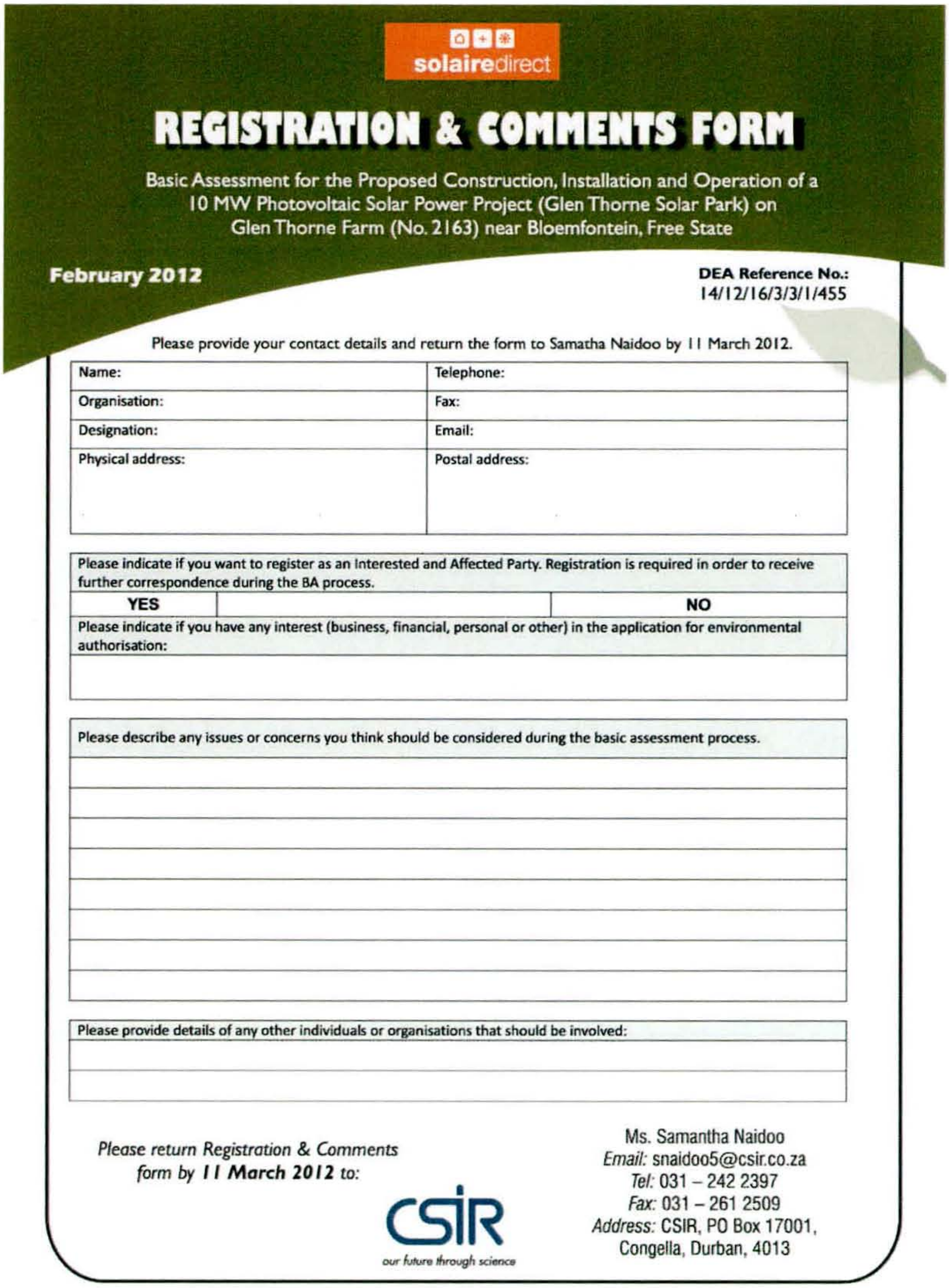

solairedirect

REGISTRATION & COMMENTS FORM

Basic Assessment for the Proposed Construction, Installation and Operation of a 10 MW Photovoltaic Solar Power Project (Glen Thorne Solar Park) on Glen Thorne Farm (No. 2163) near Bloemfontein, Free State

February 2012

DEA Reference No.:
14/12/16/3/3/1/455

Please provide your contact details and return the form to Samatha Naidoo by 11 March 2012.

Name:	Telephone:
Organisation:	Fax:
Designation:	Email:
Physical address:	Postal address:

Please indicate if you want to register as an Interested and Affected Party. Registration is required in order to receive further correspondence during the BA process.		
YES		**NO**
Please indicate if you have any interest (business, financial, personal or other) in the application for environmental authorisation:		

Please describe any issues or concerns you think should be considered during the basic assessment process.

Please provide details of any other individuals or organisations that should be involved:

*Please return Registration & Comments form by **11 March 2012** to:*

CSIR
our future through science

Ms. Samantha Naidoo
Email: snaidoo5@csir.co.za
Tel: 031 – 242 2397
Fax: 031 – 261 2509
Address: CSIR, PO Box 17001, Congella, Durban, 4013

Appendix E.8 Database of Key Stakeholders and Interested and Affected Parties

CONTACT PERSON	DESIGNATION AND DEPARTMENT	ORGANISATION
	Client	
Grant Berndsen	Project Development Manager	Solaire Direct
	CSIR Environmental Assessment Practitioner	
Paul Lochner	Environmental Assessment Practitioner	Council for Scientific and Industrial Research (CSIR)
	Landowner/s	
Jacques Strydom	Landowner	Barnie Human Landgoed Trust
	Department National	
Mrs Anneliza Collett	Directorate: Land Use & Soil Management	Department of Agriculture, Forestry & Fisheries
Nyiko Ngoveni		Department of Environmental Affairs
Mr Frans Vilakazi	Acting Director-General	Department of Water Affairs
Ms Glenda Moloi	Minister's Office	Department of Mineral Resources
Nnana Direro	Office of the Deputy Director General	Department of Energy
	Department Provincial – Free State	
Mr. Ntai Mokhitli	Media Liaison Officer: Agriculture	Department of Agriculture and Rural Development
Mr. Blair Vernon		Department of Water Affairs
Mr. Carlo Schrader	Technician	Department of Water Affairs
Mr. Willem Grobler	Deputy Director ; Water Regulation	Department of Water Affairs

CONTACT PERSON	DESIGNATION AND DEPARTMENT	ORGANISATION
Mr. Izak Venter	Scientic Manager for Range and Forage Science	Department of Agriculture
Ms. Nosisa Ndumo	Case Officer	Department of Agriculture
Mr. Ikhraam Osman	Head of Department	Department of Economic Development, Tourism and Environmental Affairs
Mr. Thabo Makweya	Head of Special Projects	Department of Economic Development,Tourism and Environmental Affairs
Ms. Disebo Khunong	Secretary: Environmental Impact Management	Department of Economic Development,Tourism and Environmental Affairs
Ms. Grace Mkhosana	Deputy Director: Environmental Management	Department of Economic Development,Tourism and Environmental Affairs
Tebogo Lioma	Deputy Director General	Department of Economic Development,Tourism and Environmental Affairs
Me N. Nkatazo	Special Programs	Department of Sport, Arts, Culture and Recreation
Adv. T.H. Malakoane	Head Of Department	Department of Sport, Arts, Culture and Recreation
Ms Malintja Molahloe		Free State Heritage Resources Authoirty
Ms. Ntando Mbatha		Free State Heritage Resources Authoirty
Ms. Loudine Philip		Free State Heritage Resources Authoirty
Mangaung Metropolitan Municipality		
Sonja Freemantle	Environmental Impact Assessment Officer	Dept of Economic Development, Tourism and Environmental Affairs
Ms. Sibongile Mazibuko	Municipal manager	Mangaung Municipality
Leon Kritzinger	Executive Manager: Engineering (he is also in charge of electrical services)	Mangaung Municipality
Tsholofelo Moemi	Manager: SMME Support	Mangaung Municipality
Mr Roger Naidoo	Environmental Manager	Mangaung Municipality
Councillor van Biljon	Ward Councillor	Ward 44

