



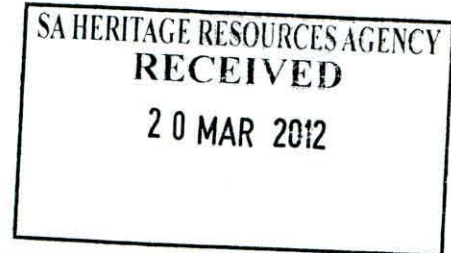
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9/2/302/0002

16 March 2012

Dr. M. Galimberti
 SA Heritage Resources Agency (Cape Town)
 PO Box 4637
 Cape Town
 8000



Dear Sir/Madam

PROPOSED CONSTRUCTION AND OPERATION OF A PHOTOVOLTAIC (SOLAR) POWER PROJECT OF 10 MW ON THE REMAINDER OF KNAPDAAR FARM (No.14) (FREE STATE PROVINCE): AVAILABILITY OF THE DRAFT BASIC ASSESSMENT REPORT FOR REVIEW - DEA reference number -14/12/16/3/3/1/456

The CSIR has been appointed by SolaireDirect Southern Africa (Pty) Ltd to undertake the Basic Assessment (BA) Process for the establishment of a Photovoltaic (Solar) Power Project of 10 MW on the Remainder of Knapdaar Farm (No.14), located approximately 6 km south-east of Springfontein, in the Free State province. The project will entail the construction of solar panel arrays and associated infrastructure. The electricity generated will be fed back into the national electricity grid via existing Eskom powerlines.

The Basic Assessment Process is undertaken in terms of GN R 544,545 and 546 promulgated under Chapter 5 of the National Environmental Management Act (Act 107 of 1998) published in Government Gazette 33306 on 18 June 2010. The need for a Basic Assessment is triggered by the inclusion of activities listed in GN R 544 and GN R 546, inter alia Activities: 1 (ii); 11 (x), (xi); 18 (i); 23 (ii); and the Listing Notice 3 activity 14(i) (GNR 546).

An application form was submitted to the National Department of Environmental Affairs (DEA) on 24 January 2012. Relevant organs of state were placed on the interested and affected parties (I&APs) register for the BA process at the outset (refer to Appendix E of the draft BA Report for details). In line with the requirements of the BA process a Draft BA Report has been completed and is now being released for a **40 day** review period, with the comments closure date set for the **30 April 2012**.

It is important to highlight that in addition to yourself the following authorities have also been couriered a copy of the draft BA Report for comment.

Contact person	Designation & Department	Organisation	Location
N. Ngoveni	Principal Environmental Officer	National Department of Environmental Affairs	Pretoria
Mrs. Anneliza Collett	Directorate: Land Use & Soil Management	Department of Agriculture, Forestry & Fisheries	Pretoria
Dr. Andile Gxasheka	Renewable Energy Specialist	NERSA	Arcadia
Dr M. Galimberti	APM Impact Assessor	South African Heritage Resources Agency	Cape Town
Mr. I. Venter	Manager for Range and Forage Science	Provincial Department of Agriculture	Bloemfontein
Mr. W. Grobler	Deputy Director: Water Regulation	Department of Water Affairs	Bloemfontein

Ms. N. Direro	Office of the Deputy Director General	Department of Energy	Arcadia
Ms. N. Ndumo	Engineering Control Technician	Provincial Department of Agriculture	Bloemfontein
Mr. X.T. Matwa	Mayor	Kopanong Municipality	Trompsburg
Mr. J. Geeringh	Senior Environmental Advisor	ESKOM	Johannesburg
Mr. X. Songcaka	Land Development Manager	ESKOM	Bloemfontein

In line with the above we encourage you to kindly submit any comments to the CSIR before the comment closure date indicated above. All comments received will be included into the Final Basic Assessment Report for submission to the DEA for decision making.

Should you have any project related queries, please do not hesitate to contact the undersigned.

Sincerely



Samantha Naidoo
CSIR Project Manager
Environmental Management Services (EMS)



solairdirect

SAHERITAGE RESOURCES AGENCY
RECEIVED
20 MAR 2012

Basic Assessment for a Photovoltaic (PV) Solar Facility
Proposed by SolaireDirect at Knapdaar Farm (No. 14)
near Springfontein, Free State Province

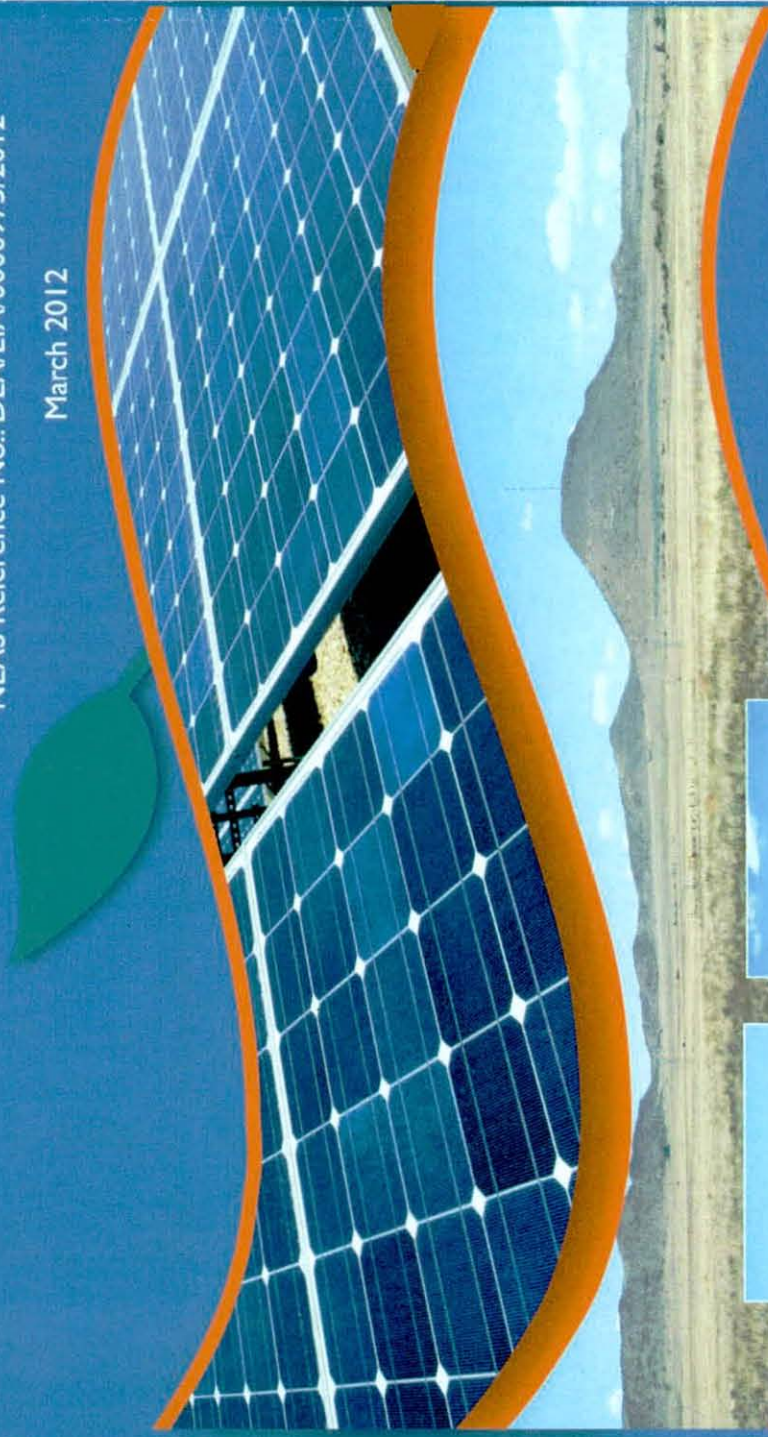
DRAFT BASIC ASSESSMENT REPORT

DEA Reference No.: 14/12/16/3/1/456

NEAS Reference No.: DEA/EIA/0000975/2012

March 2012

DRAFT BASIC ASSESSMENT REPORT



Prepared for:

SolaireDirect Southern Africa (Pty) Ltd.

Prepared by:

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CSIR Report Number:
CSIR/CAS/EMS/ER/2012/0005/B

CSIR

our future through science

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CITATION REFERENCE

When used as a reference, this report should be cited as:

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proposed by SolaireDirect at Knapdaar Farm near Springfontein, Free State
CSIR Report No. CSIR/CAS/EMS/ER/2012/0005/B.

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- *Appendix F: Environmental Management Programme (EMPr)*
- *Appendix G: Other information*

Opportunity for review:

This Draft Basic Assessment Report is released for review by stakeholders. Review comments are to be submitted by 30 April 2012 to the CSIR project manager at the address below:

Ms Samantha Naidoo
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PO Box 1700
Congella 4013
Phone: 031 242 2397
Fax: 031 261 2509
Email: SNaidoo5@csir.co.za

SUMMARY

SolaireDirect Southern Africa (Pty) Ltd. proposes to establish a Photovoltaic (PV) Solar Facility of 10MW on the Remainder of Knapdaar Farm (No.14), located approximately 6 km south-east of Springfontein, 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 and operational phases: 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 and operational phases: medium)
- Water consumption (construction and operational phases: low)
- Generation of grey water (construction phase: medium; operational phase: low)
- Generation of solid waste (construction and operational phases: low; 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 phase: 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 Springfontein area (construction phase: medium; operational phase: low).

The following potential positive impacts were identified (with 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 area (operational phase: low)

No substantial negative impacts have been identified that, in the opinion of the Environmental Assessment Practitioner, should be considered as "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. Based on the findings of this Basic Assessment, and given national and provincial strategic requirements for renewable energy, it is the opinion of the Environmental Assessment Practitioner that the project benefits outweigh the negative environmental impacts, and that the project will make a positive contribution to steering South Africa on a pathway towards sustainable development. Provided that the specified mitigation measures are applied effectively, it is proposed that the project receive environmental authorization in terms of the EIA Regulations promulgated under the National Environmental Management Act (NEMA).

In order to avoid and/or manage the potential negative impacts, and enhance the benefits, an Environmental Management Programme (EMPr) has been compiled. 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.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

Application Number:

Date Received:

12/12/2133

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is 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 report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? YES NO

If YES, please complete the form entitled "Details of specialist and declaration of interest"

for appointment of a specialist for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail¹:

Introduction and Background

SolaireDirect proposes to establish a 10 MW Photovoltaic (PV) Solar Facility on the Remainder of Knapdaar Farm (No.14), located approximately 6km south east of Springfontein in the Free State province with a farm boundary extent covering an area of approximately 2353 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 F0020000000001400000. 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).

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

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.

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.

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 Valleydora 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 Valleydora 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 Valleydora 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:

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. 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 where 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.

3. Transportation and Installation of PV Panels into an Array

The erection of solar module arrays on support structures in the form of strategically positioned steel or aluminium frameworks will be followed by the fixation of these structures 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.

It is anticipated that the following number of trips would be required:

- Delivery of panels: 42 loads consisting of 18.9 tons each on 12 m long trailers.
- Delivery of electrical equipment and components: four loads of 20 tons each.
- Delivery of frames: three loads of 20 tons each.
- Earthworks: 200 loads (potentially) of 10 m³ each to the identified Local

Authority Landfill Site.

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.

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 2.7-3.3m. A total of up to sixteen central inverters/transformers will be installed for purposes of the Valleydora solar facility. Solar panels create direct current (DC). However, this needs to be converted into alternating current (AC) in order 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.

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 Valleydora Substation, located approximately 800m south west of the centre point of the site over the railway line, 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 Valleydora Substation is dependent on which of the two alternative sites the facility will be located upon.

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 Valleydora 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.

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.

2. FEASIBLE AND REASONABLE ALTERNATIVES

“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Preferred Technology: Photovoltaic Solar Facility

Given the high irradiation values and restricted (and variable) water supplies within the vicinity of the Bloemfontein area, one of the best technologies for this region for the generation of electricity using renewable sources is photovoltaic solar systems.

Alternative Technology: There will be no alternative technologies considered

A common alternative to solar Photovoltaic power is Concentrated Solar Power (CSP). This technology requires high volumes of water thus presenting a major constraint for the utilisation of this technology type. While the irradiation values are high enough to generate sufficient solar power, the water constraints render this alternative unfeasible. Other renewable energy technologies for example, wind power is also unsuitable due to a lack of requisite wind speeds in the Free State area.

An alternative technology was initially considered for the project, that being dual axis tracking. This technology makes use of an electric motor, mechanical parts, and solar irradiation sensors to track the movement of the sun ensuring that light coming into contact with the PV panels is optimised.

Tracking PV systems are mounted on a single pole-type structure on a concrete foundation. The spacing of the mountings must be undertaken to ensure minimum inter-shading between structures. Because of the movement of the structure, however, the distance between

structures are much greater than with fixed structures, as the maximum height of a tracking structure could be up to 8m, depending on the exact model chosen. The implication of this is that less power can be installed on the same size of land when compared to fixed structures. Furthermore, the solar tracking motors consume power in order to move the solar PV modules. The consumed power will have to be deducted from the total generated power. Visual impact of the structures is high due to the overall height.

In calculations that were performed, a solar tracking-based system generated 7% less power per installed kW (peak) than a comparative fixed structure installation. This is mainly due to the power consumption of the tracking structures themselves.

The total cost of a solar tracking structure is roughly double the cost of a fixed structure. The fixed structure requires virtually no maintenance, but a tracking structure will require maintenance seeing as it is a moving structure. If these units are mounted in a sandy environment, maintenance requirements will increase.

Following detailed investigation and analysis, it was found that tracking technology is a feasible alternative but not preferred as it produces less power and costs more than fixed structures, for the land area under consideration.

Therefore, these alternatives will not be considered further in this report.

Property Alternatives

No other properties have been legally secured by SolaireDirect in the Bloemfontein area to potentially establish solar facilities. The current property satisfies the requirements for establishing a solar facility in terms of the terrain and the proximity to electrical transmission and distribution infrastructure (i.e. Valleydora Substation). Therefore no property alternatives will be considered in this report.

Site Alternatives

Two potential sites have been identified on Knapdaar Farm (No.14). The sites are located approximately 70-75m apart (refer to Appendix A1: Locality Map) and have similar site characteristics. Their fundamental differences relate to ecological sensitivity and their respective distances from existing power lines and the substation. The "preferred site" is much closer in proximity to the point at which electricity from the solar facility will be connected to transmission cables that function to transmit electricity to the Valleydora Substation. Given that the location options are very similar in nature, one environmental baseline description is provided and it represents both location options as shown in Appendix A (Section F). The differences in Site Option 1, or the "preferred site", and Site Option 2, or the "alternative site", are highlighted in greater detail in Section D of this report under sub-sections 2 and 3.

Design and Layout Alternatives

The one design option being considered at this stage relates to the structures on which solar panels will be mounted. These structures could either be based on a concrete foundation or a deep seated anchor screw. At this stage of the planning process, a generic site layout has been prepared (Appendix C, Section F).

The No-Go Alternative

If the project does not proceed, there will still be a need for alternative energy projects to supplement the current power requirements of the country. The site will remain unchanged and there will be no opportunities for temporary and permanent employment created through this

project. This alternative is included as a baseline in this report, against which the project impacts are assessed.

Paragraphs 3 – 13 below should be completed for each alternative.

3. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection. List alternative sites, if applicable.

	Latitude (S):		Longitude (E):
Alternative: Alternative S1 ² (preferred or only site alternative)	30 °	16.867'	25 °
Alternative S2 (if any)	30 °	16.017'	25 °
Alternative S3 (if any)			

In the case of linear activities:

	Latitude (S):		Longitude (E):
Alternative: Alternative S1 (preferred or only route alternative)			
<ul style="list-style-type: none"> • Starting point of the activity • Middle/Additional point of the activity • End point of the activity 			
Alternative S2 (if any)			
<ul style="list-style-type: none"> • Starting point of the activity • Middle/Additional point of the activity • End point of the activity 			
Alternative S3 (if any)			
<ul style="list-style-type: none"> • Starting point of the activity • Middle/Additional point of the activity • End point of the activity 			

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	Size of the activity:
Alternative A1 ³ (preferred activity alternative)	19.9 ha

² "Alternative S.." refer to site alternatives.

³ "Alternative A.." refer to activity, process, technology or other alternatives.

Alternative A2 (if any)
Alternative A3 (if any)
or, for linear activities:



Length of the activity:

Alternative:

Alternative A1 (preferred activity alternative)
Alternative A2 (if any)
Alternative A3 (if any)



Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Size of the site/servitude:

Alternative:

Alternative A1 (preferred activity alternative)
Alternative A2 (if any)
Alternative A3 (if any)



5. SITE ACCESS

Does ready access to the site exist? (Yes, the site is accessible from the R30)
If NO, what is the distance over which a new access road will be built



Describe the type of access road planned:

The proposed Valleydora solar field will utilise the N1 national freeway and the auxiliary R715 for access to the site and no new access roads will be required. Dual access is envisaged for both security and for emergency purposes. In addition, a site internal road network will be developed to provide access to the solar park, and other infrastructure (i.e. substation and buildings). Access will be needed primarily for light service vehicles entering the site for maintenance, inspection and panel cleaning purposes. Furthermore, a safety firebreak band will be constructed around the perimeter of the site in order to prevent the spread of external fires entering the park. Existing farm roads will be used where possible.

The site road network will include turning circles for large trucks and passing points where necessary. All internal road infrastructure will fall outside of a 100 m buffer zone for wetlands/watercourses and ecologically sensitive areas will be avoided. All internal roads will require a width of approximately 6 m. Drainage trenches along the side of the internal road network will be installed. In addition, silt traps at the outfall of the drainage trenches to existing watercourses will be installed. A setback line of 95m along main and divisional roads as measured from the centre line of the applicable road reserve will be factored in.

Within the site itself, access will be required from the existing road to the individual facility components for construction purposes (and later limited access for maintenance). The access road between panels will consist of gravel.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as **Appendix A (in Section F)** to this document.

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;
- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8 metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - rivers;
 - the 1:100 year flood line (where available or where it is required by DWA);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.11 the positions from where photographs of the site were taken.

7. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under **Appendix B (in Section F)** to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as **Appendix C (in Section F)** for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

R250-300 million

What is the expected yearly income that will be generated by or as a result of the activity?

R
See adjacent explanation

Unknown at this stage – will depend on the tariff proposed to DOE.

Will the activity contribute to service infrastructure?

YES

Is the activity a public amenity?

NO

How many new employment opportunities will be created in the development phase of the activity?

35 - 40

What is the expected value of the employment opportunities during the development phase?

R2 250 000

What percentage of this will accrue to previously disadvantaged individuals?

75%

How many permanent new employment opportunities will be created during the operational phase of the activity?

12-16

What is the expected current value of the employment opportunities during the first 10 years?

R11.4 million

What percentage of this will accrue to previously disadvantaged individuals?

%
See below explanation

SolaireDirect intends to contribute a portion of their gross profit (before tax and depending on the project stage) to a local community trust that has been set up specifically for this project (SolaireDirect would be part of the board and have voting rights). The value of this contribution will be determined on finalisation of the tariff as part of the Power Purchase Agreement (PPA).

Note: The Project Company proposes to contribute approximately 1% of revenue towards Socio-Economic Development projects/initiatives in the province. It is envisaged that these funds will be directed into the account of a Local Community Trust and in turn will be administered in accordance with the Socio-Economic Development Strategy of the Local Municipality.

Mechanism

The shareholders of the proposed Valleydora Solar Project intend to set up a Local Community Trust (the "Trust") upon successful award of Preferred Bidder status. The Trust will be given a 2.5% shareholding in the Project Company.

The Trust will be administered by a Board of Trustees made up of key local stakeholders. The Trustees will include persons representing the following organisations:-

- The "Project Company"
- A local Accountant
- A local Lawyer
- 3 x NGO's

Funding of the Trust

The Trust will essentially benefit from two sources of revenue.

1. Dividends

As a 2.5% shareholder in the Project Company the Trust will receive dividends.

2. Socio-economic contribution payments

The Project Company has committed, as part of its bid response, to making a socio-economic contribution payment of 1% of Gross Revenue to the Trust.

This method of having the same entity as both a shareholder of the Project Company and the recipient of the socio-economic contributions from the Project Company implies that the Trust will have funds available from an early stage in the project life, rather than having to wait for what could be several years for dividend payments if it were only a shareholder.

Distribution of funds

The Trust will issue a request for socio-economic project proposals on an annual basis. The criteria for selection will be fully developed and detailed in the relevant documentation and interested parties will be invited to present their proposal in person to the Trustees.

Project proposals will be adjudicated and awarded by all Trustees in a fair and equitable manner, ensuring that the needs of the community are being met.

Based on the assessment of the Trustees, the Trust will then make a formal offer of financial assistance to the relevant project initiators, including the agreed contract terms and payment milestones.

9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

NEED:	
1.	Was the relevant provincial planning department involved in the application? NO
2.	Does the proposed land use fall within the relevant provincial planning framework? NO
3.	<p>If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:</p> <p><u>Provincial Level Policy and Planning</u></p> <p>The Free State Provincial Growth and Development Strategy (FSPGDS) is a nine-year strategy (2004-2014) which aims to achieve the objectives of Vision 2014. As a provincial policy framework, it sets the tone and pace for shared growth and development in the Province. The FSPGDS identifies a number of key provincial priorities. The priorities that are relevant to the proposed PV solar energy facility include:</p> <ul style="list-style-type: none"> • Economic development, employment, and investment; • Human and social development. Economic growth is underpinned by a good socio-economic environment. <p>Furthermore, the following key objectives are set for economic development, employment and investment:</p> <ul style="list-style-type: none"> • To achieve an economic growth rate of 6%-7% per annum; • To reduce unemployment from 30% to 15%; • To reduce the number of households living in poverty by 5% per annum; • To provide adequate infrastructure for economic growth and development. <p>The installation and operation of a PV solar energy facility in the Free State will provide infrastructure that will serve to reduce unemployment levels by creating a number of job opportunities for local communities and in so doing promote economic growth and development.</p> <p><u>District Level Policy and Planning</u></p> <p>The Xhariep District Municipality IDP 2010/11 states that one of its key opportunities is, "diversifying production of energy from renewable sources such as biomass and rivers and solar to ensure both the price competitiveness of agriculture and help meet South Africa's CO² reduction targets." The proposed solar PV project will contribute directly towards this imperative.</p> <p>In addition, the Free State Development Corporation (FDC) has identified and fully appreciates the potential for solar energy projects in the larger Xhariep District Municipality DM (including the Kopanong Local Municipality) due to the excellent solar radiation rate in southern Xhariep District Municipality (only surpassed by that of Upington) and the availability of land for such developments.</p>

Local Level Policy and Planning

The most recent Kopanong Local Municipality Integrated Development Plan (IDP) appears to have been approved for the financial year 2010/2011.

The developmental policy contained in the Kopanong Local Municipality Integrated Development Plan (IDP) is underpinned by the national Strategic Plan for Local Government 2006-2011, the Free State Provincial Growth and Development Strategy (FSGDS), the national Accelerate and Shared Growth Initiative – South Africa (2006-2014) (ASGISA), and the 2009 national Local Government Turn Around Strategy (re. service delivery challenges and financially sustainable local government).

