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# PROPOSED SON SITRUS ROOFTOP SOLAR ENERGY INSTALLATION NEAR KIRKWOOD, EASTERN CAPE PROVINCE

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## DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

Submitted as part of the Final Basic Assessment Report  
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## PROJECT DETAILS

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## DEFINITIONS AND TERMINOLOGY

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**Alternatives:** Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

**Archaeological material:** Remains resulting from human activities which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

**Cumulative impacts:** The impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

**Direct impacts:** Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable

**'Do nothing' alternative:** The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

**Environment:** the surroundings within which humans exist and that are made up of:

- i. The land, water and atmosphere of the earth;
- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

**Environmental impact:** An action or series of actions that have an effect on the environment.

**Environmental impact assessment:** Environmental Impact Assessment (EIA), as defined in the NEMA Basic Assessment Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

**Environmental management:** Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

**Environmental management programme:** An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its on-going maintenance after implementation.

**Fossil:** Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

**Indirect impacts:** Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

**Interested and affected party:** Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.

**Photovoltaic effect:** Electricity can be generated using photovoltaic panels (semiconductors) which are comprised of individual photovoltaic cells that absorb solar energy to produce electricity. The absorbed solar radiation excites the electrons inside the cells and produces what is referred to as the Photovoltaic Effect.

**Significant impact:** An impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.

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## PROJECT DETAILS

## CHAPTER 1

Building Energy SpA's proposing to establish a 1.2MW photovoltaic (PV) Rooftop Solar Energy Installation on an existing Son Citrus fruit packaging building which is located on a site adjacent to the R336 to Kirkwood, in the Sundays Valley Local Municipality, Eastern Cape Province (refer to Figure 1). The Son Citrus building is located on Portion 31 of the farm Gouvernements Belooning 521. The Son Citrus building is utilised for the sorting, packaging and storage of citrus fruits (mainly oranges).

The Son Citrus rooftop solar energy installation will have a development footprint of ~1.2 hectares, within which the following typical infrastructure will be established:

- » Arrays of photovoltaic (PV) panels with a capacity of up to 1.2MW.
- » Aluminium bar mountings to support the PV panels.
- » Cabling between the project components.
- » Inverter/Transformer enclosure.

Underground 33kV cables of ~100m in length and in capacity to connect into an existing mini-substation located within the Son Citrus Packaging Facility. A preliminary layout of the proposed PV facility is shown in Figure 2.

The proposed PV facility will have an export capacity of up to 1.2 MW and will be known as the **Son Citrus rooftop solar energy installation**.

This draft EMPr has been developed based on the findings of the Final BAR, and must be implemented through controlling construction and operation activities that could have a detrimental effect on the environment, and through avoiding or minimising potential impacts. The development site for the Proposed Son Citrus Packaging facility is regarded as "brownfields", which means that it has been previously developed either for industrial or commercial purposes and is of low environmental sensitivity.

This section of the EMPr provides a summary of the environmental assessment and conclusions drawn for the proposed solar energy facility. In doing so, it draws on the information gathered as part of the Basic Assessment process and the knowledge gained by the environmental consultants during the course of the process and presents an informed opinion of the environmental impacts associated with the proposed project.

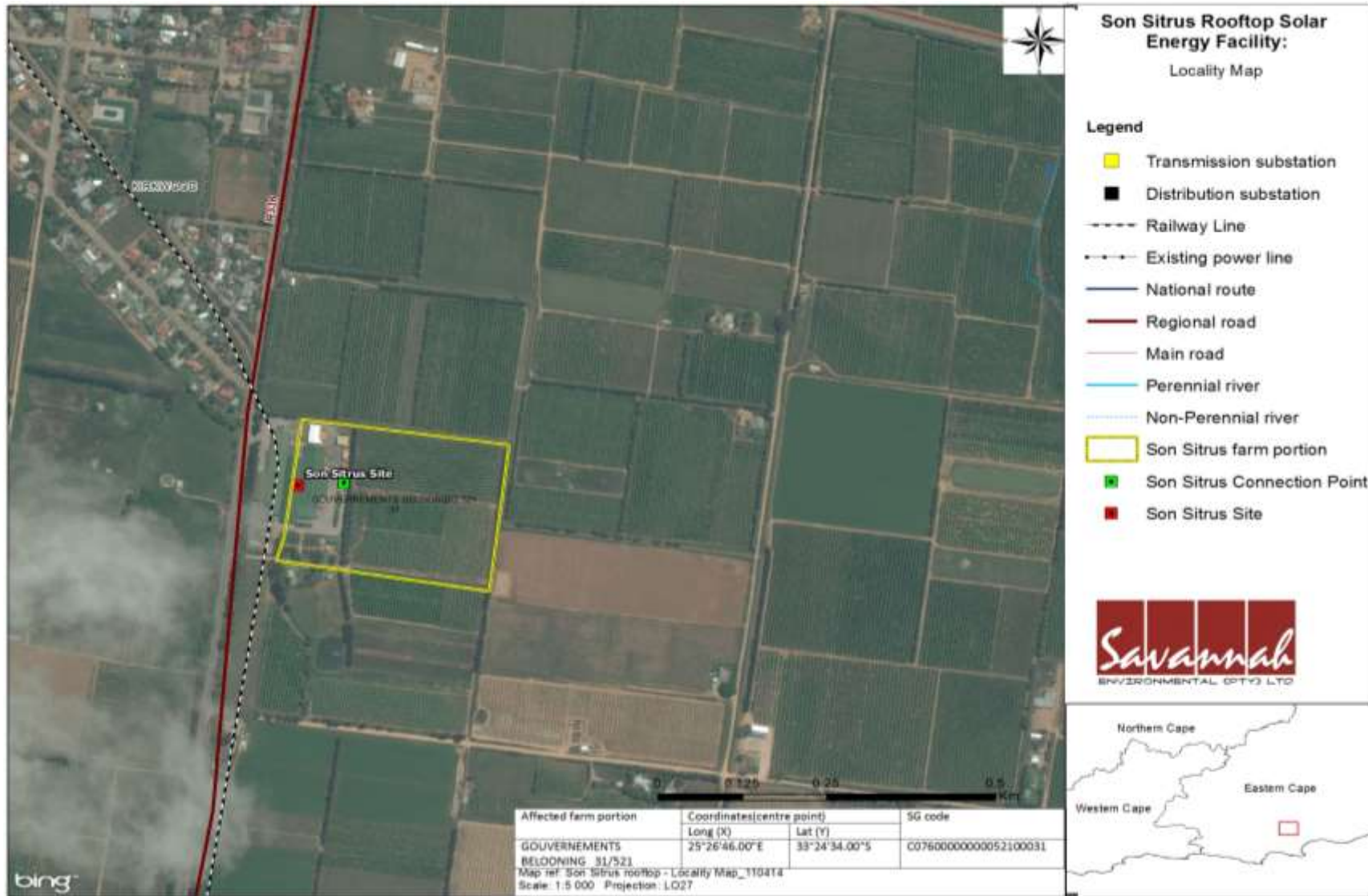
The Son Citrus Rooftop Solar Energy Installation will have minimal environmental impacts as the PV panels will be installed on the roof of an existing building. The following conclusions have been made from the Basic Assessment process:

- » **Visual Impact:** It is not expected that the proposed infrastructure will significantly alter the existing visual impacts associated with the Son Citrus

building. Visual impacts of the proposed development will be of a low significance. The potential visual impacts associated with the proposed development should therefore not influence the outcome of the project decision-making.

