

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

Background Information Document - Valleydora Solar Project



The Draft Basic Assessment, together with comments received from I&APs will be made available for a 40 day review period. Reasonable and feasible alternatives identified to date and to be included in the draft BAR are:

- No-go: to leave the land as is and not commence with the activity
- Go: the project alternative as proposed, including alternative layouts considered on site
- Reasonable and feasible alternatives as raised by I&APs.

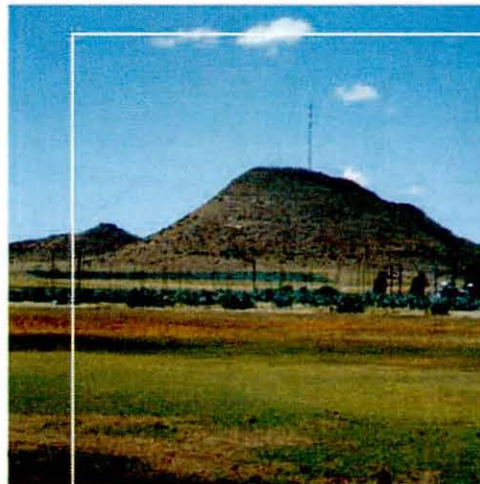
All registered I&APs on the project database will be notified in writing of the 40 day comment period for the Draft Basic Assessment. The Draft Report will be placed on the CSIR's EIA website www.csir.co.za/eia/valleydora. It is not proposed that public meetings are held during this period but telephonic consultations and one on one meetings with key I&APs will take place where required.

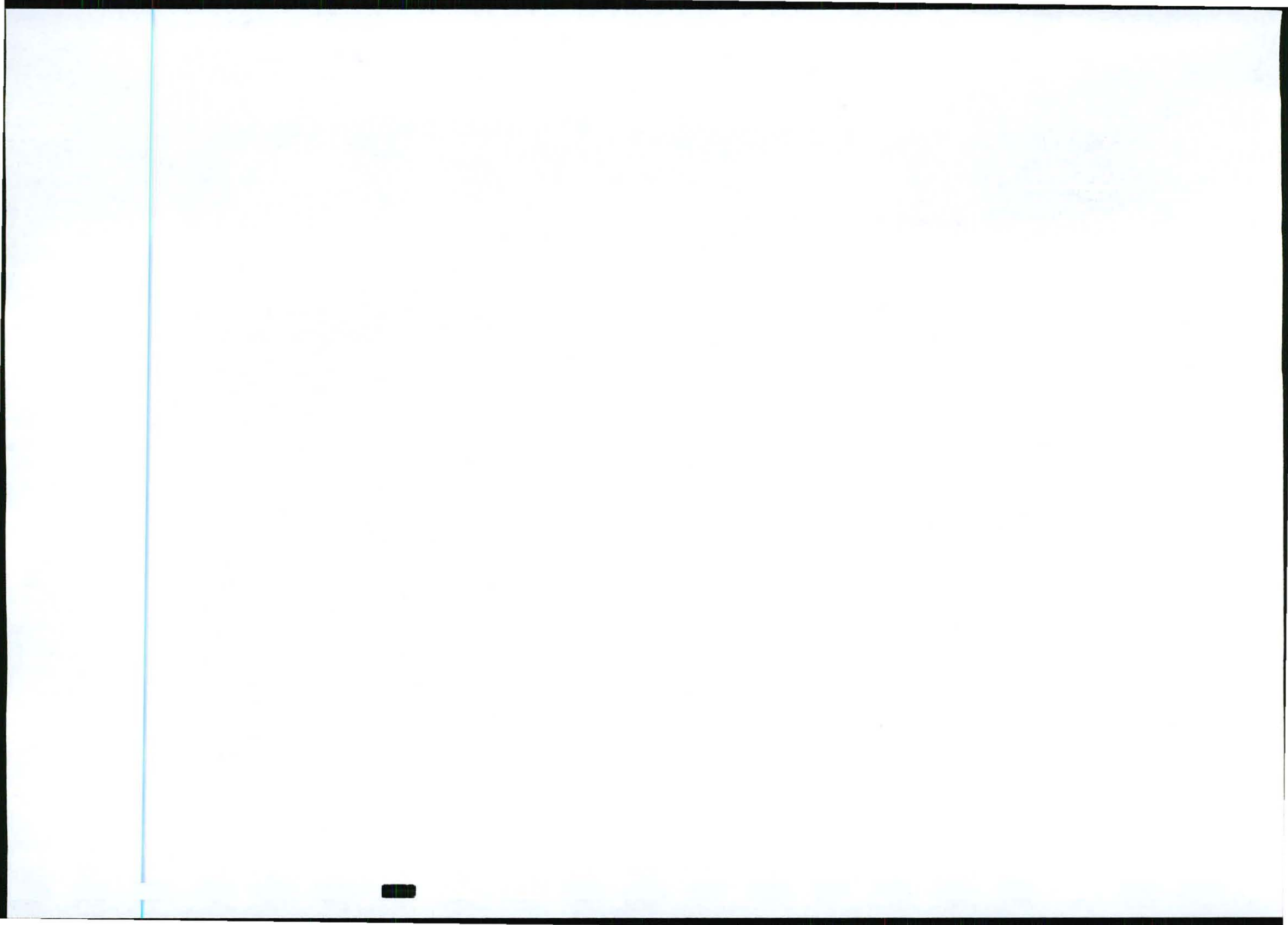
Step 3: Submit Final Basic Assessment Report and Application

The Final BA Report will be released and I&APs offered a period of 21 days to comment on the report. Comments from I&APs should be sent directly to the DEA and copied to CSIR. The DEA will look at all received comments in conjunction with the Final BAR for their decision making.