CONTACT PERSON	DESIGNATION AND DEPARTMENT	ORGANISATION
	Department Regional Office	
Tebogo Lioma	Deputy Director General	Department of Economic Development, Tourism and Environmental Affairs
	Environmental Organisations	
Tronny Mutsenga	Environmental Officer	SANPARKS
Johan Taljaard	Park Manager	Golden Gate Highlands National Park
Leon Barkhuizen	Chairperson	WESSA
	Tourism Authority	
Khotso Thole	GM: Marketing	Free State Tourism Authority
	Other Key Stakeholders	
Andrew Salomon	Heritage Impact Assessor	South African Heritage Resources Agency (Cape Town - there is currently no functional office in the Free State)
Lizell Stroh	Obstacle specialist	Civil Aviation Authority
Mr. Iqbal Hoosen	Project Manager	SANRAL - Southern Region (Greenacres)
Dr. Mariagrazia Galimberti	CEO Archaeology, Palaeontology & Meteorite Unit	SA Heritage Resources Agency (Cape Town)
Ms. Lerato Mokgwatlheng	Environmental Adviser	Eskom Transmission (Thyspunt Transmission Lines Integration Project) (Witbank)
Andile Gxasheka, PhD	Renewable Energy Specialist	NERSA
Kevin Leask	Chief Engineer: Grid Planning Department	ESKOM
Ronald Marais	Strategic Grid Planning Manager	ESKOM
Stephen Koopman	Energy Services Manager	ESKOM
Irvan Damon	Chairperson	Sustainable Energy Society of Southern Africa (SESSA)

[redacted]

CONTACT PERSON	DESIGNATION AND DEPARTMENT	ORGANISATION
Alwyn Smith	Administrator	Southern African Alternative Energy Association (SAAEA)
Godfrey Grange	Technical Director	CENTLEC (Pty) Ltd.
Neighbours		
Willie Groenewald	Neighbour	N/A
Piet Goosen	Glen Agricultural College	N/A
Kobus van Dyk	Neighbour	N/A
Pierre Bosman	Neighbour (Little Water Farm)	N/A
Andre Steyn	Neighbour	N/A

Appendix E.9 Comment received from Free State Heritage Resource Authority (Ms. Loudine Philip)

Next page/...

From: "Loudine Philip" <loudine.philip@nasmus.co.za>
To: "Samantha Naidoo" <SNaidoo5@csir.co.za>
Date: 13/03/2012 10:38
Subject: Re: Valleydora and Glen Thorne Solar Power Project - Heritage Study Report

Dear Samantha

Thank you very much for arranging for palaeontological studies to be included.

Kind regards

Loudine
----- Original Message -----
From: Samantha Naidoo
To: Loudine Philip
Cc: Ntando Mbatha
Sent: Tuesday, March 13, 2012 8:26 AM
Subject: Re: Valleydora and Glen Thorne Solar Power Project - Heritage Study Report

Dear Loudine

Noted. Potential archaeological impacts were considered in the heritage study conducted for purposes of the Valleydora and Glen Thorne EIAs. The information obtained was also incorporated into the Draft BA Reports for the respective projects such that baseline archaeological data and potential archaeological impacts are addressed. Copies of the Draft BA Reports will be sent to you by the end of this week. The need for palaeontology studies for purposes of the proposed projects is justifiable given that the Free State is a sensitive area in this regard. Hence, the EAP had appointed an accredited palaeontologist, based in the Free State, to carry out the required palaeontology studies subsequent to FSHRA's request. The information attained was included in the Draft BA Reports. See the respective palaeontology studies attached.

Thank you for your guidance and feedback on these projects thus far.

Regards,
Samantha

Samantha Naidoo

Environmental Management Services (EMS)

CSIR Consulting and Analytical Services

PO Box 17001

Congella

4013

Tel: (031) 242 2397
Fax: (031) 261 2509

Email: snaidoo5@csir.co.za

Please consider the environment before printing this email.
>>> "Loudine Philip" <loudine.philip@nasmus.co.za> 07/03/2012 14:18 >>>
Dear Samantha

Would you be so kind as to forward the visual impact assessments on these three projects as well?

Ntando's email has changed but I have copied her on this so that you can add it to your address book.

I have had a brief look at the three heritage reports you sent through and although a formal reply will be sent after our next meeting which is scheduled for the 13th of March, I would just like to mention that I was most concerned to note that only one of the three projects contained a palaeontological/archaeological report. The Free State is a very sensitive area for Stone Age surface scatters and open area sites as well as Quaternary & Karoo palaeontology. Development of this nature always has a potentially damaging effect on this. I would appreciate if it would become standard procedure to ensure a palaeontological/archaeological report, drafted by a suitably qualified professional in this field, is included with all similar studies in the Free State.

Both Project 14/12/16/3/3/1/455 (Glen Thorne Solar Park) and project 14/12/16/3/3/1/456 (Valleydora Solar Park) for that matter would most definitely require palaeontological/archaeological impact assessment reports as these areas in particular are known to contain palaeontological resources.

Regards
Loudine
----- Original Message -----
From: Samantha Naidoo
To: loudine.philip@nasmus.co.za
Cc: Malintja Molahloe
Sent: Wednesday, March 07, 2012 10:37 AM
Subject: Re: Valleydora Solar Power Project - Heritage Study Report

Hi Loudine

Please find attached the Word version of the Heritage Specialist Report for the Valleydora Solar Power Project.

Regards,
Samantha

Samantha Naidoo

Environmental Management Services (EMS)

CSIR Consulting and Analytical Services

PO Box 17001

Congella

4013

Tel: (031) 242 2397
Fax: (031) 261 2509

Email: snaidoo5@csir.co.za

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APPENDIX F:
Environmental Management Programme(EMPr)

EXECUTIVE SUMMARY

SolaireDirect Southern Africa (Pty) Ltd. proposes to establish a Photovoltaic (PV) Solar Facility of 10MW on Portion 3 of the Farm Glen Thorne (No. 2163) located approximately 25 km north-east of Bloemfontein, in the Free State province.

