENTS

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 construction phase of the EMP, when called upon to do so by the Engineer or ECO.

A Method Statement is a "live document" in that modifications are negotiated between the Contractor and the ECO/project management team, as circumstances unfold. All Method Statements will form part of the construction phase of the EMP documentation and are subject to all terms and conditions contained within the construction phase of the EMP.

Note that a Method Statement is a 'starting point' for understanding the nature of the intended actions to be carried out and allows for all parties to review and understand the procedures to be followed in order to minimise risk of harm to the environment.

Changes to, and adaptations of Method Statements can be implemented with the prior consent of all parties.

A Method Statement describes the scope of the intended work in a step-by-step description in order for the ECO and the Engineer to understand the Contractors intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks.

For each instance where it is requested that the Contractor submit a Method Statement to the satisfaction of the Engineer and ECO, the format should clearly indicate the following:

- What - a brief description of the work to be undertaken;
- How - a detailed description of the process of work, methods and materials;
- Where - a description/sketch map of the locality of work (if applicable); and
- When - the sequencing of actions with due commencement dates and completion date estimates.
- Who – The person responsible for undertaking the works described in the Method Statement;
- Why – a description of why the activity is required.

All Method Statements are to be to the satisfaction of the ECO, Engineer and, where practical and deemed necessary, should be endorsed as being acceptable by the environmental representative of the Relevant Authority.

A list of some of the Method Statements that the Contractor may need to submit during the course of the construction contract has been provided in Section 4, along with an indication of those which the ECO may require the Contractor to provide prior to the start of works on site (see **Appendix 1** for a Method Statement Template).

2.3.4 ECO DIARY ENTRIES

The ECO will maintain a site diary that relates to environmental issues as they occur on site for record keeping purposes. Comments from this diary will form part of reports presented at site meetings by the ECO.

2.3.5 SITE MEMO ENTRIES

Site memo's, stipulating recommended actions required to improve compliance with the construction phase of the EMP by the contractor, will be issued by the ECO to the Engineer, who in turn will ensure that the Contractor is informed of the said instruction.

Comments made by the ECO in the Site Memo book are advisory and all Site Instructions required may only be issued by the Engineer. Site Memo's will also be used for the issuing of stop work orders for the purposes of immediately halting any particular activity(ies) of the Contractor deemed to pose immediate and serious risk of unnecessary damage to the environment.

2.3.6 LEGISLATIVE FRAMEWORK

Obligations imposed by the EMP are legally binding in terms of environmental statutory legislation (i.e. the Environmental Authorization in terms of the National Environmental Management Act #107 of 1998, as

amended) and in terms of amendments to the Particular Conditions of Contract that pertain to this project.

The requirements of this EMP do not release the Developer from the requirements of any legislation that may be applicable to the project.

A list of Legislation applicable to the project (although not limited to those listed) has been provided below for guidance:

- National Environmental Management Act (#107 of 1998);
- National Heritage Resources Act (#25 of 1999);
- National Water Act (#36 of 1998)
- Occupational Health and Safety Act (#385 of 1993)
- Hazardous Substances Act (#63 of 1977);

2.3.7 DISPUTE RESOLUTION

Any disputes or disagreements between role players on Site (with regard to environmental management) will firstly be referred to the Engineer during the construction phase, or to a DTEEA environmental officer during the operational phase. If no resolution on the matter is possible then the matter will be referred to the DEA for clarification.

Where a dispute still persists this shall be referred for arbitration to a panel of persons consists of one specialist environmental consultant, one qualified engineer, one official of the DEA and one legal practitioner of no less than 4 years experience in environmental issues whose decision by simple majority will be final and binding on the parties. This arbitration will be informal ("the informal arbitration") and will be finalised within a period of 48 hours from the date of the declaration of a dispute, the purpose being to ensure that disagreements are rapidly resolved and thereby to limit any prejudice to the contractor or the other parties to this agreement in the construction process or during the operation of the development. In the event of a deadlock in the aforesaid panel, the legal practitioner forming part of the panel will have a casting vote.

2.3.8 COMMUNITY RELATIONS

Intikon should continue to engage with stakeholders throughout project construction and operation. Communication with local communities and other local stakeholders will be a key part of this engagement process and is one where Intikon and the contractor will need to work closely together during the construction period. Development of a Community Engagement Plan (CEP) is important to facilitate this communication.

The objectives of communication and liaison with local communities are the following.

- To provide residents in the vicinity of the development and other interested stakeholders, with regular information on the progress of work and its implications.
- To monitor implementation of mitigation measures and the impact of construction on communities via direct monitoring and feedback from those affected in order to ensure that mitigation measures are implemented and the mitigation objectives achieved.
- To manage any disputes between Intikon, the contractors and local people.

This engagement process can serve to inform the establishment of the Community Development Trust linked to the project.

Grievance Procedure

Intikon should develop a grievance procedure to ensure fair and prompt resolution of problems arising from the project. The grievance procedure should be underpinned by the following principles and commitments:

- Implement a transparent grievance procedure, and disseminate key information to directly impacted stakeholders.
- Seek to resolve all grievances timeously.

- Maintain full written records of each grievance case and the associated process of resolution and outcome for transparent, external reporting.

The responsibility for resolution of grievances will lie with Intikon and its contractors.

2.3.9 SOCIAL RESPONSIBILITIES

The Developer and Contractors shall encourage and implement wherever possible the procurement of locally based labour, skills and materials.

2.3.10 RECYCLING

Wherever possible, materials used or generated by construction and operation shall be recycled. Containers for glass, paper and metals shall be provided separate to general waste bins. During construction, office and camp areas are particularly suited to this form of recycling process. Where possible and practical, such as at stores and offices, waste shall be sorted for recycling purposes. Recycling protocols shall sort materials into the following categories:

- Paper / cardboard
- Any packaging materials suitable for re-use
- Plastics
- Aluminium
- Metals (other than aluminium)
- Wood
- Organic waste
- Glass
- Clean Building Rubble

Recycling ensures that we do not waste valuable resources.

Recycling can also create employment opportunities.

3. PRE-CONSTRUCTION EMP

3.1 SCOPE

This section covers the mitigation measures and recommendations that may be considered in the pre-construction and design stage of the project.

3.2 APPLICATION

This Specification covers the requirements for mitigating the impact on the environment during the detailed design phase of the Greonwater Solar Farm development.

3.3 PRE-CONSTRUCTION EMP REQUIREMENTS

3.3.1 DIRECTIVES IN RESPECT OF THE MICRO-SITING PROCESS

The preferred site layout must be finalised through a micro-siting process which will include a detailed site assessment of the final site layout by various specialists. Relevant authorities will be given the opportunity to comment on the final design layout and this layout must be approved by the Department of Environmental Affairs (DEA). A methodology for finalising the design layout is outlined below.

3.3.2 ANALYSIS OF SOLAR RESOURCE DATA AND REFINING OF LAYOUT

The EIA process has culminated in a preferred footprint for the activity, as well as certain "no-go" areas for development. As certain technical information was however still outstanding, a final refined layout indicating precise locations (i.e. GPS coordinates) for the roads, PV arays, substations and buildings on site, must still be designed.

From a technical perspective, the PV array size and layout depends on a number of factors including:

- local topographical conditions and the aspect of the site in relation to the sun's daily movements;
- the intensity of the solar resource at the site as determined from on site measurements and data modelling;
- other local meteorological conditions such the amount of suspended particles in the air (dust); and
- the characteristics of the specific PV panel model that is selected for the development, including the size and internal composition.

Intikon must complete the technical analysis outlined above, and use this information to compile a detailed site layout which complies with both the preferred footprint assessed within the EIA process, as well as the relevant buffer zones and "no-go" areas identified. Once this detailed layout has been designed, geo-referenced copies must be made available to the various specialists outlined within 3.3.1.2, who are to use this data to ground truth the proposed final layout against any environmental constraints on the site, and recommend any changes to the detailed layout (or any additional mitigation measures) that may be necessary.

3.3.3 FINAL SITE ASSESSMENT BY SPECIALISTS

As previously mentioned, a final walk-through of the site must be conducted by various specialists in order to determine whether additional mitigation measures or final layout changes are required based on Intikons proposed refined layout. A list of specialists to be appointed by Intikon is provided below, together with an outline of tasks to be performed:

A. Botanical Specialist:

- Assess the detailed site layout, and undertake a plant search and rescue exercise for any affected succulent (*Pachypodium succulentum*) specimens within the final development foot print. In this regard the Botanical Specialist must ensure that the relevant permit for trans-locating these specimens are obtained from DENC.

- The botanical specialist must oversee the replanting of these specimens in a suitable area outside of the development foot-print, and must oversee any required maintenance of re-planted areas for whatever time period is necessary to ensure the success of the translocation operation.

- The botanical specialist must assess the remainder of the development footprint for any areas of botanical sensitivity that require mitigation.

- The botanical specialist must prepare a short report at the conclusion of the micro-siting process summarizing their input into the process, including tasks performed and any recommendations or additional required mitigation measures for the construction phase.

A. Fresh Water Ecologist

- The Fresh Water Ecologist must undertake the delineation of any ephemeral pans that occur within the refined development footprint, as well as the physical on-site demarcation of by means of wooden (or equivalent) droppers of the recommended 10m buffer around any such features.