The Key Priority Areas (KPA) as given in the Kopanong Local Municipality IDP which are of specific relevance to the proposed photovoltaic solar energy facility include:

- KPA 2: Improved Basic Service Delivery And Infrastructure Investment
- KPA 3: Local Economic Development

KPA 2: Improved Basic Service Delivery And Infrastructure Investment

How the proposed development will contribute towards achievement of this priority goal:

In terms of the Kopanong Municipality IDP (2010/2011), to address the urgent need for improved basic service delivery and encourage investment in infrastructure, the municipality aims to "ensure the provision of adequate and sustainable electricity services to all consumers" by extending and upgrading the existing network and infrastructure. In addition, the establishment of a fully functional power generating facility will effectively increase investment in infrastructure on a local scale.

KPA 3: Local Economic Development

How the proposed development will contribute towards achievement of this priority goal:

A key objective in terms of Kopanong Local Municipality's IDP is, "to create an environment that is conducive for investors to invest in both urban and rural areas, including the availability of suitable land for a variety of uses, e.g. business, commercial and industrial." The construction and operation of the proposed 10MW solar facility will assist in attracting further investment into rural areas which have, in the past, been avoided by investors. However, realization of the suitability of such areas for the construction of solar parks has augmented the inflow of both national and international investments into the country. This ultimately gives rise to a number of benefits; one of the most significant being economic growth and development. Furthermore, the employment opportunities generated throughout the project life cycle of the proposed PV plant will provide numerous job opportunities for residents and assist in alleviating poverty levels.

The Kopanong Local Municipality IDP (2010/11) notes that the municipality has a high level of illiteracy especially in the rural areas due to a lack of facilities and adequate resources. The lack of quality education in rural areas has exacerbated rural depopulation and increased urban in-migration which in turn has contributed to social

problems brought about by unemployment. Of the 3 Local Municipalities that make up the Xhariep District Municipality, the Kopanong Local Municipality has the highest number of employed people in the District estimated at over 35 961 (2006) people in the formal and informal employment market. However, according to the Kopanong Local Municipality IDP (2010/11), approximately 40.2% of people in the Municipality are living in poverty. Considering this, the proposed solar facility will act to uplift communities within the municipality by increasing employment opportunities, decreasing the number of households living in poverty by providing a monthly income to employees, and thereby boosting local economic development.

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	YES	
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES	
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES	
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		
5.	Will the proposed land use / development impact on the sense of place?		NO
6.	Will the proposed land use / development set a precedent?	YES	
7.	Will any person's rights be affected by the proposed land use / development?		NO
8.	Will the proposed land use / development compromise the "urban edge"?		NO
9.	<p>If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.</p> <p>According to the Kopanong Local Municipality 2010/2011 IDP document, electricity demand in the local area is growing, especially in rural areas It is a key focus of the Municipality's infrastructural analysis to ensure that its residents benefit from improved access to electricity. To attain this, the municipality can use alternative energy supplies to improve electricity supply.</p> <p>To this end, solar energy is an alternative energy source that can be fed into the existing electricity grid. This will contribute to a reduction in the use of fossil fuels (i.e. coal) to generate electricity.</p> <p>The use of alternate energy sources is often listed as a goal in various planning documents. If unlisted, their utilisation will however facilitate the achievement of several other goals specified in provincial, regional or local plans. This project will, if approved, and properly executed show how alternative energy sources can be successfully integrated into mainstream power supply and aid in the meeting of infrastructural goals for the region.</p>		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	YES	
2.	Explain:		

	<p>The development of solar facilities will have several benefits for society in general, five of which are discussed below:</p> <ul style="list-style-type: none"> <p>• Reduced Air Pollution, Carbon Dioxide Emissions and Water Consumption Solar energy facilities have a much smaller carbon footprint than coal power stations as they make use of solar energy, a renewable resource, to produce electricity. The impact on the natural landscape is thus also of a lower significance as there is no need for coal mines that result in more severe and longer term impacts. The additional power supplied through solar energy will reduce the reliance on combustion of fossil fuels to produce power. This has a direct impact on the volume of pollution produced as a result of fossil fuel combustion i.e. the volumes of carbon dioxide and other air pollutants will also decrease. In addition, coal power requires high volumes of water, in areas of South Africa where water supply is already over-stretched and water availability is highly variable.</p> <p>• Lower costs of Alternative Energy The greater the number of solar facilities being commissioned, the lower the costs of power generation through PV technology will be. This will contribute to the country's objectives of utilising more renewable energy and less fossil fuel based power sources.</p> <p>• Increased Surety of Supply and Increased Quantity of Available Power By diversifying the sources of power in the country, the surety of supply will increase. Additionally, the power demands of South Africa are ever increasing and by adding solar power this demand can be met, and even exceeded without increasing pollution in relation to the use of fossil fuels.</p> <p>• Improved Living Standards for Rural Populations An increase in power supply means that rural electrification can be more easily achieved. Electrification brings about opportunities for development of institutions such as clinics, hospitals and schools. There is the possibility of access to the internet, radio and television, as well as development of water treatment facilities and sanitation. By introducing these improvements, there may be a reduced need for rural –urban migration.</p> <p>• Economic Development and Employment Opportunities By supplying power to an area, there exists the potential to develop industries and businesses.</p> 	
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES <input checked="" type="checkbox"/>
4.	<p>Explain:</p> <p>Creation of Employment Opportunities and Poverty Reduction The main benefit of the proposed project operating near the Springfontein area is that local companies or contractors could be hired during the construction period (8-10</p>	

	<p>months). This will create temporary employment opportunities for locals. Additionally during the operational phase, 8-10 security guards are likely to be employed on a full time basis and 4-6 operation and maintenance labourers to clean the panels will also be required on a permanent basis.</p> <p>The labour contract between the developer and contractors who are appointed to provide services for the developer during the construction phase of the development should, inter alia, specify local labour employment criteria, e.g. percentage of total workforce.</p> <p>This will provide a number of households with a source of income and concomitantly reduce the poverty levels of communities.</p> <p><u>Economic Growth and Development</u></p> <p>The additional power supply will likely result in more reliable power supply to the town and consequent opportunities for business expansion. This could add to the economic output of the town.</p>
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10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
<p>Government Gazette 33306 GN R 544: Activities 1, 11, 18 and 23:</p> <p>1. The construction of facilities or infrastructure for the generation of electricity where:</p> <p style="padding-left: 20px;">ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.</p> <p>11. The construction of:</p> <p>(x) buildings exceeding 50 square metres in size; or</p> <p>(xi) infrastructure or structures covering 50 square metres or more</p> <p>Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p> <p>18. The infilling or deposition of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5</p>	<p>National Department of Environmental Affairs</p>	<p>18 June 2010</p>

<p>cubic metres from: (i) a watercourse</p> <p>23. The transformation of undeveloped, vacant or derelict land to – (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.</p> <p>Government Gazette 33306 GN R 546 Listing Notice 3, Activity 14</p> <p>14. The clearance of an area of 5 hectare or more of vegetation where 75% or more of the coverage constitutes indigenous vegetation – (a) i. All areas outside urban areas.</p>	
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11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES

If yes, what estimated quantity will be produced per month?

222 m³

How will the construction solid waste be disposed of (describe)?

Construction waste will most likely consist of concrete (if concrete foundations are utilised to support mounting structures) mixed with scrap metal. It is recommended that all concrete mixing be undertaken on impermeable plastic lining to prevent contamination of the soils and surrounding areas. Construction solid waste will be managed via a Construction Environmental Management Plan (EMP) and will incorporate reduction, recycling and re-use principles. The contractor shall remove refuse collected from the working areas at the site at least once a week. Furthermore, all builders' rubble generated during the construction phase shall be removed from the site regularly to a licensed landfill site.

Where will the construction solid waste be disposed of (describe)?

All construction wastes will be collected and temporarily stored in skips on site. The skips will be emptied into trucks and waste taken to the nearest registered landfill. Any scrap metal will be sent for recycling.

Will the activity produce solid waste during its operational phase?

YES

If yes, what estimated quantity will be produced per month?

0.2 m³

How will the solid waste be disposed of (describe)?

Waste in the form of general waste will be produced by on-site labourers. A contracting party will be responsible for the disposal of general wastes in accordance with municipal guidelines and policies.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

General wastes will temporarily be stored in skips on-site. A contracting party will be responsible for the periodic emptying of skips, and the transportation and subsequent disposal of all wastes.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? YES NO

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility? YES NO

If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? YES NO

If yes, what estimated quantity will be produced per month?

Will the activity produce any effluent that will be treated and/or disposed of on site? YES NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? YES NO

If yes, provide the particulars of the facility:

Facility name:

Contact

person:

Postal
address:

Postal code:

Telephone:

E-mail:

Cell:

Fax:

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere? YES NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

During the construction phase, dust will be generated from the clearing of vegetation and movement of vehicles accessing the site. Given that the site has pre-existing areas of open sand and tracks (from previous power line construction), the dust generated during construction is not expected to be significantly more than is currently experienced at the site on any given day.

Trucks will bring in water for the cleaning of panels and more frequently for refuse removal once per annum. However, the generation of dust and vehicle emissions is likely to be negligible. The settling of dust on solar panels affects the overall efficiency of power generation. It is therefore in the proponent's best interests to minimise the dust from the site. Approved soil stabilizing agents may need to be used to minimise dust. No emissions would be generated from the actual functioning of the facility during the operational phase as solar energy facilities operate by converting solar energy to electricity. The proposed facility would in fact assist in reducing South Africa's carbon emissions in the long term by contributing to Government's renewable energy target.

11(d) Generation of noise

Will the activity generate noise?

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

YES	
	NO

During the construction phase, noise will be generated by the construction activities, workers and vehicle on the site. The levels of noise are not expected to be very high and furthermore any potential receptors are likely to be the farm workers that tend the sheep. However, the sheep farming activities are not routinely undertaken in the area or the surrounds. The site is at least 6km from the edge of Springfontein residential areas. Therefore construction noise is not expected to influence these nearest residential areas.

During the operational phase there will be no noise generated.

Noise generation would be limited to the construction phase and is thus considered to be short-term and of low significance.

12. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

	Other (see explanation below)	
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

N/A

Does the activity require a water use permit from the Department of Water Affairs? YES NO

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

The most significant quantities of water will be used in the construction phase of the development to facilitate construction-related activities, such as concrete-mixing (if concrete foundations are opted for as anchorage for mounting structures) and dust control. A total of approximately 5.4 million litres of water would be required for the construction phase of the project, of which an amount of 575,586 litres would be required for concrete-mixing, and a quantity of 4,800,000 litres for dust control and consumption purposes.

During the operational phase of the project, the main activities usually requiring water use include the maintenance or "up-keep" of solar panels and meeting the domestic needs of security and operational staff on site. In the case of this particular project, solar panels would be cleaned manually with a window washer type device covered with a specialized cloth material, such as a squeegee, a soft brush or cloth, on an annual basis. Hence, no water will be required for cleaning purposes. Water will only be required for consumption by on-site labourers.

The water source has not yet been determined; however should the landowner contain a lawful water licence, arrangements will be made with him for water use, on consent from the Department of Water Affairs. The project developer will also need to apply to the Department of Water Affairs for a Water Use Licence.

13. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The design takes the position of the optimum solar radiation into account in order to efficiently capture solar energy. The proposed solar energy facility would generate electricity from a renewable source, i.e. solar energy, and thereby promote the use of more energy efficient technologies for power production.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Not applicable

SECTION B: SITE / AREA / PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No.
(e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? YES

If YES, please complete the form entitled "Details of specialist and declaration of interest"

for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property
description/physical
address:

Remainder of Knapdaar Farm (No. 14), located adjacent to the N1 road on the right side travelling toward Trompsburg. The farm lies approximately 6km south-east of Springfontein.

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use
zoning:

The proposed sites are currently used as grazing camps for small livestock farming and agricultural purposes.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?
Must a building plan be submitted to the local authority?

YES
 YES

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	
------	--

Alternative S2 (if any):

Flat	
------	--

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline

2.2 Plateau

2.3 Side slope of hill/mountain

2.4 Closed valley

2.5 Open valley

2.6 Plain

2.7 Undulating plain / low hills

2.8 Dune

2.9 Seafront

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative: site option 1	Alternative: site option 2
Shallow water table (less than 1.5m deep)	NO	NO
Dolomite, sinkhole or doline areas	NO	NO
Seasonally wet soils (often close to water bodies)	NO	NO
Unstable rocky slopes or steep slopes with loose soil	NO	NO
Dispersive soils (soils that dissolve in water)	NO	NO
Soils with high clay content (clay fraction can exceed 40%)	YES	YES
Any other unstable soil or geological feature	NO	NO
An area sensitive to erosion	YES	YES

Note: Site options 1 and 2 are located on Swartland type soils characterised by a clay content that may exceed 40% and a high sensitivity to erosion (site options are shown on maps contained in Appendix A, Section F). However, the implementation of mitigation measures will decrease the negative impacts associated with erosion (see Appendix F: EMPr).

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUND COVER

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).



Note: The overall level of alien infestation can be considered low to negligible. Also, the veld condition is relatively poor with signs of overgrazing present.

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area (i.e. Xhariep Karroid Grassland and Besemkaree Koppies Shrubland species dominates the sites)

- 5.2 Low density residential
- 5.3 Medium density residential
- 5.4 High density residential
- 5.5 Informal residential^A
- 5.6 Retail commercial & warehousing
- 5.7 Light industrial
- 5.8 Medium industrial^{AN}
- 5.9 Heavy industrial^{AN}
- 5.10 Power station
- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam^A
- 5.14 Quarry, sand or borrow pit

5.15 Dam or reservoir

- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant^A
- 5.22 Train station or shunting yard^N

5.23 Railway line^N

- 5.24 Major road (4 lanes or more)^N
- 5.25 Airport^N
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station^H
- 5.31 Landfill or waste treatment site
- 5.32 Plantation
- 5.33 Agriculture
- 5.34 River, stream or wetland

5.35 Nature conservation area

5.36 Mountain, koppie or ridge

5.37 Museum

5.38 Historical building

5.39 Protected Area

5.40 Graveyard

5.41 Archaeological site

5.42 Other land uses (describe)

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

The proposed project will not in any way impact upon the railway line. Likewise, there will be no impacts on the proposed activity resulting from the existing railway line.

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? N/A

If YES, specify and explain:

If YES, specify:

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity. N/A

If YES, specify and explain:

If YES, specify:

6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site?

NO

See discussion below.

If YES,
explain:

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:	<p>A discussion on the findings of archaeological and palaeontological studies conducted are presented below:</p> <p>Heritage and archaeological studies:</p> <p>A Heritage Impact Assessment (HIA) was conducted to locate and evaluate the significance of cultural heritage sites, archaeological material, manmade structures older than 60 years, sites associated with oral histories and graves that might be affected by the proposed development. The study likewise aimed to assess the potential impact on archaeological and historical material and to recommend specific mitigation measures to avoid the risk of any damage or destruction of the finds during the construction and operation of the proposed developments. The HIA was done in terms of the National Heritage Resources Act (NHRA), (25 of 1999) and under the Environmental Conservation Act, (73 of 1989).</p> <p>The study indicated the Free State province is closely associated with Iron Age archaeology, and that stone tools are likely to occur on flat Karoo vegetation areas and along the foothills of mountains or against koppies and hills characterising the property of interest. Furthermore, in a series of Environmental Impact Assessments (EIA) previously done in the Springfontein region, we have learnt that Anglo-Boer War remnants could be found in the vicinity of Springfontein. Some of the most possible finds could include fired cartridge shells and metal food containers displaying heavily soldered seams.</p> <p>On the site visit conducted on the 06 of February 2012, a single piece of a soldered tin canned milk container dating from the Anglo-Boer War (1899-1902) was found on the surface opposite the N1 and adjacent to the Kuilfontein farm stall. Furthermore, it was discovered that over time the present farm house at Knapdaar had been renovated and extended into a modern dwelling. It is alleged that the original farm house was used as a hospital by the British Military Forces during the Anglo-Boer War (1899-1902). Judging by the large size of the trees on the farm yard it is clear that the farm could be very old. In addition, gates which appears to be hand made by a smithy protects the railway crossings on the farm. These features which bear witness of expert workmanship are of special interest, and should be protected and preserved in some way.</p> <p>The Anglo-Boer War finds are not considered to be of significant heritage importance. Furthermore, no other cultural and historical material or graves were found during the investigation, nor were there any stone tool material visible. The HIA also revealed that the implementation of mitigation measures is not required for the specified area of development. It was further recommended that the planning of the proposed the PV Solar installation on the farm Knapdaar, No. 14 outside Springfontein may proceed.</p> <p>Palaeontological studies:</p>
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The palaeontological significance of the affected area was evaluated through a desktop study and carried out on the basis of existing field data, database information and published literature.

The affected area is underlain by Late Permian Beaufort Group sediments of the lower Adelaide (Pa). These sediments form the base on which younger, weakly developed superficial deposits of Late Cenozoic age have been deposited and include pedocretes, colluvial slope deposits, sheet wash and alluvium. There are no objections to the proposed development on palaeontological grounds provided that access by a specialist should be facilitated at the appropriate stage during the construction phase of the development. Also, newly uncovered objects of palaeontological significance, found during the course of excavation activities must be reported to the appropriate heritage authorities. It must be noted that such finds may require a Phase 2 rescue operation at the cost of the developer.

The Draft Basic Assessment Report is being sent to the Provincial Heritage Resources Authority of the Free State for their review and comments. The outcome will be communicated to all interested and affected parties and presented in the Final Basic Assessment Report.

Will any building or structure older than 60 years be affected in any way?
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

	NO
	NO

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;
- (b) giving written notice to—
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
 - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
 - (iii) the nature and location of the activity to which the application relates;
 - (iv) where further information on the application or activity can be obtained; and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

6. AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Note: list of authorities and contact details in Appendix E, Section F

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

List of authorities informed:

National authorities:

- Department of Agriculture, Forestry and Fisheries
- Department of Environmental Affairs
- Department of Water Affairs
- Department of Mineral Resources
- Department of Energy

Provincial authorities:

- Department of Agriculture
- Department of Water Affairs
- Department of Economic Development, Tourism and Environmental Affairs
- Department of Sport, Arts, Culture and Recreation (Free State Heritage Resources Authority)
- Free State Tourism Authority

Local authority:

- Kopanong Local Municipality

Other key authorities:

- South African Heritage Resources Agency (SAHRA)
- Civil Aviation Authority (CAA)
- South African National Roads Agency Limited (SANRAL)
- National Energy Regulator of South Africa (NERSA)
- Wildlife and Environment Society of South Africa (WESSA)

List of authorities from whom comments have been received:

National authorities:

Department of Environmental Affairs (DEA)

- Dated: 01 March 2012
- *via*: facsimile and post

Provincial authorities:

Department of Agriculture and Rural Development (DARD)

- Representative: Ms. Nosisa Ndumo (Engineering Control Technician - Provincial Department of Agriculture)
- Date: 21 February 2012
- *via*: Key Stakeholder Meeting

Department of Water Affairs (DWA)

- Representative: Mr. Carlo Schrader (Technician)
- Dated: 21 February 2012
- *via*: Key Stakeholder Meeting

Department of Economic Development, Tourism and Environmental Affairs (DETEA)

- Representatives: Ikhraam Osman (HOD - Provincial Department of Economic Development, Tourism and Environmental Affairs), Thabo Makweya (Head of Strategic Projects - Provincial Department of Economic Development, Tourism and Environmental Affairs), Mr Coenie Erasmus (Environmental Manager - Provincial Department of Economic Development, Tourism and Environmental Affairs)
- Dated: 21 February 2012
- *via*: Key Stakeholder Meeting

Department of Sport, Arts, Culture and Recreation - Free State Heritage Resources Authority (FSHRA)

- Representative: Ms. Loudine Philip (Member: Heritage Free State: Permit Committee)
- Dated: 06 March 2012
- *via*: e-mail

Other key authorities:

South African Heritage Resources Agency (SAHRA)

- Mr. Andrew Salomon (Member: Archaeology, Palaeontology and Meteorite Unit)
- Dated: 29 February 2012
- *via*: postage

Civil Aviation Authority (CAA)

- Representative: Mr. Christopher Isherwood (Obstacle Specialist)
- Dated: 16 February 2012
- *via*: e-mail

Note: See Appendix G for the above-mentioned e-mail and letter correspondence. Below we have listed the key stakeholder meetings with authorities together with a brief summary of the discussions that took place.

**Key Stakeholder meeting with the Provincial Department of Agriculture
(Representative: Ms. Nosisa Ndumo)**

Date: 21 February 2012

Time: 11:30 a.m. – 12:30 p.m.

Individuals present: Nosisa Ndumo (Engineering Control Technician - Provincial Department of Agriculture) Reggie Niemand (SolaireDirect), Ismail Banoo (CSIR), Samantha Naidoo (CSIR)

Outline of discussion:

Nosisa Ndumo: Will arable lands be utilised for the development?

Reggie Niemand: No, arable land will not be used for the proposed development. The facility will be constructed on land categorised as having low agricultural potential, and which is currently being used for the grazing of livestock.

Nosisa Ndumo: For how long is the lease on the land valid?

Reggie Niemand: The lease covers a period of 25 years, with the option to renew or decommission the project thereafter.

Nosisa Ndumo: Did SolaireDirect obtain approval of the project from the Department of Energy and ESKOM?

Reggie Niemand: SolaireDirect will submit all pertinent information to the Department of Energy and Eskom for project approval once the Record of Decision (ROD) from the Department of Environmental Affairs is obtained.

Nosisa Ndumo: Will SolaireDirect provide the Department of Agricultural Affairs with information indicating approval of the project from the Department of Energy and Eskom?

Reggie Niemand: The Department of Agriculture will be greatly involved in the project during conduction of the Basic Assessment process. However, SolaireDirect will most definitely provide the Department of Agriculture with all requested information. The CSIR will also facilitate the active involvement of the Department of Agriculture in the public participation process for the Basic Assessment being conducted for this project.

Nosisa Ndumo: SolaireDirect must indicate the land on which the proposed solar facility will be located so that the provincial department can provide this information to the Department of Agriculture offices in Pretoria for application of lease agreement and change of landuse.

Reggie Niemand: SolaireDirect will provide this information as soon as a ROD is obtained from the Department of Environmental Affairs.

Nosisa Ndumo: What if such projects act to change the attitude and perspective of farmers towards agriculture?

Reggie Niemand: Such projects are unlikely to cause significant changes in the attitude of farmers as they will only be constructed on farms where substation capacity in the area supports them. Hence, agriculture will remain the major source of income for the majority of farmers in the Glen and Springfontein areas.

Reggie Niemand: Will the land portion utilised for construction of the solar facility require a special zone in terms of rezoning?

Nosisa Ndumo: Yes, a special zoning will be required. However, the portion of land will still remain zoned for agriculture.

Nosisa Ndumo: Will water be used for cleaning of the solar panels?

Reggie Niemand: No, a window-washer type device will be used for cleaning purposes. Water will only be used during the construction phase of the project.

Nosisa Ndumo: Will the project generate employment opportunities for local communities?

Reggie Niemand: Yes. Between 35 and 40 employment opportunities will be created during the operational phase of the project, 16 of which are permanent. SolaireDirect will also initiate a Trust, comprising of local authority representatives, a community representative as selected by the community and members of the SolaireDirect company. The Trust will operate such that a percentage of the income generated from operation of the solar facility will be utilised to fund community projects in line with the local municipality's Integrated Development Plan (IDP).