The following potential negative impacts were identified (with the relevant project phase and significance ratings shown in brackets):

- **Direct Impacts**
  - Loss of vegetation (construction phase: medium)
  - Alien plant invasion (operational phase: medium)
  - Soil erosion (construction phase: high; operational phase: medium)
  - Soil compaction and disturbance (construction phase: very low)
  - Soil contamination (construction phase: medium; and operational phase: low)
  - Redistribution of sunlight, temperature and rainwater by solar panels (operational phase: low)
  - Temporary decrease in air quality from dust (construction phase: low)
  - Loss of habitat for fauna and livestock (construction phase: medium; operational phase: low)
  - Loss of grazing land, agricultural land and change in land-use (construction and operation phases: low)
  - Disruption of landscape connectivity for fauna (construction and operational phases: medium)
  - Temporary noise disturbance during construction (construction phase: low)
  - Visual intrusion/impact (planning and design, construction, operational phases: medium)
  - Water consumption (construction and operational phases: low)
  - Generation of grey water (construction phase: medium; operational phase: low)
  - Generation of solid waste (operational phase: low; construction and decommissioning phase: medium)
  - Potential disturbance and damage to freshwater features/ecosystems (planning and design phase: high)
  - Disturbance of potential drainage lines (construction phase: medium)
  - Contamination of downstream water bodies (construction phase: medium; operational phases: medium-high)
  - Effects on areas of recharge that support wetlands/streams on-site (operational phase: medium-high)
  - Potential disturbance and damage to Heritage and Archaeological Artefacts (construction phase: low)
  - Potential disturbance and damage to Palaeontological Features (construction phase: low-medium)
  - Traffic impacts (construction phase: medium; operational phase: low; decommissioning phase: medium)
  - Disturbance or use of no-go areas (decommissioning phase: high)
  - Termination of employment (decommissioning phase: low)

- **Indirect impacts:**
    - Change in the sense of place (construction phase: low)
    - Potential disturbance and damage to freshwater features (planning and design phase: high)
- **Cumulative impacts:**
    - Additional water consumption in the Bloemfontein area (construction phase: medium; operational phase: low).

The following potential positive impacts were identified (with the relevant project phase significance ratings shown in brackets):

- **Direct Impacts**
    - Permanent Employment (operational phase: medium)
    - Temporary Employment and other economic benefits (construction phase: medium)
    - Generation of "green" power and increased surety of power supply (operational phase: medium)
    - Potential palaeontological impacts (construction phase: low, if features preserved)
- **Cumulative impacts:**
    - Increase in power supply in the Free State (operational phase: low)

In order to avoid and/or manage the potential negative impacts and enhance the benefits of the proposed project, an Environmental Management Programme (EMPr) has been compiled. The EMP lists the phases, at which various impacts may occur, the impacts, the significance of impacts without mitigation measures, the proposed mitigation measures, the significance of impacts with mitigation measures, the responsible person or party for ensuring that the mitigation measures are complied with, and the frequency of monitoring to be undertaken. This EMP is intended to be a standalone document that is simple to use and to provide implementable measures to ensure that the proposed establishment and operation of the solar facility is undertaken in a responsible a manner. The EMPr is a dynamic document that should be updated regularly and provides clear and implementable measures for the establishment and operation of the solar facility.

1. INTRODUCTION

SolaireDirect proposes to establish a 10 MW Photovoltaic (PV) Solar Facility on Portion 3 of Glen Thorne Farm, No. 2163 located approximately 25km north east of Bloemfontein in the Free State province with a farm boundary extent covering an area of approximately 185 hectares. SolaireDirect has commissioned the CSIR to undertake the Basic Assessment (BA) process required for the project. The 21 digit Surveyor General code for the property is F00300000000216300003.The project proponent had also proposed to construct a 75MW Solar PV Facility on the same property, for which an Environmental Impact Assessment (EIA) process was initiated in November 2011. The BA and EIA processes will be run in parallel, and considering that specialist studies conducted for purposes of the EIA assess all features that fall within the property bounds, the information is largely applicable to the site location of the 10 MW solar facility, and will therefore be used as input into the BA Report (See Specialist Declaration of Interest Forms in Appendix G of the BA Report).

SolaireDirect is a solar photovoltaic (PV) developer, contractor and operator founded in 2006 and based in Paris & Aix-en-Provence (France). It is a vertically integrated power producer providing a turnkey solar power generation service. The company's current South-African interest is a solar panel manufacturing facility in Cape Town that was commissioned in early 2009, and currently has a number of solar photovoltaic projects under development. SolaireDirect has made significant private investment into the local renewable energy manufacturing industry in the past five years, with more than R50million invested in not only the photovoltaic module manufacturing facility in Cape Town, but also in solar farm development projects .

This project is proposed as part of the Integrated Resource Plan (IRP) for South Africa (2010). The IRP proposes to develop 17 800 MW of renewable energy capacity by 2030. Early in 2011, the Department of Energy (DoE) made the decision to abandon the renewable energy feed-in tariffs, or REFIT, in favour of a competitive bidding process or "REBID"; also known as the Independent Power Procurement Program (IPPP). The REBID commits the government to the purchase of 1 450 MWp of generation capacity from PV solar farms over 5 individual bid submission dates, starting November 2011 and occurring approximately every 6 months until the end of 2013. If a bid is found to be 'compliant', the bid is then evaluated against certain stipulated evaluation criteria. The selection criteria include price, economic development, technical feasibility and grid connectivity, environmental acceptability, black economic empowerment, community development, and local economic and manufacturing propositions. The bidders whose responses rank the highest according to these criteria will be appointed Preferred Bidders by DoE. Preferred Bidders would then need to enter into an implementation agreement with the DoE and a power purchase agreement with a "buyer", which will most probably be Eskom. Regular reporting to demonstrate compliance during the life of the project is a strict requirement, and non-compliance will result in progressive demerits, and may eventually result in cancellation of the PPA and other agreements. This project forms part of a pipeline of projects by potential developers to submit proposals for the financing, construction, operation and maintenance of any onshore wind, solar thermal, solar photovoltaic, biomass, biogas, landfill gas, or small hydro technologies.

Despite the small scale nature of the proposed solar energy facility, the electricity generated by this facility would feed into the national grid and assist in South Africa's aim to procure 3 725 MW capacity of renewable energy by 2016 (the first round of procurement). This 3 725 MW is broadly in accordance with the capacity allocated to renewable energy generation in IRP 2010. The IRP 2010 allows for an additional 14 749 MW of renewable energy in the electricity blend in South Africa by 2030. In addition, ESKOM also recently indicated a capacity of 4 149 MW for power generated by independent power producers to the National Grid by 2012.

2 PROJECT DESCRIPTION

The project involves the construction of a solar facility wherein solar panels will be erected on support structures. The electricity generated by the panels will then be transferred to inverters where it will be converted from direct current into alternating current. Once converted, the electricity will be transferred via overhead power lines to a nearby ESKOM substation and consequently feed into the electricity grid.

The project involves the construction of a solar facility wherein solar panels will be erected on support structures. For the proposed Glen Thorne solar facility, SolaireDirect will utilise Photovoltaic (PV) technology to generate electricity. PV power generation employs solar panels composed of a number of solar cells containing a photovoltaic material (in this case, crystalline silicon). PV technology utilises the principals of semiconductor technology and converts solar radiation into DC. This in turn is connected to inverters that convert DC to alternating current AC. The exact number of PV arrays and more detailed design specifications will follow as proposed Glen Thorne solar facility development progresses. PV technology consists of the following components:

- **PV cell** - A basic photovoltaic device, which generates electricity when exposed to solar radiation. All photovoltaic cells produce direct current.
- **PV module or panel** - The smallest complete assembly of interconnected photovoltaic cells. In the case of crystalline silicon cells - following testing and sorting to match the current and voltage, the cells are interconnected and encapsulated between a transparent front (usually glass) and a backing material. The module is then typically mounted in an aluminium frame.
- **Photovoltaic array** - A mechanically integrated assembly of modules and panels together with support structure to form a direct current power producing unit. The proposed solar energy facility would consist of antireflective modules arranged in numerous arrays.

The PV module dimensions that will be used for the proposed Glen Thorne solar facility:

Length	1 660 mm
Width	990 mm
Height	45 mm
Weight	19 kg

The actual construction and establishment of the facility will entail the following:

2.1 *SITE CLEARING AND PREPARATION*

The site will need to be cleared of vegetation and debris, and topsoil removed and stockpiled on site for later use. Foundation and platform areas will be levelled and compacted in preparation for the casting of foundations.