- The fresh water ecologist is also responsible to logging the location of all pans on GPS (WGS 84 format), and providing this information to the EIA consultant for inclusion into the final constraints map for the site.

- The Fresh Water Ecologist is responsible for the physical on-site demarcation by means of wooden (or equivalent) droppers (at max 30m intervals) of the recommended 15m buffer along each side of the southern non-perennial water course. The outer edges of the buffer must be GPS`d once demarcated, and the GPS data provided to the EIA consultant for inclusion into the final constraints map for the site.

- The Fresh Water Ecologist must assess any areas where the proposed refined site layout intersects or crosses any watercourse or drainage line on the site, and relevant recommendations in respect of mitigation or avoidance that may be required.

- The Fresh Water Ecologist must prepare a short report at the conclusion of the micro-siting process summarizing their input into the process, including tasks performed and any recommendations or additional required mitigation measures for the construction phase.

B. Avifaunal Specialist

- The Avifaunal Specialist must review the detailed design of all pylons and power lines associated with the proposed development and confirm that they comply with the "bird friendly" design recommendations contained within the Ecological Specialist Report contained within *Annex E* of the EIR report.

- In the event that the Avifaunal specialist identifies any areas of the detailed design that are not sufficiently bird friendly, the specialist must make relevant recommendations to the design team.

- The Avifaunal Specialist must prepare a brief report at the conclusion of the micro-siting process outlining their input into the process, and confirming that that final detailed design meets the relevant "bird friendly" criteria.

Comments and mitigation measures will be fed back the Intikon team, who will make adjustments if required.

3.3.3.1 FINAL LAYOUT APPROVAL PROCESS

The refined site layout, together with the relevant specialist short reports mentioned within section 3.3.1.2 will be distributed to the following authorities, who will be given an opportunity to provide comment:

- Department of Water Affairs; and
- Department of Environment of Northern Cape (DENC)

The final design layout, together with comments received from the above mentioned authorities, will be submitted to the DEA for final approval. No works may proceed on site until such time as DEA approves the final site layout.

3.3.4 PERMIT REQUIREMENTS

Activities undertaken during site preparation, construction and operation may require additional permits, over and above the Environmental Authorisation. Intikon is responsible for ensuring that they hold the necessary permits in order to comply with national and local regulations. Additional permit requirements are described below.

Borrow Pits

A borrow pit refers to an open pit where material (soil, sand or gravel rock) is removed for use at another location. Intikon may want to use borrow pits for certain earthworks operations, such as the construction of roads, embankments, bunds, berms, and other structures.

The establishment of borrow pits is regarded as a mining activity and is legislated in terms of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA). A mining permit must be obtained from the Department of Minerals and Energy prior to the establishment of barrow pits on the site.

Water Use

There are licensing procedures that need to be followed for particular "water uses". Water uses that may be of relevance to the development of solar farms and associated road construction include the following:

- Taking of water from a water resource, including a water course, surface water, estuary or aquifer (i.e. borehole)
- altering the bed, banks, course or characteristics of a water course; and/or
- impeding or diverting of a flow in a water course.

Under the National Water Act (Act No. 36 of 1998), either General Authorisation or a Water Use Licence must be applied for by Intikon.

Vegetation Search and Rescue

The required plant search and rescue exercise for any affected succulents (*Pachypodium succulentum*) specimens within the final development foot print, may require a permit for trans-locating these specimens in terms of the DENC.

3.3.5 TENDER DOCUMENTATION

3.3.3a Intikon shall ensure that this EMP is included within the tender documents for all contractors tendering to undertake any aspects of the construction phase of the project.

3.3.3b In the adjudication of any tenders to undertake any aspect of the construction or operation of the proposed project, Intikon (or Intikons' agent in this regard) must ensure that the costs of compliance

with the Environmental Management Program have been adequately allowed for within the winning tender.

3.3.6 ADDITIONAL PRE – CONSTRUCTION REQUIREMENTS

- Notify all registered I&APs and key stakeholders of the Environmental Authorisation opportunity and appeal procedure
- Notify DEA prior to commencement of construction
- A health and safety plan must be developed prior to the commencement of construction to identify and avoid work related accidents
- Intikon should establish a recruitment and procurement policy which sets reasonable targets for the employment of South African and local residents /suppliers. All contractors should be required to procure and recruit in terms of the Intikon recruitment and procurement policy.
- A Code of Conduct must be developed for all workers (Intikon and contractors including their workers) directly related to the project. The objective of the code of conduct is to limit, where possible, social ills brought about by the construction and operation of the renewable energy facility.

4. CONSTRUCTION ENVIRONMENTAL SPECIFICATION

4.1 SCOPE

This Specification covers the requirements for controlling the impact on the environment of all construction activities for the Greonwater Solar Farm project. All construction activities shall observe the requirements of this specification as well as any relevant environmental legislation and in so doing shall be undertaken in such a manner as to minimize impacts on the natural and social environment.

4.2 APPLICATION

This Specification contains clauses that are generally applicable to the undertaking of civil engineering works in areas where it is necessary to impose pro-active controls on the extent to which the construction activities impact on the environment. The roles and responsibilities in terms of the application and implementation of this Specification have been outlined in Section 2 above.

4.3 METHOD STATEMENTS

Any Method Statement required by the Engineer or the Environmental Specification shall be produced within such reasonable time as the Engineer shall specify or as required by the Specification. The Contractor shall not commence the activity until the Method Statement has been approved and shall, except in the case of emergency activities, allow a period of two weeks for approval of the Method Statement by the Engineer. Such approval shall not unreasonably be withheld.

The Engineer or ECO may request a Method Statement for any activity they believe may impact on the environment. The Engineer in consultation with the ECO may also require changes to a Method Statement if the proposal does not comply with the Specification or, if in the reasonable opinion of the Engineer, the proposal may result in, or carry a greater than reasonable risk of damage to the environment in excess of that permitted by the Specifications.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

The following Method Statements shall be provided by the Contractor and submitted to the Engineer and ECO at least 7 working days before site establishment:

4.3.1 SITE CAMP AND SITE DIVISION (CLAUSE 4.4.1 AND 4.4.2)

The location, layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project)

4.3.2 VEGETATION CLEARING (CLAUSE 4.4.3A)

Method of vegetation clearing during site establishment and disposal procedure for cleared material.

4.3.3 TOP SOIL (CLAUSE 4.4.3B)

Method of clearing topsoil and location of topsoil stockpiles including erosion protection.

4.3.4 ACCESS/HAUL ROUTES (CLAUSE 4.4)

Details, including a drawing, showing where and how the access points and routes will be located and managed, including traffic safety measures.

4.3.5 FUEL STORAGE AND USE (CLAUSE 4.5.2)

The design, location and construction of the fuel storage area, service areas as well as for the filling and dispensing from storage tanks and management of drip trays.

4.3.6 SOLID WASTE MANAGEMENT (CLAUSE 4.5.4)

Expected solid waste types, quantities, methods of recycling to be employed, monitoring and record keeping procedures, staff responsible for the oversight of waste management and recycling and frequency of collection and disposal of the non-recycled component, as well as location of disposal sites.

4.3.7 CONTAMINATED WATER (CLAUSE 4.5.8)

Methods of minimizing, controlling, collecting and disposing of contaminated water.

4.3.8 HAZARDOUS SUBSTANCES (CLAUSE 4.5.9)

Details of any hazardous substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

4.3.9 CEMENT AND CONCRETE BATCHING (CLAUSE 4.5.19)

Location, layout and preparation of cement/ concrete mixing areas including, the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete.

4.3.10 EMERGENCY PROCEDURES (CLAUSE 4.5.20)

Emergency procedures for fire and accidental leaks and spillages of hazardous substances (including fuel and oil). Include details of risk reduction measures to be implemented, such as fire fighting equipment, fire prevention procedures and spill kits (materials and compounds used to reduce the extent of spills and to breakdown or encapsulate hydrocarbons).

Other Method Statements required by the Engineer and ECO during the course of construction are to be provided by the Contractor a minimum of 14 working days prior to commencement of the works or activities to which they apply (these activities may not commence on site before these Method Statements have been approved except in the case of emergency activities).

4.3.11 EROSION AND SEDIMENTATION CONTROL (CLAUSE 4.5.26)

The proposed methods of Sedimentation and Erosion Control for bulk earthworks in particular and the remainder of the construction period, in order to ensure the prevention of sedimentation of water courses, and storm-water infrastructure.

4.4 SITE ESTABLISHMENT

4.4.1 SITE DIVISION

The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified, and shall restrict his activities to only those areas that are necessary to undertake the works.

A Method Statement detailing the layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project) shall be submitted.

Disturbed areas rather than pristine or intact landscape areas should preferably be used for the construction camp.

4.4.2 SITE DEMARCATION

The Contractor shall erect and maintain permanent and/ or temporary fences of the type and in the locations

directed by the Engineer. Such fences shall, if so specified, be erected before undertaking designated activities. The construction camp, material stores and lay-down areas should be screened and sited as far as possible from the local roads.

4.4.3 SITE CLEARANCE

a) Vegetation Clearance

Vegetation clearance should preferably be phased as required to work in certain areas, rather than clearing of the entire site initially. If this is not practical and the entire site is cleared at the start of the contract, it is to be stabilized immediately to control dust. Where ever possible, vegetation shall be trimmed rather than cleared.