- » **Social impact:** the proposed Son Citrus Rooftop Solar Energy Installation will have a positive impact on the social environment through the creation of employment and transfer of skills to the local people.
- » **Cumulative impact:** the cumulative impacts on visual will be very low considering the existing infrastructure (i.e. Son Citrus Package Facility) on the site.





**Figure 1:** Locality map showing the site for the proposed Son Citrus Solar Energy Installation



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## **LEGISLATIVE REQUIREMENTS**

## **CHAPTER 2**

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Table 2.1 provides an outline of the relevant environmental legislation and permitting requirements associated with the proposed project. This list of legislation is applicable at this time and should be updated on a continuous basis as the environmental legislation within South Africa changes.

**Table 2.1:** Relevant legislative and permitting requirements applicable to the establishment of the proposed Son Citrus Solar Energy Facility

<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
<b>National Legislation</b>			
National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> <li>» NEMA requires, inter alia, that:                             <ul style="list-style-type: none"> <li>* Development must be socially, environmentally, and economically sustainable.</li> <li>* Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.</li> <li>* A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.</li> </ul> </li> <li>» EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations.</li> <li>» In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Environmental Affairs</li> <li>» Eastern Cape DEDEAT</li> </ul>	<ul style="list-style-type: none"> <li>» The Final Basic Assessment Report is to be submitted to the DEA for review and decision making.</li> <li>» The EC DEDEAT will act as the commenting authority.</li> </ul>

<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
	<p>with granting of the relevant environmental authorisation.</p> <ul style="list-style-type: none"> <li>» In terms of GNR 543 of 18 June 2010, a Basic Assessment Process is required to be undertaken for the proposed project.</li> </ul>		
National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> <li>» A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts.</li> <li>» In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Environmental Affairs</li> </ul>	<ul style="list-style-type: none"> <li>» While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the BA process.</li> <li>» The implementation of mitigation measures will be included as part of the Draft EMPr and will continue to apply throughout the life cycle of the project.</li> </ul>
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	<ul style="list-style-type: none"> <li>» The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</li> <li>» In terms of the regulations published in terms of this Act (GN 921, 29 November 2013), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities.</li> <li>» Any person who stores waste must at</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Water and Environmental Affairs</li> <li>» Eastern Cape DEDEAT</li> </ul>	<ul style="list-style-type: none"> <li>» As no waste disposal site is to be associated with the proposed project, no permit is required in this regard.</li> <li>» Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act.</li> <li>» The volumes of waste to be generated and stored on the site during construction and operation PV facility will not require a waste license</li> </ul>

<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
	least take steps, unless otherwise provided by this Act, to ensure that (a) The containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit for the safe storage of waste; (b) Adequate measures are taken to prevent accidental spillage or leaking; (c) The waste cannot be blown away; (d) Nuisances such as odour, visual impacts and breeding of vectors do not arise; and (e) Pollution of the environment and harm to health are prevented.		(provided these remain below the prescribed thresholds detailed in GNR 921).
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	<ul style="list-style-type: none"> <li>» S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas"</li> <li>» Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards</li> <li>» The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.</li> <li>» Dust control regulations promulgated in November 2013 may require the</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Environmental Affairs</li> <li>» Eastern Cape DEDEAT</li> </ul>	<ul style="list-style-type: none"> <li>» While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project.</li> </ul>

<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
	implementation of a dust management plan.		
National Water Act (Act No. 36 of 1998)	<ul style="list-style-type: none"> <li>» Under S21 of the act, water uses must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation.</li> <li>» In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Water Affairs</li> <li>» Eastern Cape Department of Water Affairs</li> </ul>	<ul style="list-style-type: none"> <li>» A water use license is not required for the proposed development.</li> </ul>
Environment Conservation Act (Act No. 73 of 1989)	<ul style="list-style-type: none"> <li>» National Noise Control Regulations (GN R154 dated 10 January 1992)</li> </ul>	<ul style="list-style-type: none"> <li>» National Department of Environmental Affairs</li> <li>» Local Authorities</li> </ul>	<ul style="list-style-type: none"> <li>» There is no requirement for a noise permit in terms of the legislation. A Noise Impact Assessment is required to be undertaken in accordance with SANS 10328. This must be completed as part of the EIA process for the project.</li> </ul>
National Veld and Forest Fire Act (Act 101 of 1998)	<ul style="list-style-type: none"> <li>» Provides requirements for veldfire prevention through firebreaks and required measures for fire-fighting. Chapter 4 places a duty on landowners to prepare and maintain firebreaks, and Chapter 5 places a duty on all landowners to acquire equipment and have available personnel to fight fires.</li> </ul>	<ul style="list-style-type: none"> <li>» Department of Agriculture, Forestry and Fisheries</li> </ul>	<ul style="list-style-type: none"> <li>» While no permitting or licensing are required for the proposed development.</li> </ul>

<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
	<ul style="list-style-type: none"> <li>» In terms of S12 the applicant would be obliged to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land.</li> <li>» In terms of S12 the firebreak would need to be wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material.</li> <li>» In terms of Section 17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires.</li> </ul>		
<p>Hazardous Substances Act (Act No. 15 of 1973)</p>	<ul style="list-style-type: none"> <li>» This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and</li> </ul>	<ul style="list-style-type: none"> <li>» Department of Health</li> </ul>	<ul style="list-style-type: none"> <li>» It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled.</li> </ul>



<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
	<p>products.</p> <ul style="list-style-type: none"> <li>» Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance;</li> <li>» Group IV: any electronic product;</li> <li>» Group V: any radioactive material.</li> <li>» The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</li> </ul>		
<p>National Road Traffic Act (Act No 93 of 1996)</p>	<p>The Technical Recommendations for Highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>Legal axle load limits and the restrictions imposed on abnormally heavy loads are</p>	<ul style="list-style-type: none"> <li>» Provincial Department of Transport (provincial roads)</li> <li>» South African National Roads Agency Limited (national roads)</li> </ul>	<p>An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include:</p> <ul style="list-style-type: none"> <li>» Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads.</li> <li>» Transport vehicles exceeding the dimensional limitations (length) of 22m.</li> <li>» Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations</li> </ul>

<b>Legislation</b>	<b>Applicable Requirements</b>	<b>Relevant Authority</b>	<b>Compliance requirements</b>
	<p>discussed in relation to the damaging effect on road pavements, bridges and culverts.</p> <p>» The general conditions, limitations and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p>		<p>(height and width).</p>
<b>Provincial Legislation</b>			
<p>Nature Conservation Ordinance (Act No. 19 of 1974)</p>	<p>» Article 63 prohibits the picking of certain fauna (including cutting, chopping, taking, and gathering, uprooting, damaging, or destroying).</p> <p>» Schedule 3 lists endangered flora and Schedule 4 lists protected flora.</p> <p>» Articles 26 to 47 regulate the use of wild animals.</p>	<p>» Eastern Cape DEDEAT</p>	<p>» No permitting or licensing is required for the proposed development</p>

## PURPOSE & OBJECTIVES OF THE EMPr

## CHAPTER 3

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An Environmental Management Programme (EMPr) is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced”.