2.2 *CIVIL WORKS*

The main civil works are:

Terrain levelling - Levelling will be minimal as the potential sites chosen are relatively flat.

Access and inside roads/paths - Existing roads/paths will be used were possible. A safety firebreak band and roadway will be constructed around the perimeter of the site. On the same principle, road design will be determined within detailed engineering in accordance with SABS standards and South African road regulation requirements (e.g. compacted road layer works and crushed stone surfacing).

Trenching - Cabling sleeves shall be installed underground as part of the civil works. All DC and AC cabling will be installed at a minimum of 800mm below finished ground level and have a 200mm cover of sifted bedding soil. Three strips of warning tape will be placed on top of the layer of sifted bedding sand on either side and in the middle of trenches prior to trenches being filled in with unsifted bedding soil.

2.3 TRANSPORTATION AND INSTALLATION OF PV PANELS INTO AN ARRAY

A solar facility will be constructed wherein solar modules of 250Wp each would be arranged in arrays and erected on support structures in the form of strategically positioned steel or aluminium frameworks. These will be fixed into the ground either through deep seated anchor screws or concrete foundations. Once these frames have been installed, the panels will be transported to site for erection.

2.4 CONNECTION TO ARRAY ENCLOSURES

The electricity generated from the solar modules will be transferred to array enclosures which are positioned underneath the solar module mounting structures, an area of approximately 1m². These enclosures function to combine the power transmitted by numerous solar modules and enable its transmission via two Direct Current (DC) cables to inverter/transformer enclosures.

2.5 WIRING TO CENTRAL INVERTERS/TRANSFORMERS

Array enclosures are wired to central inverters/transformer enclosures which can have a rated power of 630Kw each at peak operation. A typical 630kw central inverter/transformer has an approximate width of 2.5-3m and a breadth of 2.7-3.3.m. A total of up to sixteen central inverters/transformers will be installed for purposes of the Glen Thorne solar facility. Solar panels create direct current (DC). However, this needs to be converted into alternating current (AC) to be able to feed into the grid. The central inverters/transformers function to convert DC current to AC current at grid frequency. They also contain step-up transformers that subsequently transform low voltage AC (350kW) to medium voltage AC (22KW) for distribution to the grid connection substation.

2.6 CONNECTION TO THE GRID

The grid connection substation is a building, similar to a central inverter/transformer in appearance, and contains metal-clad circuit breakers that serve to combine the power generated by each inverter/transformer enclosure. The required protection equipment, such as circuit breakers, will be installed in the substation building to Eskom specifications. Electricity generated from the solar park will be transmitted via 22kV overhead cables to the Glen Rural Substation, located approximately 300m east of the site over the provincial toll road R30, and connected by a single monopole wooden or concrete structure, intended to be 10 m, 12m or 13m in height. The length of the power line connection from the PV facility to Glen Rural Substation is dependent on which of the two alternatives sites the facility will be located upon.

[redacted]

2.7 AUXILIARY ELECTRICAL INFRASTRUCTURE

Apart from the essential components of a solar power facility required for effective power generation, the installation of numerous other auxiliary electrical infrastructure is integral in ensuring optimal operation of the plant. In the case of the proposed Glen Thorne solar facility, these include diesel generator sets that will supply power to security and monitoring systems in the event of a grid failure, a security system including fencing and access control, a fire detection system and weather monitoring equipment, plant monitoring equipment, and associated telecommunication links. In addition, air-conditioning equipment will be installed inside inverter/transformer enclosures to regulate their operating temperatures.

2.8 SUPPORTING INFRASTRUCTURE

A control facility/substation containing electrical infrastructure and protection circuitry would be constructed at the site and would have an approximate footprint of 400m². Other supporting infrastructure would include fire breaks, access roads, site perimeter fire breaks and site perimeter fencing (electrical palisade fencing of approximately 2.8m in height), access gates and a guardhouse (approximately 4m x 6m x 3m) situated at the site entrance to accommodate full time security on site during and after the construction phase of the project. Project maintenance would consist mainly of panel replacement, panel cleaning and other minor mechanical and electrical infrastructure repairs.

3 THE APPROACH TO THE EMP

A typical EMP takes the planning and design, construction, operational and decommissioning phases of a project into account. The EMP is compiled as part of the Basic Assessment (BA) process and is an annexure to the project report.

The EMP is based largely on the findings and recommendations of the BA process. However, the EMP is considered a "live" document and must be updated with additional information or actions during the design, construction and operational phases.

The EMP follows an approach of identifying an over-arching goal and objectives, accompanied by management actions that are aimed at achieving these objectives. The management actions are presented in a table format in order to show the links between the goal and associated objectives, actions, responsibilities, monitoring requirements and targets. The management plans for the design, construction, operation and decommissioning phases consist of the following components:

- Description of the activity taking place;
- The potential impacts associated with that activity;
- Significance of the impact prior to mitigation;
- The appropriate mitigation measures;
- Significance of the impact post-mitigation;
- The responsible party; and
- Monitoring frequency.

3.1 ROLES AND RESPONSIBILITIES

For the purposes of the EMP, the generic roles that need to be defined are those of the:

- Project Developer
- Environmental Control Officer (ECO)
- Lead Contractor
- Operations Manager.

Note: The specific titles for these functions will vary from project to project. The intent of this section is to give a generic outline of what these roles typically require.

i. PROJECT DEVELOPER

The Project Developer (i.e. SolaireDirect) is the 'owner' of the project and as such is responsible for ensuring that the conditions of the environmental authorisation issued in terms of NEMA (should the project receive such authorisation) are fully satisfied, as well as ensuring that any other necessary permits or licences are obtained and complied with. It is expected that the Project Developer will appoint the Environmental Control Officer, Construction Manager and the Operations Manager.

ii. ENVIRONMENTAL CONTROL OFFICER (ECO)

The Environmental Control Officer (ECO) will be responsible for overseeing the implementation of the EMP during the construction and operations phases, and for monitoring environmental impacts, record-keeping and updating of the EMP as and when necessary.

During ***construction***, the Environmental Control Officer will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones;
- Weekly or bi-weekly (i.e. every two weeks) monitoring of site activities during construction to ensure adherence to the specifications contained in the EMP, using a monitoring checklist that is to be prepared by the ECO at the start of the construction phase;
- Preparation of the monitoring report based on the weekly or bi-weekly site visit;
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager.

During ***operation***, the Environmental Control Officer will be responsible for:

- Overseeing the implementation of the EMP for the operation phase;
- Ensure that the necessary environmental monitoring takes place as specified in the EMP;
- Update the EMP and ensure that records are kept of all monitoring activities and results.

During ***decommissioning***, the Environmental Control Officer will be responsible for:

- Overseeing the implementation of the EMP for the decommissioning phase;
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

At the time of preparing this draft EMP, the ECO appointment is still to be made by the proponent. The appointment is dependent upon the project proceeding to the construction phase.

iii. LEAD CONTRACTOR

The lead contractor will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction for the solar project.

- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project management related to project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employ an ECO to monitor and report on the daily activities on-site during the construction period
- Ensuring that safe, environmentally acceptable working methods and best practices are implemented and that sufficient plant and equipment is made available, properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the Environmental Control Officer prior to the commencement of construction activities to confirm the construction procedure and designated activity zones;
- Ensuring that all appointed contractors and sub-contractors are aware of this Environmental Management Plan and their responsibilities in relation to the plan;
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of specifications contained in the Environmental Management Plan, to the satisfaction of the Environmental Control Officer.