Cleared vegetative material is not to be dumped anywhere other than an approved waste disposal site. Wherever possible and where the material is suitable, the material should be chipped for later use as mulch in landscaped areas or for stabilization purposes or it should be dumped at a green waste recycling depot for compost production.

Invasive alien plant species, which are removed from the site, are not to be chipped for mulch if they are in a seed bearing state. Such material is to be disposed of at a suitable waste disposal site. Wherever possible, suitable larger stumps should be made available to the local community as fire wood.

Plant material removed from the site is not to be burnt for disposal on site unless a burning permit has been obtained from the local authority.

Sensitive ecosystems in the vicinity of the areas of construction should be demarcated (e.g. using danger tape or droppers) prior to any construction activities, so that these can be avoided.

Removal of vegetation should be kept to a minimum, and cleared areas must be re-vegetated after clean-up. A detailed planting plan should be developed, in consultation with a landscaper and ecologist.

Clear demarcation during the construction phase of all undisturbed areas that are not within the direct footprint of the REF to ensure that there is no uncontrolled access by construction vehicles and labourers.

An Alien control and monitoring program must be developed to ensure that the site is cleared of alien plants (as listed under the Conservation of Agricultural Resources Act 43 of 1983 - as amended/updated) and kept free from alien plants for the duration of the construction phase.

b) Topsoil

Topsoil / top material shall be removed from all areas cleared of vegetation and retained for future landscaping use, where feasible. Top material should exclude litter, building rubble, alien plant material or any other waste. All topsoil, and specifically any topsoil from areas which are likely to contain bulbs, must be stripped and stockpiled for re-use in landscaped areas. This will constitute at least a 300mm layer.

Topsoil shall be stored in areas demarcated by the ECO and Engineer and in piles not higher than 2 m, and may not be removed from site, or used for any purpose other than in the final landscaping of the site. The stockpiles shall not be compacted or disturbed, and shall be domed at the top to promote runoff. The period between the stockpiling of topsoil and its utilization shall be as short as possible, and ideally the topsoil should be transferred to its intended site of use immediately following site clearance and stockpiling. This would also avoid double handling.

Stockpiles that are to be stored for less than three months should be covered with shade-cloth or Geotech fabrics or similarly suitable material to prevent erosion, and kept moderately moist in order to maintain the vitality of the soil. If stockpiles are to be stored for more than 3 months a protective vegetation layer must be established to cover topsoil stockpiles in order to protect them against erosion and desiccation. The stockpile must be kept moist in order to maintain the vitality of the vegetation. Vegetation may not consist of weeds, but must comprise grass or ground covers.

c) Water Courses, Drainage Lines and Ephemeral Pans

A non-perennial water course crosses the site in the south western corner; this should have a 15 metre buffer zone and a 10m buffer area around all ephemeral pans. These buffer areas have been demarcated by the freshwater ecologist in the pre-construction phase of the project, and are to be treated as no-go areas for the duration of construction, in accordance with the requirements of clause 4.5.15 of this document. Works within

the buffer areas may only be undertaken if they are approved in terms of the final layout of the site which has been authorized by the DEA. Should such works be required, they may only be permitted subject to an approved method statement.

4.4.4 ACCESS ROUTES/ HAUL ROADS

The Contractor shall control the movement of all vehicles including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition, such vehicles shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site. The vehicles of the Contractor and his suppliers shall not exceed a speed of 40 km/h on gravel or earth roads on Site and within 500m of the Site.

During construction, arrangements and routes for abnormal loads (if required) must be agreed in advance with the relevant authorities and the appropriate permit must be obtained for the use of public roads.

4.5 GENERAL REQUIREMENTS

4.5.1 MATERIALS HANDLING, USE AND STORAGE

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications.

Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to, sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

All manufactured and/ or imported material shall be stored within the Contractor's camp. All lay down areas outside of the construction camp shall be subject to the Engineer's approval.

All building materials should be stored away (at least 50m) from aquatic ecosystems and the areas bunded appropriately such that there will be no runoff from these areas towards aquatic systems. All building materials should be removed after construction.

4.5.2 FUEL (PETROL AND DIESEL) AND OIL

All fuel is to be stored within a demarcated area in the Contractor's Camp. No refuelling of vehicles or machinery is to take place outside of this demarcated area unless authorised by the Engineer. The Engineer shall be advised of the area that the Contractor intends using for the storage of fuel.

The Contractor shall ensure that all liquid fuels (petrol and diesel) are stored in tanks with lids, which are kept firmly shut. Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.

Tanks containing fuels shall be situated on a smooth impermeable surface (plastic or concrete) base with a bund (if plastic, it must have sand on top to prevent perishing) to contain any possible spills and prevent infiltration of fuel into the ground. The impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be 110% x the total capacity of all the storage tanks.

The floor of the bund shall be sloped towards an oil trap or sump to enable any spilled fuel to be removed. An Enretech or similar hydrocarbon absorption/remediation product approved by the ECO shall be installed in the sump to reduce the risk of pollution. Bulk fuel storage and bunded areas shall have overhead cover to prevent rain from entering the bunded area.

The Contractor shall keep fuel under lock and key at all times.

If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank shall be stored in a waterproof container when not in use.

During fuel tanker delivery, the tanker driver must be present at all times during offloading of product. An emergency cut off switch must be installed to immediately stop fuel delivery should an accident occur. An anti-flash nozzle must be installed at the end of the vent pipe with a fuel dispenser equipped with an automatic cut off switch to prevent fuel tank overfills.

Vehicles using the temporary fuel storage tanker must be located on a concrete hard standing area for fuel containment.

No smoking shall be allowed in the vicinity of the stores. Symbolic safety signs depicting "No Smoking", "No Naked Lights" and "Danger" are to be provided, and are to conform to the requirement of SABS 1186. The volume capacity of the tank shall be displayed. The product contained within the tank shall be clearly identified; using the emergency information system detailed in SABS 0232 part 1. Any electrical or petrol-driven pump shall be equipped and positioned, so as not to cause any danger of ignition of the product.

Areas for storage of fuels and other flammable materials shall comply with standard fire safety regulations and may require the approval of the Municipal Fire Prevention Officer.

The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

Where reasonably practical, plant shall be refuelled at a designated re-fuelling area or at the workshop as applicable. If it is not reasonably practical then the surface under the temporary refuelling area shall be protected against pollution to the reasonable satisfaction of the Engineer prior to any refuelling activities. The Contractor shall ensure that there is always a supply of appropriate material readily available to absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200l of hydrocarbon liquid spill. This material must be approved by the Engineer prior to any refuelling or maintenance activities.

4.5.3 SOLID WASTE MANAGEMENT

For the purposes of these Environmental Specifications, solid waste includes all debris and waste (e.g. litter, food waste, cable pieces, vegetation and tree stumps, building rubble, etc), including hazardous waste (e.g. oils) resulting from any demolition and construction activities on site.

The Contractor shall be responsible for the establishment of a waste control system (Waste Management Plan) that is acceptable to the Engineer and ECO, and a method statement is required in this regard. The contractor shall keep detailed records of all waste removed from site, together with proof of recycling or legal disposal at a registered landfill site (disposal certificates).

NO REFUSE OR WASTE MATERIAL WILL BE DISPOSED OF BY BURYING.

a) Refuse Control

The Contractor shall provide labourers to clean up the Contractor's camp and working areas on a daily basis.

Litter and waste materials (excluding rubble and hazardous waste materials) shall be disposed of into scavenger- and weather-proof bins. The Contractor shall provide sufficient bins with lids on Site to store the waste produced on a daily basis. In order to facilitate recycling it is recommended that a number of bins be provided at each location, and that such bins be clearly marked according to the category of waste being recycled (eg paper, metals, plastics, glass etc) Bins shall not be allowed to become overfull and shall be emptied a minimum of once daily. The waste may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the Engineer has approved. The Contractor shall then remove the refuse collected from the working areas, from Site at least once a week. Any refuse not being re-cycled must be disposed of at a registered waste disposal facility.

The Contractor shall ensure that waste and surplus food, food packaging and organic waste are not deposited by employees anywhere on the site except in refuse bins.

b) Empty Cement Bags

Empty cement bags must be collected from the construction area by the end of every day and before rain events and shall be stored in bins that are either placed under cover or have been fitted with lids. This prevents the bags getting wet and the cement powder leaching into the environment.

c) Hazardous Waste

Petroleum, chemical, harmful and hazardous waste is to be stored in an enclosed and bunded area. The location of these sites is to be approved by the Engineer and the ECO. This waste shall be disposed of at a registered hazardous waste disposal site. The Contractor shall submit copies of receipts from such waste disposal sites to the Engineer and ECO as proof of proper disposal. Storage and disposal etc is also controlled through other relevant legislation which must be complied with e.g. Occupational Health & Safety Act.

d) Builders rubble

The Contractor shall provide labourers to clean up the Contractor's camp and working areas of rubble generated in the course of construction work at least once a week.

Rubble shall be temporarily stockpiled in a waste skip or a central stockpile. Any rubble not being recycled (eg sent for crushing) or reused shall be removed from site to an approved landfill site as soon as it constitutes a practical load for removal and before temporary closure of the site. No plastics, shrink wrap, paint buckets or any other debris that does not constitute clean building rubble, shall be stored at such stockpile sites.