The EMPr has the following objectives:

- » To outline mitigation measures and environmental specifications which are required to be implemented for the planning, construction, rehabilitation, and operation phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the solar energy facility
- » To ensure that the construction and operation phases do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.
- » To propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation.
- » To facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the Basic Assessment (BA) process.

The mitigation measures identified within the Basic Assessment (BA) process are systematically addressed in the EMPr, ensuring the minimisation of adverse environmental impacts to an acceptable level.

Building Energy SpA must ensure that the implementation of the project complies with the requirements of Environmental Authorisation (EA) (once issued) and obligations emanating from other relevant environmental legislation.

This obligation is partly met through the development and the implementation of the EMPr through its integration into the contract documentation. Since this EMPr is part of the BA process undertaken for the proposed Son Citrus Rooftop Solar Energy Installation, it is important that this document be read in conjunction with the BA Report. This will contextualise the EMPr and enable a thorough understanding of its role and purpose in the integrated environmental management process. This EMPr for construction and operation activities has been compiled in accordance with Section 33 of the EIA Regulations and will be further developed in terms of specific requirements listed in an EA (once issued).

To achieve effective environmental management, it is important that Contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The Contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental

specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts.

This EMPr is applicable to all the employees and contractors of the proposed Son Citrus Rooftop Solar Facility working on the pre-construction, construction, operation and maintenance phases of the facility. The EMPr is a dynamic document, which must be updated when required. It is considered critical that this draft EMPr be updated to include site-specific information and specifications as required throughout the life-cycle of the facility. All revisions made to the EMPr should be submitted to DEA for approval before such revisions are implemented. This will ensure that the project activities are planned and implemented taking sensitive environmental features into account.

**STRUCTURE OF THIS EMPr**

**CHAPTER 4**

The first two chapters provide background to the EMPr and the proposed project, while the chapters which follow consider the following:

- » Key legislation applicable to the development;
- » Planning and design activities;
- » Construction activities;
- » Operation activities; and
- » Decommissioning activities.

These chapters set out the procedures necessary for Building Energy SpA, as the project developer, to minimise environmental impacts and achieve environmental compliance. For each of the phases of implementation, an over-arching environmental **goal** is stated. In order to meet this goal, a number of **objectives** are listed. The EMPr has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions, monitoring requirements and performance indicators. A specific EMPr table has been established for each environmental objective. The information provided within the EMPr table for each objective is illustrated below:

**OBJECTIVE: Description of the objective, which is necessary to meet the overall goals; which take into account the findings of the Basic Assessment specialist studies**

<b>Project Component/s</b>	List of project components affecting the objective, i.e. » PV panels and associated infrastructures.
<b>Potential Impact</b>	» Description of potential environmental impact if objective is not met.
<b>Activity/Risk Source</b>	» Description of activities which could affect achieving objective.
<b>Mitigation: Target/Objective</b>	» Description of the target and/or desired outcomes of mitigation.

Mitigation: Action/Control	Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above.	Who is responsible for the measures?	Periods for implementation.
<b>Performance Indicator</b>	Description of key indicator(s) that track progress/indicate the effectiveness of the EMPr.	
<b>Monitoring</b>	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods, and reporting.	

The objectives and EMPr tables are required to be reviewed and possibly modified whenever changes, such as the following, occur:

- » Planned activities change (i.e. in terms of the components and/or layout of the facility);
- » Modification to or addition to environmental objectives and targets;
- » Relevant legal or other requirements are changed or introduced; and
- » Significant progress has been made on achieving an objective or target such that it should be re-examined to determine if it is still relevant, should be modified, etc.

**MANAGEMENT PROGRAMME: PLANNING AND DESIGN**

**CHAPTER 5**

**Overall Goal:** undertake the planning and design phase in a way that:

- » Ensures that the design of the facility responds to the identified environmental constraints and opportunities.
- » Enables the solar energy facility construction activities to be undertaken without significant disruption to other land uses and activities in the area.

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

**5.1 Objectives**

**(MPPD 1) OBJECTIVE: To ensure effective communication mechanisms**

On-going communication with affected and surrounding landowners is important to maintain during the construction and operational phases of the solar energy facility. Any issues and concerns raised should be addressed as far as possible in as short a timeframe as possible.

<b>Project component/s</b>	» Solar energy facility
<b>Potential Impact</b>	» Impacts on affected and surrounding landowners and land uses
<b>Activity/risk source</b>	» Activities associated with solar energy facility construction » Activities associated with solar energy facility operation
<b>Mitigation: Target/Objective</b>	» Effective communication with affected and surrounding landowners » Addressing of any issues and concerns raised as far as possible in as short a timeframe as possible

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Utilise a grievance mechanism procedure (for both the public and labour) (refer to Appendix A) and stakeholder forum for addressing any complaints during both the construction and operational phases of the facility.	Building Energy SpA	Pre-construction (construction procedure) Pre-operation (operation procedure)

<b>Performance Indicator</b>	» Effective communication procedures in place.
<b>Monitoring</b>	» An incident reporting system should be used to record non-conformances to the EMPr



## MANAGEMENT PROGRAMME: CONSTRUCTION

## CHAPTER 6

**Overall Goal:** Undertake the construction phase in a way that:

- » Ensures that construction activities are appropriately managed in respect of environmental aspects and impacts.
- » Enables construction activities to be undertaken without significant disruption to other land uses and activities in the area, in particular concerning noise impacts, traffic and road use, and effects on local residents.

### 6.1 Institutional Arrangements: Roles and Responsibilities for the Construction Phase

As the proponent, Building Energy SpA must ensure that the implementation of the facility complies with the requirements of all environmental authorisations and obligations emanating from other relevant environmental legislation. This obligation is partly met through the development of the EMPr, and the implementation of the EMPr through its integration into the contract documentation. Building Energy SpA will retain various key roles and responsibilities during the construction of the facility.

**(MPC 1) OBJECTIVE: Establish clear reporting, communication, and responsibilities in relation to overall implementation of the EMPr**

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Manager, Site Manager, ECO, Safety, Health and Environment Representative, and Contractor for the construction phase of this project are as detailed below.

**Project Manager** will:

- » Ensure all specifications and legal constraints specifically with regards to the environment are highlighted to the Contractor(s) so that they are aware of these.
- » Ensure that Building Energy SpA and its Contractor(s) are made aware of all stipulations within the EMPr.
- » Ensure that the EMPr is correctly implemented throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes.
- » Be fully knowledgeable with the Basic Assessment for the project, the EMPr, the conditions of the Environmental Authorisation (once issued), and all relevant environmental legislation.

**Site Manager** (Building Energy's on-site Representative) will:

- » Be fully knowledgeable with the contents of the Basic Assessment.
- » Be fully knowledgeable with the contents and conditions of the Environmental Authorisation (once issued).
- » Be fully knowledgeable with the contents of the EMPr.
- » Have overall responsibility of the EMPr and its implementation.
- » Conduct audits to ensure compliance to the EMPr.
- » Ensure there is communication with the Project Manager, the ECO, and relevant discipline engineers on matters concerning the environment.
- » Ensure that no actions are taken which will harm or may indirectly cause harm to the environment, and take steps to prevent pollution on the site.
- » Confine activities to the demarcated construction site.