At the time of preparing this draft EMP, the appointment of a lead contractor has not been made and will depend on the project proceeding to the construction phase.

iv. OPERATIONS MANAGER

The solar facility will be remotely controlled however, it is envisaged that an "Operations Manager" will visit the facility on a monthly basis and will be responsible for the following:

- Operation of the solar energy facility.
- Required maintenance of the panels, cabling and control room facilities.

Ensuring that the specified environmental monitoring programmes during operations are undertaken effectively and that the findings are analysed and applied.

4 MANAGEMENT ACTIONS FOR THE DETAILED PLANNING AND DESIGN PHASE

The aim of managing tasks associated with the planning and design phase of the solar PV project is to ensure that potential environmental impacts identified during the Basic Assessment (BA) process are effectively used to inform project design. This promotes the use of pre-emptive measures that serve to minimise the potential environmental impacts that may otherwise require mitigation at a later stage in the process.

TABLE 1: MANAGEMENT ACTIONS FOR THE PLANNING AND DESIGN PHASE

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	PREVENTATIVE MEASURES	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
Planning and designing of the project	**Potential disturbance and damage to freshwater features/ecosystems**	High (Negative)	Water courses and wetland areas should be protected by adequately sized buffer areas, sized and designed according to the actual functional requirements of the buffers. Hardened surfaces should be setback by at least 50m from all drainage lines / flow dissipation pathways The alignment and design of all infrastructure, including roads, pylons and pipes, should take cognisance of natural drainage lines, and be designed such that they do not result in erosion as a result of narrowing of channels and flow corridors. It is recommended that a system of shallow depressions should be created in the area across which the solar panels will extend, and that these be used as part of the stormwater attenuation system. The site design should allow for the retention or re-establishment of appropriate indigenous vegetation beneath the panels, as this will further reduce runoff rates. A detailed stormwater management system must be developed, that clearly indicates how attenuation of stormwater volumes and velocities is to be achieved upstream of existing water courses – these include the braided	Project Developer	Low (Negative)	Restricted to the Planning and Design phase of the activity

			ephemeral streams mapped in the freshwater ecosystems report, which currently dissipate across disturbed agricultural areas			
	Visual Impacts	Medium (Negative)	The visual impact resulting from the presence of the solar facility on-site can be prevented by locating the development: - Away from the R30 road - Away from koppies present on-site , and as low as possible - Close to the existing powerlines The impacts can also be reduced by reducing the footprint of the solar facility.	Project Developer	Low – Medium (Negative)	Restricted to the Planning and Design phase of the activity

5 MANAGEMENT PLAN FOR THE CONSTRUCTION PHASE

The overall goal for the construction phase is to undertake all relevant construction activities in a way that ensures proper management of environmental aspects and impacts; and to minimise disruption to other landuse activities in the area, traffic and livestock farming activities that occur elsewhere on the farm.

[redacted]

TABLE 2: MANAGEMENT PLAN FOR THE CONSTRUCTION PHASE

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
Site clearing and construction camp establishment	**Uncontrolled access to the site camp and security concerns.**	Medium (Negative)	Once the site camp has been established, fencing will need to be erected and security guards employed to ensure that access to the construction site is controlled. All construction materials that are to remain on the site must be located within the site camp and locked in specialised containers if necessary.	Lead Contractor	Low (Negative)	Monthly
	Loss of vegetation and sensitive species, habitats and ecosystems	Medium (Negative)	The construction area must be clearly demarcated (e.g. with hazard tape or ski netting) prior to any clearing of vegetation. No additional clearing of vegetation must be undertaken in areas outside the demarcated construction area. The removal or collecting of any plants or shrubs must be prohibited. No-go areas containing important plant habitat in the immediate vicinity of the construction activities must be declared; mapped and clearly demarcated using hazard tape or ski netting. Contractors and construction workers must be clearly informed of the no-go areas and held accountable for any infringements that may occur. No access to the demarcated areas should be permitted during the construction phase.	Lead Contractor	Low (Negative)	Initially on establishment of the site camp and prior to site clearing, with subsequent monthly monitoring

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			A suitable control measure (such as a fine system) must be implemented to discourage infringement by contractors.			
	Increased erosion risk	High (Negative)	Only areas necessary for construction activities should be cleared. Areas should be cleared just prior to being developed and must be cleared in sections. Wherever possible, roads and tracks should be constructed so as to run along the contour. All roads and tracks running down the slope must have water diversion structures present. Any extensive cleared areas that are no longer or not required for construction activities should be re-seeded with locally-sourced seed of suitable species. Bare areas can also be packed with brush removed from other parts of the site, to encourage natural vegetation regeneration and limit erosion. The construction/upgrade of access roads to include improved storm water management (e.g. drainage gulleys along roads) and be constructed in a manner that will not result in increased and uncontrolled runoff. Drainage systems for the control of run-off water where necessary must be put into place at the facility. No construction vehicles should be allowed to drive around the veld. All construction vehicles should remain on	Lead Contractor	Low (Negative)	Monthly

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			properly demarcated roads.			
	Compaction and disturbance of soil	Very low (Negative)	Traffic should be prevented on wet soil, a condition expected more during rainy season. No construction vehicles should be allowed to drive around the veld. All construction vehicles should remain on properly demarcated roads.	Lead Contractor/Construction Manager	Very low (Negative)	Monthly
	Temporary decrease in air quality	Low (Negative)	Speed of construction vehicles must be restricted, as defined by the Lead Contractor and ECO. Vehicles and equipment used for construction activities must be maintained in good working condition to prevent unnecessary emissions. Dust emissions to be limited by: • Minimising the presence of construction vehicles in and around the site. • Using soil stabilizing agents or water for dust control purposes.	Lead Contractor and ECO	Low (Negative)	Monthly
	Faunal habitat destruction, alteration and physical disturbance	Medium (Negative)	Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO. The collection, hunting or harvesting of any plants or animals at the site should be	Lead Contractor and ECO	Medium (Negative)	Monthly

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			strictly forbidden. Fires should only be allowed within fire-safe demarcated areas, otherwise prohibited. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the construction phase. Fire fighting equipment must be made available at various appropriate locations on the construction site. No fuelwood collection should be allowed on-site. No dogs should be allowed on site. All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.			
	Temporary Visual Intrusion	Medium (Negative)	All construction equipment and materials must be kept within the boundaries of the site camp which is to be located away from direct view of any sensitive receptors.	Lead Contractor	Low (Negative)	Monthly
Establishment of the solar facility	**Decrease in soil agricultural suitability**	Low (Negative)	For all excavations (e.g. for mounting foundations, buried cables etc) and other direct disturbance of the soil surface (e.g. for roads, buildings) that are to be	Lead Contractor	Low (Negative)	Initially at the start of erecting the solar panels of the PV facility

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			returned to agricultural use, the upper 20cm of the top soil must be stripped, stockpiled, and then re-spread over the surface of the backfilled excavation or disturbed surface. Also, the project should utilise existing roads wherever possible and the length of any new roads should be minimised.			
	Change in Land-use	Low (Negative)	Only areas within the demarcated construction site must be cleared and developed.	Lead Contractor and ECO	Low (Negative)	Monthly
	Change in sense of place	Low (Negative)	None.	N/A	N/A	N/A
	Loss of grazing and agricultural land	Low (Negative)	Only areas within the demarcated construction site must be cleared and developed.	Lead Contractor and ECO	Low (Negative)	Monthly
	Loss of connectivity and habitat fragmentation for fauna	Medium (Negative)	Fencing should be constructed in a manner which allows for the passage of small and medium sized mammals. Steel palisade fencing (20 cm gaps min) is a good option in this regard as it allows most medium sized mammals to pass between the bars, but remains an effective obstacle for humans. Alternatively the lowest strand or bottom of the fence should be elevated to at least 15 cm above the ground at strategic places to allow for fauna to pass under the fence.	Lead Contractor and ECO	Low (Negative)	Monthly