4.5.4 ABLUTION FACILITIES

Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided.

Latrine and ablution facilities and first-aid services shall comply with the regulations of the local authority concerned and shall be maintained in a clean and sanitary condition to the satisfaction of the Engineer.

The Contractor shall provide suitable sanitary arrangements at the Contractor's Camp and approved points around the designated work area to allow easy access to all employees on site. No staff is permitted to commence with work on a site without suitable toilet facilities available for them. Sanitary facilities shall be located within 100 m from any point of work, but not closer than 50 m to any water body. One chemical toilet is to be provided on site for every 15-contract personnel at each working area. These toilets must have doors and locks and shall be secured to prevent them blowing over. Toilet paper shall be provided.

The Contractor shall ensure that suitable sanitation facilities are provided for or by all his sub-contractors on site.

Toilets are to be emptied prior to builders' holidays. The contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.

The Contractor shall keep the toilets in a clean, neat and hygienic condition. If the Contractor fails to provide and/or maintain all site sanitation facilities in a clean and hygienic condition, the Engineer may order the Contractor to suspend any or all work on the site until these requirements are met. No payment shall be made for any delays or disruption of the Works caused thereby nor shall extensions of time be granted for such delays.

4.5.5 EATING AREAS

The Contractor shall designate eating areas to the approval of the Engineer which shall be clearly demarcated. Sufficient bins, as specified in 4.5.4a shall be present in this area. Any cooking on Site shall be done on well maintained gas cookers with fire extinguishers present.

4.5.6 DRINKING WATER

The Contractor shall ensure that drinking water is available for all staff on site. If no potable water source is available on site then the Contractor shall import drinking water to the site.

4.5.7 CONTAMINATED WATER

Potential pollutants of any kind and in any form shall be kept, stored, and used in such a manner that any escape can be contained and the water table not endangered. Water containing such pollutants as cements, concrete, lime, chemicals, fuels and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling. This particularly applies to water emanating from concrete batching plants and concrete swills, and to runoff from fuel depots/workshops/truck washing areas.

Wash down areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. The Contractor shall notify the Engineer immediately of any pollution incidents on Site.

If construction areas are to be pumped of water (e.g. after rains), this water must first be pumped into a settlement area, and not directly into a natural ecosystem.

A Method Statement shall be required for all wash areas where hydrocarbon and hazardous materials, and pollutants are expected to be used. This includes, but is not limited to, vehicle washing, workshop wash bays and paint equipment cleaning. Wash areas for domestic use shall ensure that the disposal of contaminated "grey" water is sanctioned by the Engineer.

4.5.8 HAZARDOUS SUBSTANCES

Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.

If potentially hazardous substances are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/ materials to be used, together with the storage, handling and disposal procedures of the materials.

No paint products and chemical additives and cleaners such as thinners and turpentine, may be disposed of on Site. Brush / roller wash facilities shall be established to the satisfaction of the Engineer. A Method Statement, approved by the Engineer, is required.

4.5.9 SITE STRUCTURES

The Contractor shall supply and maintain adequate and suitable sheds for the storage of materials. Sheds for the storage of materials that may deteriorate or corrode if exposed to the weather shall be weatherproof, adequately ventilated and provided with raised floors.

All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of the area disturbed. The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection. The contractors' camp shall be fenced with a fence height of at least 1.8m, and the camp area shall be screened via the attachment of shade cloth to the fence surrounding the site camp.

4.5.10 LIGHTS

The Contractor shall ensure that any lighting installed on the site for his activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area.

4.5.11 WORKSHOP, EQUIPMENT MAINTENANCE AND STORAGE

Where practical, all maintenance of plant on Site shall be performed in the workshop. If it is necessary to do maintenance outside of the workshop area, the Contractor shall obtain the approval of the Engineer prior to commencing activities.

The Contractor shall ensure that in his workshop and other plant maintenance facilities, including those areas where, after obtaining the Engineer's approval, the Contractor carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The workshop shall have a smooth impermeable floor either constructed of concrete or thick plastic covered with sufficient sand to protect the plastic from damage. The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages of substances (e.g. oil). A Method Statement detailing the design and construction of the workshop must be submitted.

When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles).

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the Site.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken in the workshop or maintenance areas, and these areas must be equipped with a suitable impermeable floor and sump/oil trap. The use of detergents for washing shall be restricted to low phosphate and nitrate containing and low sudsing-type detergents.

4.5.12 NOISE

The Contractor shall limit noise levels (e.g. install and maintain silencers on machinery). When working in built-up areas, or any areas within audible distance of residents whether in urban, peri-urban or rural areas, the Contractor shall provide and use suitable and effective silencing devices for pneumatic tools and other plant that would otherwise cause a noise level exceeding 85 dB(A) during excavations and other work.

Appropriate directional and intensity settings are to be maintained on all hooters and sirens.

No amplified music shall be allowed on Site. The use of radios, tape recorders, compact disc players, television sets etc shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. The Contractor shall not use sound amplification equipment on Site unless in emergency situations.

The Contractor's attention is drawn to the Noise Regulations as promulgated in terms of the Environment Conservation Act and relevant Local Authority bylaws.

4.5.13 ENVIRONMENTAL AWARENESS TRAINING

Environmental awareness training courses shall be run for all personnel on site. Two types of course shall be run, one for the Contractor's and Subcontractor's management and one for all site staff and labourers. Courses shall be run in the morning during normal working hours at a suitable venue provided by the Contractor. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the Engineer.

Contractor general site staff are to attend an initial presentation of approximately 45 minutes, and 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-contractors employees that spend more than 1 day a week or four days in a month to attend the environmental education program within 1 (one) week of commencement of work on site. 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 30 people shall attend each course and the cost, venue and logistics for this/ these course/s shall be for the Developer's responsibility. The ECO shall keep a register of all personnel attending the Environmental Education Program.

Notwithstanding the specific provisions of this clause it is incumbent upon the Contractor to convey the sentiments of the EMP to all personnel involved with the works. Please note appendix 2 of the EMP contains a template Environmental Awareness Poster.

a) Training course for management and foremen

The environmental awareness training course for management shall include all management and foremen. The course, which will be presented by the Engineer or ECO, will be of approximately one-hour duration. The initial course shall be undertaken not less than 7 days prior to commencement of work on site. Subsequent courses shall be held as and when required.

b) Training course for site staff and labour

The environmental awareness training course for site staff and labour shall be presented by the Engineer or ECO. The course will be approximately 45 minutes long. The course shall be run not more than 7 days after commencement of work on site with sufficient sessions to accommodate all available personnel. Subsequent courses shall be held as and when required

4.5.14 CONTRACTOR'S ENVIRONMENTAL OFFICER

The Contractor shall appoint an Environmental Officer who shall be responsible for undertaking a daily site inspection to monitor compliance with this Specification. The Contractor shall submit the name of the Contractor's Environmental Officer to the Engineer for his approval seven days prior to the date of the environmental awareness training course.

4.5.15 "NO GO" AREAS

The demarcated buffer areas around the heritage sites (see clause 4.5.28 below), ephemeral pans on site, as well as along the south western watercourse are to be considered no-go areas for the duration of construction. The Contractor shall ensure that, insofar as he has the authority, no person, machinery, equipment or material enters the "no go" areas at any time. For work to be carried out in these areas, a method statement must be submitted.

4.5.16 CONSTRUCTION PERSONNEL INFORMATION POSTERS

The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with aspects of the Specifications. Such posters shall be erected at the eating areas and any other locations specified by the Engineer. A template poster is attached in Appendix 2.

4.5.17 FIRE CONTROL

No fires may be lit on site. Any fires, which occur, shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where it is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to make liable the rapid spread of an initial flame. In terms of the Atmospheric Pollution Prevention Act, burning is not permitted as a disposal method.

The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedure to be followed. The Contractor shall forward the name of the Fire Officer to the Engineer for his approval seven days prior to the date of the environmental awareness training course.

The Contractor shall ensure that there is basic fire fighting equipment available on Site at all times.

4.5.18 CONCRETE AND CEMENT WORK

Cement powder has a high pH. Spillage of dry cement powder and concrete slurry will affect both soil and water pH adversely. Careless handling of cement products resulting in spillage can have detrimental effects on the surrounding environment.

The permitted location of the batching plant (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the Site layout plan and approved by the ECO. A Method Statement indicating the layout and preparation of this facility is required in this regard.

Cement is to be stored in a secure weatherproof location to avoid contamination of the environment.

All runoff from batching areas shall be strictly controlled so that contaminated water does not enter storm water, or groundwater. Dagga boards and mixing trays should be used at all mixing and supply points. Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment:

Suitable screening and containment shall be in place to prevent windblown contamination associated with bulk cement silos, loading and batching.

All visible remains of excess concrete shall be physically removed to an approved Municipal waste site on completion of the plaster or concrete pour section and disposed off.

4.5.19 EMERGENCY PROCEDURES

The Contractor shall submit Method Statements covering the procedures for the following emergencies:

a) Fire

The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. The Contractor shall ensure that his employees are aware of the procedure to be followed in the event of a fire.

b) Accidental leaks and spillages

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured.

4.5.20 SAFETY

The Contractor shall at all times observe proper and adequate safety precautions on the Site. Telephone numbers of emergency services, including the local fire fighting service, shall be posted conspicuously in the Contractor's office near the telephone.