Nosisa Ndumo: Why are the proposed solar projects near Bloemfontein and Springfontein (the 75MW and 10MW projects) split?

Reggie Niemand: Given the shorter period required for the completion of a Basic Assessment process in comparison to full Environmental Impact Assessment process, SolaireDirect intends to use the 10MW solar facility to bid in Round Three of the bidding process.

Nosisa Ndumo: How long has SolaireDirect been operating in South Africa?

Reggie Niemand: Since the year 2009. SolaireDirect has made significant investment in the local energy market since then.

Reggie Niemand: Will it be possible for you to distribute all information pertinent to all proposed projects to the relevant persons within the Department?

Nosisa Ndumo: Yes I will.

Nosisa Ndumo: I am happy that the project proposes to benefit the local community in a number of ways. Thank you for proposing projects that have a core focus on community upliftment.

Key Stakeholder meeting with the Provincial Department of Water Affairs

(Representative: Mr. Carlo Schrader)

Date: 21 February 2012

Time: 13:30 p.m. – 14:15 p.m.

Individuals present: Carlo Schrader (Industrial Technician - Provincial Department of Water Affairs) Reggie Niemand (SolaireDirect), Ismail Banoo (CSIR), Samantha Naidoo (CSIR)

Outline of discussion:

Carlo Schrader: Where will water be sourced from for use in the proposed project? Will arrangements be made with the landowner or will water be extracted from a natural water source?

Reggie Niemand: SolaireDirect intends on making arrangements with the land owner to use his/her existing water use licence, on consent from the Department of Water Affairs.

Reggie Niemand: However, which of these will be the best option?

Carlo Schrader: I recommend using the property owner's water use licence. In this case, the registered water use will have to be changed from agricultural use to industrial use.

Reggie Niemand: Will SolaireDirect be required to fill in any forms regarding water use?

Carlo Schrader: Yes. SolaireDirect will have to fill in a form to register their water use and indicate that a change in land use activities, from agricultural to industrial, will occur.

Ismail Banoo: If 100m buffers (as accepted by the provincial Department of Water Affairs) are added to all existing water features, and sensitive areas are thereby avoided, will developing on the property be acceptable?

Carlo Schrader: Yes.

Ismail Banoo: Should section 21 (a) be applied for in this projects?

Carlo Schrader: At this stage, section 21 (f) is applicable to the projects.

Carlo Schrader: The Department of Water Affairs needs to determine whether the landowner's water use is lawful.

Reggie Niemand: If the owner's water use is found to be unlawful, will this prevent SolaireDirect from applying for water use?

Carlo Schrader: No, SolaireDirect can still apply for water use.

Carlo Schrader: Is the intended water source covered in the lease agreement between SolaireDirect and the landowner?

Reggie Niemand: Yes it is. However, should SolaireDirect opt to use the deep-seated anchor screw option instead of concrete foundations on their mounting structures then water use may not be required.

Ismail Banoo: Will it be possible for the Provincial Department of Water Affairs to provide the CSIR with a letter indicating that the Department is aware of the proposed projects and that Water Use Licence Application processes may have to be followed should these projects be accepted in the next Round of bids?

Carlo Schrader: Yes, the Department will supply such a letter.

Carlo Schrader: If water volumes to be used are found to be very low, then water use registration may not be required.

Key Stakeholder meeting with the Provincial Department of Economic Development, Tourism and Environmental Affairs (Representatives: Mr. Ikhraam Osman, Mr. Thabo Makweya and Mr. Coenie Erasmus)

Date: 21 February 2012

Time: 14:30 p.m. – 15:30 p.m.

Individuals present: Ikhraam Osman (HOD - Provincial Department of Economic Development, Tourism and Environmental Affairs), Thabo Makweya (Head of Strategic Projects - Provincial Department of Economic Development, Tourism and Environmental

Affairs), Mr Coenie Erasmus (Environmental Manager - Provincial Department of Economic Development, Tourism and Environmental Affairs), Reggie Niemand (SolaireDirect), Ismail Banoo (CSIR), Samantha Naidoo (CSIR)

Reggie Niemand: These sites were selected based on proximity to substations that were found to have sufficient capacity to support the project.

Coenie Erasmus: What will be the cumulative impact of the development of solar facilities at a broader scale?

Ismail Banoo: The cumulative impact will be much smaller than that of power being generated via the conventional coal-based method. They do not result in the release of pollutants into the atmosphere that act to reduce air quality and deteriorate the health and well-being of communities. Solar facilities produce a number of positive impacts which benefit people immensely and support the need for a switch over to 'greener' methods of power production in South Africa.

Ikhraam Osman: Will a relaxation on any environmental laws applicable to the project be applied for? Are there any project-related activities or associated tasks that complicate the normal procedure to be followed regarding application for environmental authorisation?

Ismail Banoo: No.

Ikhraam Osman: Given this, the procedure should run smoothly.

Reggie Niemand: Are there any steps that SolaireDirect or the CSIR can take to ensure that the procedure is not delayed?

Coenie Erasmus: If all the relevant information is supplied to the Department, then there should be no delays.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?

YES

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

The following summarises the issues raised by I&APs, copies of the comments received are included in Appendix E8 and E9.

1. Environmental impacts associated with the presence of solar panels on the property
Are solar panels harmful to the environment?

2. Requirement of a Palaeontology Study to be conducted

It was noted that a palaeontology study was not undertaken. A palaeontology study must be conducted by an accredited local palaeontologist to determine if sensitive areas occur on the proposed development site. This is important as the Free State is known for its abundance of palaeontological features. Free State Heritage Resources Authority also requests that the Visual Impact Assessment conducted be provided for review.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties:

1. Environmental impacts associated with the presence of solar panels on the property.
2. Requirement of a Palaeontology Study to be conducted.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

1. Environmental impacts associated with the presence of solar panels on the property

English: No. Solar panels act to absorb, not reflect, solar radiation. Solar panels utilise solar energy to generate electricity and are thus not as significant a threat to the environment as conventional coal-burning methods of electricity production. In fact, the use of solar facilities for power generation will reduce air pollution and other significant environmental impacts associated with coal-burning technologies.

Afrikaans: Nee, sonpanele reflekteer nie sonstraling nie, dit absorbeer dit. Sonpanele gebruik sonkrag om elektrisiteit op te wek en is dus nie so 'n beduidende bedreiging vir die omgewing as konvensionele steenkoolverbranding metodes vir die opwekking van elektrisiteit nie. Trouens, die gebruik van sonkrag fasiliteite vir kragopwekking verminder lugbesoedeling en ander belangrike omgewingsimpakte wat verband hou met steenkoolverbranding tegnologie.

2. Requirement of a Palaeontology Study to be conducted

An accredited palaeontologist, based in the Free State, was appointed to carry out the required palaeontology study subsequent to Free State Heritage Resources Authority's request (See Appendix D for copy of the report). The information attained was included in this Draft BA Report. Palaeontological baseline data for the area and the significance of potential impacts on palaeontological features are highlighted in Sections B and D of this report.

Full responses are provided in the Comments and Response Report in Appendix E6.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning

and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

Alternative (“preferred site” and “alternative site” unless otherwise stated in the content presented below)

Planning and Design Phase

Direct impacts:

There are no Direct impacts. All planning and design activities are done off site.

Indirect impacts:

1. Potential disturbance and damage to freshwater features/ecosystems

Considering that an ephemeral drainage line was identified on-site, it is likely that the development will act to degrade the health of this system if precautionary measures are not put in place at the very outset of the project. Two dams and a number of drainage lines run across the property in a north to south direction. It is therefore imperative that the planning and designing of the facility be informed by a set of preventative measures that will serve to minimise disturbance to these environments throughout the project life-cycle. Hence, a number of preventative measures that can be effectively integrated into the project design are highlighted in the EMPr (Appendix F, Section F).

2. Visual impacts

The establishment of a site camp and construction of the solar facility will change the nature of the site. The visual impact resulting from the presence of the solar facility on-site can be prevented by locating the development away from the N1 road; away from koppies present on-site, and as low as possible; and close to the existing powerlines and railway lines. The impacts can also be reduced by reducing the footprint of the solar facility.

Cumulative impacts:

There are no Cumulative impacts

Construction Phase

Direct impacts:

1. Loss of Vegetation

In terms of the national vegetation map, the site falls within an area characterised by two vegetation types, namely Xhariep Karroid Grasslands and Besemkaree Koppies Shrubland, with the former being the most extensive. The grasslands at the site are fairly homogenous except where shallow or rocky soils occur which are dominated by a larger proportion of woody shrubs. Common species within this vegetation type include shrubs such as:

- *Chrysocoma ciliata*
- *Rosenia oppositifolia*
- *Asparagus capensis*.

It also includes grasses such as:

- *Eragrostis lehmanniana*
- *E.curvula, Cynodon incompletus*
- *Tragus koelerioides* with occasional low forbs and geophytes.

In general this plant community does not represent a highly sensitive environment and should form the focus of the development. Also, the vegetation on-site site can be considered to be in a poor to average condition as although palatable grass species such as *Themeda triandra* are common within the run-on areas, unpalatable species such as *Chrysocoma ciliata* which increase as a result of overgrazing are dominant across large parts of the site.

The area on which the facility will be constructed will need to be cleared of vegetation in order for vehicles to access the site as well as for the placement of panel structures and panels. In terms of national conservation status, species of the Xhariep Karroid Grassland vegetation type are classified as "Not Threatened".

The above information is broadly relevant to both the preferred and alternative sites. The distinction between them however relates to ecological sensitivity, as elucidated below:

"Preferred site"

The preferred site falls within a portion of the property zoned as a "medium-high" ecologically sensitive area. Approximately 60% of the preferred site falls within this sensitivity category, whilst the remaining area falls within a section of the property classified as a "medium" ecologically sensitivity area. Potential impacts on inhabitant vegetation as a result of site clearing are likely to be of low significance throughout the site. However, this effect is compounded by the higher erosion potential on the "medium-high" sensitivity portion of the site, resulting in an overall ecological sensitivity rating of "medium-high". Nevertheless, this preferred site alternative is recognised as an area that is potentially suitable for the development from an ecological perspective, and given that the recommended mitigation measures are implemented, the residual impact on vegetation will be low, and overall ecological sensitivity will be reduced to a medium-low significance. Furthermore, given the closer proximity of this site to the point at which generated electricity will be connected to transmission lines that connect to the Valleydora substation, the extent of the area to be cleared of vegetation for access paths will be much smaller compared to that required for the "alternative site"; and as a corollary, the total area subject to physical disturbance as a result of the development will be much smaller.

"Alternative site"

This site alternative falls completely within an area marked as having a "medium" ecological sensitivity rating. It must be noted that in terms of biodiversity, there is little difference between the areas that have been classified as "medium" and "medium-

high" sensitivity. The primary factor which relates to this differentiation is that the areas classified as "medium-high" sensitivity, lie within washes and other areas which are more vulnerable to erosion than the adjacent areas. The implementation of mitigation measures will in effect decrease the resultant impact of the activity on general ecology of the area to low significance. However, given the site's larger distance from the grid connection point, the area subject to vegetation clearing and physical disturbance as a result of the need for additional trenching and excavations will be much more significant.

Hence, significance of the impacts of vegetation clearing on both the "preferred" and "alternative" sites is likely to be very similar.

2. Soil Erosion

Clearing of vegetation will likely result in more areas of loose soil that will be susceptible to wind and water erosion. Furthermore, the existence of hard surfaces (roads and solar panels) will increase runoff and also lead to erosion. However, given that vast areas within the site and further afield are sensitive to erosion, the area to be cleared is not large enough to impact significantly on the area's overall erodability. In addition, sheetwash had occurred in some areas of the site and had resulted in the banding of vegetation which can readily be discerned on satellite imagery of the site. The erosion risk is higher within these areas and specific measures to reduce erosion potential will need to be implemented. Vegetation will be allowed to grow back after construction. If the deep seated screw method is used for the foundations of mounting structures, then less vegetation will be cleared. This will also assist the developer in reducing dust and therefore maximise efficiency of the PV facility.

"Preferred site"

Approximately 60% of this site falls within a "medium-high" sensitivity category, indicating that this area is more sensitive to sheetwash and soil erosion that will occur as a result of vegetation clearing and construction activities associated with the proposed development. However, given that the remaining portion falls within an area classified as "medium" sensitivity, and that mitigation measures to reduce soil erosion will be implemented, the impact significance is likely to reduce to a medium-low significance. Furthermore, given the proximity of the site to the grid connection point, the area subject to trenching and excavations, and thus physical disturbance, will be limited. In addition, if construction activities and the movement of heavy vehicles are restricted to the portion of the site that has "medium" sensitivity, then the significance of soil compaction and disturbance can be further reduced.

"Alternative site"

This site falls completely within an area of the property classified as "medium" sensitivity, and is therefore not subject to significant erosion as a result of the development given its situation away from identified wash areas. The clearing of vegetation and the undertaking of construction activities in this area will increase the risk of soil erosion, and mitigation measures will need to be implemented to counteract the potential detrimental effects. The significance of impacts will subsequently decrease to reflect "low" significance. However, given the greater distance from the site to the grid connection point, a larger area is likely to be disturbed as a result of the

need for additional trenching, excavations, and access road creation.

Overall, it must be noted that the slope of both "preferred" and "alternative" sites is quite low, and therefore the probability that severe erosion problems would result from the development after suitable mitigation measures have been put in place would be very low.

3. Soil compaction and disturbance

During the construction phase vehicle movement will compact the soil to some degree depending on the number of passes. It will also deteriorate vegetation even when driven over once or twice, demolish vegetation in tracks used frequently and remove vegetation where foundations are made for solar panels. Hence, the movement of heavy vehicles in and around the site must be minimised.

"Preferred site"

Given the higher potential for soil erosion on this site, it is likely that the movement of construction vehicles on the portion of the site identified as being of "medium-high" sensitivity will result in increased soil compaction and disturbance. However, the implementation of mitigation measures will reduce the significance of this potential impact to "medium-low" significance. Furthermore, given the proximity of the site to the grid connection point, the area subject to trenching, excavations, the movement of construction vehicles, and thus physical disturbance, will be limited. Furthermore, if construction activities and the movement of heavy vehicles are restricted to the portion of the site that has "medium" sensitivity, then the significance of soil compaction and disturbance can be further reduced.

"Alternative site"

This site is most definitely subject to soil compaction and disturbance, as is the "preferred site", but the significance is likely to be slightly lower given the reduced potential of soil erosion in this area and its positioning a more substantial distance away from wet and wash areas on-site. The implementation of mitigation measure is likely to reduce potential soil compaction and disturbance to "low" significance. However, given the greater distance from the site to the grid connection point, a larger area is likely to be disturbed as a result of the need for additional trenching, excavations, the movement of vehicles, and access road creation.

- 4. Soil Contamination** – there is the potential that during construction activities, accidental spillage of small amounts of cement and oil for machinery maintenance or from vehicles may contaminate the soil. Hence, it is important that plastic linings be used to prevent the direct contact of oils and cement with the ground.

5. Temporary Decrease in Air Quality

The movement of construction vehicles across cleared areas of the site will generate dust. This will lead to a temporary deterioration in air quality. This impact is not considered to be significant as other portions of the farm and the site have naturally occurring areas of bare soil. There are also no occupants of land within at least a 1km radius that will be impacted by windblown dust.

6. Loss of Habitat for fauna and livestock

Approximately 55 terrestrial mammals and 5 bats potentially occur within the property. The limited extent and range of habitats available however implies that the actual number likely to be present is significantly less. Five species of conservation concern potentially occur on the farm. These are the White-tailed Mouse *Mystromys albicaudatus* (Endangered), Brown Hyaena *Hyaena brunnea* (Near Threatened), Leopard *Panthera pardus* (Near Threatened), Black-footed Cat *Felis nigripes* (Vulnerable) and Schreibers' Long-fingered Bat *Miniopterus schreibersii* (Near Threatened). Of these, the Leopard and Brown Hyaena are not likely to occur in the proposed development site, whilst there is a good probability that the White-tailed and Mouse Black-footed Cat occurs within the property as the habitat is broadly suitable. However, the development occupies a very small area relative to the extensive range of these species, and the impact of the development on habitat loss for these species would be minimal. Within the proposed development site itself there does not appear to be any specific habitats which are highly sensitive from a mammalian perspective.

The property lies in or near the distribution range of at least 40 reptile species, of which comprise 1 terrapin, 23 snakes, 14 lizards and skinks and 2 geckos. A single species of conservation concern may occur at the site, the Striped Harlequin Snake *Homoroselaps dorsalis* (Near Threatened). The rocky outcrops and drainage areas on the property are likely to represent the most important habitats for reptiles and have therefore been excluded during preliminary site assessments carried out to determine the most suitable location for the PV facility.

The property lies within or near the range of 12 amphibian species. Those that require permanent water are likely to be restricted to the vicinity of drainage areas, and two dams to the south of the railway line. As such these species are not likely to be directly impacted by the development. The only species of conservation concern which may occur in the property is the Giant Bullfrog *Pyxicephalus adspersus*. Within the boundaries of the proposed development site at least, there does not appear to be any suitable breeding habitat for this species and is probably not an important area for this species.

Loss of the proposed development area (less than 20 hectares) makes up less than 0.85% of the total farm area available for foraging and shelter of livestock. The extent of the farm is approximately 2353 hectares (Remainder of Farm Knapdaar) and is used for grazing livestock.

7. Disruption of landscape connectivity for fauna

Disruption of landscape connectivity for fauna could result if the site is fenced off in a manner which prevents the movement of larger and middle-sized mammals. However, fencing will be constructed in a manner which allows for the passage of small and medium sized mammals.

8. Loss of grazing land, agricultural land and a Change in Land-use

Livestock farming is the current land use on Knapdaar Farm. However, given that the vegetation condition of the site is considered to be between poor and average and that it constitutes a large proportion of unpalatable plant species, the loss of vegetation resulting from construction activities will not have a significant negative impact on

livestock within the property. It must also be noted that although installation of solar panels will cover an area of less than 20 ha, the above-ground height of panels allows for the grazing of livestock, and gates providing access into the actual solar park will be opened periodically for livestock grazing.

Potential agricultural land will also be lost. Considering however that these areas are categorised as low agricultural potential land, no significant agricultural loss will be incurred.

Furthermore, due to the extent of the farm portion (Remainder of Knapdaar Farm) being approximately 2353 ha and the proposed site being less than 0.85% of the total area, the loss of grazing and agricultural area are considered negligible.

9. Temporary Noise Disturbance

Construction activities will result in the generation of noise. However, once construction ends so too will the associated noise. Sources of noise are likely to include vehicles, the use of machinery such as drills and people working on the site. There are no residential areas within 1 km of the site and the farm workers tending the livestock are unlikely to be in the vicinity of the construction activities for extended periods of time.

10. Potential disturbance and damage to Heritage and Archaeological Artefacts

In the event that heritage artefacts are present, clearing activities may result in damage to these objects. However, observations during the site visit and the report compiled by the specialist did not indicate the presence of objects of heritage significance, or the presence of graves or historical buildings in the area.

11. Potential disturbance and damage to Palaeontological Features

The proposed development will impact on fossil-bearing Adelaide Subgroup strata especially during the construction phase, if excavations into bedrock are required. There are no objections to the proposed development on palaeontological grounds provided that access by a specialist should be facilitated at the appropriate stage during the construction phase of the development. Also, newly uncovered objects of palaeontological significance, found during the course of excavation activities must be reported to the appropriate heritage authorities. It must be noted that such finds may require a Phase 2 rescue operation at the cost of the developer.

12. Temporary Visual Intrusion

Establishment of the solar facility during the construction phase of the project will result in a change in landscape. However, the number of receptors will be limited to residents in Springfontein and on farmsteads, visitors to the area and observers travelling along the R715 regional road, N1 national road and other nearby roads. Overall, visual impact is expected to be low to moderate, depending on the level of exposure, distance from the facility, the orientation of the viewer (on the road, at home, in the veld, etc.) and the quality of the landscape around him/her.

13. Increased Water consumption

In the event that the applicant opts to mix concrete on-site, water will be needed to complete the mixing of concrete. Water will also be required for purposes of dust

control and human consumption given that local construction workers will be employed to work on-site. As previously mentioned, the applicant intends on setting up arrangements with the landowner regarding access to and usage of water, with consent from the Provincial Department of Water Affairs. On consultation with the Provincial Department of Water Affairs, this was deemed acceptable (refer to summaries of key stakeholder meetings in Section C).

14. Generation of Waste - General waste, Construction waste, Sewage and Grey Water

The workers on site are likely to generate general waste such as food wastes, packaging, bottles, etc. Construction waste is likely to consist of packaging, scrap metals, waste cement, etc. Ablution facilities will be necessary at the construction site. With regards to the guardhouse, a composting toilet would be installed which makes use of an aerobic process to treat human waste material. The composting toilet requires no water and produces compost-like, odourless, de-hydrated material that could be either disposed of via municipal waste services or be used in the production of compost. 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. All wastes must be recycled/re-used as much as possible. It must also be ensured that all grey water generated as a result of construction activities is properly disposed to prevent the soil and subsequent water contamination.

15. Disturbance of potential drainage lines

A drainage line traverses the preferred development site in a south to north direction, with flows arising from the south of the property. The risk exists of disturbing naturally occurring drainage lines and increasing runoff velocities that enter these systems as a result of construction activities. The outcome would be an increased vulnerability to erosion and overall degradation of wet areas. Hence, in order to mitigate these potential impacts, freshwater features on-site should be marked with temporary fencing, located 50m from the edge of the drainage line, and demarcated as no-go areas. Also, construction design should seek to minimise disturbance of natural ground levels and to maintain, as far as possible, existing ground cover by vegetation. A comprehensive set of mitigation measures have been recommended (See Appendix F) to ensure that potential damage to all natural freshwater features on-site is prevented, or otherwise minimised during construction.

16. Contamination of downstream water bodies

Considering the sensitivities involved in developing close to wet areas of this nature, the risk of disturbance, water contamination and water flow inhibition exist due to the activities to be undertaken on-site. Sources of potential pollution would include any grey water discharges, and car park or road runoff. No wash water or water that is in any way contaminated by construction or other materials should be passed into natural watercourses, and arrangements should be made for their proper disposal. It is thus imperative that water quality be monitored and water flows off-site be effectively managed to facilitate processes that determine the functioning of natural freshwater

features.

17. Traffic impacts

During the construction phase, traffic impacts will be a little higher than normal as trucks will transport materials and equipment to the site. Infrastructure required for the proposed development, including support structures, PV modules, frames, as well as machinery will be transported to and from the site area from various locations in the region. 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.

18. Temporary Employment and other economic benefits

The project will require the appointment of workers to undertake the construction activities. It is likely that local construction companies with the necessary expertise to construct solar facilities will be partnered with. The construction period is estimated to span over 8-10 months. During this period security personnel will also be required to work at the site particularly after working hours. It is also likely that some materials such as fencing, and other construction related consumables will be sourced locally.

Indirect impacts:

1. Change in the sense of place

The site is characterised by open veld with a rural agricultural sense of place. The establishment of a site camp, the presence of temporary construction equipment and structures on-site, and the associated activities will result in a change of sense of place. However, the site is not occupied by tenants or the landowners and neighbours are not situated within viewing distance of the site. Additionally, there is a large-scale regional Eskom substation across the railway track with high-voltage power lines that traverse the farm as well. Therefore, the impact of a low-lying PV facility on the sense of place is not expected to be significant as the number of receptors is very low and the surrounding area has also been subject to transformation.