An **Environmental Control Officer** (ECO) must be assigned to the project by Building Energy SpA prior to the commencement of any authorised activities. The ECO will be responsible for monitoring monthly or as stipulated in the EA (once issued), reviewing and verifying compliance by the Contractor with the environmental specifications of the EMPr and the conditions of the Environmental Authorisation (once issued). Accordingly, the ECO will:

- » Be fully knowledgeable with the contents within the BA.
- » Be fully knowledgeable with the contents within the conditions of the Environmental Authorisation.
- » Be fully knowledgeable with the contents within the EMPr.
- » Be fully knowledgeable with the contents within all relevant environmental legislation, and ensure compliance with them.
- » Ensure that the contents of this document are communicated to the Contractor site staff and that the Site Manager and Contractor are constantly made aware of the contents through discussion.
- » Ensure that the compliance of the EMPr is monitored through regular and comprehensive inspection of the site and surrounding areas.
- » Ensure that if the EMPr conditions or specifications are not followed then appropriate measures are undertaken to address this.
- » Monitoring and verification must be implemented to ensure that environmental impacts are kept to a minimum, as far as possible.
- » Ensure that the Site Manager has input into the review and acceptance of construction methods and method statements.
- » Ensure that activities on site comply with all relevant environmental legislation.
- » Ensure that appropriate measures are undertaken to address any non-compliances recorded.
- » Ensure that a removal is ordered of any person(s) and/or equipment responsible for any contravention of the specifications of the EMPr.

- » Ensure that the compilation of progress reports for submission to the Project Manager, with input from the Site Manager, takes place on a regular basis, including a final post-construction audit.
- » Ensure that there is communication with the Site Manager regarding the monitoring of the site.
- » Ensure that any non-compliance or remedial measures that need to be applied are reported.
- » Keep record of all activities on site, problems identified and transgressions noted.

An independent audit and report in terms of compliance with the specifications of the EMPr and conditions of the Environmental Authorisation should be undertaken by suitably qualified party where required by the DEA (or in line with the Environmental Authorisation).

**Contractors and Service Providers:** It is important that contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The contractor's obligations in this regard include the following:

- » employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment.
- » A copy of the EMPr must be easily accessible to all on-site staff members.
- » employees must be familiar with the requirements of this EMPr and the environmental specifications as they apply to the construction of the proposed facility.
- » Prior to commencing any site works, all employees and sub-contractors must have attended environmental awareness induction training that must provide staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- » Staff will be informed of environmental issues as deemed necessary by the EO.

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- » Ensuring adherence to the environmental management specifications.
- » Ensuring that Method Statements are submitted to the Site Manager for approval before any work is undertaken.
- » Any lack of adherence to the above will be considered as non-compliance to the specifications of the EMPr.
- » Ensuring that any instructions issued by the Site Manager on the advice of the EO are adhered to.

- » Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- » Ensuring that a register of all public complaints is maintained.
- » Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained as to the environmental obligations).

## 6.2 Objectives

In order to meet the overall goal for construction, the following objectives, actions, and monitoring requirements have been identified.

### (MPC 1) OBJECTIVE: Minimise impacts related to inappropriate site establishment

The Contractor must take all reasonable measures to ensure the safety of the public in the surrounding area. Where the public could be exposed to danger by any of the works or site activities, the contractor must, as appropriate, provide suitable flagmen, barriers and/or warning signs in appropriate local languages, all to the approval of the Site Manager.

<b>Project Component/s</b>	» Area infrastructure (i.e. PV panels).
<b>Potential Impact</b>	» Hazards to landowners and public.
<b>Activities/Risk Sources</b>	» Movement of construction vehicles in the area and on-site.
<b>Mitigation: Target/Objective</b>	» To secure the site against unauthorised entry. » To protect members of the public/landowners/residents.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Secure site, working areas and excavations in an appropriate manner, as agreed with the EO.	Contractor	Site establishment, and duration of construction.
Adequate protective measures must be implemented to prevent unauthorised access to the working area.	Contractor	Site establishment, and duration of construction.
Demarcate area of designated contractor's equipment camp.	Contractor	Site establishment
Establish appropriately bunded areas for storage of hazardous materials (i.e. fuel to be required during construction).	Contractor	Site establishment

Mitigation: Action/Control	Responsibility	Timeframe
Supply adequate waste collection bins at site where construction is being undertaken. Separate bins should be provided for general and hazardous waste. As far as possible, provision should be made for separation of waste for recycling.	Contractor	Site establishment, and duration of construction.

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Site is secure and there is no unauthorised entry.</li> <li>» No members of the public/ landowners injured as a result of the construction activities.</li> <li>» Appropriate and adequate waste management facilities provided at construction site.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» An incident reporting system will be used to record non-conformances to the EMPr.</li> <li>» EO to monitor all construction areas on a continuous basis until all construction is completed. Non-conformances will be immediately reported to the site manager.</li> </ul>

**(MPC 2) OBJECTIVE: Environmentally sensitive location of construction equipment camps on site**

It is expected that all construction workers will be accommodated within existing accommodation within nearby townships as far as possible. No construction workers will be accommodated on site. In addition, construction equipment may need to be stored at an appropriate location on the site for the duration of the construction period.

<b>Project Component/s</b>	» Construction equipment camps.
<b>Potential Impact</b>	» None identified- the proposed site has been paved.
<b>Activities/Risk Sources</b>	» Access to and from the equipment storage area/s.
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To limit equipment storage within the demarcated site.</li> <li>» To also limit impacts on existing activities on site.</li> </ul>

Mitigation: Action/Control	Responsibility	Timeframe
The construction equipment camp must be situated in a position agreed upon with the current tenant of the building as this would need to be placed so as to not impact on their daily activities.	Contractor	Contract duration

<b>Performance Indicator</b>	» Appropriate waste management.
<b>Monitoring</b>	» Regular audits of the construction camps and areas of construction on site. » An incident reporting system should be used to record non-conformances to the EMP.

**(MPC 3) OBJECTIVE: Mitigate the possible visual impact associated with the construction phase**

During the construction phase heavy vehicles, components, equipment and construction crews will frequent the area and may cause, at the very least, a visual nuisance to landowners and residents in the area as well as road users. Secondary visual impacts associated with the construction phase, such as the sight of construction vehicles and construction litter must be managed to reduce visual impacts.

<b>Project component/s</b>	» Construction site
<b>Potential Impact</b>	» Visual impact of general construction activities and associated impacts.
<b>Activity/risk source</b>	» Potential impact on sensitive receptors.
<b>Mitigation: Target/Objective</b>	» Minimal visual intrusion by construction activities and general acceptance and compliance with Environmental Specifications.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Contractor to sign and undertake to comply with Environmental Specifications.	Contractor	Pre-construction
Keep disturbed areas at ground level to a minimum.	Contractor	Throughout construction

<b>Performance Indicator</b>	» Construction site is confined to the demarcated areas identified on a Development Plan. » No transgression of the Environmental Specifications visible.
<b>Monitoring</b>	Monitoring to be undertaken by an Environmental Officer who will ensure compliance with the Environmental Specifications.



**(MPC 4) OBJECTIVE: Appropriate management of the construction site and construction workers**

The construction phase of the PV facility is expected to extend over a period of 5 months. Approximately 20 people are expected to be required during the construction phase. Ideally low skilled and semi-skilled positions will be filled by locals living in the Kirkwood area. This will however be dependent on the skills availability in the area. Workers not living in the area, including those required for skilled positions will be transported to site on a daily basis and will not be housed on site. However, the security team will be required on site at all times.