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			If electrified strands are to be used, there should be no strands within 30 cm of the ground as tortoises retreat into their shells when electrocuted and eventually succumb from repeated shocks.			
	Visual impact	Medium (Negative)	Security lighting should make use of down-lights to minimise glare and sky glow, and motion detectors where possible so that lighting at night is minimised. Care should be taken with the layout of the security lights to prevent motorists on the adjacent and nearby roads from being blinded by lights. Vegetation clearing should be limited during the construction phase, and cleared areas should be rehabilitated. A landscape architect, horticulturist or botanist should be consulted in order to select the best screening option should there be a reflection problem. If plants are to be used for screening they will be consulted closer to the time to select the most appropriate vegetation. There are a number of tree species that would do well in that area, however the availability of plants at the time of construction will also dictate the species selected. Also, the lush vegetation lining the Modder River can be used to screen visual impacts. Alternatively it may be possible to erect berms and to plant it with suitable shrubs.	Project Developer, Lead Contractor and ECO	Low (Negative)	Initially at the start of erecting the solar panels of the PV facility

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
Day to day construction activities	**Disturbance and damage to Heritage and Archaeological Artefacts**	Low (Negative)	The construction team must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all construction activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted. The contact details for SAHRA are: Telephone: 021 462 4502 Fax: 021 462 4509 Email: mgalimberti@sahra.org	Project Developer, Lead Contractor and ECO	Low (Negative)	Monthly
	Disturbance and damage to Palaeontological Features	Low – Medium (Negative)	The construction team must be briefed on the potential uncovering of palaeontological features and what actions are then required. In the event that artefacts of palaeontological significance are discovered, all construction activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted. The contact details for SAHRA are: Telephone: 021 462 4502 Fax: 021 462 4509 Email: mgalimberti@sahra.org	Project Developer, Lead Contractor and ECO	Low (Negative)	Monthly

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			Fresh exposures and bedrock excavations into potential fossil-bearing strata must be monitored during the construction phase of the proposed activity. Inspection of fresh excavations must be undertaken by a professional palaeontologist in order to determine whether, as is probable, palaeontological remains or features are exposed *in situ*.			
	Temporary Noise Disturbance	Low (Negative)	Construction activities should be limited to working hours. As there are no nearby receptors, it is unlikely that notice will need to be given to neighbours should work continue beyond regular working hours.	Lead Contractor and ECO	Low (Negative)	Monthly
	Presence and operation of construction vehicles	Low (Negative)	Construction vehicles to be present on-site only when necessary as they create a physical impact as well as generate noise, pollution and other forms of disturbance at the site.	Lead Contractor and ECO	Low (Negative)	Monthly
	Disturbance of sensitive drainage lines, resulting in increased vulnerability to erosion **&**	Medium (Negative)	All ephemeral drainage lines (including the braided flow paths marked in the freshwater report) should be demarcated as no-go areas during construction; they should be marked with temporary fencing, located 50m from the edge of the drainage line Construction design should seek to minimise disturbance of natural ground	Lead contractor and ECO	Low (Negative)	Weekly

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
	Contamination of downstream water bodies as a result of receipt of contaminated water from construction activities (e.g. runoff containing oils, sediments, cement)		levels and to maintain, as far as possible, existing ground cover by vegetation Temporary sediment collection ponds should be created between the construction zone and the demarcated ephemeral drainage lines, in which runoff from the disturbed site can collect before passing into the downstream catchment after. Measures to dissipate the velocities of runoff from the site into adjacent water courses should be outlined in detailed Method Statements and implemented on site prior to the start of any activities that will disturb existing surface conditions. No wash water or water that is in any way contaminated by construction or other materials should be passed into natural watercourses – arrangements should be made for the containment and separate disposal of water used for ablutions or cooking during construction.l			
	Soil Contamination	Medium (Negative)	Spill kits must be present at various appropriate locations on the construction site and appropriate corrective actions must be taken as soon as possible. Spilled cement must be cleaned up as soon as possible. Cement mixing should preferably be done on impermeable surfaces such as plastic lining.	Lead Contractor and ECO	Low (Negative)	Monthly

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
	Generation of Grey Water	Medium (Negative)	It must be ensured that all grey water generated as a result of construction activities is properly disposed to avoid soil and subsequent water contamination.	Lead Contractor and ECO	Low (Negative)	Monthly
	Generation of Waste and Sewage	Medium (Negative)	Suitable receptacles must be provided for the temporary storage of general waste until removed to the nearest licensed landfill. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types. It is proposed that the contracting company supplying the ablution facilities will also be responsible for the removal and treatment thereof. It is the responsibility of the applicant to ensure that the contractor hired is accredited and has the necessary permits to remove the sewage. The sewage will be treated in accordance with the municipal sewage works policies and guidelines.	Lead Contractor and ECO	Low (Negative)	Monthly
	Traffic impacts	Medium (Negative)	Impacts associated with the higher traffic volumes can be accommodated by proper site management, e.g. controlling the size of orders that would be transported to the site at any given time, and by notifying the public through local and regional media centres when large freight-carrying vehicles will be on the roads.	Lead Contractor	Low (Negative)	Weekly

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
Undertaking of construction activities	**Increased Water Consumption**	Medium (Negative)	Water brought to the site must be appropriately used. Wastage must be strongly discouraged and where possible, water must be re-used.	Lead Contractor and ECO	Low (Negative)	Monthly
Training and management of labour on site	**Negligence by construction workers resulting in unforeseen impacts**	Medium (Negative)	Staff training and awareness of environmental impacts should be provided.	Lead Contractor and ECO	Low (Negative)	Monthly
General construction activities	**Temporary Employment and Other economic Benefits**	N/A	Wherever possible, local workers and suppliers should be employed or contracted to undertake the construction of the solar facility.	Project Developer	Medium (Positive)	Monthly

General Recommendation:

1. **Implementation of a construction phase Environmental Management Programme**

   A construction phase Environmental Management Programme should be compiled and implemented, such that it clearly addresses inter alia the above activities, as well as appropriate locations for construction camps, vehicle storage and parking areas, ablution facilities and waste management, such that these do not impact on sensitive or otherwise important terrestrial or wetland areas.

6 MANAGEMENT PLAN FOR THE OPERATIONAL PHASE

The objective for managing the operational phase of the solar PV project is to ensure that the daily operations do not have unforeseen impacts on the environment; to ensure that all potential impacts are monitored and that the necessary corrective actions are undertaken in a timeous manner.