Cumulative impacts:

1. Additional Water Consumption due to Multiple Developments in the Springfontein Area

The number of developments and the amount of water required for each project needs to be considered. In terms of this particular project, the most substantive amounts of water will be utilised for activities undertaken during the construction period of the development. Thereafter, a much smaller quantity of water will be required to meet the consumption needs of on-site workers on an ongoing basis.

Operational Phase

Direct impacts:

1. Alien plant invasion

Apart from the loss of plant cover in cleared areas, the disturbance would also encourage the invasion of alien plant species. These species will increase in number subsequent to the clearing of vegetation. Hence, regular monitoring and the effective management of alien plants will be required to prevent their increased presence on-site.

2. Soil Erosion

Clearing of vegetation will likely result in more areas of loose soil that will be susceptible to wind and water erosion. Furthermore, the existence of hard surface (roads and solar panels) will also increase runoff and lead to erosion. However, vegetation will be allowed to grow back after construction, and if the deep seated screw method is used for the foundations of mounting structures, then less vegetation will be cleared. This will also assist the developer in reducing dust and therefore maximise efficiency of the PV facility.

“Preferred site”

Approximately 60% of this site falls within a “medium-high” sensitivity category, indicating that this area is more sensitive to sheetwash and soil erosion. However, given that the remaining portion falls within an area classified as “medium” sensitivity, and that mitigation measures to reduce soil erosion will be implemented, the impact significance is likely to reduce to a medium-low significance. Furthermore, the movement of vehicles on-site will be significantly less than that in the construction phase. In addition, if the movement of vehicles is restricted to the site portion that has “medium” sensitivity, then the significance of soil disturbance and erosion can be further reduced. The closer proximity of the site to the grid connection point will also decrease the area disturbed by operational activities as a result of the development.

“Alternative site”

This site falls completely within an area of the property classified as “medium” sensitivity, and is therefore not subject to significant erosion as a result of the development, given its situation away from identified wash areas. However, the clearing of vegetation and the undertaking of operational activities in this area will also increase the risk of soil erosion, and mitigation measures will need to be implemented to counteract the potential detrimental effects. The significance of impacts will subsequently decrease to reflect “low” significance. The greater distance of the site from the grid connection point will increase the area disturbed by operational activities and thereby increase vulnerability to erosion.

Overall, it must be noted that the slope of both “preferred” and “alternative” sites is quite low, and therefore the probability that severe erosion problems would result from the development after suitable mitigation measures have been put in place would be very low.

- 3. Soil Contamination** – only window washer type devices will be utilised for the cleaning of panels. Hence, the possibility of soil contamination as a result is extremely low.

4. Loss of habitat for fauna and livestock

Additional disturbance to the site will result from the increased presence of people in and around the area during the operational phase of the project. The possible outcomes include a reduction in suitable habitat areas for fauna on-site, increased incidences of fire, and the illegal hunting and poaching of inhabitant fauna. Hence it is imperative that unauthorised persons are prevented from entering the site and on-site labourers receive environmental education so as to ensure that no harm is inflicted on occupant faunal species. This will also imply a loss of available grazing land for livestock. However, loss of this area (less than 20 hectares) makes up less than 18% of the total farm area available for foraging and shelter. The extent of the farm is 111.218 hectares (Remainder of Farm Knapdaar) and is used for grazing livestock.

5. Redistribution of sunlight, temperature and rainwater by solar panels

The solar panels reduce the direct sunlight and rain on vegetation. Direct sunlight can reach shaded areas during early morning and late afternoon. Indirect sunlight will play a role radiating on vegetation. The reduction in direct sunlight has two effects. Firstly it potentially reduces photosynthesis and vegetative growth. Secondly it reduces the temperature of the shaded area. Dry semi-arid regions of South Africa have excessive sunlight and reduction of midday heat may contribute more to vegetative production than what is lost by shading.

Also, rain water will be redistributed by the solar panels. The water falling on the panels will be accumulated in a line at the bottom of the panels. Swartland soils are sensitive and Oakleaf soils slightly sensitive to erosion.

In order to mitigate these impacts, horizontal ridges and adjacent basins will be constructed next to each row of solar panels, which will act to boost vegetation growth in and around basins and limit erosion.

6. Loss of grazing land, agricultural land and a Change in Land-use

Livestock farming is the current land use on Knapdaar Farm. However, given that the vegetation condition of the site is considered to be between poor and average and that it constitutes a large proportion of unpalatable plant species, the loss of vegetation resulting from construction activities will not have a significant negative impact on livestock within the property. It must also be noted that although installation of solar panels will cover an area of less than 20 ha, the above-ground height of panels allows for the grazing of livestock, and gates providing access into the actual solar park will be opened periodically for livestock grazing.

Potential agricultural land will also be lost. Considering however that these areas are categorised as low agricultural potential land, no significant agricultural loss will be incurred.

Furthermore, due to the extent of the farm portion (Remainder of Knapdaar Farm) being approximately 2353 ha and the proposed site being less than 0.85% of the total area, the loss of grazing and agricultural area are considered negligible.

7. Increased Consumption of Water

Water will be needed to wash the dust off of the panels on an annual basis. Water will be sourced from the landowner and will be trucked to the site. The applicant is currently liaising with Kopanong Local Municipality regarding the water use agreements. The water availability for non-human consumption purposes needs to be considered as the town is often affected by water shortages.

8. Generation of Waste Water

No water will be required for cleaning of the solar panels.

9. Visual Intrusion

Infrastructure in the study area consists of a network of roads, power lines, substations, railway lines, and communication towers on koppies. The N1 national road between Bloemfontein and Colesberg abuts the development area on its western boundary. An arterial road (the R715), a railway line and transmission line transect the development area from east to west.

The location of a town within 3 – 6 km from the development site, as well as existing infrastructure such as transmission lines and highly visible communication towers, have collectively established visual impacts in the region, which may provide some visual absorption capacity to mitigate the visual impact of the solar energy facility.

The viewshed analysis reflects a core zone of possible visibility for 3km to the east, south and west of the facility. High ridges and koppies (Seinheuwel) north of the development area effectively screen the solar energy facility from exposure to the north. Within this zone, visual exposure is expected to be high with possible high impacts. Visibility extends further south-west and west to distances of up to 14km from the site. To the south and east, visibility is limited to isolated spots.

Visual exposure is expected to decrease with distance from the development site. Within the zone of 3 – 9km from the site, visual exposure is expected to be moderate to low. Within the zone of 9 – 18km from the site, visual exposure is expected to be low to very low, beyond which any exposure of the solar energy facility will be insignificant in relation to the dominant landscape at such distances.

The modelling of visibility is merely conceptual. It does not take into account the effect of buildings, trees etc. that could shield the facility from being visible. The viewshed analysis therefore signifies a worst-case scenario. The immediate landscape surrounding the observer has a determining influence on long distance views. It is expected that vegetation may offer some degree of visual screening, especially where tall trees occur around farmsteads.

Overall, visual impact is expected to be low to moderate, depending on the level of exposure, distance from the facility, the orientation of the viewer (on the road, at home, in the veld, etc.) and the quality of the landscape around him/her.

10. Disruption of landscape connectivity for fauna

Disruption of landscape connectivity for fauna could result if the site is fenced off in a manner which prevents the movement of larger and middle-sized mammals.

Furthermore, since most such mammals have home ranges which exceed the extent of the site, any mammals trapped within the site would probably not have sufficient resources present to be able to support themselves. However, fencing will be constructed in manner which allows for the passage of small and medium sized mammals. Also, access gates will be left open to facilitate easy movement of larger fauna between the site and adjacent farmlands.

11. Generation of General Waste and Sewage

Security guards will be stationed at the solar facility 24 hours a day and 7 days a week. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed weekly. The waste will be taken to the Kopanong Municipal landfill by a contractor employed by the applicant, as the site is located outside of the waste collection route. The applicant will need to arrange an agreement with the municipal landfill to accept the general waste from the site which will be disposed according to municipal guidelines and policies. With regards to the guardhouse, a composting toilet would be installed which makes use of an aerobic process to treat human waste material. The composting toilet requires no water and produces compost-like, odourless, de-hydrated material that could be either disposed of via municipal waste services or be used in the production of compost. 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. All wastes must be recycled/re-used as much as possible. It must also be ensured that all grey water generated as a result of operational activities is properly disposed to prevent the soil and subsequent water contamination.

12. Contamination of downstream water bodies

Considering the sensitivities involved in developing close to wet areas of this nature, the risk of disturbance, water contamination and water flow inhibition exist due to the activities to be undertaken on-site. Sources of potential pollution would include any grey water discharges, and car park or road runoff. No wash water or water that is in any way contaminated by construction or other materials should be passed into natural watercourses, and arrangements should be made for their proper disposal. It is thus imperative that water quality be monitored and water flows off-site be effectively managed to facilitate processes that determine the functioning of natural freshwater features.

13. Effects on areas of recharge that support wetlands/streams on-site

Runoff from the site may result in the passage of concentrated flows into drainage lines; result in bank or bed erosion in these systems; necessitate their being lined or otherwise artificially stabilised; and result in droughting of natural systems through diversion of flows into adjacent water courses. Hence, a stormwater management system must be designed, implemented and maintained. The stormwater plan should also address areas likely to generate high volumes of water during rainfall events, including car parks, roofs and the solar panels themselves.

14. Traffic impacts

During the operational phase, traffic impacts will be less, with vehicles only required to transport infrastructure during routine maintenance and upgrading phases. 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.

15. Generation of additional electricity

The photovoltaic effect of the panels will generate electricity that will be fed directly into the 22kV power lines that lead toward the Valleydora Substation. The additional electricity generated will supplement the power supply in the area and will contribute to an increased surety of supply on a national level and is a clear benefit of the project.

16. Permanent Employment

Security Guards will be required for 24 hours every day of the week. It is envisaged that 8-10 security guards and 4-6 maintenance workers will be required. This will assure work for at least 12 people on an ongoing basis and is a clear benefit of the project.

Indirect impacts:

There are no indirect impacts

Cumulative impacts:

1. Increase in electrical infrastructure in the Springfontein area

The immediate surrounding area already has substantial electrical generation infrastructure with the power lines and substation. The addition of a solar facility to this area will result in a hub of electrical infrastructure in the area.

Closure and Decommissioning Phase

Direct impacts:

1. Generation of Waste

The removal of the supporting infrastructure such as the concrete foundations, cabling, fencing and control rooms, etc will generate waste. Some of the waste will where possible be recycled, for example steel support structures can be re-used elsewhere or melted down to form new products. The amount of waste will be limited and is not expected to significantly reduce the capacity of the chosen landfill. However, the project is estimated to last for 20-25 years and the current landfill near Springfontein may at that stage (or sooner) reach its capacity. The applicant will need to assess the project lifespan and make suitable arrangements for waste disposal when the site is decommissioned.

- ##### **2. Disturbance or use of no-go areas** – Disassembled structures should be temporarily placed in areas identified to be least sensitive from an environmental perspective, and loaded onto trucks for transportation off-site as soon as possible. No-go areas should not be disturbed or used for the stockpiling of disassembled structures or other

materials.

3. Traffic impacts

During the decommissioning phase, traffic impacts will be a little higher than normal as trucks will transport disassembled structures and equipment to a landfill site. Infrastructure utilised for the proposed development, including support structures, PV modules, frames, as well as machinery will be transported to the landfill for disposal. 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.

4. Termination of Security Guard jobs

It is a general trend that over time there will be people leaving one job for another and so it is expected that there will be periodic security staff turnover. At the stage where decommissioning becomes the next logical step, any staff employed at that time must be given adequate notice so that they may seek alternative employment.

Indirect impacts:

There are no indirect impacts.

Cumulative impacts:

There are no cumulative impacts

3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Impact Assessment Methodology

The following section comprises a summary table of Environmental Issues identified during the environmental assessment process, i.e. how, where and when the proposed facility could interact and affect the environment, and summarises what mitigation measures may be taken to ameliorate the significance of the identified issues. The content below contains data relevant to both the "preferred" and "alternative" sites, and differences in impact significance are also highlighted in the applicable sections.

A qualitative rating of the significance of environmental issues has been included. The purpose of the significance rating is to highlight relevant and important issues, and to eliminate the insignificant issues from the investigation. Each category was divided into a number of different levels. These levels were then assigned various criteria. This is detailed in the table below.

Nature of the potential Impact		Description of the effect, and the affected aspect of the environment
Duration (time scale)	Short-term	Impact restricted to construction and early operation (e.g. 0-5 years)
	Medium-term	Impact restricted to operational phase (e.g. 5 years – closure)
	Long-term	Impact will cease after the operational life of the activity either by natural processes or by human intervention
	Permanent	Where mitigation either by natural processes or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability	Improbable	Possibility of the impact to materialise is very low, either because of design or historic experience
	Probable	There is a distinct possibility that the impact will occur
	Highly probable	Where it is most likely that the impact will occur
	Definite	Where the impact will occur regardless of any mitigation measures
Overall Significance (Synthesis of the aspects produced in terms of their nature, duration, intensity, extent, and probability)	Low	Where the impact will not have an influence on the decision
	Medium	Where it should have an impact on the decision unless it is mitigated
	High	Where it would influence the decision regardless of any possible mitigation

Evaluation of Potential Environmental Impacts Associated with the Proposed Solar Facility – PLANNING AND DESIGN PHASE

Type of Impact	Duration	Probability	Overall Significance
Potential disturbance and damage to freshwater features/ecosystems - Considering that a number an ephemeral drainage line was identified on-site, it is likely that the development will act to degrade the health of this system if precautionary measures are not put in place at the very outset of the project. Two dams and a number of drainage	Long term	Highly Probable	Low (Negative)

<p>lines run across the property in a west to east and south to north direction. It is therefore imperative that the planning and designing of the facility be informed by a set of preventative measures that will serve to minimise disturbance to these environments throughout the project life-cycle. Hence, a number of preventative measures that can be effectively integrated into the project design are highlighted in the EMPr (Appendix F, Section F).</p>			
<p>Visual Impact – The establishment of a site camp and construction of the solar facility will change the nature of the site. The visual impact as a resulting from presence of the solar facility on-site can be prevented by locating the development:</p> <ul style="list-style-type: none"> - Away from the N1 road - Away from koppies present on-site , and as low as possible - Close to the existing powerlines and railway lines <p>The impacts can also be reduced by reducing the footprint of the solar facility.</p>	Long Term	Highly Probable	Low (Negative)

Evaluation of Potential Environmental Impacts Associated with the Proposed Solar Facility – CONSTRUCTION PHASE

Type of Impact	Duration	Probability	Overall Significance
<p>Loss of vegetation – Some vegetation will need to be cleared prior to construction. However, the vegetation will be allowed to grow back and will be kept trimmed. Therefore the extent of the loss of vegetation is not expected to be significant.</p>	Short Term	Definite	Low (negative)

<p>Soil Erosion - The removal of vegetative cover and an increase in hard surfaces (roads and panels) will not significantly increase the erodability of the site. Vegetation is expected to grow back and the site will revert to its current form. Furthermore, given the small area involved and the low slopes on site, the erosion danger is expected to be low.</p>	<p>“Preferred site”</p>	Short Term	Highly probable	Low - Medium (negative)
	<p>“Alternative site”</p>	Short Term	Highly probable	Low (negative)
<p>Soil compaction and disturbance - vehicle movement will compact the soil in some degree depending on the number of passes.</p>	<p>“Preferred site”</p>	Short Term	Highly Probable	Low - Medium (negative)
	<p>“Alternative site”</p>			Low (negative)
<p>Decrease in Air Quality – there is the potential for construction activities such as site clearing and movement of construction vehicles to generate dust and temporarily deteriorate the local air quality.</p>		Short Term	Probable	Low (negative)
<p>Loss of habitat – the clearing of vegetation and site disturbance will likely result in a loss of habitat. However the extent of the clearing will be limited to less than 20 ha. The total area of the farm portion is approximately 2353 ha. Therefore there will be adequate habitat of similar nature to accommodate fauna in other areas.</p>		Long term	Highly probable	Medium (negative)
<p>Disruption of landscape connectivity for fauna - Disruption of landscape connectivity for fauna could result if the site is fenced off in a manner which prevents the movement of larger and middle-sized mammals. Furthermore, since most such mammals have home ranges which exceed the extent of the site, any mammals trapped within the site would probably not have sufficient resources present to be able to support themselves.</p>		Short Term	Highly probable	Low (negative)

<p>Loss of grazing areas, agricultural land and change in land use – The establishment of a site camp will result in a change of land use and the consequent loss of grazing areas. However, the extent of the area to be transformed is less than 20 ha and there remain sufficient grazing land for the sheep on the farm.</p>	Long term	Highly probable	Low (negative)
<p>Noise – there is the potential for noise to be generated by construction vehicles and construction workforce.</p>	Short Term	Probable	Low (negative)
<p>Soil Contamination – there is the potential that during construction activities, accidental spillage of small amounts of cement and oil for machinery maintenance or from vehicles may contaminate the soil. Hence, it is important that plastic linings be used to prevent the direct contact of oils and cement with the ground.</p>	Short term	Improbable.	Low (negative)
<p>Visual impacts – The establishment of a site camp and construction of the solar facility will change the nature of the site. However, there already exist power lines that run across the farm itself leading to the substation. Additionally the high ridges and koppies situated north of the development area and the occurrence of bush, trees and buildings may act to conceal the solar facility from potential visual receptors.</p>	Long Term	Highly probable	Low (negative)
<p>Water consumption – Water will be required for construction purposes and an agreement must be obtained from the local municipality stating that water will be supplied to the site.</p>	Short Term	Definite	Low (negative)
<p>Generation of Waste, Sewage and Grey Water – All the above-mentioned waste will be produced as a result of construction activities and presence of workers on the site. The applicant will employ waste removal contractors to collect, remove and dispose of waste generated at the site. It will be necessary to ensure that the contractors have the necessary permits and that the waste is disposed of at a licensed waste disposal</p>	Long Term	Definite	Low (negative)

<p>site. All waste must be recycled/re-used as much as possible. It must also be ensured that grey water produced is properly disposed to prevent soil and water contamination.</p>			
<p>Potential disturbance and damage to Heritage and Archaeological Artefacts – In the event that archaeological and palaeontological features are discovered on the site, construction must stop and the heritage authorities must be informed. The features can then be protected and recorded. However, no graves or historical buildings occur on the site. Additionally, although two artefacts of Anglo-Boer War origin were found on the property, these are not considered to be of significant heritage importance. The project could have a positive impact on the palaeontological record if features are uncovered during excavations and properly documented.</p>	Permanent	Improbable	Low (negative)
<p>Potential disturbance and damage to Palaeontological Features - The proposed development will impact on fossil-bearing Adelaide Subgroup strata especially during the construction phase, if excavations into bedrock are required. There are no objections to the proposed development on palaeontological grounds provided that access by a specialist should be facilitated at the appropriate stage during the construction phase of the development. Also, newly uncovered objects of palaeontological significance, found during the course of excavation activities must be reported to the appropriate heritage authorities. It must be noted that such finds may require a Phase 2 rescue operation at the cost of the developer.</p>	Permanent	Highly Probable	Low (negative) Positive (low) - if palaeontological features are discovered and added to the heritage record.
<p>Disturbance of potential drainage lines - During construction, the risk exists of disturbing naturally occurring drainage lines and increasing runoff velocities that enter these systems. The outcome would be an increased vulnerability to erosion and overall</p>	Short Term	Highly Probable	Low (negative)

<p>degradation of wet areas. Hence, freshwater features on-site should be marked with temporary fencing, located 50m from the edge of the drainage line, and demarcated as no-go areas. Also, construction design should seek to minimise disturbance of natural ground levels and to maintain, as far as possible, existing ground cover by vegetation.</p>			
<p>Contamination of downstream water bodies - Considering the sensitivities involved in developing close to wet areas of this nature, the risk of disturbance, water contamination and water flow inhibition exist due to the activities to be undertaken on-site. Sources of potential pollution would include any grey water discharges, and car park or road runoff. No wash water or water that is in any way contaminated by construction or other materials should be passed into natural watercourses, and arrangements should be made for their proper disposal. It is thus imperative that water quality be monitored and water flows off-site be effectively managed to facilitate processes that determine the functioning of natural freshwater features.</p>	Medium Term	Highly Probable	Low (negative)
<p>Traffic impacts - During the construction phase, traffic impacts will be a little higher than normal as trucks will transport materials and equipment (PV panels, frames) to the site. Infrastructure required for the proposed development, including support structures, PV modules, frames, as well as machinery will be transported to and from the site area from various locations in the region. 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.</p>	Short Term	Highly Probable	Low (Negative)

<p>Temporary Employment and other economic benefits - The project will require the appointment of workers to undertake the construction activities. It is likely that local construction companies with the necessary expertise to construct solar facilities will be partnered with. The construction period is estimated to span over 8-10 months. During this period security personnel will also be required to work at the site particularly after working hours. It is also likely that some materials such as fencing, and other construction related consumables will be sourced locally.</p>	Short Term	Definite	Medium (positive)
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Evaluation of Potential Environmental Impacts Associated with the Proposed Solar Facility – OPERATIONAL PHASE

Type of Impact	Duration	Probability	Overall Significance	
<p>Alien plant invasion – Apart from the loss of plant cover in cleared areas, the disturbance would also encourage the invasion of alien plant species in the post-construction phases of the project.</p>	Medium Term	Definite	Low (negative)	
<p>Loss of grazing areas, agricultural land and change in land use – The establishment of a solar facility will result in a change of land use and the consequent loss of grazing areas. However, the extent of the area to be transformed is less than 20 ha and there remain sufficient grazing land for the sheep on the farm.</p>	Long term	Highly probable	Low (negative)	
<p>Soil Erosion – The increase in hard surfaces (roads and panels) will not significantly increase the erodability of the site. Given the small area involved and the low slopes on site, the erosion danger is expected to be low.</p>	<p>“Preferred site”</p> <p>“Alternative site”</p>	Medium term	Probable	Low - Medium (negative)
Low (Negative)				