<b>Project Component/s</b>	» Area infrastructure (i.e. PV panels).
<b>Potential Impact</b>	» Pollution/contamination of the environment. » Impacts on surrounding and affected landowners/occupiers
<b>Activities/Risk Sources</b>	» Contractors not aware of the requirements of the EMPr, leading to unnecessary impacts on the surrounding environment.
<b>Mitigation: Target/Objective</b>	» Limit equipment storage within demarcated designated areas. » Ensure appropriate management of actions by on-site personnel in order to minimise impacts to the surrounding environment.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Ensure waste removal facilities are maintained and emptied on a regular basis.	Contractor	Site establishment, and duration of construction.
The terms of this EMPr and the Environmental Authorisation (once issued) must be included in all tender documentation and Contractors contracts.	Building Energy SpA	Tender process
Ensure that all personnel have received the appropriate level of environmental awareness training to ensure continued environmental due diligence and on-going minimisation of environmental harm. This can be achieved through the provision of appropriate environmental awareness training to all personnel. Records of all training undertaken must be kept.	Contractor	Duration of construction
Establish the necessary ablution facilities with chemical toilets and provide adequate sanitation facilities and ablutions for construction workers (1 toilet per every 15 workers) at appropriate locations on site.	Contractor	Site establishment, and duration of construction.
All litter must be deposited in a clearly marked, closed disposal bin in the construction area. Particular attention needs to be paid to food waste.	Contractor and sub-contractor/s	Duration of contract
Fire - fighting equipment must be available on the site and training must be provided to the relevant safety	Contractor and sub-	Duration of contract

Mitigation: Action/Control	Responsibility	Timeframe
officers before the construction phase commences.	contractor/s	
Draft and implement a Code of Conduct for construction workers.	Contractor and sub-contractor/s	Pre-construction
Contractors must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.	Contractor and sub-contractor/s	Construction
On completion of the construction phase, all construction workers must leave the site within one week of their contract ending.	Contractor and sub-contractor/s	Construction
Develop and implement a grievance mechanism for the construction, operational and closure phases of the project for all employees, contractors, subcontractors and site personnel. This procedure should be in line with the South African Labour Law.	Building Energy SpA	Pre-construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Ablution and waste removal facilities are in a good working order.</li> <li>» No complaints regarding contractor behaviour or habits.</li> <li>» Appropriate training of all staff is undertaken prior to them commencing work on the construction site.</li> <li>» Code of Conduct drafted before commencement of construction phase.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Regular audits of the construction camps and areas of construction on site by the EO.</li> <li>» An incident reporting system should be used to record non-conformances to the EMPr.</li> <li>» Observation and supervision of Contractor practices throughout construction phase by the EO.</li> <li>» Complaints will be investigated and, if appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMPr.</li> </ul>

**(MPC 5) OBJECTIVE: Maximise local employment and business opportunities associated with the construction phase**

Although limited, employment opportunities could be created during the construction phase specifically for semi-skilled and unskilled workers. The unemployment rate in the study area is quite high and there are therefore various individuals in the area in search of employment. Employment of locals and the involvement of local SMMEs would enhance the social benefits associated with the project, even if the opportunities are only



temporary. The procurement of local goods could furthermore result in positive economic spin-offs.

<b>Project Component/s</b>	» Area infrastructure (i.e. PV panels).
<b>Potential Impact</b>	» The opportunities and benefits associated with the creation of local employment and business should be maximised as far as possible.
<b>Activities/Risk Sources</b>	» The employment of outside contractors to undertake the work and who make use of their own labour will reduce the employment and business opportunities for locals. Employment of local labour will maximise local employment opportunities.
<b>Mitigation: Target/Objective</b>	» Building Energy SpA should aim to employ as many as possible low-skilled workers from the local area. This should also be made a requirement for all contractors. Building Energy SpA should also develop a database of local BEE service providers

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Attempt to employ a majority of the low-skilled workers from the local area.	Building Energy SpA & contractors	Employment and business policy document that sets out local employment targets must be in compiled before construction phase commences.
Where required, implement appropriate training and skills development programmes prior to the initiation of the construction phase to ensure that local employment target is met.	Building Energy SpA	Initiate prior to the initiation of the construction phase

<b>Performance Indicator</b>	» Majority of semi and unskilled labour locally sourced.
<b>Monitoring</b>	» Project EO must monitor indicators listed above to ensure that they have been met for the construction phase.

**(MPC 6) OBJECTIVE: Avoid the potential impacts on family structures and social networks associated with presence of construction workers from outside the area**

Even though the inflow of jobseekers is likely to occur, the probability of this issue becoming problematic and resulting in severe negative social impacts is seen to be improbable.

Other possible negative impacts due to the workforce's presence in the area and especially when jobseekers come to the area would include misconduct of workers,

trespassing of workers on privately owned farms, the possible increase in crime, littering, increase in traffic, increase in noise, the development of informal vending stations, and poaching of livestock.

<b>Project Component/s</b>	» Area infrastructure (i.e. PV panels).
<b>Potential Impact</b>	» The presence of construction workers who live outside the area and who are housed in local town can affect family structures and social networks.
<b>Activities/Risk Sources</b>	» The presence of construction workers can affect negatively on family structures and social networks, especially in small, rural communities.
<b>Mitigation: Target/Objective</b>	» To avoid and or minimise the potential impact of construction workers on the local community. This can be achieved by maximising the number of locals employed during the construction phase..

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Where appropriate, attempt to ensure that the majority of the low-skilled workers are sourced from the local area. This should be included in the tender documents. Construction workers should be recruited from the local area (Kirkwood).	Building Energy SpA and contractors	Construction phase.
Identify local contractors who are qualified to undertake the required work.	Contractor	Pre-construction
Develop and implement a Code of Conduct to cover the activities of the construction workers.	Contractor	Pre-construction
Ensure that construction workers attend a brief session before they commence activities. The aim of the briefing session is to inform them of the rules and regulations governing activities on the site as set out in the Code of Conduct.	Contractor	Pre-construction
Ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct.	Contractor	Pre-construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Employment policy and tender documents that sets out local employment and targets completed before construction phase commences.</li> <li>» Tender documents for contractors include recommendations for construction camp.</li> <li>» Code of Conduct drafted before commencement of construction phase.</li> <li>» Briefing session with construction workers held at outset of construction phase.</li> </ul>
<b>Monitoring</b>	» Project EO must monitor indicators listed above to ensure that they have been met for the construction phase.

**(MPC 7) OBJECTIVE: Minimise impacts related to traffic and transportation of equipment and materials to site**

The construction phase of the project will be the most significant in terms of generating traffic impacts; resulting from the transport of equipment (including panels components) and materials and construction crews to the site and the return of the vehicles after delivery of materials. Potential impacts associated with transportation and access relate to works within the site boundary and external works outside the site boundary.