TABLE 3: MANAGEMENT PLAN FOR THE OPERATIONAL PHASE

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
Post-construction of the solar facility	**Alien plant invasion**	Low (Negative)	Regular monitoring to ensure that alien plants are not increasing as a result of the disturbance that has taken place. A long-term alien maintenance plan must be designed and implemented in conjunction with a suitably qualified expert. All alien plants present at the site should be controlled annually using the best practice methods for the species present.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Increased erosion risk	Medium (Negative)	Regular visual monitoring for erosion is required to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. If erosion occurs, the necessary changes to the drainage system must be noted. All erosion problems observed should be rectified as soon as possible. All maintenance vehicles to remain on the demarcated roads.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Change in Land-use	Low (Negative)	None.	N/A	N/A	Monthly monitoring, with annual reporting during the operational lifetime of the project

[redacted]

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Loss of grazing and agricultural land	Low (Negative)	None.	N/A	N/A	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Visual impact	Medium (Negative)	Areas subject to vegetation clearing should be rehabilitated.	Medium (Negative)	Operational Manager and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project
On-going operation of the solar facility	**Faunal habitat destruction, alteration and physical disturbance**	Low (Negative)	Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO. No unauthorized persons should be allowed onto the site. The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Fires should only be allowed within fire-safe demarcated areas, otherwise prohibited. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the construction phase. Fire fighting equipment must be made available at various appropriate locations on the construction site. No fuelwood collection should be allowed on-site.	Low (Negative)	Project Developer, Operational Manager and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
			No dogs should be allowed on site. All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.			
	Redistribution of sunlight, temperature and rainwater	Low (Negative)	The accumulation of rain water of a runoff area on a small area is the basic principle of Infield Rain-Water Harvesting (IRWH) developed at Glen Agricultural Research Station. Soil removed from the foundation pits of the panels can be used to build a small horizontal ridge and basins can be made next to the ridge by hand. The water accumulating in the ridges will boost vegetative growth in and around the basins. In spite of reduced growth under the panels due to limited rain, the grazing capacity may be increased by IRWH. Groundwater recharge potential will be increased by limiting erosion and techniques like IRWH.	Low (Positive)	Project Developer and Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Loss of connectivity & habitat fragmentation for fauna	Medium (Negative)	Ensure that no larger fauna enter and become trapped within the fenced-off area, either by leaving a gate open so that animals can move freely between the site and the adjacent farm or by keeping all gates closed to ensure that they are excluded.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Discharge of polluted water into downstream areas, or water with a different salinity to natural systems **&** **Affects on areas of recharge that would support wetlands / streams on the site**	Medium - High (Negative)	Sources of potential pollution would include any grey water discharges, car park or road runoff, and wash water when solar panels are periodically cleaned A stormwater management system must be designed, implemented and maintained so as to ensure that runoff from the site does not result in the passage of concentrated flows into drainage lines, does not result in any bank or bed erosion in these systems, does not necessitate their being lined or otherwise artificially stabilised and does not result in droughting of natural systems through diversion of flows into adjacent water courses. The stormwater management plan should specifically address runoff from areas likely to generate high volumes of water during rainfall events, including car parks, roofs and the solar panels themselves. Wash water from the panels should be directed through settlement / filtration areas upstream of its passage into any watercourse, or ideally filtered, stored and recycled for subsequent washing activities. The use of measures that will contribute to the filtration of potentially contaminated water from car parks or other sources of contamination should be included in the stormwater management system; examples of appropriate measures include gravel filtration beds, vegetated swales (assuming that vegetation will be sustained, given the dry climate of the	Medium (Negative)	Operational Manager and ECO	Annual inspection, with annual reporting during the operational lifetime of the project

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
			area) Septic tanks should not be used for the management of sewage on site, given the close proximity of drainage lines and shallow subsurface systems directly into water courses			
	Traffic impacts	Low (Negative)	Impacts associated with the higher traffic volumes can be accommodated by proper site management, e.g. controlling the size of orders that would be transported to the site at any given time, and by notifying the public through local and regional media centres when large freight-carrying vehicles will be on the roads.	Low (Negative)	Lead Contractor	Weekly
	Increased Water Consumption	Low (Negative)	Water conservation must be strongly encouraged. Where possible water must be re-used.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Soil Contamination	Low (Negative)	Spill kits must be present at various appropriate locations on the site and appropriate corrective actions must be taken as soon as possible. Spilled substances must be cleaned up as soon as possible.	Low (Negative)	Lead Contractor and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Generation of Grey Water	Low (Negative)	It must be ensured that all grey water generated as a result of operational activities is properly disposed to avoid soil and subsequent water contamination.	Low (Negative)	Lead Contractor and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Generation of General Waste and Sewage	Medium (Negative)	Suitable receptacles must be provided for the temporary storage of general waste until removed to the nearest licensed landfill. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types. It is proposed that the contracting company supplying the ablution facilities will also be responsible for the removal and treatment thereof. It is the responsibility of the applicant to ensure that the contractor hired is accredited and has the necessary permits to remove the sewage. The sewage will be treated in accordance with the municipal sewage works policies and guidelines.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Generation of additional electricity	N/A	None.	Low (Positive)	N/A	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Permanent Employment	N/A	The developer needs to ensure that all employment contracts comply with the relevant South African labour laws and staff needs to be informed of and adhere to any applicable codes of conduct or terms of employment.	Medium (Positive)	Project Developer	Monthly monitoring, with annual reporting during the operational lifetime of the project

[redacted]

7 MANAGEMENT PLAN FOR THE DECOMMISSIONING PHASE

The infrastructure that will be utilised for the solar facility can, with on-going maintenance, last up to 25 years. Equipment will only be decommissioned once it has reached the end of its economic life. It is likely that at the stage of decommissioning, an assessment will be done to determine the viability of installing new available technologies at the site. It is also anticipated that the obsolete equipment will be re-used, recycled or discarded as appropriate.

[redacted] [redacted]

TABLE 4: MANAGEMENT PLAN FOR THE DECOMMISSIONING PHASE

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
Disassembly of the solar facility	**Generation of Waste**	Medium (Negative)	Suitable receptacles must be provided for the temporary storage of various waste types such as scrap metal and concrete, until it is removed to the nearest licensed landfill. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types. The panels contain materials that may be hazardous in nature if released into the environment. If the panels are intact, there will be no risk of exposure. Therefore the panels need to be disposed of appropriately. Additionally, other structures from the solar facility will need to be removed and disposed of. The applicant must ensure that the final disposal site can accept the waste and the anticipated volumes thereof. Any hazardous waste must be disposed of at a hazardous waste disposal site.	Low (Negative)	Lead Contractor	Weekly, during the decommissioning phase
	Disturbance or use of no-go areas for the stockpiling of	High (Negative)	All areas identified as no-go areas with reference to ecological, soil and land use, visual, heritage and freshwater features within the site	Low (Negative)	Lead Contractor	Weekly, during the decommissioning phase

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
	disassembled structures or other materials		should **not** be disturbed or used for the stockpiling/temporary storage of disassembled structures or other materials.			
Decommissioning of the solar facility	**Traffic impacts**	Medium (Negative)	Impacts associated with the higher traffic volumes can be accommodated by proper site management, e.g. controlling the quantity of materials that would be transported to the landfill, and by notifying the public through local and regional media centres when large waste-carrying vehicles will be on the roads.	Low (Negative)	Lead Contractor	Weekly, during the decommissioning phase
	Termination of Employment	Low (Negative)	Training may be considered during the employment term to aid staff in finding alternative employment once the solar facility has been decommissioned.	Low (Negative)	Project Developer	At the discretion of the Project Developer

8 SITE REHABILITATION

It will be necessary to completely remove all infrastructure associated with the solar facility. Once this is achieved, rehabilitation of the site will be required. It is recommended that the developer take into account the appropriate land use requirements at the time. It is important to note that in a period of 20-25 years, land uses in the area may change significantly, given the proximity of the site to Bloemfontein.

Consultation with the local authority is encouraged as the rehabilitation should meet the requirements set out by the local authorities and be in accordance with any relevant legislation.