<p>Redistribution of sunlight, temperature and rainwater by solar panels - The solar panels reduce the direct sunlight and rain on vegetation. Rain water will be redistributed by the solar panels. The water falling on the panels will be accumulated in a line at the bottom of the panels.</p>	Permanent	Definite	Low (positive)
<p>Disruption of landscape connectivity for fauna - Disruption of landscape connectivity for fauna could result if the site is fenced off in a manner which prevents the movement of larger and middle-sized mammals. Furthermore, since most such mammals have home ranges which exceed the extent of the site, any mammals trapped within the site would probably not have sufficient resources present to be able to support themselves.</p>	Long Term	Highly probable	Low (negative)
<p>Loss of habitat – the presence of a solar facility for approximately 20-25 years will likely result in a loss of habitat for current fauna utilising the site. However the extent of the clearing will be limited to less than 20 ha. The total area of the farm portion is approximately 2353 ha. Therefore there will be adequate habitat of similar nature to accommodate fauna in other areas.</p>	Long term	Highly probable	Low (negative)
<p>Soil Contamination – only window washer type devices will be utilised for the cleaning of panels. Hence, the possibility of soil contamination as a result is extremely low.</p>	Short term	Improbable	Low (negative)
<p>Visual impacts – The construction of the solar facility will change the nature of the site. However, there already exist power lines that run across the farm itself leading to the substation. Therefore the view of the area will not change substantially. Additionally the solar facility is partially blocked by koppies situated at the northern end of the property and the occurrence of bush, trees and buildings may act to conceal it from potential visual receptors.</p>	Long Term	Highly probable	Medium (negative)
<p>Additional Water consumption on a quarterly basis – Water will be required</p>	Short Term	Definite	Low (negative)

for human consumption (i.e. the security guards on site)> Therefore an agreement must be obtained from the local municipality stating that water will be supplied to the site.			
Generation of Waste, Sewage and Grey Water – All the above-mentioned waste will be produced as a result of the presence of security personnel on the site. The anticipated volumes will be low and are not expected to have a significant impact. The applicant will employ waste removal contractors to collect, remove and dispose of waste generated at the site. It will be necessary to ensure that the contractors have the necessary permits and that the waste is disposed of at a licensed waste disposal site. All waste must be recycled/re-used as much as possible. It must also be ensured that grey water produced is properly disposed to prevent soil and water contamination.	Long Term	Definite	Low (negative)
Contamination of downstream water bodies - Considering the sensitivities involved in developing close to wet areas of this nature, the risk of disturbance, water contamination and water flow inhibition exist due to the activities to be undertaken on-site. Sources of potential pollution would include any grey water discharges, and car park or road runoff. No wash water or water that is in any way contaminated by construction or other materials should be passed into natural watercourses, and arrangements should be made for their proper disposal. It is thus imperative that water quality be monitored and water flows off-site be effectively managed to facilitate processes that determine the functioning of natural freshwater features.	Medium Term	Highly Probable	Medium (negative)
Effects on areas of recharge that support wetlands/streams on-site - Runoff from the site may result in the passage of concentrated flows into drainage lines, result in bank or bed erosion in these systems, necessitate their being lined or otherwise artificially	Medium Term	Highly Probable	Medium (negative)

stabilised and result in droughting of natural systems through diversion of flows into adjacent water courses. Hence, a stormwater management system must be designed, implemented and maintained. The stormwater plan should also address areas likely to generate high volumes of water during rainfall events, including car parks, roofs and the solar panels themselves.			
Traffic impacts - During the operational phase, traffic impacts will be less, with vehicles only required to transport infrastructure during routine maintenance and upgrading phases. 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.	Medium Term	Highly Probable	Low (negative)
Generation of Electricity – The additional electricity generated will <u>positively</u> contribute to the country's drive toward sustainable energy generation.	Long Term	Definite	Medium (positive)
Increase in Electrical Infrastructure in Kopanong Municipality – The additional power may give rise to increased business opportunities in terms of industrial businesses that the power supply cannot currently accommodate.	Long Term	Probable	Medium (positive)
Permanent Employment - The solar facility will require round the clock security. Operational staff and at least four security guards will be needed on a permanent basis.	Long Term	Definite	Low (positive)

Evaluation of Potential Environmental Impacts Associated with the Proposed Solar Facility – DECOMMISSIONING PHASE

Generation of Waste – 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	Long Term	Definite	Low (negative)
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<p>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. The disassembled structures and other wastes must be recycled/re-used as much as possible.</p>			
<p>Disturbance or use of no-go areas – No-go areas should not be disturbed or used for the stockpiling of disassembled structures or other materials.</p>	Short Term	Probable	Low (negative)
<p>Traffic impacts - During the decommissioning phase, traffic impacts will be a little higher than normal as trucks will transport disassembled structures and equipment (PV panels, frames) to a landfill site. Infrastructure utilised for the proposed development, including support structures, PV modules, frames, as well as machinery will be transported to the landfill for disposal. 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.</p>	Short Term	Probable	Low (negative)
<p>Termination of Employment – Once the facility has been decommissioned there will be no need for operational staff and security guards.</p>	Short Term	Definite	Low (negative)

No-go alternative (compulsory)

The status quo will remain and there will be no generation of additional power from renewable energy sources.

SECTION E: RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

An Environmental Management Plan Report (EMPr) has been compiled and is included in Appendix F. The mitigation measures necessary to ensure that the project is planned, constructed, operated and decommissioned in an environmentally responsible manner are listed in the EMPr.

Is an EMPr attached?

YES

The EMPr must be attached as Appendix F.

SECTION F: APPENDIXES

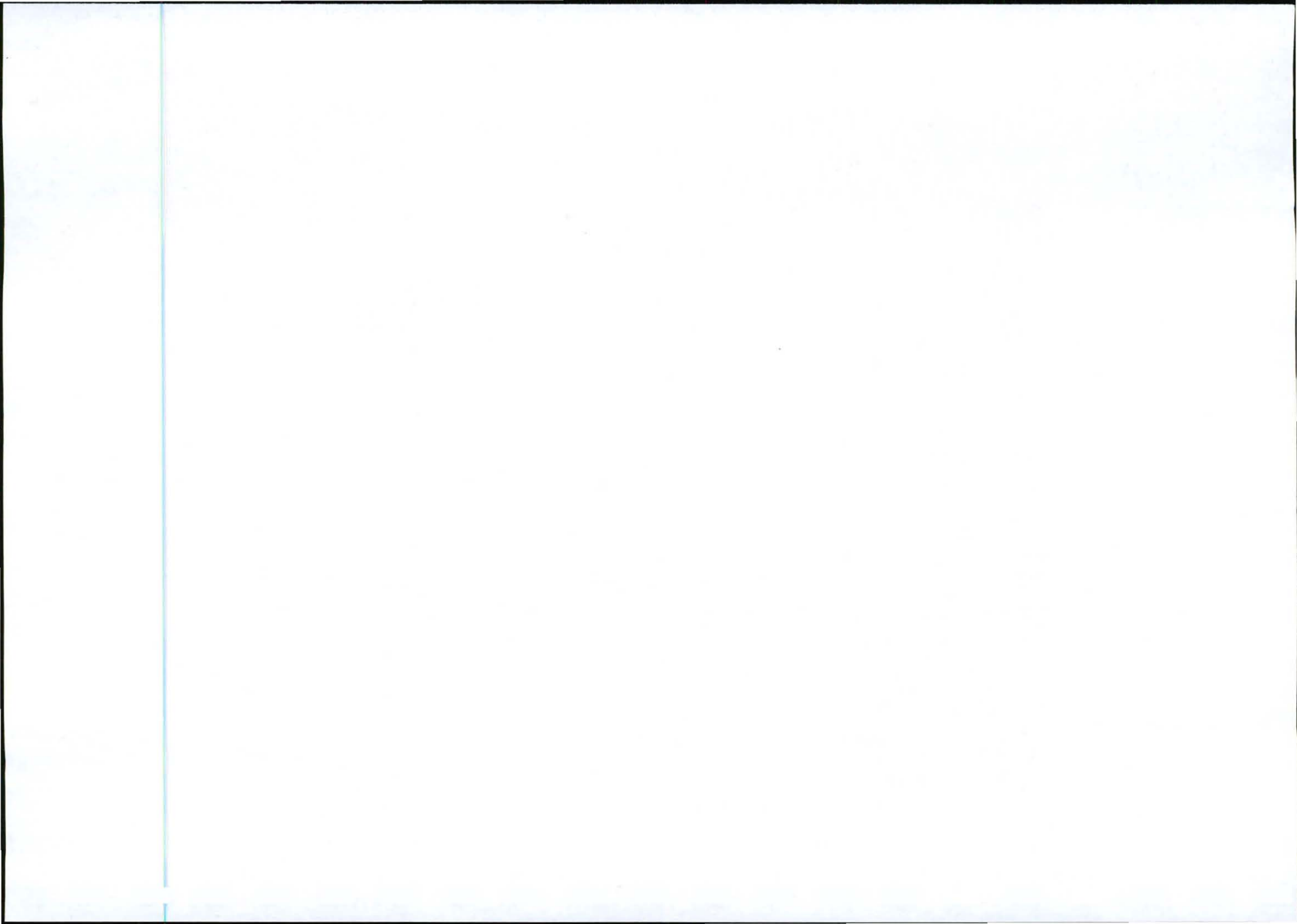
The following appendixes must be attached as appropriate:

- Appendix A: Site plans
- Appendix B: Photographs
- Appendix C: Facility illustrations
- Appendix D: Specialist reports
- Appendix E: Stakeholder Engagement
- Appendix F: Environmental Management Programme (EMPr)
- Appendix G: Other information

SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by
SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

SECTION F: Appendices



SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

APPENDIX A: SITE LAYOUT PLANS

- A.1: Site location map for proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map)
- A.2: Status Quo map for proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map)
- A.3: Recommended site options based on Ecological Sensitivity Map for the proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map)
- A.4: Co-ordinates of recommended site options for the proposed Solar PV facility at Knapdaar Farm, near Springfontein

APPENDIX B: PHOTOGRAPHS

- B.1 PHOTOGRAPHS FOR THE SITE 1
 - Photographs taken from the centre of Site 1 in the 8 compass directions
- B.1 PHOTOGRAPHS FOR THE SITE 2
 - Photographs taken from the centre of Site 2 in the 8 compass directions

APPENDIX C: FACILITY ILLUSTRATIONS

- C.1: Generic Layout Plan for the proposed 10MW Solar PV Facility.
- C.2: General Layout of Solar PV Frames and Panels.
- C.3: Solar PV Technology Specifications.

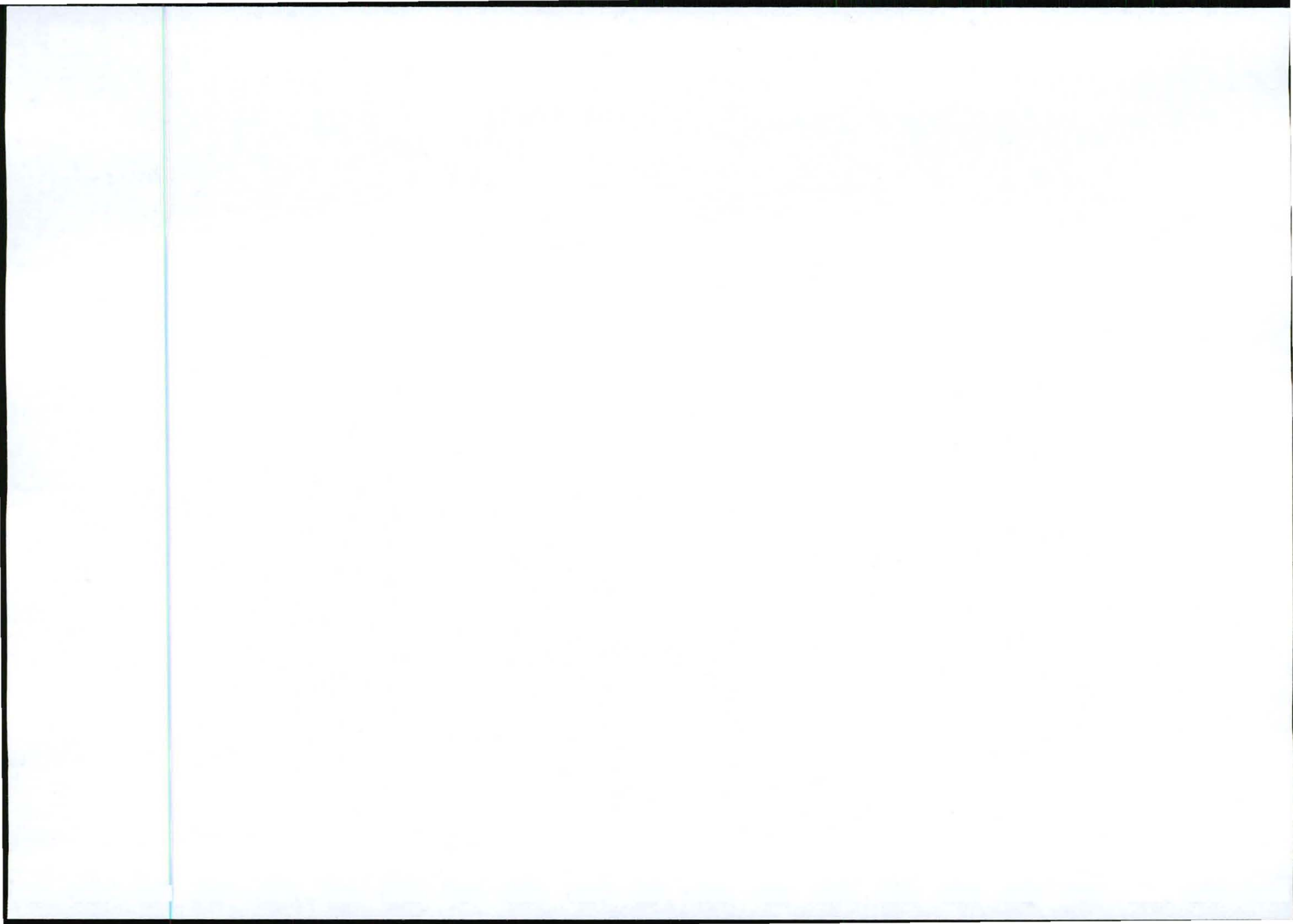
APPENDIX D: SPECIALIST REPORTS

- D.1 Biodiversity and Ecology Impact Assessment Report
- D.2A Freshwater Ecosystem Impact Assessment Report
- D.2B Freshwater Ecosystem Inputs for the Environmental Management Plan
- D.3 Built Heritage and Archaeology Impact Assessment Report
- D.4 Soil/Land and Agricultural Potential Impact Assessment Report
- D.5 Visual Impact Assessment Report
- D.6 Palaeontology Impact Assessment Report
- D.7 Social Impact Assessment Report

APPENDIX E: STAKEHOLDER ENGAGEMENT

- E.1 Names and contact details of authorities included in the consultation process
- E.2 Advertisement placed in The Express (Date: 22/02/2012)
- E.3 Advertisement placed in the Volksblad (Date: 21/02/2012)
- E.4 Photographs of the site notice boards
- E.5 Letter 1 distributed to I&APs as notification of the proposed Solar PV Facility
- E.6 Comments and Response Report
- E.7 Background Information Document and I&AP Registration and Comments Form distributed to I&APs as notification of the proposed Solar PV Facility
- E.8 Database of Key Stakeholders and Interested and Affected Parties
- E.9 Comment received from Interested and Affected Parties (Mr. Wim Botha)
- E.10 Comment received from Free State Heritage Resource Authority (Ms. Loudine Philip)

APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

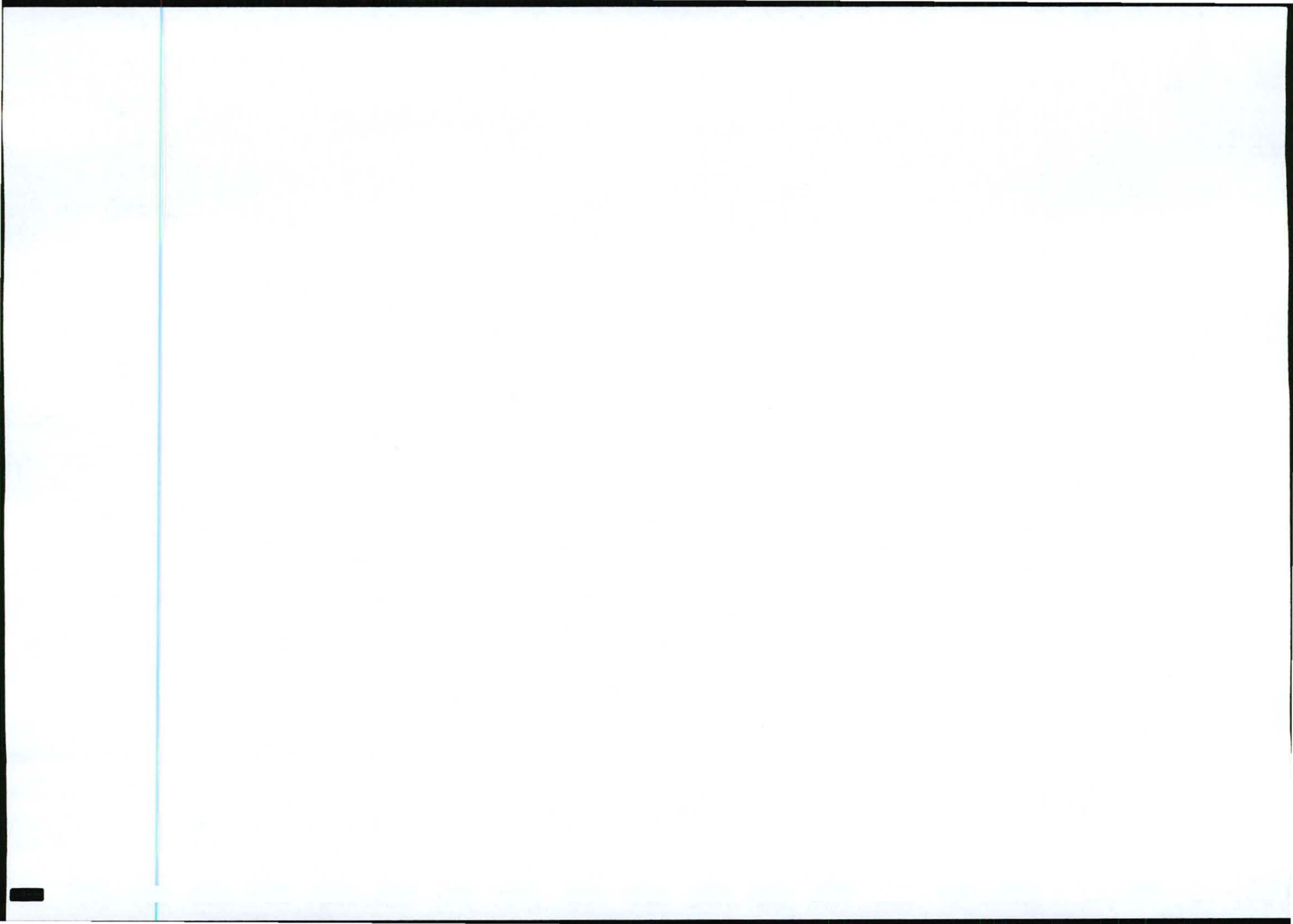


SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by
SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

APPENDIX G: OTHER INFORMATION

- G.1 Application form submitted by CSIR to DEA (*Dated: 24/01/2012*).
- G.2 Letter from DEA acknowledging receipt of the Application (*Dated: 14/02/2012*).
- G.3 Letter from DEA acknowledging receipt of letter (*Dated: 01/03/2012*).
- G.4 Letter from SAHRA acknowledging receipt of the Application.
- G.5 Letter from the Free State Heritage Resources Authority acknowledging receipt of Notice of Basic Assessment process.
- G.6 Correspondence between the CSIR and the Free State Heritage Resource Authority.
- G.7 Correspondence between the CSIR and the Civil Aviation Authority.
- G.8 Specialist Declaration of Interest Forms.
- G.9 Confirmation of consultation with the Landowner.
- G.10 Property Deeds applicable to the proposed Solar PV facility at Knapdaar Farm, near Springfontein.

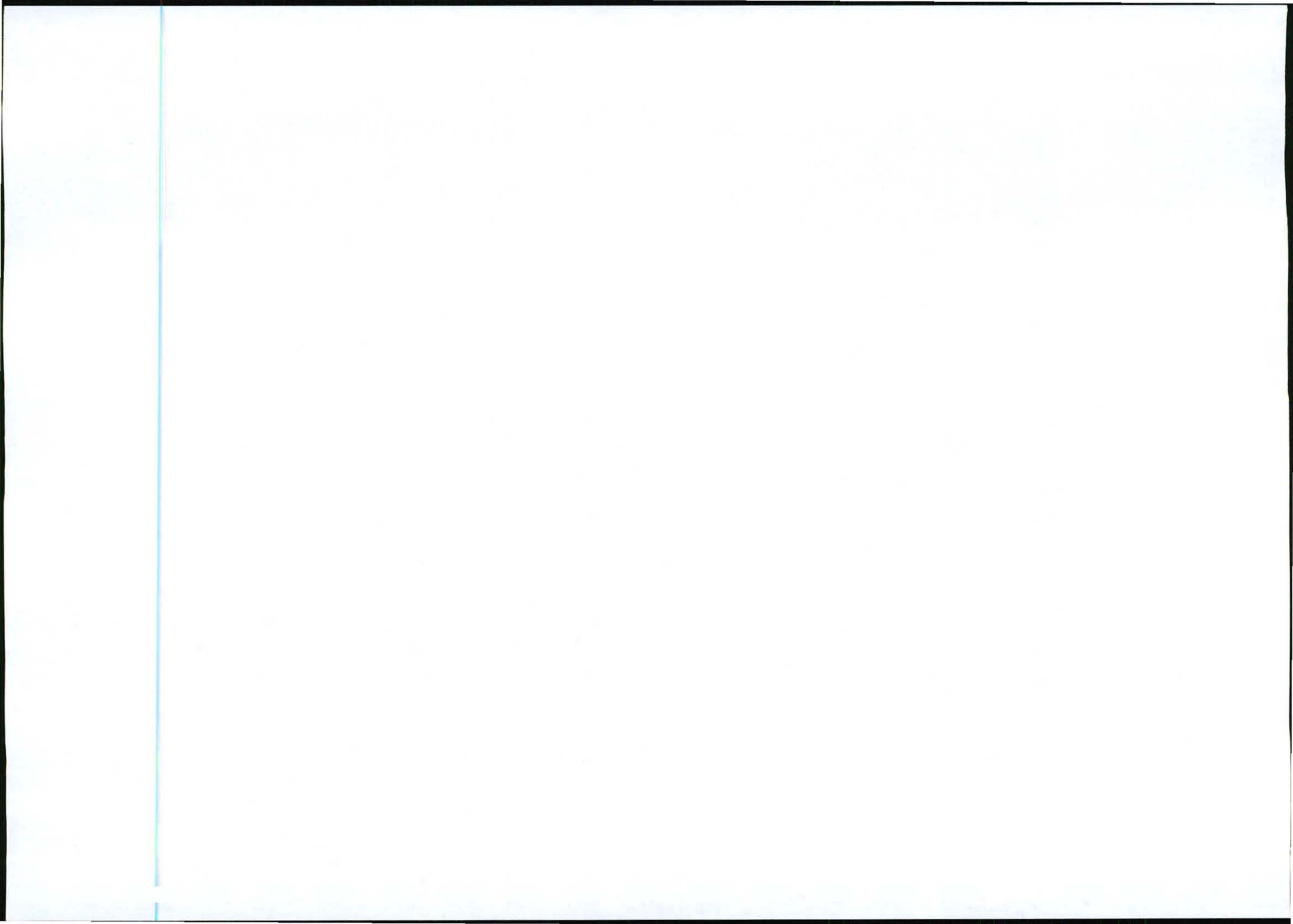


SECTION F: APPENDICES

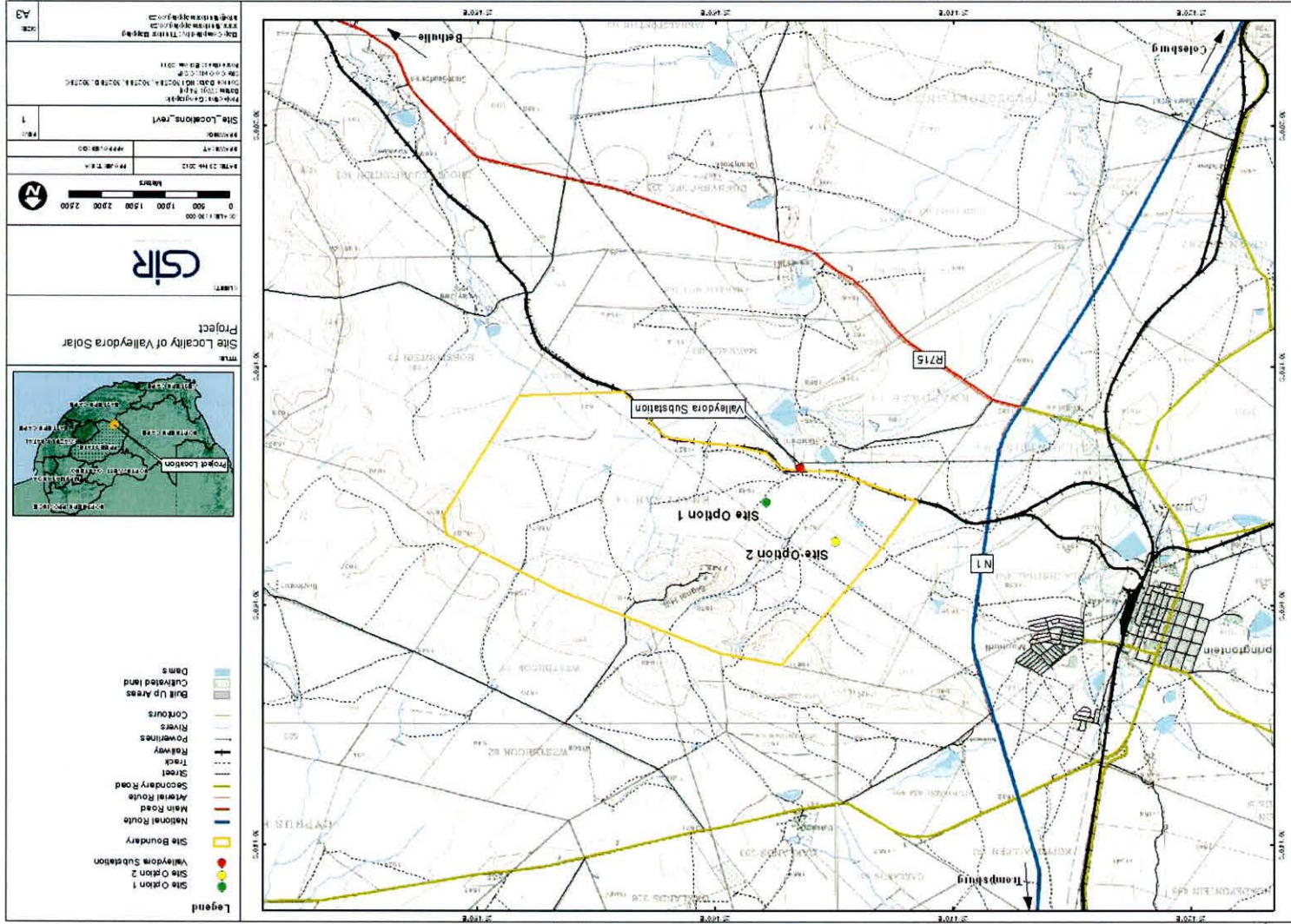
Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