No unauthorised firearms are permitted on Site.

The Occupational Health and Safety Act (Act 85 of 1993) and in particular the requirements of the Construction Regulations issued in July 2003, must be complied with.

4.5.21 SECURITY

With the possible exception of any security staff who may be required to stay overnight at the Contractor's Camp, no personnel will be permitted to live on site. Security staff must be provided with heating and cooking facilities (in order that they do not need to light fires) access to toilet facilities and communication equipment.

Any security lighting at the Contractor's Camp is to be placed in such a way as to not cause a nuisance to residents of the area and traffic on adjacent roads.

4.5.22 COMMUNITY RELATIONS

The Contractor shall erect and maintain information boards in the position, quantity, design and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer.

All interactions with the surrounding community shall be undertaken in terms of the Community Engagement Plan developed by Intikon in terms of clause 2.6 of this document.

The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself. All grievances raised shall be dealt with in accordance with the Intikon Grievance Procedure which is to be developed in accordance with clause 2.6 of this document.

4.5.23 PROTECTION OF NATURAL FEATURES

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Contractor in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the Engineer.

The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

4.5.24 PROTECTION OF FLORA AND FAUNA

Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted.

Trapping, poisoning and/ or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site during the construction phase. Where the use of herbicides, pesticides and other poisonous substances has been specified, the Contractor shall submit a Method Statement.

4.5.25 EROSION AND SEDIMENTATION CONTROL

The Contractor shall take all reasonable measures to limit erosion and sedimentation due to the construction activities. Where erosion and/or sedimentation, whether on or off the Site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the Engineer. Where erosion and/or sedimentation occur due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the Engineer.

Any runnels or erosion channels developed during the construction period or during the maintenance period shall be backfilled and compacted. Stabilisation of cleared areas to prevent and control erosion shall be actively managed. Consideration and provision shall be made for various methods, namely, brush-cut packing, mulch or chip cover, straw stabilising (at a rate of one bale/square metre and rotorvated into the top 100 mm of the completed earthworks), watering, soil binders and anti erosion compounds, mechanical cover or packing structures (e.g. Hessian cover).

Traffic and movement over stabilised areas shall be restricted and controlled, and damage to stabilized area shall be repaired and maintained to the satisfaction of the Engineer.

4.5.26 AESTHETICS

The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

4.5.27 DUST CONTROL

The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the Engineer and ECO. Dust control measures may include the stabilization of disturbed areas via the rotorvation of straw into the soil surface. In extreme instances, the use of specific dust suppressant additives such as "*Dustex*" may be necessary in order to limit dust generation from haul roads.

During high wind conditions, the Contractor shall comply with the Engineers instructions regarding dust-suppression measures. The Engineer may request the temporary cessation of all construction activities where wind speeds are unacceptably high, and until such time as wind speeds return to acceptable levels.

4.5.28 POLLUTION

The Contractor shall take all reasonable measures to minimize any dust nuisance, pollution of streams and inconvenience to or interference with the public (or others) as a result of the execution of the Works. A method statement may be required in this regard as determined by the Engineer and ECO.

Washing of vehicles and machinery should take place within 50m from any watercourse. All machinery should be regularly checked for leaks. No runoff shall enter any watercourse.

4.5.29 ARCHAEOLOGY AND PALAEONTOLOGY

The Humansrus homestead should be is fenced off with a 20m buffer and no development may takes place within the established border. If development of the substation or access roads needs to be placed near the transmission lines, then it is recommended that an archaeologist should be asked to monitor construction in this particular area.

In view of the close proximity of the homestead to the family graveyard (which is of high significance), it is recommended that 20m buffer around the graveyard is fenced off and that no construction takes place within the fence.

Buffer zones around built structures and heritage sites should be maintained during the construction phase to prevent damage to structures of cultural heritage interest.

All artefacts over 50 years of age and all fossils are protected by law. Should anything of an archaeological nature be found on site by the Contractor (or any other party), e.g. stone hand tools, remnants of old structures not previously visible, old ceramic shards etc. work is to be stopped in the area immediately, and the ECO/Engineer/Archaeologist notified. Failure to notify the ECO and Engineer of a find will result in a penalty.

The ECO will advise on demarcation of this area, and notify a relevant specialist to view material and ascertain whether further study of the area is required.

Should a specialist confirm a genuine artefact and recommend further study of the area, work in the area of any artefact or fossil is to cease until further notice and the South African Heritage Resources Agency (SAHRA) is to be informed forthwith by the archaeologist. A maximum of 30 days should be set aside in the construction program for the recovery of archaeological material where/if discovered. The contact details for the SAHRA are as follows:

111 Harrington Street, Cape Town, 8001

P O Box 4637, Cape Town, 8000
Tel: (021) 462 4502
Fax: (021) 462 4509
Email: director@sahra.org.za

4.5.30 WORKING HOURS

Working hours in terms of the planning approval shall be adhered to. If works are to take place outside of normal working hours, the ECO and the Engineer are to be notified and disturbance to the surrounding residents or land users is to be prevented. The Engineer will, where required, in turn notify the Relevant Authority of work done outside of normal working hours.

4.5.31 EXCAVATION AND TRENCHING

During excavation and trenching activities, care is to be taken to ensure that the stockpiling of top material is kept separate from sub-soils. Top material thus saved is to be replaced as top material and is to be the final layer when back-filling. The Contractor shall reinstate all working areas to the satisfaction of the Engineer.

Areas opened for trenching should be restricted to the minimum required to be worked in and closed up in a working day or as dictated by technical requirements such as length of pipe or cable, in order to prevent them from posing safety hazards to people, traffic and animals and to prevent rainwater erosion. Trenches shall be re-filled to the same level as (or slightly higher to allow for settlement) the surrounding land surface to minimise erosion. Excess soil shall be stockpiled in an appropriate manner. No stockpiling must occur within 50 m of a water course.

In the event of material removed during trenching being excessive after backfilling or being unsuitable as overburden, the excess material must be removed from the construction site to a site agreed upon by the Engineer and, where applicable, the Local Authority

4.5.32 TEMPORARY SITE CLOSURE

If the Site is closed for a period exceeding one week, a checklist procedure shall be carried out by the Contractor in consultation with the ECO.

Contractor's Safety Officers (in terms of the Occupational Health and Safety Act) are to check, the Site and report to the Engineer regarding the following:

Fuels / flammables / hazardous materials stores:

- Ensure fuel stores as low in volume as possible;
- No leaks;
- Outlet secure / locked;
- Bund empty;
- Fire extinguisher serviced and accessible;
- Secure area from accidental damage e.g. vehicle collision;
- Emergency and Management telephone numbers to be available and displayed;
- Adequate ventilation.

Other:

- All trenches and manholes secured.
- Fencing and barriers in place per the Occupational Health and Safety Act (No. 85 of 1993).

- Notice boards applicable and secured.
- Security persons briefed and have facility for contact.
- Night hazards checked e.g. reflectors, lighting, traffic signage.
- Fire hazards identified – local authority notified of any potential threats e.g. large brush stockpiles, fuels etc.
- Pipe stockpile wedged / secured.
- Scaffolds secure.
- Inspection schedule and log by security or contracts staff.

The ECO is to check and report to the Engineer regarding the following issues:

- Wind and dust mitigation in place e.g. straw, brush packs, irrigation.
- Slopes and stockpiles at stable angle.
- Landscape areas watering schedules & supply secured.
- Fuels/hazardous substances stores secure.
- Cement and materials stores secured
- Toilets empty and secured
- Refuse bins empty and secured (lids)
- Bunding clean and treated e.g. Spill Sorb or Enretech #1 powder
- Drip trays empty & secure (where possible)
- Structures vulnerable to high winds secure.

The Contractor is to ensure that all temporary closure requirements are met before leaving the Site.

4.6 SITE CLEAN UP AND REHABILITATION

4.6.1 SITE CLEAN UP

The Contractor shall ensure that all temporary structures, equipment, materials, waste and facilities used for construction purposes are removed upon completion of the project. The site cleanup shall be to the satisfaction of the Engineer and the ECO.

4.6.2 REHABILITATION

Where appropriate, the contractor shall employ a suitably qualified person (a botanist with experience in restoration of grassland areas) to rehabilitate areas damaged by construction activities during the course of the project. The Contractor shall be responsible for rehabilitating areas identified by the ECO and the Engineer, or recommended by the aforementioned botanist. The Contractor's procedure for rehabilitation shall be approved by the ECO and the Engineer and, where required, the Local Authority environmental representative.

4.7 PENALTIES AND BONUSES

Where the Contractor inflicts damage upon the environment or fails to comply with any of the Environmental Specifications contained within this EMP, he shall be liable to pay a penalty for breach of the conditions of the Environmental Specifications which form part of the works contract.

The Contractor is deemed NOT to have complied with this Specification if:

- There is evidence of contravention of the Specification within the boundaries of the site, site extensions and haul/ access roads;
- Environmental damage ensues due to negligence;
- The Contractor fails to comply with corrective or other instructions issued by the Engineer with in a specific time; or
- The Contractor fails to respond adequately to complaints from the public.

Penalties shall be issued per incident and per individual for the Contractor's responsibility. 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 he shall notify the consulting quantity surveyor to deduct such a penalty from monies due under the Contract prior to the issuing of the monthly payment certificates.