<b>Project Component/s</b>	» Area infrastructure (i.e. PV panels).
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Impact of heavy construction vehicles on road surfaces, and possible increased risk in accidents involving people and animals.</li> <li>» Traffic congestion, particularly on narrow roads or on road passes where overtaking is not permitted.</li> <li>» Deterioration of road pavement conditions due to abnormal loads.</li> </ul>
<b>Activities/Risk Sources</b>	<ul style="list-style-type: none"> <li>» Construction vehicle movement.</li> <li>» Speeding on local roads.</li> <li>» Degradation of local road conditions.</li> <li>» Plant equipment installation.</li> <li>» Mobile construction equipment movement on-site.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Minimise impact of traffic associated with the construction of the facility on local traffic volume, existing infrastructure, property owners, animals, and road users.</li> <li>» To minimise potential for negative interaction between pedestrians or sensitive users and traffic associated with the facility construction.</li> <li>» To ensure all vehicles are roadworthy and all materials/ equipment are transported appropriately and within any imposed permit/licence conditions.</li> </ul>

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
The contractor's plans, procedures and schedules, as well as the anticipated intrusion impacts should be clarified with affected parties prior to the commencement of construction activities on site.	Contractor	Pre-construction
Source general construction material and goods locally where available to limit transportation over long distances.	Building Energy SpA and Contractor	Pre-construction and construction
Construction vehicles and those transporting materials and goods should be inspected by the contractor or a sub-contractor to ensure that these are in good working order and not overloaded.	Transport Contractor	Construction
Strict vehicle safety standards should be implemented	Contractor	Construction

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
and monitored.		
All relevant permits for abnormal loads must be applied for from the relevant authority.	Contractor (or appointed transportation contractor)	Pre-construction
No deviation from approved transportation routes must be allowed, unless roads are closed for whatever reason outside the control of the contractor.	Contractor	Duration of contract
Appropriate road management strategies must be implemented on external and internal roads with all employees and contractors required to abide by standard road and safety procedures.	Contractor (or appointed transportation contractor)	Pre-construction
Any traffic delays because of construction traffic must be co-ordinated with the appropriate authorities.	Contractor	Duration of contract
The movement of all vehicles within the site must be on designated roadways and must be agreed upon by Son Citrus Packers (Pty) Ltd.	Contractor	Duration of contract
Signage must be established at appropriate points warning of turning traffic and the construction site (all signage to be in accordance with prescribed standards).	Contractor	Duration of contract
Appropriate maintenance of all vehicles of the contractor must be ensured.	Contractor	Duration of contract
All vehicles of the contractor travelling on public roads must adhere to the specified speed limits and all drivers must be in possession of an appropriate valid driver's license.	Contractor	Duration of contract
Signs must be placed along construction roads to identify speed limits, travel restrictions and other standard traffic control information.	Contractor	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Vehicles keeping to the speed limits.</li> <li>» Vehicles are in good working order and safety standards are implemented.</li> <li>» Local residents and road users are aware of vehicle movements and schedules.</li> <li>» No construction traffic related accidents are experienced.</li> <li>» Local road conditions and road surfaces are up to standard.</li> <li>» Complaints of residents are not received (e.g. concerning the speeding of heavy vehicles).</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Project EO must monitor indicators listed above to ensure that they have been implemented.</li> </ul>

**(MPC 8) OBJECTIVE: To avoid and or minimise the potential impacts of safety, noise and dust and damage to roads caused by construction vehicles during the construction phase**

During the construction phase, limited gaseous or particulate emissions are anticipated from exhaust emissions from construction vehicles and equipment on-site.

<b>Project Component/s</b>	» Area infrastructure (i.e. PV panels).
<b>Potential Impact</b>	» Heavy vehicles can generate noise and dust impacts. Movement of heavy vehicles can also damage roads.
<b>Activities/Risk Sources</b>	» The movement of heavy vehicles and their activities on the site can result in noise and dust impacts (minimal) and damage roads.
<b>Mitigation: Target/Objective</b>	» To avoid and or minimise the potential noise and dust impacts associated with heavy vehicles, and minimise damage to roads.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Ensure that vehicles used to transport building materials are fitted with tarpaulins or covers.	Contractors	Duration of Construction
Ensure that all vehicles are road-worthy; drivers are qualified and are made aware of the potential noise, dust and safety issues.	Contractors	Duration of Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Drivers made aware of the potential safety issues and enforcement of strict speed limits when they are employed.</li> <li>» Road worthy certificates in place for all heavy vehicles at outset of construction phase and up-dated on a monthly basis.</li> </ul>
<b>Monitoring</b>	» Project EO must monitor indicators listed above to ensure that they have been met for the construction phase.

**(MPC 9) OBJECTIVE: Appropriate handling and management of waste**

The main wastes expected to be generated by the construction of the rooftop solar energy facility will include general construction waste including hazardous waste (i.e. hydrocarbons), and liquid waste (including grey water and sewage)

In order to manage the wastes effectively, measures for the assessment, classification, and management of wastes, along with industry principles for minimising construction wastes must be implemented.

<b>Project Component/s</b>	» PV panels.
<b>Potential Impact</b>	» Inefficient use of resources resulting in excessive waste generation. » Litter or contamination of the site poor waste management practices.
<b>Activity/Risk Source</b>	» Packaging. » Other construction wastes. » Spoil material from excavation.
<b>Mitigation: Target/Objective</b>	» To comply with waste management legislation. » To minimise production of waste. » To ensure appropriate waste storage and disposal. » To avoid environmental harm from waste disposal.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Construction method and materials should be carefully considered in view of waste reduction, re-use, and recycling opportunities.	Contractor	Duration of contract
Construction contractors must provide specific detailed waste management plans to deal with all waste streams.	Contractor	Duration of contract
Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (metal scrap), and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage, and vermin control.	Contractor	Duration of contract
Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as metals, general refuse etc.).	Contractor	Duration of contract
Disposal of waste must be in accordance with relevant legislative requirements.	Contractor	Duration of contract
Waste must be removed for recycling/ disposal at an appropriate frequency determined by the developer.	Waste contractor	Duration of contract
Waste must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal.	Contractor	Duration of contract
Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste. Waste disposal records must be available for review at any time.	Contractor	Duration of contract
Upon the completion of construction, the area must be cleared of potentially polluting materials.	Contractor	Completion of construction
Dispose of all solid waste collected at an appropriately registered waste disposal site. Waste disposal shall be	Contractor	Duration of construction

Mitigation: Action/Control	Responsibility	Timeframe
in accordance with all relevant legislation and under no circumstances may waste be burnt on site.		

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No complaints received regarding waste on site or indiscriminate dumping.</li> <li>» Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately.</li> <li>» Provision of all appropriate waste manifests for all waste streams.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and supervision of waste management practices throughout construction phase.</li> <li>» Waste collection will be monitored on a regular basis.</li> <li>» Waste documentation completed.</li> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

**(MPC 10) OBJECTIVE: Appropriate handling and storage of chemicals, hazardous substances**

The construction phase will involve the storage and handling of a variety of chemicals including adhesives, abrasives, oils and lubricants, paints and solvents.

<b>Project Component/s</b>	» PV panels.
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Release of contaminated water from contact with spilled chemicals.</li> <li>» Generation of contaminated wastes from used chemical containers.</li> </ul>
<b>Activity/Risk Source</b>	» Construction activities
<b>Mitigation: Target/Objective</b>	» To ensure that the storage and maintenance of machinery on-site does not cause pollution of the environment or harm to persons.