APPENDIX A: Site Plans

Appendix A.1:	Site location map for proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map) _____	5
Appendix A.2	Status Quo map for proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map) _____	6
Appendix A.3:	Recommended site options based on Ecological Sensitivity Map for the proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map) _____	7
Appendix A.4:	Co-ordinates of recommended site options for the proposed Solar PV facility at Knapdaar Farm, near Springfontein _____	8

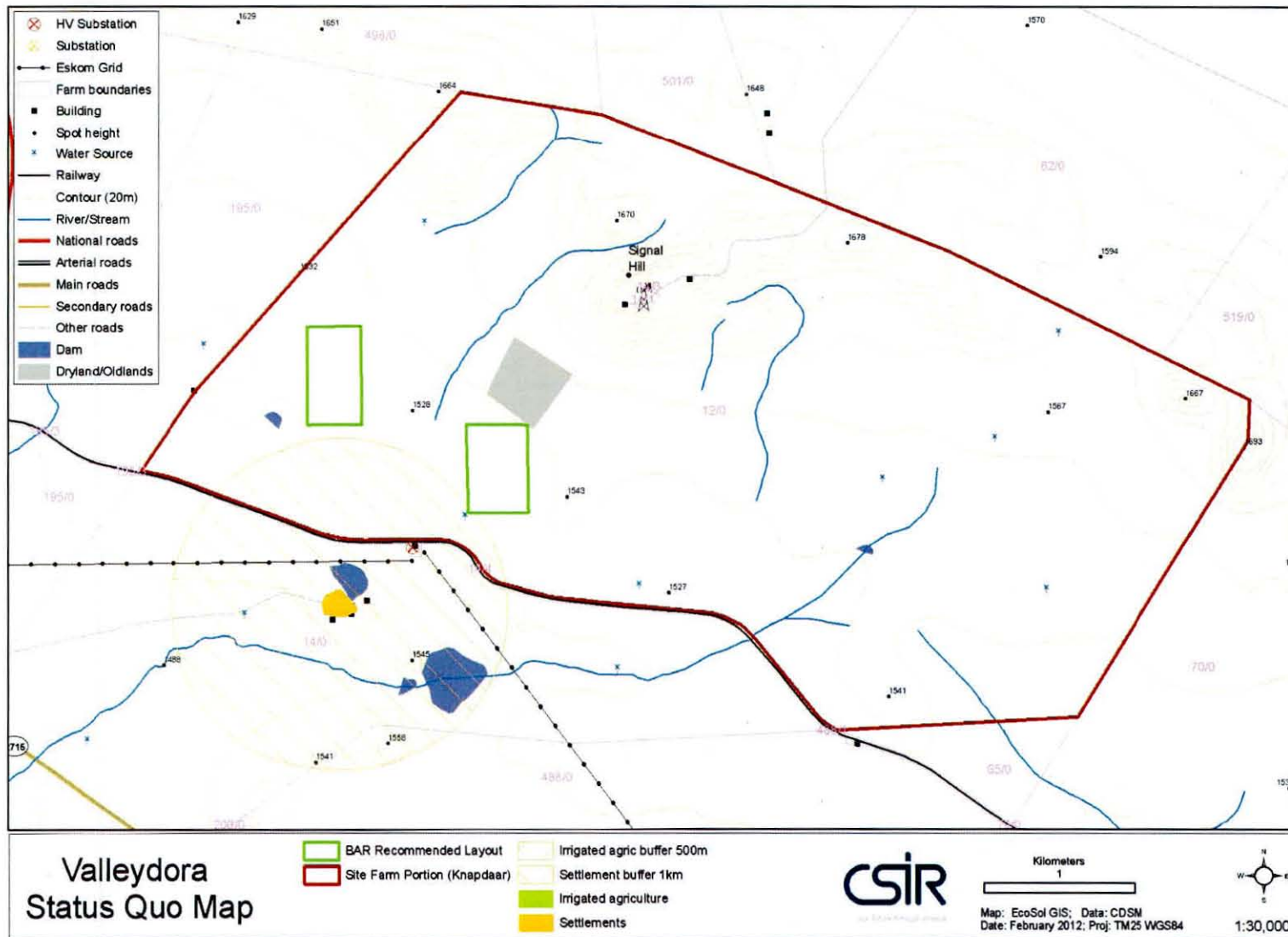


Appendix A.1: Site location map for proposed Solar PV facility at Knappaar Farm, near Springfontein (based on 1:50 000 map)

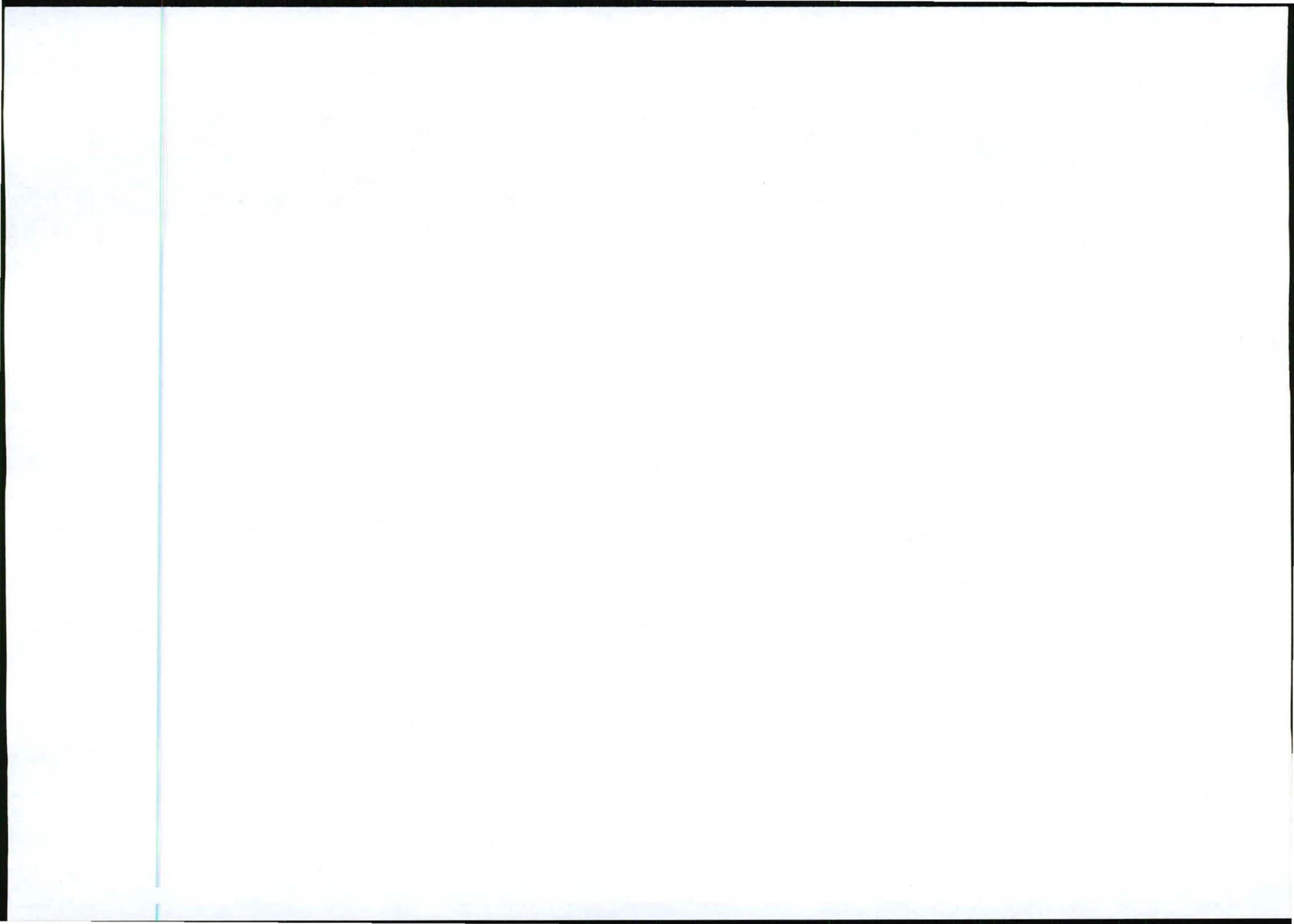




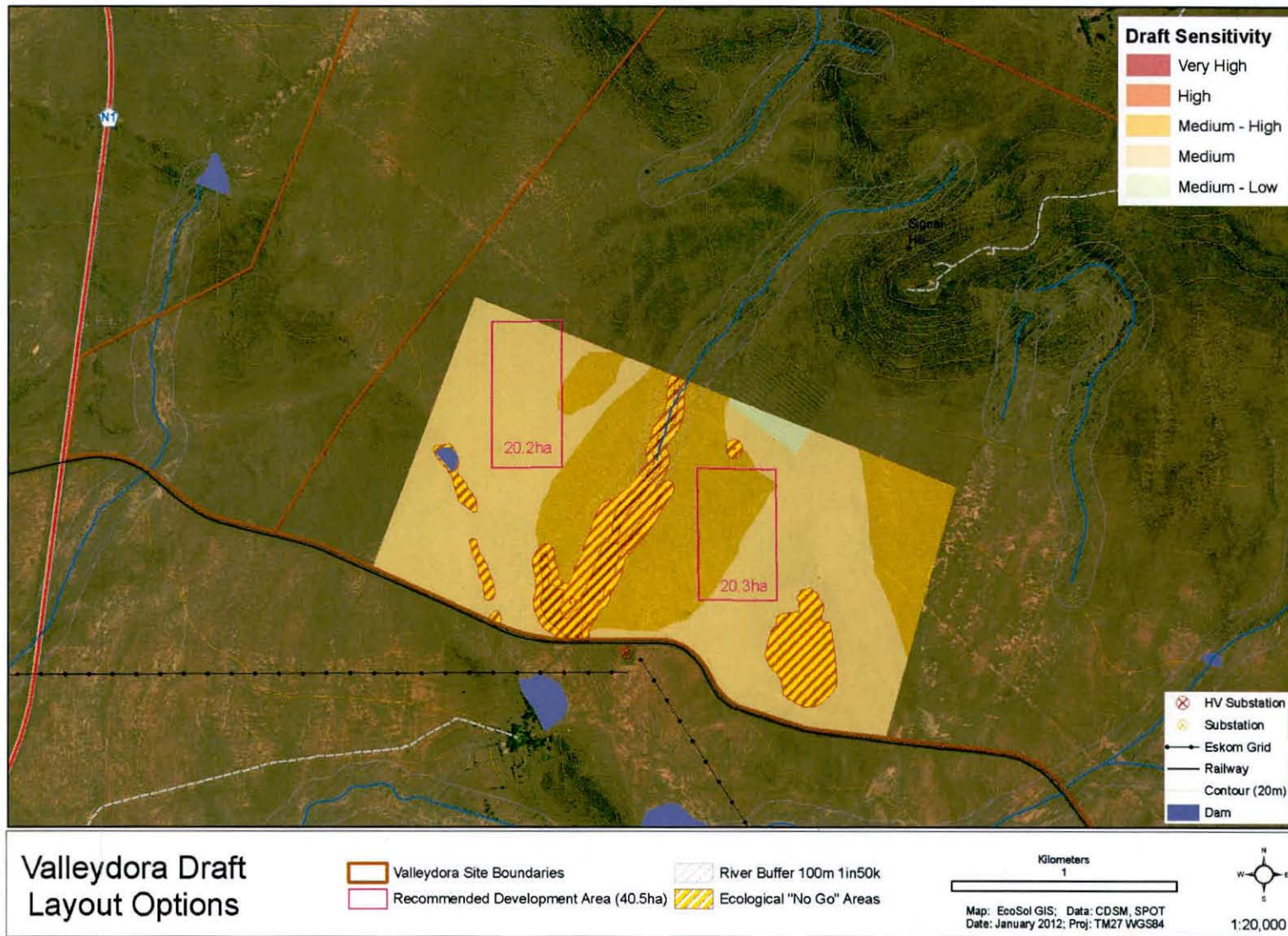
SECTION F: APPENDICES



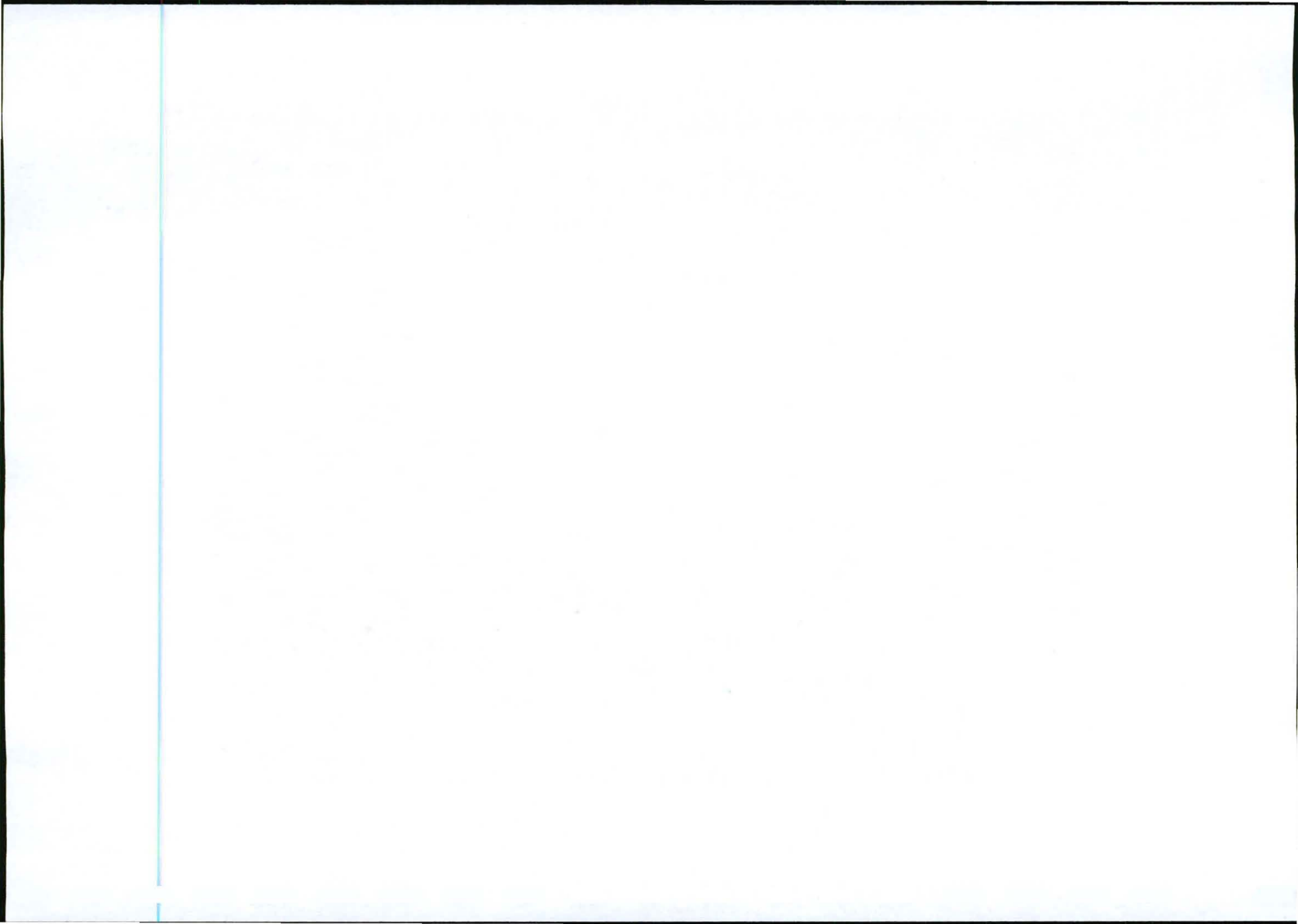
Appendix A.2 Status Quo map for proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map)



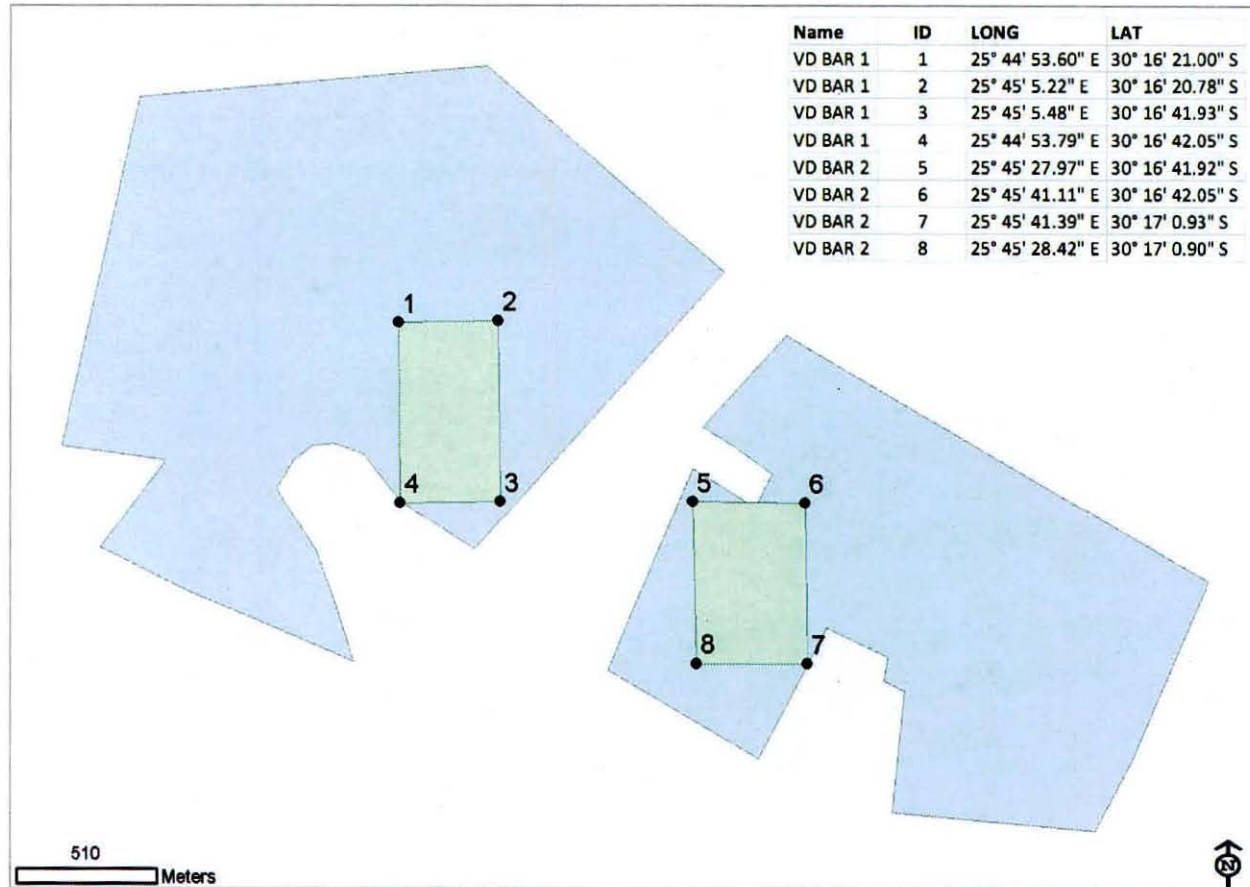
SECTION F: APPENDICES



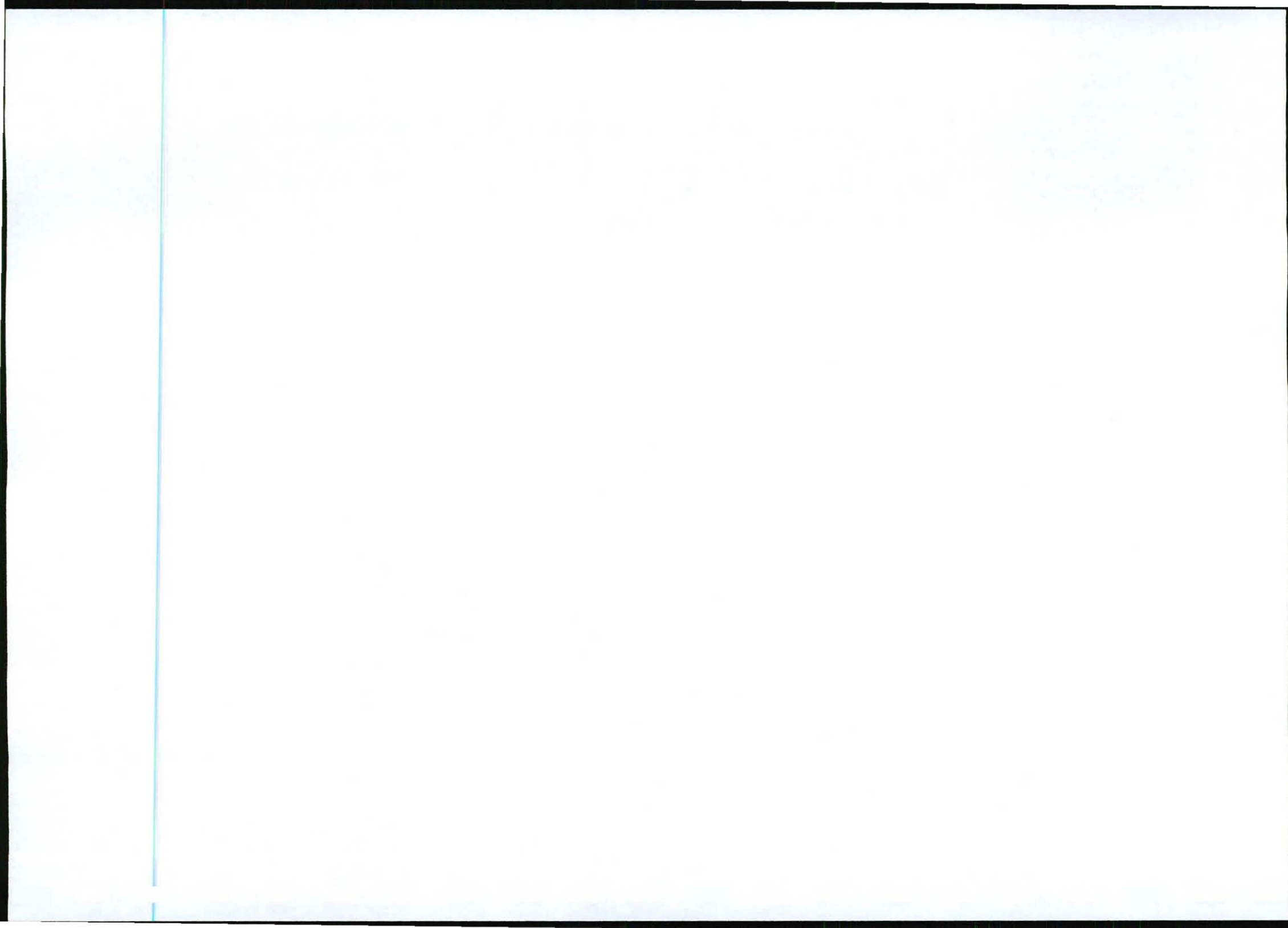
Appendix A.3: Recommended site options based on Ecological Sensitivity Map for the proposed Solar PV facility at Knapdaar Farm, near Springfontein (based on 1:50 000 map)