Payment of any penalties in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

The following penalties (not an exclusive list) shall be issued in addition to any remedial costs incurred as a result of non-compliance with the Environmental Specification and shall be 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:

a.	An individual entering a "no-go" area by foot (without Engineer's/ ECO's permission)	R 500
b.	An individual failing to adhere to speed limit	R 500
c.	An individual driving a vehicle in a no-go area	R2000
d.	An individual driving any earthmoving plant in a no–go area	R2000 – R5000
e.	A plant operator ignoring a written warning to have an oil leak from his machinery repaired	R 1000
f.	An individual littering on site	R100
g.	An individual not making use of the ablution facilities	R500
h.	An individual making an illegal fire on site	R500 – R10 000
j.	An individual/contractor causing unnecessary damage to flora and fauna on site	R500 – R5000
j.	An individual/team wasting water	R500 – R5000
k.	An individual/contractor not reporting a suspected archaeological find to the ECO	R1000 – R10 000

For each subsequent similar offence committed by the same individual, the penalty shall be doubled in value to a maximum value of R20 000.

The following penalties are suggested for transgressions where damage has been done to the environment:

a.	Erosion	A penalty equivalent in value to the cost of rehabilitation plus 20%
b.	Oil spills	A penalty equivalent in value to the cost of cleanup operation plus 20%
c.	Damage to sensitive environments	A penalty equivalent in value to the cost of restoration plus 20%.
d.	Damage to archaeological finds	A penalty to a maximum of R 100 000 shall be paid for any damage to any archaeological sites/finds

All monies collected through penalties shall be held in an environmental fund 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 for the purposes of contributing to environmental education efforts in the local community e.g. for environmental books for the library, posters, excursions or trees for the local school or environmental resource material for the local public library. The Developer, in consultation with the ECO, Engineer and possibly the Local Authority, will make a final decision regarding the precise allocation of all penalty funds. Documentation accounting for all penalty funds obtained and how these funds were utilized shall be copied to Stellenbosch Municipality and D:EA&DP, together with the environmental closure documentation on completion of the project.

4.8 TOLERANCES

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the Works.

It is thus required that the Contractor shall comply with the environmental requirements on an ongoing basis and any failure on his part to do so will entitle the Engineer to certify the imposition of a fine subject to the details set out in the Environmental Specification.

4.9 TESTING

Void

4.10 MEASUREMENT AND PAYMENT

4.10.1 BASIC PRINCIPLES

Except as noted below and as per the Scheduled Items, no separate measurement and payment will be made to cover the costs of complying with the provisions of this Specification and such costs shall be deemed to be covered by the rates tendered for the items as contained in the Schedule of Quantities, as completed by the Contractor when submitting his tender.

Some of the important cost items have been listed below to assist the Contractor in making provision for implementation of the Specifications:

a) Protection of stock piles from blowing or washing away: The spraying or covering of stockpiles, including the supply of the spray or cover material or vegetation, as required.

b) Storage of fuel and oils: The supply, construction, installation, transport, upkeep and removal of all facilities required for storage and management of fuel and oils.

c) Cement laden water management: The supply, construction, installation, transport, upkeep and removal of all facilities required for the management of wastewater from concrete operations.

d) Contaminated water management: The supply, construction, installation, transport, upkeep and removal of all facilities required for managing contaminated water.

e) Storm water and flood management: The supply, construction, installation, transport, upkeep and removal of all facilities required for managing storm water run-off from the site and protection of works from flooding.

f) Bunding and management of run-off from workshop areas and supply of drip trays for stationary and "parked" plant: The supply, construction, installation, transport, upkeep and removal of all facilities required for bunding and managing the run-off from workshop areas as well as all drip trays required.

g) Dust management: The supply, application, transport, upkeep and removal of all materials required to ensure that dust is adequately controlled.

h) Solid waste management: The supply, application, transport, upkeep and removal of all materials required to ensure that solid waste is adequately controlled in accordance with the specification (including the recycling program).

i) Fire Control: The supply, transport, upkeep and removal of all material required for fire control.

j) Eating areas: The supply, construction, installation, transport, upkeep and removal at the end of the construction of all eating areas structures.

k) Ablutions: The supply, maintenance, regular emptying and removal of toilets.

l) Site demarcation: The supply, installation and removal at the end of the construction of all temporary fences.

m) Vegetation protection: The supply, installation and removal at the end of the construction of all vegetation protection fences.

4.10.2 SCHEDULED ITEMS

a) Provision of venue and staff attendance at the environmental awareness training course

The provision of a venue and attendance at the environmental training course will be measured as a lump sum.

The sum shall cover all costs incurred by the Contractor in providing the venue and facilities and in ensuring the attendance of all relevant employees and sub-contractors at the training.

b) Method Statements: Additional Work

No separate measurement and payment will be made for the provision of Method Statements where the Engineer requires a change on the basis of his opinion that the proposal may result in, or carry a greater than warranted risk of damage to the environment, in excess of that warranted by the Specifications, then any additional work required, provided it could not reasonably have been foreseen by an experienced contractor, shall be valued in accordance with GCC 90 Clause 40.

A stated sum is provided in the Schedule of Quantities to cover payment for such additional work.

5. OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN (OEMP)

5.1 SCOPE

This Specification covers the requirements for controlling the impact on the environment of operational activities.

5.2 AIM AND PURPOSE OF THE OEMP

This OEMP aims to provide Intikon with the necessary tools to ensure that the potential impacts on the environment during the operation of the development are minimised. Moreover, it aims to ensure that the infrastructure is operated and maintained according to Best Practice. The OEMP aims to ensure that the development is maintained and operated in an environmentally sensitive and sustainable manner, and that the operation of the development does not result in reasonably avoidable environmental impacts.

The OEMP is a working document that may be amended to enhance its effectiveness for environmental control. Therefore not all specifications and details are prescribed here but should be discussed and the best possible practicable application made by the responsible parties.

5.3 APPLICATION

The application and implementation of the Operational Environmental Management Plan (OEMP) shall be the responsibility of Intikon. Intikon is to appoint an Environmental Site Manager (ESM) to ensure that relevant requirements of the OEMP document are implemented, and that the site is suitably managed. Intikon may appoint a suitably qualified and experienced person from within the existing staff to to fulfil the role of ESM. Intikon may also form an Environmental Liaison Committee (ELC) to facilitate the implementation of the OEMP. If the ELC is formed, many of the responsibilities of Intikon may be delegated to the ELC. The ELC should consist of at the very least the following:

- Representative of Intikon;
- Environmental Site Manager
- Representative of the local authority.

Other members may include an external environmental control officer (ECO) or representatives from community based organisations or environmental groups.

Should Intikon sub-contract the running of the solar farm to a third party, the OEMP must be part of the contract and must be binding.

The roles and responsibilities of each of the above mentioned environmental management bodies have been detailed below:

5.3.1 ENVIRONMENTAL LIAISON COMMITTEE (ELC)

The ELC is a representative body of various key role players involved in development and environment-related organisations, which have a particular interest in the Greonwater Solar Farm development. Members of this committee will not remain constant, and may vary over time.

The ELC will play an advisory role, and provide a forum for democratic decisions regarding OEMP implementation during the operational phase of the development, as well as periodically reviewing the OEMP in terms of its applicability to management requirements on site. They are to meet periodically to receive a report back on environmental management. This frequency may need to be reviewed following the first year of operation, but should not be less than twice a year.

All members of the ELC will be expected to attend the meetings, and are to provide the chairperson of the committee with a written apology if unable to attend. In such a case, the member will receive minutes of the meeting, and may be expected to respond to certain issues.

5.3.2 INTIKON ENERGY

The implementation of the OEMP, as well as the adherence to any conditions within the Environmental Authorization relating to the operational phase of the development, shall be the responsibility of Intikon. Intikon will appoint an Environmental Site Manager and various specialists as required to ensure that the specifications of this document as they relate to general site management and maintenance, as well as environmental audits are suitably implemented on site.

5.3.3 ENVIRONMENTAL SITE MANAGER (ESM)

A suitably qualified and trained individual appointed by Intikon prior to the operation of the Solar Farm, will fulfil the role of the Environmental Site Manager. The primary roles and responsibilities of the ESM will be:

- Oversee the implementation of the EMP on site;
- to visit the site on a monthly basis and advise on areas of environmental management, or compliance with the OEMP, requiring attention;
- to visit the site more regularly during the first 3 months of operation, during which more frequent monitoring may be required for the establishment of certain programmes or aspects of environmental management;
- to be called to site in the case of any emergency situation which may impact on the local environment;
- to liaise with various specialists and the local authorities if required, regarding issues relating to environmental management;
- to report on compliance with the OEMP specifications to the ELC/Intikon;
- to facilitate environmental audits and ensure that they are undertaken, as required;
- to keep a comprehensive record of environmental management, issues of non-compliance and minutes of ELC meetings for audit purposes;
- to undertake any other tasks outlined in this document, on the behalf of Intikon.

5.3.4 INDEPENDANT ENVIRONMENTAL CONTROL OFFICER (ECO)

Since provision has been made for the ESM to be an internal Intikon appointment, Intikon must employ an independent Environmental Professional with post graduate degree in environmental studies and a minimum of 5 years relevant experience to act as the independent environmental auditor for the site. The ECO is to be employed upon completion of the first year of operation, and is to perform an annual formal audit on the management plan, and it's implementation by the relevant parties for the duration for the operational phase of the project. Specific audit requirements are contained within section 5.6.5.