Mitigation: Action/Control	Responsibility	Timeframe
Develop and implement an emergency preparedness plan during the construction phase.	Contractor	Pre-construction and implement for duration of Contract
Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants.	Contractor	Duration of contract
Corrective action must be undertaken immediately if a complaint is made, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the	Contractor	Duration of contract

Mitigation: Action/Control	Responsibility	Timeframe
affected environment as much as practically possible and implementing preventive measures.		
In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents.	Contractor	Duration of contract
Routine servicing and maintenance of vehicles must not take place on-site (except for emergencies). If repairs of vehicles must take place on site, an appropriate drip tray must be used to contain any fuel or oils.	Contractor	Duration of contract
Construction machinery must be stored in an appropriately sealed area.	Contractor	Duration of contract
The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with Material Safety Data Sheets (MSDS) files.	Contractor	Duration of contract
Transport of all hazardous substances must be in accordance with the relevant legislation and regulations.	Contractor	Duration of contract
Upon the completion of construction, the area must be cleared of potentially polluting materials.	Contractor	Completion of construction
Implement an effective monitoring system to detect any leakage or spillage of all hazardous substances.	Contractor	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No chemical spills outside of designated storage areas.</li> <li>» No complaints received regarding waste on site or indiscriminate dumping.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase.</li> <li>» A complaints register must be maintained, in which any complaints from the community will be logged.</li> <li>» An incident reporting system will be used to record non-conformances to the EMPr.</li> </ul>

**(MPC 11) OBJECTIVE: Ensure all construction activities are undertaken with the appropriate level of environmental awareness to minimise environmental risk**

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract, and how specifications within this EMPr will be met. That is, the



Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager.

A Method Statement is defined as "a written submission by the Contractor in response to the environmental specification or a request by the Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Site Manager is able to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications". Where appropriate, these method statements should use, complement and extend the method statements developed as part of the project SHE requirements.

The Method Statement must cover applicable details with regards to:

- » Responsible person/s
- » Construction procedures;
- » Materials and equipment to be used;
- » Getting the equipment to and from site;
- » How the equipment/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; and
- » Any other information deemed necessary by the Site Manager.

Method Statements for pre-construction and post-construction should, where appropriate, inter alia:

- » Site Establishment plan (which explains all activities from induction training to offloading, construction sequence for site establishment and the different amenities and to be established etc. Including a site camp plan indicating all of these).
- » Preparation of the site.
- » Excavations and backfilling procedure and processes (required for the installation of underground cables).
- » Stipulate norms and standards for water supply and usage (i.e.: comply strictly with licence and legislation requirements and restrictions as applicable).
- » Ablution facilities (maintenance, management and servicing).
- » Solid Waste Management:
  - \* Description of the waste storage facilities (on site and accumulative).
  - \* Placement of waste stored (on site and accumulative).
  - \* Management and collection of waste process.
  - \* Recycle, re-use and removal process and procedure.
- » Noise pollution:

- \* Describe necessary measures to ensure that noise from construction activities is maintained within lawfully acceptable levels (construction activities generating output levels of 85 dB(A) near human settlement, are to be confined to working hours (06h00 - 18h00) Mondays to Fridays).
- » Hazardous substance storage (ensure compliance with all national, regional and local legislation with regard to the storage of oils, fuels, lubricants, solvents, wood treatments, and any other harmful and hazardous substances and materials. South African National Standards apply).
  - \* List of all potentially hazardous substances to be used.
  - \* Appropriate handling, storage and disposal procedures.
  - \* Prevention plan of accidental contamination of soil at storage and handling areas.
  - \* All storage areas, (i.e.: for harmful substances appropriately bunded with a suitable collection point for accidental spills must be implemented and drip trays underneath dispensing mechanisms including leaking engines/machinery).
- » Traffic management.
- » Incident and accident reporting protocol.
- » General administration (and stipulating that all documentation and licences must be on site at all times).
- » Designate access road and the protocol on while roads are in use.
- » Requirements of gate control protocols.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Building Energy SpA Construction Manager/Project Manager, except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract. Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved.

The Project EO should monitor the construction activities to ensure that these are undertaken in accordance with the approved Method Statement.

### **6.3 Awareness and Competence: Construction Phase of the Solar Energy Facility**

**(MPC 14) OBJECTIVE: To ensure all construction personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm**

To achieve effective environmental management, it is important that Contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The Contractor is responsible for informing employees and sub-

contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts.

The Contractors obligations in this regard include the following:

- » Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment.
- » Ensuring that a copy of the EMPr is readily available on-site, and that all site staff are aware of the location and have access to the document.
- » Employees will be familiar with the requirements of the EMPr and the environmental specifications as they apply to the construction of the facility.
- » Employees must undergo training for the operation and maintenance activities associated with a PV facility and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.
- » Ensuring that, prior to commencing any site works, all employees and sub-contractors have attended an Environmental Awareness Training course.
- » The course should be sufficient to provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- » Awareness of any other environmental matters, which are deemed necessary by the EO.
- » Ensuring that employee information posters, outlining the environmental "do's" and "don'ts" (as per the environmental awareness induction training) are erected at prominent locations throughout the site.
- » Ensure that relevant construction workers have received basic awareness training in environmental management, including the storage and handling of hazardous substances and management of waste.
- » Records must be kept of those that have completed the relevant training.
- » Training should be done either in a written or verbal format but must be appropriate for the receiving audience.
- » Refresher sessions, during toolbox talks, must be held to ensure the contractor staff are aware of their environmental obligations as practically possible.

Therefore, prior to the commencement of construction activities on site and before any person commences with work on site thereafter, adequate environmental awareness and responsibility are to be appropriately presented to all staff present onsite, clearly describing their obligations towards environmental controls and methodologies in terms of this EMPr. This training and awareness will be achieved in the following ways:

### **6.3.1 Environmental Awareness Training**

Environmental Awareness Training must take the form of an on-site talk and demonstration by the EO before the commencement of site establishment and construction on site. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor team. A record of attendance of this training must be maintained by the Contractor on site.

### **6.3.2 Induction Training**

Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations; Contractor's or Engineer's staff; administrative or site staff; sub-contractors or visitors to site.

This induction training should include discussing the developer's environmental policy and values, the function of the EMPr and Contract Specifications and the importance and reasons for compliance to these. The induction training must highlight overall do's and don'ts on site and clarify the repercussions of not complying with these. The non-conformance reporting system must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the SHE Officer on site.

### **6.3.3 Toolbox Talks**

Toolbox talks should be held on a scheduled and regular basis (at least twice a month) where foremen, environmental and safety representatives of different components of the Works and sub-consultants hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

## **6.4 Monitoring Programme: Construction Phase**

**(MPC 15) OBJECTIVE: To monitor the performance of the control strategies employed against environmental objectives and standards**

A monitoring programme must be in place not only to ensure conformance with the EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the Environmental Authorisation (once issued). Where this is not clearly dictated, Building Energy SpA will determine and stipulate the period and frequency of

monitoring required in consultation with relevant stakeholders and authorities. The Project Manager will ensure that the monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- » Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- » Ensure adequate and appropriate interventions to address non-compliance.
- » Ensure adequate and appropriate interventions to address environmental degradation.
- » Provide a mechanism for the lodging and resolution of public complaints.
- » Ensure appropriate and adequate record keeping related to environmental compliance.
- » Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- » Aid communication and feedback to authorities and stakeholders.

## MANAGEMENT PROGRAMME: OPERATION

## CHAPTER 7

**Overall Goal:** To ensure that the operation of the solar energy facility does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate the facility in a way that:

- » Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enables the solar energy facility operation activities to be undertaken without significant disruption to other land uses in the area.

Building Energy SpA must appoint an environmental manager who will be ensuring the implementation of the operational EMPr.