SECTION F: APPENDICES



Appendix A.4: Co-ordinates of recommended site options for the proposed Solar PV facility at Knapdaar Farm, near Springfontein



SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by
SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

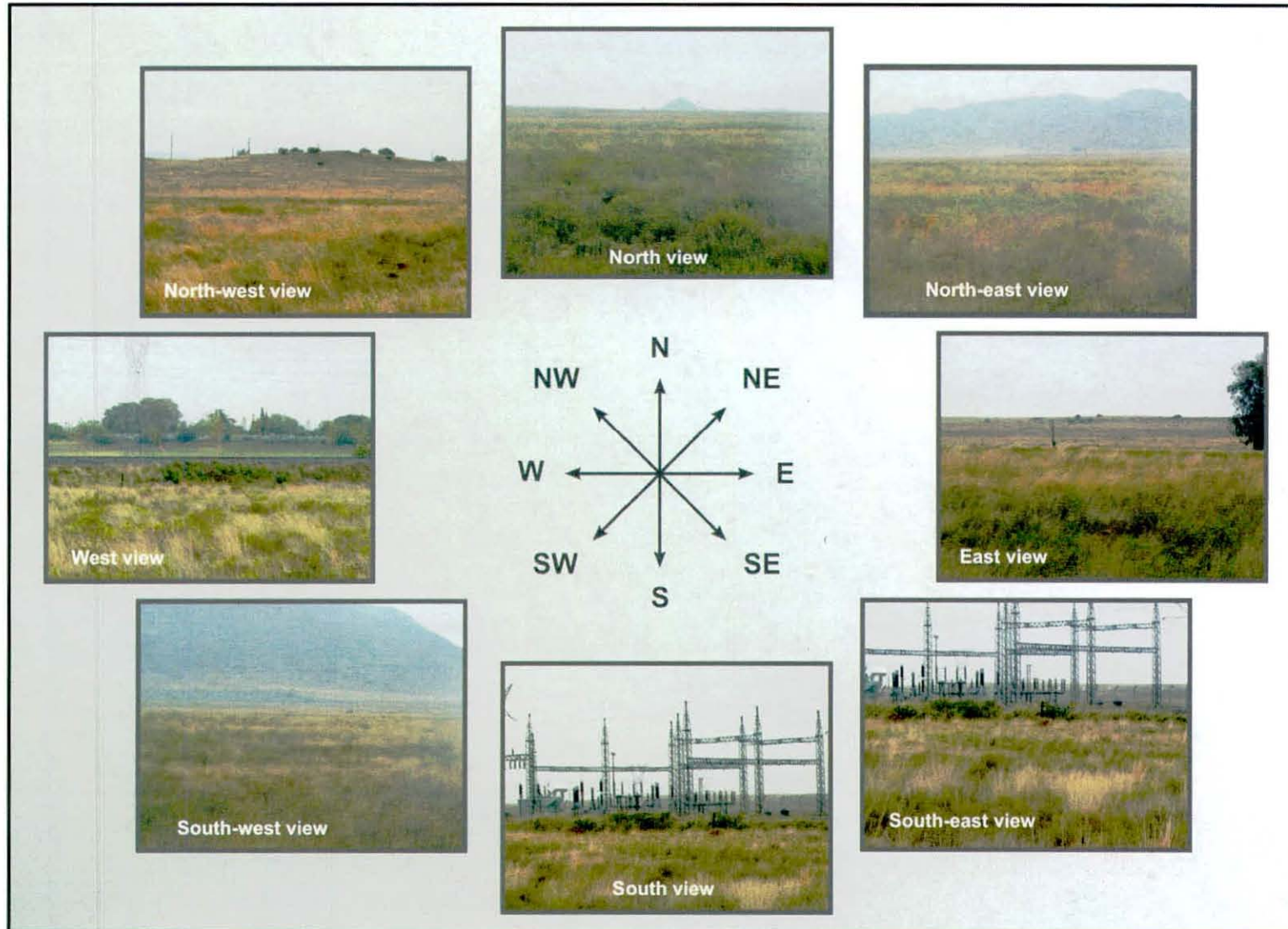
APPENDIX B: Photographs

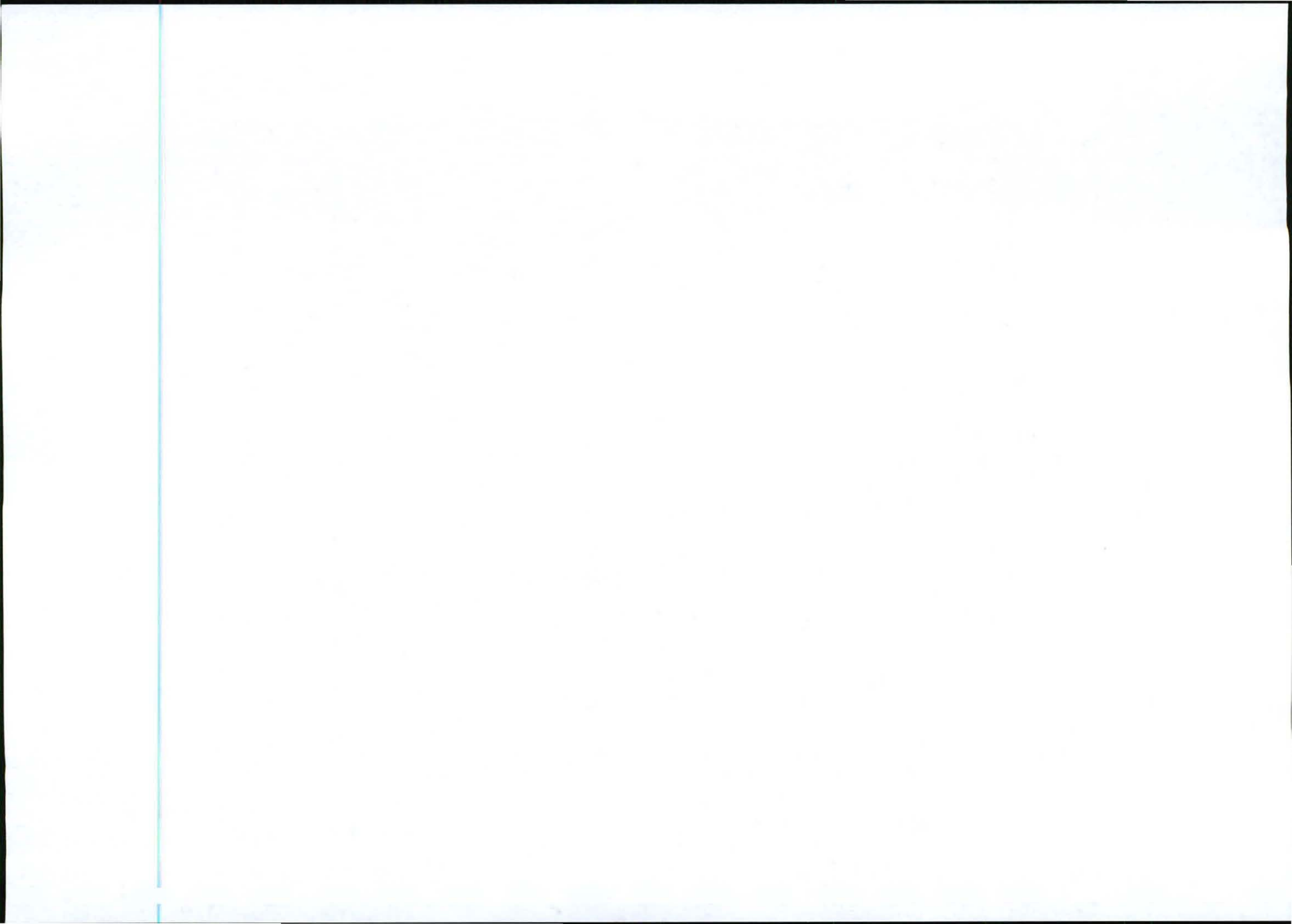
Appendix B.1	PHOTOGRAPHS FOR THE SITE • Photographs taken from the centre of Site 1 in the 8 compass directions _____	10
Appendix B.2	PHOTOGRAPHS FOR THE SITE • Photographs taken from the centre of Site 2 in the 8 compass directions _____	11



Appendix B.1 PHOTOGRAPHS FOR THE SITE

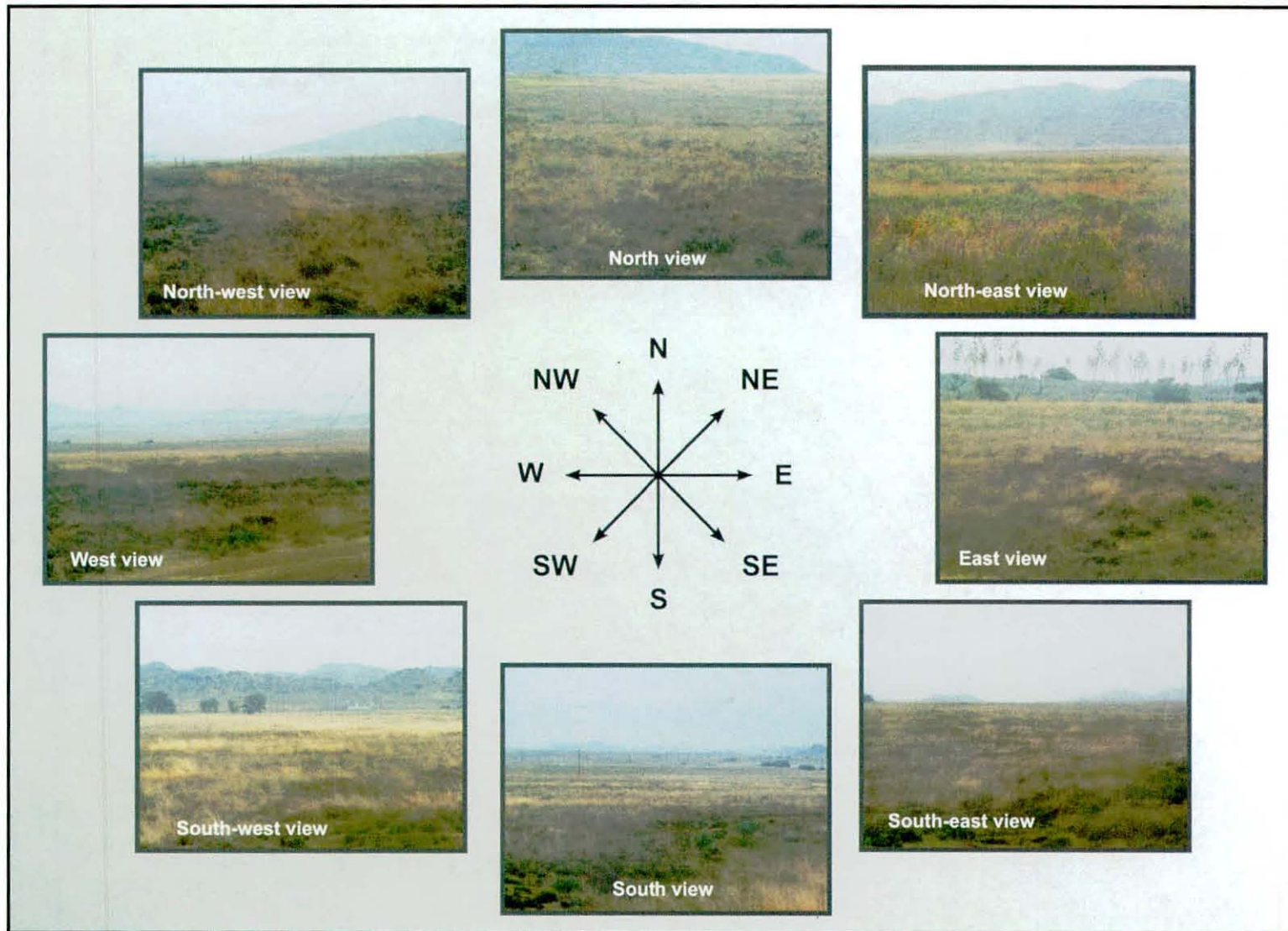
- **Photographs taken from the centre of Site 1 in the 8 compass directions**

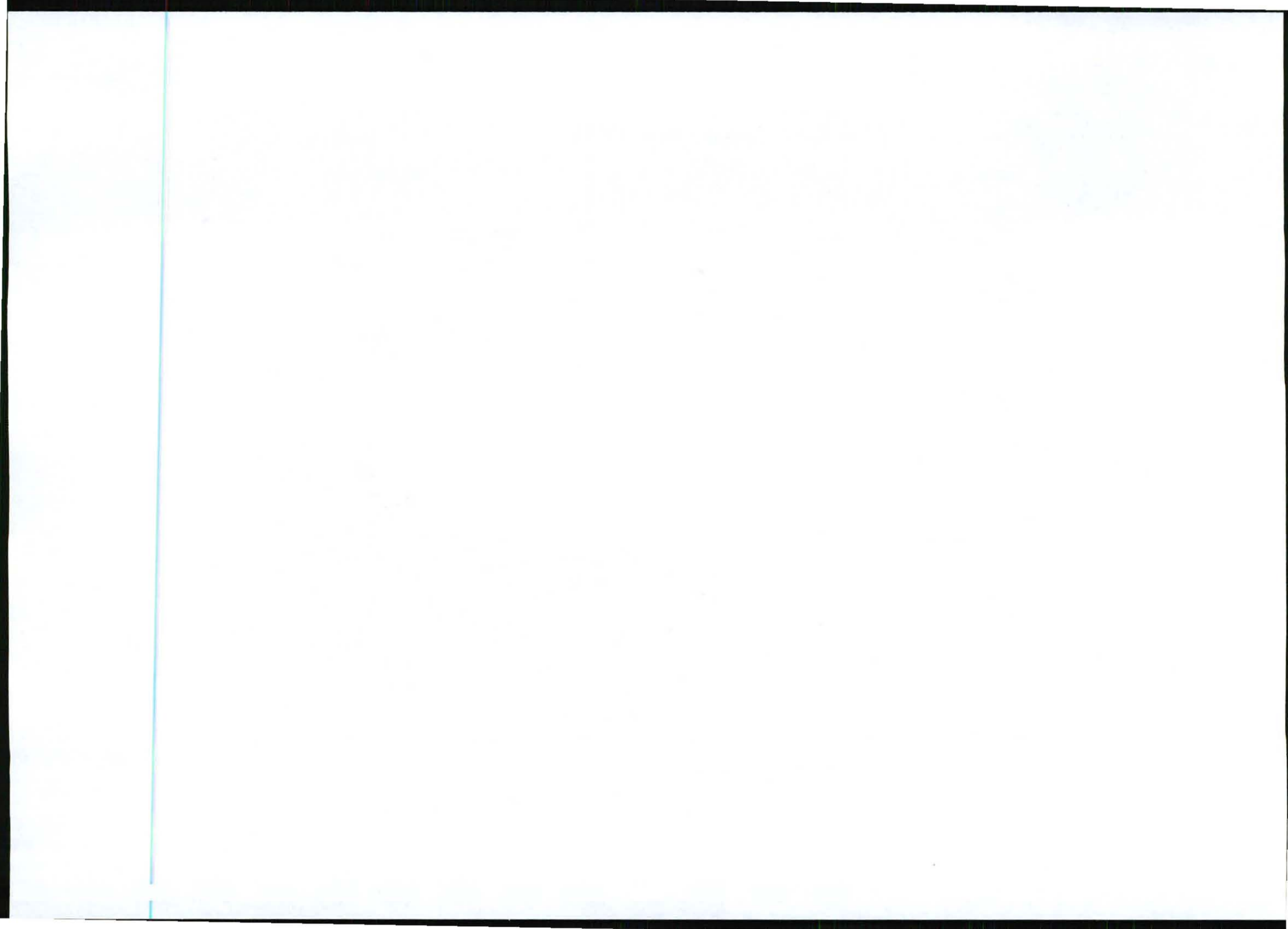




Appendix B.2 PHOTOGRAPHS FOR THE SITE

- Photographs taken from the centre of Site 2 in the 8 compass directions



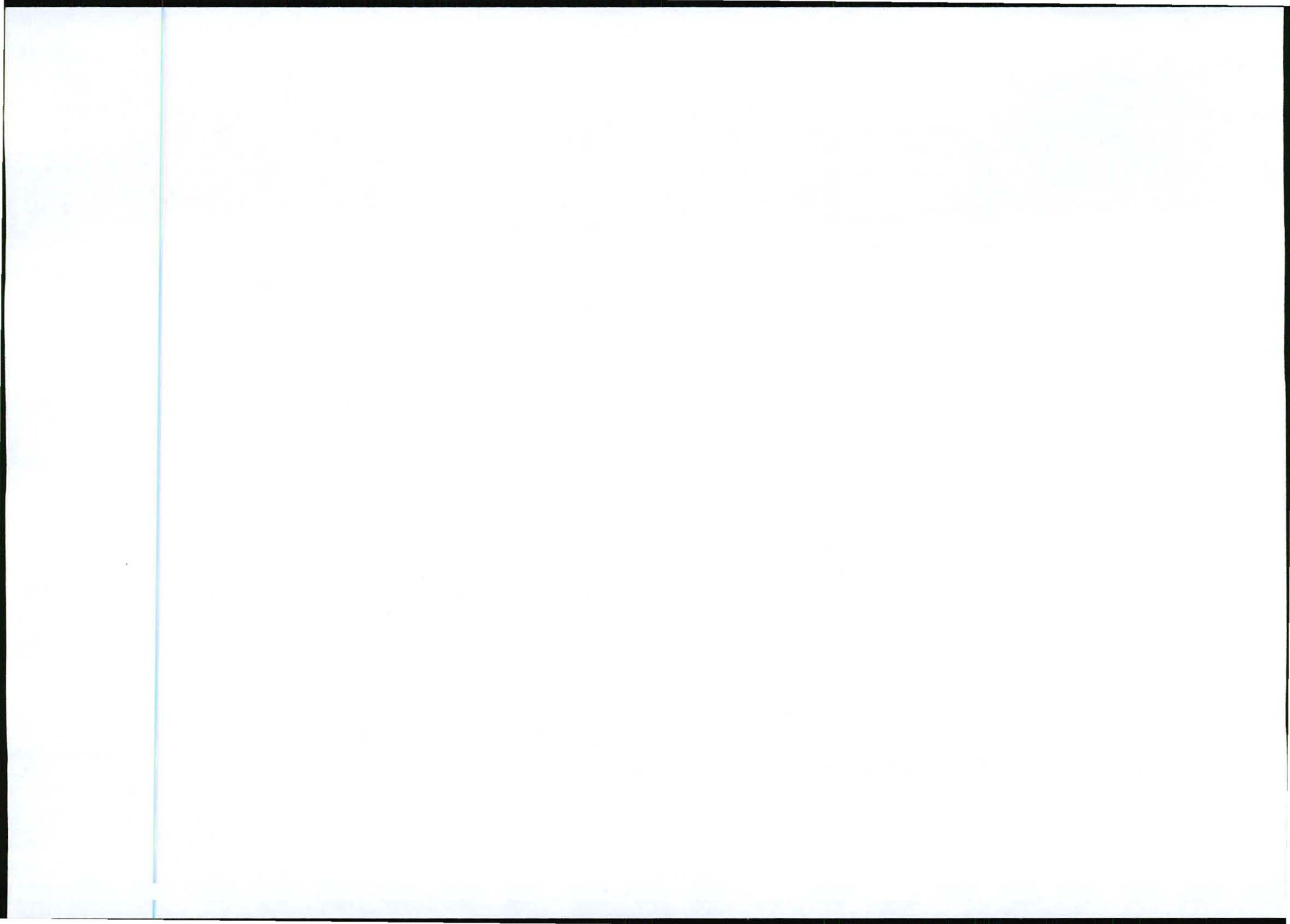


SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by
SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