5.4 FINANCING FOR ENVIRONMENTAL MANAGEMENT

The budget for the implementation of the OEMP shall come out of Intikon's operational budget. Intikon must review the OEMP and allocate the requisite funds to facilitate compliance. Since many of the items addressed in the OEMP relate to required preventative maintenance, operator legal compliance, and responsible environmental management, this cost should not represent significant additional expenditure.

5.5 SUMMARY OF OPERATIONAL ENVIRONMENTAL SPECIFICATIONS

In this section of the document, specifications for environmental management on site have been summarized to facilitate easy reference, and implementation.

This section clearly lays out the management requirements, who is responsible for undertaking the required actions, time frames within which they are required, as well as requirements for monitoring, or where applicable approval of the required action. Further details of how each of these actions is to be undertaken (where applicable) have been included in **section 5.6**. Relevant references to these details have been provided in the tables below.

Where Intikon has been identified as the responsible party, this should be read as Intikon, or a suitable individual/organisation employed by them to undertake such task. Where another party has been identified as responsible for undertaking a management action, they are to fulfil this requirement, although the Intikon will ultimately be held responsible for any requirements or specifications of this document which are not fulfilled. Intikon holds the responsibility of ensuring that the action is undertaken according to the specifications of this document.

5.5.1 VISUAL IMPACTS

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref for further details
Minimize the visual impacts during the operation phase.	Signage related to the REF must be discrete and confined to entrance gates.	Intikon	Throughout operation	Visual Monitoring / Photographic evidence	ESM	N/A
	The footprint of the maintenance facilities, as well as parking and vehicular circulation, should be clearly defined, and not be allowed to spill over into other areas of the site.	Intikon	Throughout operation	Visual Monitoring / Photographic evidence	ESM	N/A
	The maintenance and storage areas should be screened by buildings, walls, hedges and/or tree planting, and should be kept in a tidy state to minimise visual impact	Intikon	Throughout operation	Visual Monitoring / Photographic evidence	ESM	N/A

5.5.2 LITTER, WASTE & EFFLUENT MANAGEMENT

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Recycling	Recycling programme to be established on site. To include cardboard, glass, plastic, paper, & metals	Intikon	Within first 3 months of operation	Visual inspection	ESM	5.6.1
	Separation/ deposition of suitable materials in recycling containers	Intikon Contracted cleaning service	On-going	Visual inspection, random monthly checks on recycling waste storage area	ESM	5.6.1
	Emptying of recycling containers	Recycling companies / Waste Contractor, as arranged by Intikon	As required –Intikon/ELC to determine frequency	Visual inspection	ESM	5.6.1

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Refuse disposal	Refuse agreement entered with Council or private contractor	Intikon	Prior to start of operation			5.6.1
	Provision of suitable waste disposal containers at operations and maintenance buildings	Intikon	Prior to start of operation	Visual inspection	ESM	5.6.1
	Temporary waste storage area to be weather proof to prevent dispersion of waste through eg. wind or rain	Intikon	Ongoing	Visual inspection	ESM	5.6.1
	Emptying of waste disposal containers	As arranged by Intikon	As required	Visual inspection	ESM	5.6.1
Prevention of Soil or groundwater pollution.	Any hydrocarbons or other hazardous substances stored on site must be stored in an impervious container, within a bunded area.	Intikon	Monthly Inspection	Visual Inspection	ESM	5.6.1

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Management of hazardous substance spillage	Any spillage of hazardous substance to be reported to ESM and Council	Intikon	Immediately following spillage	Visual inspection of incident to evaluate potential threat for contamination of water course/ephemeral pan/ groundwater.	ESM	5.6.1
	Suitable mitigation actions to be recommended	ESM	As soon as required to prevent further damage	Report to Council/ relevant State Department.	ESM	5.6.1
	Implementation of recommended actions	Intikon /ESM to coordinate	As required by recommended mitigatory actions	Visual inspection	ESM	5.6.1
	Detailed records kept of all such incidents	Intikon/ESM	Immediately following each incident	Report to appropriate level of government as required by legislation	ESM	5.6.1

5.5.3 EROSION MANAGEMENT / LOSS OF TOPSOIL

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Erosion Management	Bi-annual monitoring of erosion in the vicinity of the roads, PV arrays, buildings and other hard-standing surfaces to be conducted to ensure erosion sites can be identified early and remedied.	ESM	Before and after the rainy season	Visual inspection for erosion	ESM	N/A
	Determine cause of erosion	ESM	As required	Visual inspection for erosion	ESM	N/A
	Implementation of suitable repair and mitigation	Intikon, ESM	Within a month following request for mitigation by ESM	Visual inspection of mitigation measures to ensure that they are preventing further erosion	ESM	N/A

5.5.4 VEGETATION MANAGEMENT

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Minimize unnecessary damage to or loss of vegetation	On-site employees, farm workers and visitors to the site will be educated about the conservation of vegetation. This will include strict guidelines for remaining on existing roads while on site to avoid unnecessary destruction or damage to undisturbed and rehabilitated vegetation.	Intikon	Ongoing	Erection of signage at the Admin Building and site entrance.	ESM	5.6.2
Vegetation management during general maintenance	Any cutting or clearing of vegetation shall be kept to the minimum necessary to facilitate the ongoing operation of the solar farm.	Intikon	Ongoing	Visual Inspection.	ESM	5.6.2

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Control of Alien Species	Alien control and monitoring program must be developed to ensure that the site is kept free from alien plants.	Intikon	Bi-annually	Visual Inspection	ESM or botanist/ horticulturalist if the ESM is not adequately skilled.	5.6.2

5.5.5 MAINTENANCE OF SOLAR FARM

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Ensure compliance with conditions of water use licence	Monitor borehole usage, and any specific parameters required by the Water Use Licence, and ensure adherence thereto.	Intikon	Prior to operation/ ongoing	Borehole Water Use Licence/ Registration	Intikon/ESM	5.6.3
Environmental management during general maintenance	Notify ESM of external maintenance to be undertaken	Intikon	Prior to starting work	Visual inspection of area	ESM	5.6.3

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
	Specify environmental procedures to prevent environmental contamination. CEMP (section 4 of this document) to be applicable to significant maintenance activities.	ESM	Prior to starting work	Visual monitoring of maintenance to ensure compliance with specification Reports of transgressions to ELC/ Intikon	ESM ESM	5.6.3
Minimize any traffic impact	During operation, if abnormal loads are required for maintenance, the appropriate arrangements will be made to obtain the necessary transportation permits and the route agreed with the relevant authorities to minimise the impact of other road users. All internal and access roads that will be used by Intikon during the operational phase of the project will be maintained by Intikon throughout the life of the Project.	Intikon	Throughout Operation of the facility	Permit if required	ESM	N/A

5.5.6 ELECTROMAGNETIC INTERFERENCE

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Prevent EMI effects	Appropriate mitigation measures for reducing noise in electronic systems may include the shielding, cancellation, filtering and suppression	Intikon, with input from relevant specialist.	Throughout operation, but only if such impacts occur.	Installation reports	Intikon/ESM	N/A

5.5.7 DUST MINIMIZATION

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Prevention of excessive dust generation	Intikon to ensure that vehicles related to the solar farm travelling on gravel roads should not exceed a speed of 40 km/h. Intikon to erect signage and undertake driver education in this regard.	Intikon.	Throughout operation.	Visual monitoring	Intikon/ESM	N/A

5.5.8 ENHANCEMENT OF TOURISM POTENTIAL

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Enhance tourism potential	Intikon will establish a information kiosk/notice board on the site boundary or entrance to facilitate educating the public about the need and benefits of project. This is aimed at instilling the concept of sustainability and creating awareness by engaging the community and local schools. Information brochures and posters will be made available at the kiosk that will provide more information about the facility. These should be presented in the appropriate languages to maximise the benefits	Intikon	Throughout operation	Photographic evidence	Intikon/ESM	N/A

5.5.9 EMERGENCY PROCEDURES

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
To ensure a reduced risk to human life and of damage if a fire were to take place	Fire control system to be maintained according to the relevant SANS requirements.	Intikon	As required by SANS requirements	Records of maintenance to be kept	Intikon/ESM	5.6.4
	All measures to avoid the risk of fire according to the Environmental Regulations for Workplaces promulgated by Government Notice No. R2281 of 16 October 1987, as amended should be adhered to.	Intikon	As required	Maintenance records to be kept	Intikon	5.6.4
	Fire hydrants and hoses to be visible Emergency contact numbers always visible	Intikon	Prior to operation	Records of incidents to be kept	Intikon/ESM	5.6.4

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
	Ensure all site occupants adequately trained in evacuation and other procedures in the event of an emergency.	Intikon	As required	Records of emergency drills to be kept	Intikon/ESM	5.6.4

5.5.10 AUDITS AND EMP REVIEWS

Management Objectives	Actions required	Responsible Party	Frequency/Time frame	Approval and Monitoring Procedures	Monitoring Party	Ref. for further details
Environmental Audit	Audit relevance of management plan and its implementation	Independent Environmental auditor (ECO)	Annually, commencing 1 year after start of operation.	Audit report to be presented to ELC, Intikon and the DEA.	ESM / Intikon to ensure that Independent Audit is undertaken.	5.6.5
	Recommend changes to OEMP/ implementation of OEMP required	Independent Environmental auditor (ECO)	Following each audit	Recommended changes discussed with ELC, Intikon and the DEA.	ESM	5.6.5