### 7.1. Objectives

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

#### **(MPO 1) OBJECTIVE: Maximise local employment and business opportunities associated with the operational phase**

Although limited, 6 permanent employment opportunities could be created during the operational phase specifically for semi-skilled and unskilled workers within the Kirkwood area.

<b>Project Component/s</b>	» PC facility
<b>Potential Impact</b>	» The opportunities and benefits associated with the creation of local employment and business should be maximised.
<b>Activities/Risk Sources</b>	» The employment of outside workers to undertake the work will reduce the employment and business opportunities for locals. Employment of local labour will maximise local employment opportunities.
<b>Mitigation: Target/Objective</b>	» Building Energy SpA should aim to employ a minimum of 14 workers from the local area.

Mitigation: Action/Control	Responsibility	Timeframe
Attempt to employ a majority of the low-skilled workers from the local area.	Building Energy SpA & contractors	Employment and business policy document that sets out local employment targets to be in place before operation phase commences.

<b>Performance Indicator</b>	» Majority of semi and unskilled labour locally sourced.
<b>Monitoring</b>	» Building Energy's Project Manager must monitor the recruitment process.

**(MPO 2) OBJECTIVE: The mitigation and possible negation of visual associated with the operational phase**

The solar facility would packaging facilities rooftop therefore there would be impacts such as glare from the panels during the day and the solar plant would need to be maintained in good condition.

<b>Project component/s</b>	PV facility and associated infrastructure
<b>Potential Impact</b>	Visual impact of facility.
<b>Activity/risk source</b>	The viewing PV facility by observers on or near the site (i.e. within 2 km of the site).
<b>Mitigation: Target/Objective</b>	Well maintained and neat facility.

Mitigation: Action/control	Responsibility	Timeframe
Maintain the general appearance of the facility as a whole.	Building Energy SpA & contractors	Throughout the operational phase.

<b>Performance Indicator</b>	Well maintained and neat facility.
<b>Monitoring</b>	Monitoring of the entire site on an on-going basis (by operator).

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## **MANAGEMENT PROGRAMME: DECOMMISSIONING**

## **CHAPTER 8**

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The solar infrastructure which will be utilised for the proposed solar energy facility is expected to have a lifespan of 20 years (i.e. with maintenance). Equipment associated with this facility would only be decommissioned once it has reached the end of its economic life. It is most likely that decommissioning activities of the infrastructure of the facility would comprise the disassembly and replacement of the solar infrastructure with more appropriate technology/infrastructure available at that time.

The relevant mitigation measures contained under the construction section should be applied during decommissioning and therefore is not repeated in this section. It must be noted that decommissioning activities will need to be undertaken in accordance with the legislation applicable at that time, which may require this section of the EMPr to be revisited and amended.

Should the activity ever cease or become redundant, the applicant shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time.

### **8.1. Site Preparation**

Site preparation activities will include confirming the integrity of the access to the site to accommodate required equipment, preparation of the site and the mobilisation of construction equipment.

### **8.2 Disassemble and Remove Infrastructure**

Disassembled components will be reused, recycled, or disposed of in accordance with regulatory requirements.



**APPENDIX A:  
GRIEVANCE MECHANISM FOR PUBLIC COMPLAINTS  
AND ISSUES**

## **GRIEVANCE MECHANISM / PROCESS**

### **AIM**

The aim of the grievance mechanism is to ensure that grievances / concerns raised by local landowners and or communities are addressed in a manner that is:

- » Fair and equitable;
- » Open and transparent; and
- » Accountable and efficient.

It should be noted that the grievance mechanism does not replace the right of an individual, community, group or organization to take legal action should they so wish. However, the aim should be to address grievances in a manner that does not require a potentially costly and time consuming legal process.

### **Proposed generic grievance process**

- » Local landowners, communities and authorities will be informed in writing by the proponent (the renewable energy company) of the grievance mechanism and the process by which grievances can be brought to the attention of the proponent.
- » A company representative will be appointed as the contact person for grievances to be addressed to. The name and contact details of the contact person will be provided to local landowners, communities and authorities.
- » Project related grievances relating to the construction, operational and or decommissioning phase must be addressed in writing to the contact person. The contact person should assist local landowners and or communities who lack resources to submit/prepare written grievances.
- » The grievance will be registered with the contact person who, within 2 working days of receipt of the grievance, will contact the Complainant to discuss the grievance and agree on suitable date and venue for a meeting. Unless otherwise agreed, the meeting will be held within 2 weeks of receipt of the grievance.
- » The contact person will draft a letter to be sent to the Complainant acknowledging receipt of the grievance, the name and contact details of Complainant, the nature of the grievance, the date that the grievance was raised, and the date and venue for the meeting.
- » Prior to the meeting being held the contact person will contact the Complainant to discuss and agree on who should attend the meeting. The people who will be required to attend the meeting will depend on the nature of the grievance. While the Complainant and or proponent are entitled to invite their legal representatives to attend the meeting/s, it should be made clear that to all the parties involved in the process that the grievance

mechanism process is not a legal process. It is therefore recommended that the involvement of legal representatives be limited.

- » The meeting will be chaired by the company representative appointed to address grievances. The proponent will provide a person to take minutes of and record the meeting/s. The costs associated with hiring venues will be covered by the proponent. The proponent will also cover travel costs incurred by the Complainant, specifically in the case of local, resource poor communities.
- » Draft copies of the minutes will be made available to the Complainant and the proponent within 4 working days of the meeting being held. Unless otherwise agreed, comments on the Draft Minutes must be forwarded to the company representative appointed to manage the grievance mechanism within 4 working days of receipt of the draft minutes.
- » In the event of the grievance being resolved to the satisfaction of all the parties concerned, the outcome will be recorded and signed off by the relevant parties. The record should provide details of the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed upon timeframes for the measures to be implemented.
- » In the event of a dispute between the Complainant and the proponent regarding the grievance, the option of appointing an independent mediator to assist with resolving the issue should be discussed. The record of the meeting/s will note that a dispute has arisen and that the grievance has not been resolved to the satisfaction of all the parties concerned;
- » In the event that the parties agree to appoint a mediator, the proponent will be required to identify three (3) mediators and forward the names and CVs to the Complainant within 2 weeks of the dispute being declared. The Complainant, in consultation with the proponent, will identify the preferred mediator and agree on a date for the next meeting. The cost of the mediator will be borne by the proponent. The proponent will provide a person to take minutes of and record the meeting/s.
- » In the event of the grievance, with the assistance of the mediator, being resolved to the satisfaction of all the parties concerned, the outcome will be recorded and signed off by the relevant parties, including the mediator. The record should provide details on the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed upon timeframes for the measures to be implemented.
- » In the event of the dispute not being resolved, the mediator will prepare a draft report that summarizes the nature of the grievance and the dispute. The report should include a recommendation by the mediator on the proposed way forward with regard to the addressing the grievance.

- » The draft report will be made available to the Complainant and the proponent for comment before being finalised and signed by all parties. Unless otherwise agreed, comments on the draft report must be forwarded to the company representative appointed to manage the grievance mechanism within 4 working days.

The way forward will be informed by the recommendations of the mediator and the nature of the grievance. As indicated above, the grievance mechanism does not replace the right of an individual, community, group or organization to take legal action should they so wish. In the event of the grievance not being resolved to the satisfaction of Complainant and or the proponent, either party be of the opinion that legal action be the most appropriate option.