9 CONCLUSION

It is anticipated that if the proposed solar facility is constructed, operated and decommissioned in accordance with the recommendations made herein, the project is unlikely to have significant adverse environmental impacts.

APPENDIX G:
Other information

Appendix G.1 Application form submitted by CSIR to DEA (Dated: 24/01/2012).

Next page/...

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Email: snaidoo5@csir.co.za

24 January 2012

Attention: Director: Environmental Impact Evaluation

Department of Environmental Affairs
Fedsure Forum Building (corner of Pretorius and Van der Walt Streets)
2nd Floor North Tower
315 Pretorius Street
Pretoria
0002

Tel: 012-310-3268
Fax: 012-320-7539

Dear Sir/Madam

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED SOLAIREDIRECT 10MW SOLAR ENERGY PROJECT NEAR BLOEMFONTEIN IN THE FREE STATE

Please find attached the Application for Environmental Authorisation for the solar energy project being proposed by Solaire Direct near Bloemfontein in the Free State. The CSIR has been appointed by Solaire Direct, as the independent Environmental Assessment Practitioners, to conduct the BA process.

Should you have any further enquiries, please do not hesitate to contact me.

Yours sincerely,

Samantha Naidoo
CSIR Project Manager
Environmental Management Services (EMS)

Tel: (031) 242 2397
Fax: (031) 261 2509
Email: snaidoo5@csir.co.za

www.csir.co.za

[redacted]

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

APPLICATION FORM FOR ENVIRONMENTAL AUTHORISATION

	(For official use only)
File Reference Number:	12/12/20/
NEAS Reference Number:	DEAT/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010

PROJECT TITLE

Solaire Direct Glen Thorne Solar Photovoltaic Facility of 10MW near Bloemfontein, Free State

Kindly note that:

1. This application form is current as of 2 August 2010. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
2. The application must be typed within the spaces provided in the form. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. Spaces are provided in tabular format and will extend automatically when each space is filled with typing.
3. Where applicable **black out** the boxes that are not applicable in the form.
4. Incomplete applications may be returned to the applicant for revision.
5. The use of the phrase "not applicable" in the form must be done with circumspection. Should it be done in respect of material information required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the Regulations.
6. This application must be handed in at the offices of the relevant competent authority as determined by the Act and regulations.
7. No faxed or e-mailed applications will be accepted.
8. Unless protected by law, all information filled in on this application will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this application on request, during any stage of the application process.
9. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

Queries must be addressed to the contact hereunder:

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Director: Environmental Impact Evaluation
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Fedsure Forum Building (corner of Pretorius and Van der Walt Streets)
2nd Floor North Tower
315 Pretorius Street
Pretoria
0002

Queries should be directed to the Directorate: Environmental Impact Evaluation at:

Tel: 012-310-3268
Fax: 012-320-7539

Please note that this form must be copied to the relevant provincial environmental department/s.

View the Department's website at http://www.deat.gov.za/ for the latest version of the documents.

SITE IDENTIFICATION AND LINKAGE

Please indicate all the Surveyor-general 21 digit site (erf/farm/portion) reference numbers for all sites (including portions of sites) that are part of the application.

F	0	0	3	0	0	0	0	0	0	0	0	2	1	6	3	0	0	0	0	0
F	0	0	3	0	0	0	0	0	0	0	0	2	1	6	3	0	0	0	0	3
F	0	0	3	0	0	0	0	0	0	0	0	2	1	6	3	0	0	0	0	4

(if there are more that 6, please attach a list with the rest of the numbers)

(These numbers will be used to link various different applications, authorisations, permits etc. that may be connected to a specific site)

PROJECT TITLE

Solaire Direct Glen Thorne Solar Photovoltaic Facility of 10MW near Bloemfontein, Free State

1. BACKGROUND INFORMATION

Project applicant:	Solaire Direct Southern Africa		
Trading name (if any):	Solaire Direct		
Contact person:	Mr. Grant Berndsen		
Physical address:	Regus Offices, Ground Floor Liesbeek House Glouster Road River Park Mowbray		
Postal address:	PO Box 501, Athlone		
Postal code:	7760	Cell:	+27 82 551 3552
Telephone:	+27 21 953 6014	Fax:	+27 21 951 2840
E-mail:	gberndsen@solairedirect.co.za		

Provincial Authority:	Department of Economic Development, Tourism and Environmental Affairs		
Contact person:	Tebogo Lioma		
Postal address:	Private Bag X20801, Bloemfontein		
Postal code:	9300	Cell:	
Telephone:	+27 51 400 4913	Fax:	+27 51 400 9523
E-mail:	tindlenit@dteea.fs.gov.za		

Landowner:	Barnie Human Landgoed Trust		
Contact person:	Jacques Strydom		
Postal address:	PO Box 1035, Bloemfontein		
Postal code:	9300	Cell:	+27 82 777 7500
Telephone:	+27 51 430 1011	Fax:	+27 51 430 5253
E-mail:	jacques@humanauto.co.za		

In instances where there is more than one landowner, please attach a list of landowners with their contact details to this application.

Local authority in whose jurisdiction the proposed activity will fall:	Mangaung Municipality		
Nearest town or districts:	Bloemfontein		
Contact person:	Sonja Freemantle		
Postal address:	PO Box 3704, Bloemfontein		
Postal code:	9300	Cell:	
Telephone:	+27 51 405 8540	Fax:	+27 51 405 8310
E-mail:	sonja.freemantle@mangaung.co.za		

In instances where there is more than one local authority involved, please attach a list of local authorities with their contact details to this application.

2. ACTIVITIES APPLIED FOR TO BE AUTHORISED

2.1 For an application for authorisation that involves more than one listed or specified activity that, together, make up one development proposal, all the listed activities pertaining to this application must be indicated.

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity as per project description[1]:
GN 544, 18 June 2010	1 (ii)	**The projected output of the solar facility is 10MW and the extent of the facility will cover an area of greater than 1 hectare.**
GN 544, 18 June 2010	11 (x), (xi)	**The boundaries of the project may fall within 32 meters of a watercourse.**
GN 544, 18 June 2010	18 (i)	**Soil may potentially be removed or moved from a watercourse during construction of the solar facility.**
GN 544, 18 June 2010	23 (ii)	**Undeveloped land of greater than 1 hectare but less than 20 hectares in size will be transformed for industrial use outside an urban area.**
GN 546, 18 June 2010	13 (ii) (bb)	**The clearance of 1 hectare or more of vegetation outside an urban area, where 75% or more of the vegetative cover is indigenous, may be required. The land portion to be cleared also falls partially within an area categorised as a National Protected Area Expansion Strategy Focus area.**
GN 546, 18 June 2010	14 (i)	**The solar facility will be situated outside an urban area. It may require the clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover may constitute of indigenous vegetation.**

Notes from CSIR:

1) *A precautionary approach has been adopted, whereby if there is uncertainty at this conceptual design phase whether a listed activity is part of the proposed project, then it is included in the Table above. This set of listed activities will be refined during the course of the EIA process and certain activities may be excluded or added as required.*

Please note that any authorisation that may result from this application will only cover activities specifically applied for.

2.2 A project schedule, indicating the different phases and timelines of the project, must be attached to this application form. **(See Appendix A)**

3. OTHER AUTHORISATIONS REQUIRED

3.1 DO YOU NEED ANY AUTHORISATIONS IN TERMS OF ANY OF THE FOLLOWING LAWS?

3.1.1 National Environmental Management: Waste Act [redacted]/**No**
3.1.2 National Environmental Management: Air Quality Act /**No**
3.1.3 National Environmental Management: Protected Areas Act /**No**

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[1] Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description