Review of OEMP	Evaluate relevance of OEMP, and identify additional issues requiring management and changes recommended by auditor	Intikon, ELC	Annually and following each audit		ESM	5.6.5
	Submit proposed changes to local authority, and D:EA for approval	ESM	Prior to implementation	Obtain written approval from DEA	ESM	5.6.5
	Effect changes; include approved amendments as annexure to OEMP where appropriate	ESM	Within month of receipt of all approvals	Distribution of annexure/ amended OEMP to all relevant parties	ESM	5.6.5

5.6 DETAILED OPERATIONAL ENVIRONMENTAL SPECIFICATIONS

5.6.1 LITTER AND WASTE MANAGEMENT

A litter and waste management system must be established by Intikon. Litter and waste management should address the following:

a) Recycling

It is recommended that a recycling program be established for the site as a whole, but specifically for the admin and maintenance buildings and all site occupants. This may achieved vi a an agreement with the waste management contractor for the site. Intikon must make adequate staff resources available to implement and manage the recycling program. Waste separation is best conducted at source, and the recycling waste storage area must at a minimum separate waste into the following categories:

- Paper products;
- Cardboard;
- Glass;
- Plastics; and
- Metals

Recycling will involve greater effort, but offers the reward of environmentally sustainable practices and potential employment opportunities. The ELC/ Intikon should establish what recycling facilities are available within the broader area and determine a recycling program that can support any community efforts already underway.

b) Solid Waste

A distinction should be made between dry solid waste and wet solid waste. These should be separated and collected in different containers for storage at a central waste depot before removal to a recognised municipal waste facility.

All waste storage areas are to be kept in a clean and hygienic condition to prevent odours, spreading of litter, and scavengers.

The frequency of collection must be determined and specified by the ELC/ Intikon in this OEMP.

Refuse and litter management is to be monitored visually by the ESM. Findings are to inform changes in the waste management procedures to eliminate litter problems.

c) Hazardous Waste

Should any hazardous waste be generated by the Solar Farm, this must be disposed of at a hazardous waste facility and adhere to any health and safety requirements for the storage, transport and disposal of hazardous waste.

5.6.2 VEGETATION MANAGEMENT

- All landscaped areas related with the development are to be maintained and be kept clear of invasive alien vegetation species, as listed under the Conservation of Agricultural Resources Act 43 of 1983 (as amended/updated).

- The use of pesticides and herbicides is to be limited to a bare minimum and are to be strictly controlled, and limited to only biodegradable, natural substances. Application should be not prior to the imminent arrival of rain, or within at least 5 days after the passing of a significant rain event.
- On-site employees, farm workers and visitors to the site will be educated about the conservation of vegetation. This will include strict guidelines for remaining on existing roads while on site to avoid unnecessary destruction or damage to undisturbed and rehabilitated vegetation.
- Any cutting or clearing of vegetation shall be kept to the minimum necessary to facilitate the ongoing operation of the solar farm.

5.6.3 MAINTENANCE OF DEVELOPMENT

This section refers to both internal and external maintenance of the centre.

- Intikon must monitor borehole usage, and any other specific parameters required by conditions of the Water Use Licence, and ensure adherence thereto.
- Intikon must notify the ESM of any external maintenance to be undertaken. Any significant structural maintenance should require compliance with the CEMP.
- The ESM must specify any additional environmental procedures necessary to prevent contamination of the environment.
- Intikon is responsible for notifying the maintenance contractor of the conditions under which maintenance is to be done, as well as the possibility of monetary penalties for contamination.

5.6.4 EMERGENCY PROCEDURES

An appropriate and timeous response to emergency situations will ensure that the environmental consequences of such situations are managed and curtailed. Since the fire is seen as the most likely foreseeable emergency for the site, the emergency procedure for fire is provided below. In the event of a fire occurring, the requisite procedure shall be implemented. To ensure preparedness, all key staff on site shall be trained in terms of the requirements of this emergency procedure.

Intikon shall ensure that the fire control system is maintained according to the relevant SANS requirements.

Intikon shall ensure that all measures to avoid the risk of fire according to the Environmental Regulations for Workplaces promulgated by Government Notice No. R2281 of 16 October 1987, as amended, is adhered to.

Fire hydrants and hoses to be visible

Emergency procedure in the event of a fire

- Contact relevant parties as well as local fire department and report the location and details of the fire
- Alert other staff by calling "Fire"
- Attend to human life in danger and remove all combustible items in the vicinity (where possible), guide people away from danger area
- If trained, personal to attempt to extinguish the fire without endangering life
- If uncertain or unable to extinguish the fire, leave the area and wait for assistance

Emergency contact details

A list of emergency services contact numbers shall be posted on site. As a minimum, the following emergency services shall be included on the list:

- Environmental Department: 053 807 7416
- Fire Department: 10111
- Disaster Management: 107
- Ambulance Services: 10177
- South African Police Services: 10111

5.6.5 OEMP REVIEW AND AUDIT

5.6.5.1 OEMP REVIEW

A schedule for the review of the OEMP should be established by the ELC/Intikon. It is recommended that the effectiveness of the OEMP be reviewed on an annual basis, and possibly bi-annually in the first year of operation.

Any proposed changes are to be submitted by the ESM to the DEA for approval prior to implementation. Amendments or additions made to the document (with the approval of the relevant authorities) are to be included as annexure's, distributed to all relevant parties, and should be considered OEMP specifications to which all relevant parties are bound.

Results of environmental audits (see section 5.6.5.2) are to inform the ELC/Intikon of changes required to the EMP documentation.

5.6.5.2 OEMP AUDIT

Audits of the OEMP implementation in the development should be undertaken on a regular basis. Internal audits (by the ESM) should be done on a quarterly basis with an external audit conducted by an independent consultant undertaken as specified below.

An independent environmental auditor (ECO) is to be employed after the first year of operation, and annually thereafter, to perform a formal audit on the management plan, and its implementation by the relevant parties.

Each audit is to be based on site visits by the auditor as well as a review of any records of environmental management to be kept by the ESM. The audit must also determine whether the OEMP is adequately dealing with the range of environmental impacts on the site, i.e. whether the plan is still appropriate, or whether it needs to be extended.

The audit report is to include recommendations of changes required to the OEMP document, management practices etc to improve environmental management of the site. The results of this audit are to be submitted to the provincial and local environmental authority, and DEA.

APPENDIX 1

METHOD STATEMENT TEMPLATE

METHOD STATEMENT

CONTRACT: **DATE**: _____

PROPOSED ACTIVITY (give title of method statement and reference number from the EMP):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:	End Date:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):

Note: please give too much information rather than too little. Please ensure that issues such as emergency procedures, hydrocarbon management, wastewater management, access, individual responsibilities, materials, plant used, maintenance of plant, protection of natural features etc are covered where relevant

DECLARATIONS

1) RESPONSIBLE OFFICER (ECO/ ESO)

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

_____ _____

(signed) (print name)

Dated:._____

2) PERSON UNDERTAKING THE WORKS (Contractor)

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO/ ESO will audit my compliance with the contents of this Method Statement. I understand that this method statement does not absolve me from any of my obligations or responsibilities in terms of the Contract.

_____ _____

(signed) (print name)

Dated: _____

3) EMPLOYER (*i.e.* Developer/ Owner/Project manager)

The works described in this Method Statement are approved.

_____ _____ __ _____

(signed) (print name) (designation)

Dated: _____

APPENDIX 2

Training Materials for Environmental Awareness Training

ENVIRONMENTAL AWARENESS ON SITE

STAY INSIDE WORKING AREAS

INDAWO EKUSETYENZWA KUYO

BLY BINNE DIE TERREINGRENSE

DO NOT INJURE OR KILL ANY ANIMALS

SUKWENZAKALISA OKANYE UBULALE

IZILWANYANA ESAYITINI

MOENIE ENIGE DIERE BESEER OF DOOD NIE

TREES AND FLOWERS

IMITI KUNYE NEENTYATYAMBO

BOME EN BLOMME

SMOKING AND FIRE

UKUTSHAYA NEMILILO

ROOK EN VURE

PETROL, OIL AND DIESEL

PETROLI, OYILE NE DIZILI

PETROL, OLIE EN DIESEL

DUST

UTHULI

STOF

NOISE

INGXOLO

GERAAS

USE TOILETS PROVIDED

SEBENZISA IZINDLU ZANGASESE HAYI ITYHOLO

GEBRUIK DIE VOORSIENDE TOILETTE

ONLY EAT IN DEMARKATED EATING AREAS

TYELA KWINDAWO EZENZELWE OKO

EET SLEGS IN GEMERKTE GEBIEDE

RUBBISH

INKUNKUMA

VULLIS

TRUCKS AND DRIVING

IZITHUTHI NABAQHUBI BAZO

TROKKE EN BESTUUR

PROBLEMS - WHAT TO DO!

IINGXAKI - KUFUNEKA WENZENI?

PROBLEME - WAT OM TE DOEN!

Based on the City of Cape Town's Environmental Awareness Course