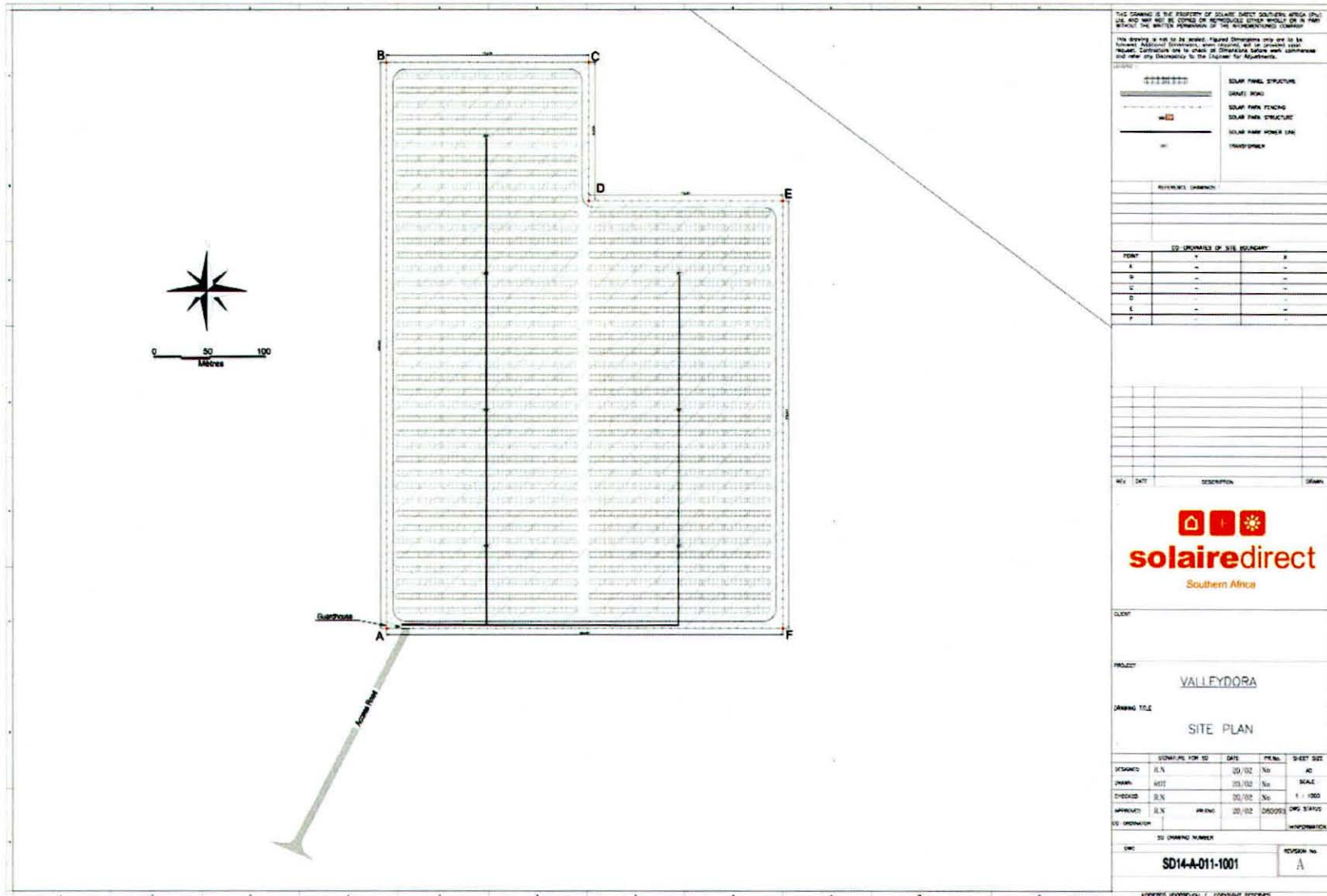
APPENDIX C: Facility illustrations

Appendix C.1:	Generic Layout Plan for the proposed 10MW Solar PV Facility. _____	13
Appendix C.2:	General Layout of Solar PV Frames and Panels. _____	14
Appendix C.3:	Solar PV Technology Specifications. _____	15

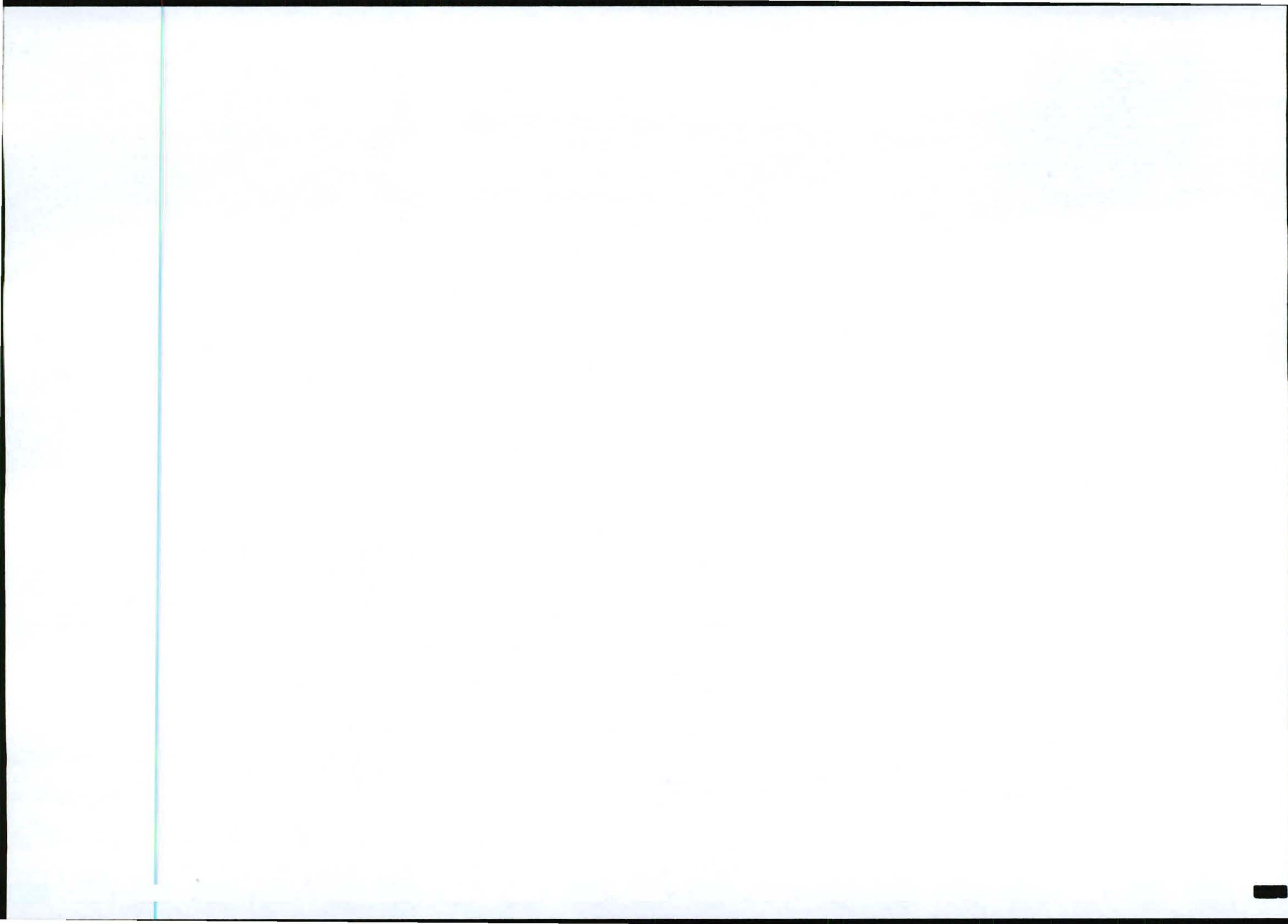


SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

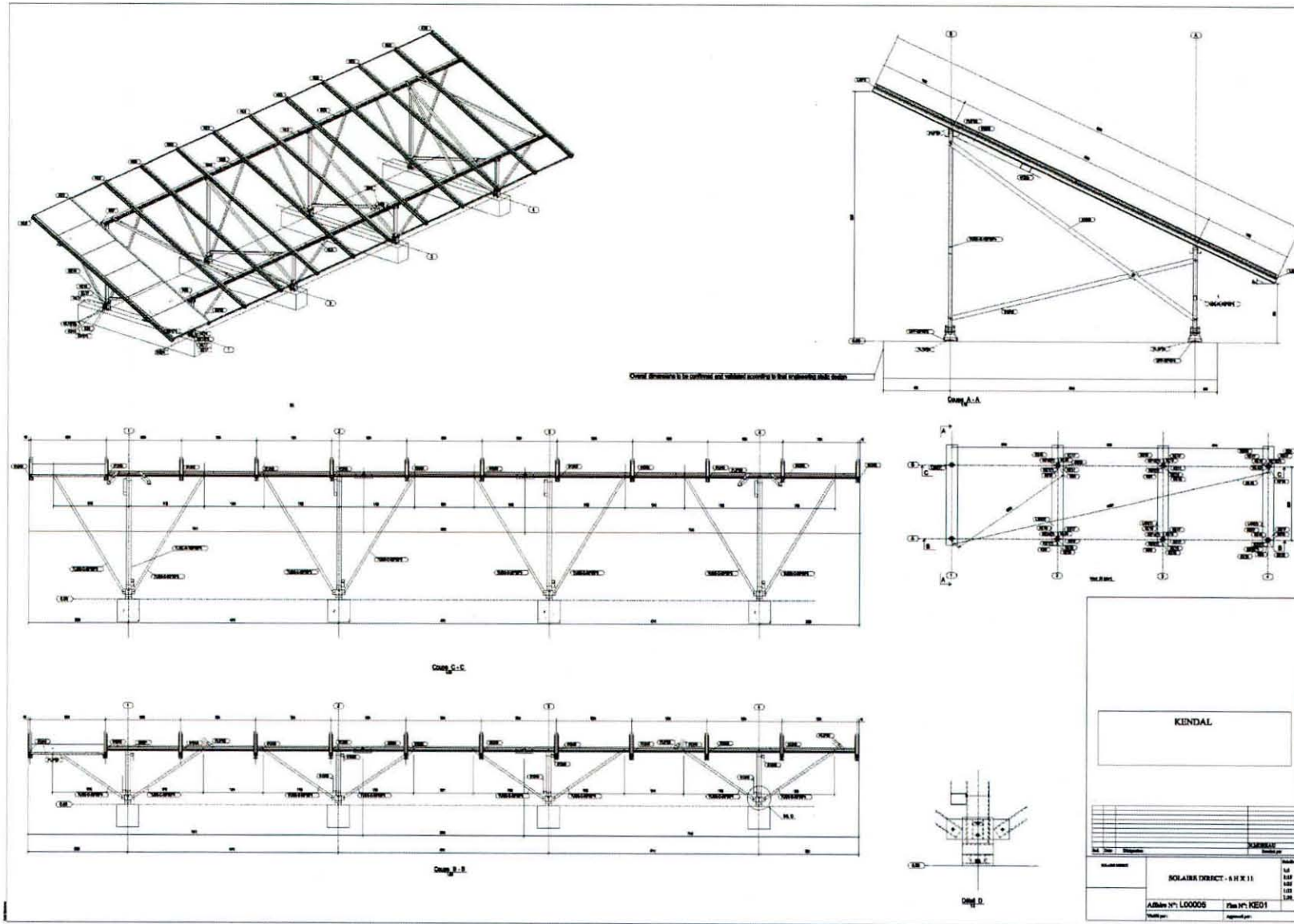


Appendix C.1: Generic Layout Plan for the proposed 10MW Solar PV Facility.

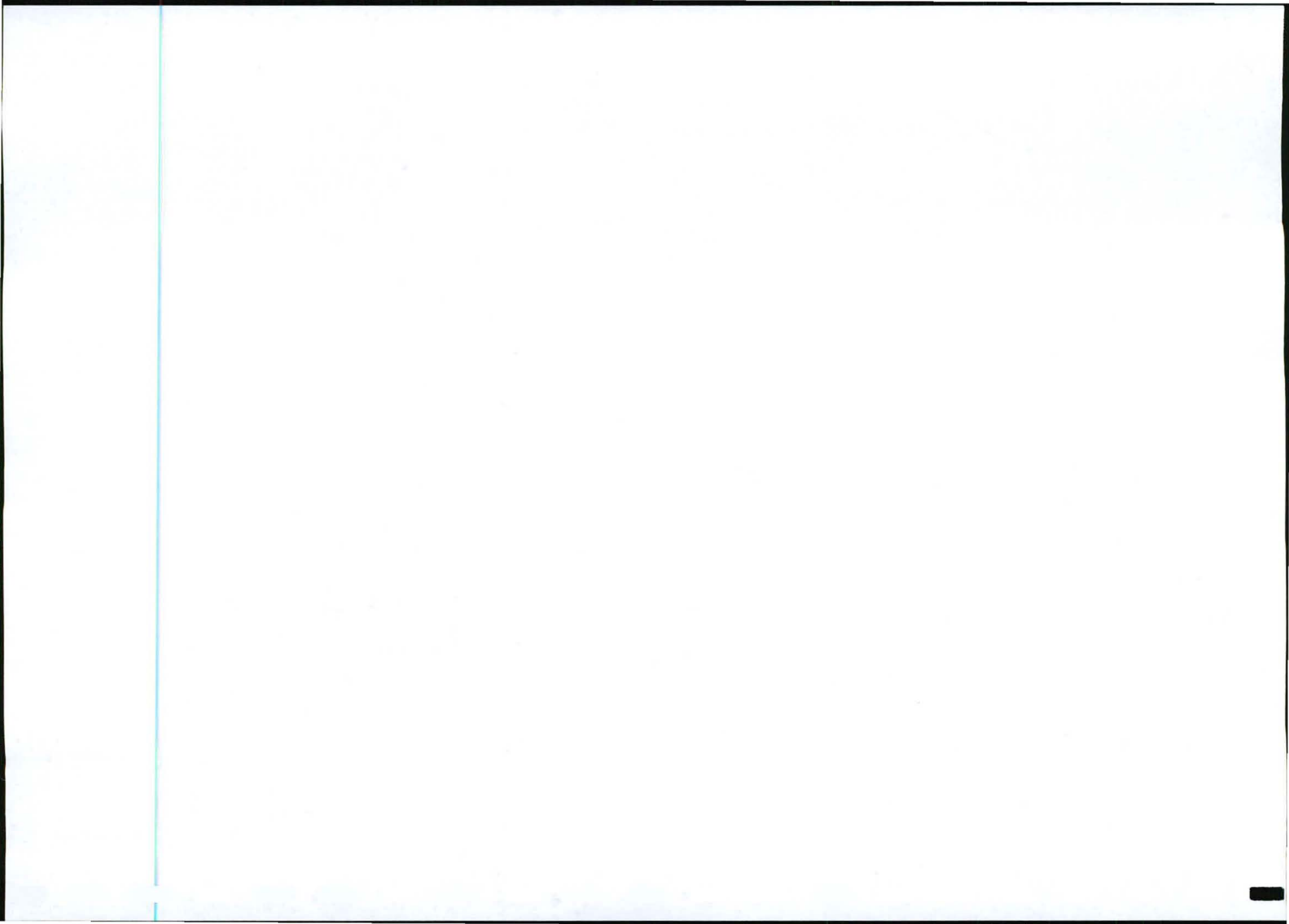


SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by SolaireDirect at Knappaar Farm (No. 14) near Springfontein, Free State Province



Appendix C.2: General Layout of Solar PV Frames and Panels.



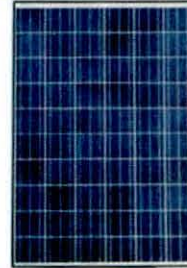
SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by
SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

SOLAIRE DIRECT TECHNOLOGIES : SD610

Mechanical Characteristics

Length (mm)	1660
Width (mm)	990
Height (mm)	45
Weight (Kg)	19
Junction Box	1 x Tyco junction Box with 3 Bypass diodes
Cables	Solar Cable, Length 1000mm, 4 mm ² thick Assembled
Front Substrate	HIT SM, ARC White Glass glass 3.2mm thickness
Cells	60 polycrystalline cells (156 x 156 mm)
Encapsulation Material	EVA - Ethylene Vinyl Acetate
Back Substrate	Composite Sheet Tedlar or APA
Frame	45 mm Aluminum profile - Natural or Black Anodized
Unframed Dimensions	1652 x 982 x 5 mm (LxWxH) (Tol. +/- 2mm)



Electrical Characteristics

Power Class	235	230	225	220	215	210
Power Tolerance	+/- 3%	+/- 3%	+/- 3%	+/- 3%	+/- 3%	+/- 3%
Min Power (W)	227.95	223.1	218.25	213.4	208.55	203.7
Voltage at Max Power (Vmp)	29.4	29.3	28.9	28.8	28.6	28.3
Current at Max Power (Imp)	8.04	7.95	7.82	7.75	7.6	7.49
Open circuit Voltage (Voc)	36.9	36.7	36.6	36.4	36.3	36.1
Short Circuit Voltage (Isc)	8.65	8.55	8.4	8.3	8.2	8.1
Maximum System Voltage	1000	1000	1000	1000	1000	1000

Voltage temperature correction factor (Open Circuit)	-0.35%/K
Current Temperature correction factor (Short Circuit)	0.05%/K
Power Temperature correction Factor	-0.44 %/K
NOCT	45°C
(STC) Standard testing conditions :	1000 W/m ² , AM 1.5, 25°C

Use Conditions

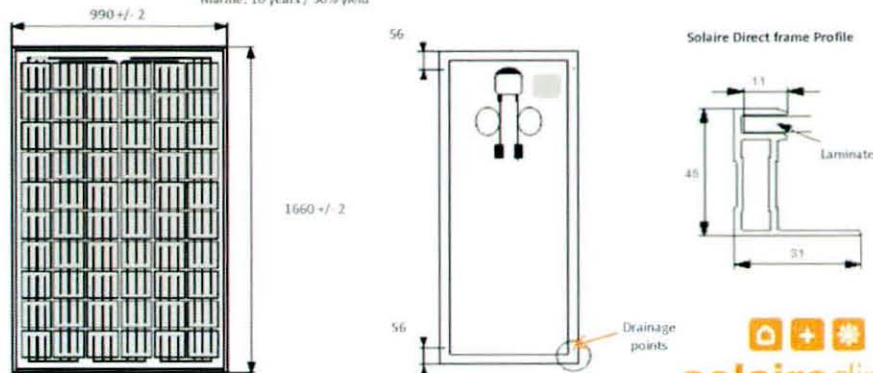
Temperature Range	-40 °C to + 85°C
Hail Test	Limited to a diameter of 28mm at an impact speed of 86 km/h
Test Load	Certified up to 5400 Pa according to IEC 61215 Ed. 2

Certification

IEC 61215:2005 Ed. 2	Certified
EN6170 Class 1 & Class 2	Certified

Warranty

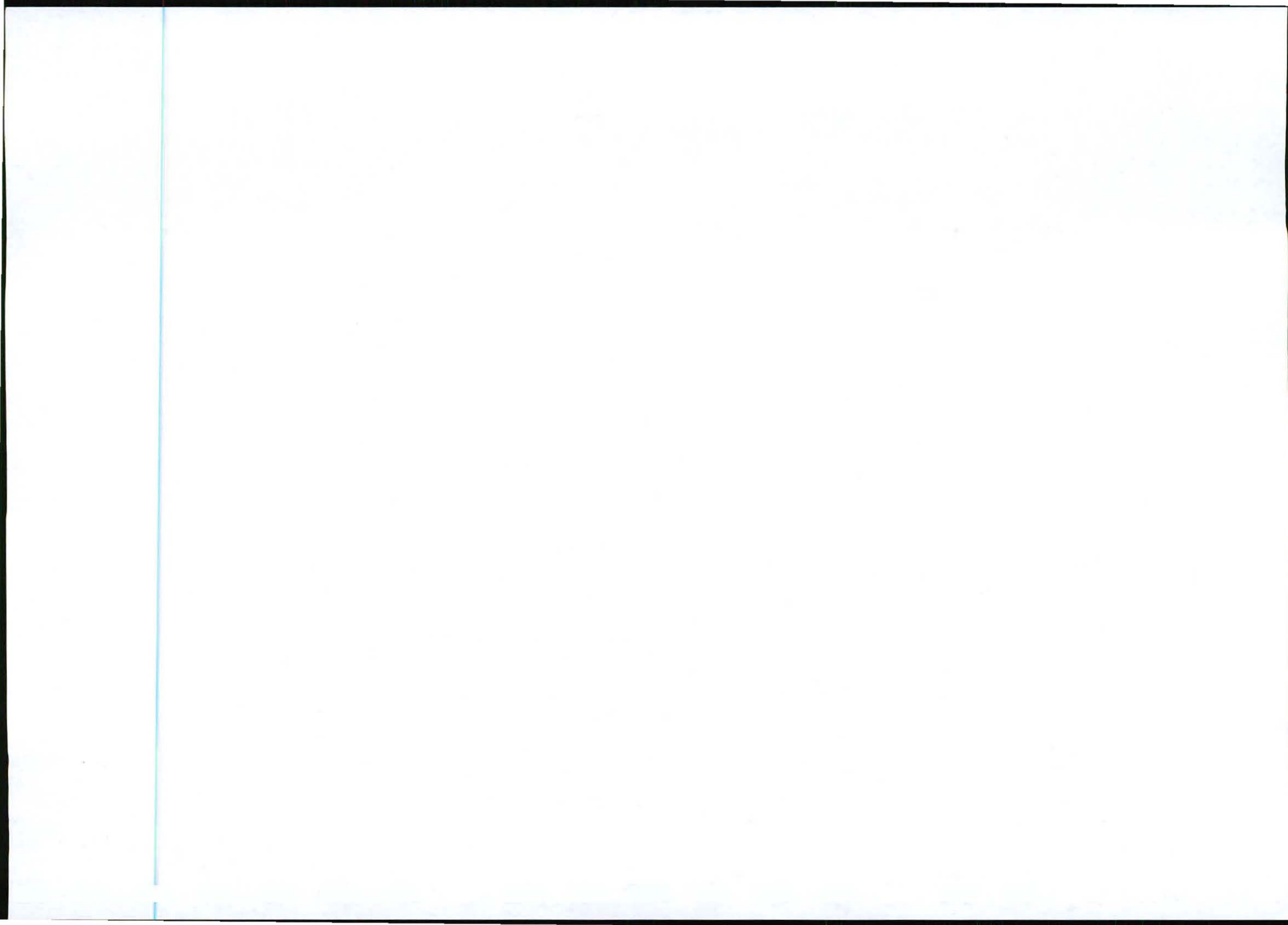
Product	3 years
Power	Terrestrial: 25 years 80% yield Marine: 10 years / 90% yield



Version 03/2009. Can be modified without notice. Average Electrical characteristics for Power class
Power tolerance related to power class before <<1.0>> / Pictures and Drawings Are not contractual



Appendix C.3: Solar PV Technology Specifications.



SECTION F: APPENDICES

Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by
SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

APPENDIX D: Specialist Reports

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Appendix D.2	Freshwater Ecosystem Impact Assessment Report _____	18
Appendix D.3	Built Heritage and Archaeology Impact Assessment Report _____	19
Appendix D.4	Soil/Land and Agricultural Potential Impact Assessment Report _____	20
Appendix D.5	Visual Impact Assessment Report _____	21
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