Step 4: Notification of Environmental Authorisation and Appeal Period

The final step in the process entails providing written notification to all I&APs on the project database of the issuing of the environmental authorisation and appeal period, including the manner of appeal. Project construction may only commence once all necessary approvals have been received from government.





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Background Information Document - Valleydora Solar Project

6. HOW CAN YOU GET INVOLVED?

1. By responding to our invitation for your involvement advertised in local newspapers.
2. By mailing or faxing a comment form to the participation consultant indicated below.
3. By telephonically contacting the participation consultant if you have a query, comment, or require further project information.
4. By reviewing the various reports within the comment periods provided.
5. By attending any feedback meetings, which may be held during the review period. Should you be registered as an I&AP you will be invited to attend these meetings.

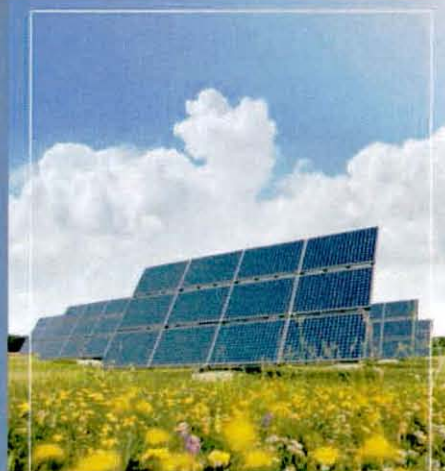
7. WHO SHOULD YOU CONTACT?

Environmental Consultant Details

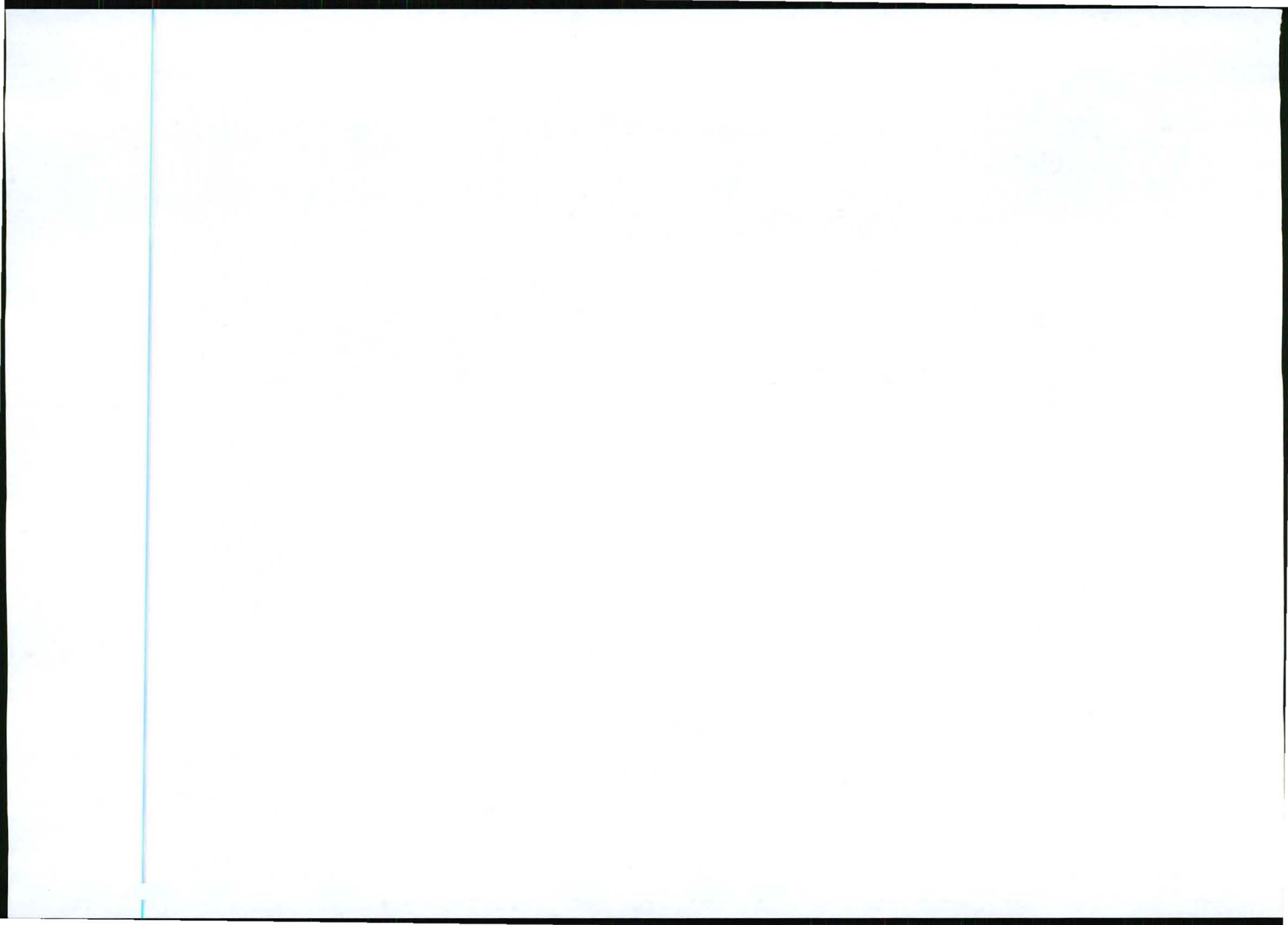
To register as an I&AP, please complete the Registration Form included with this BID and kindly send to:

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

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p.7



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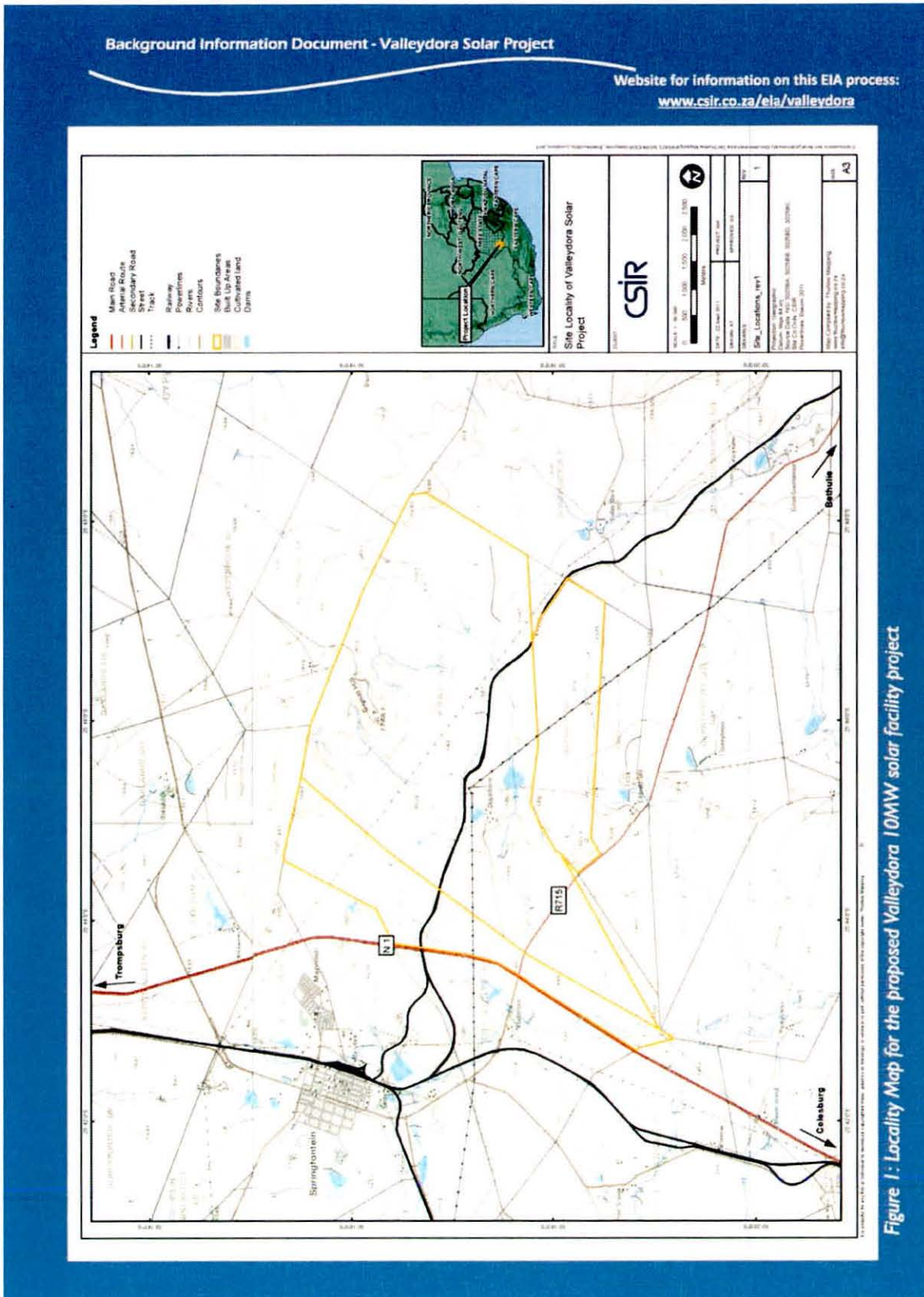
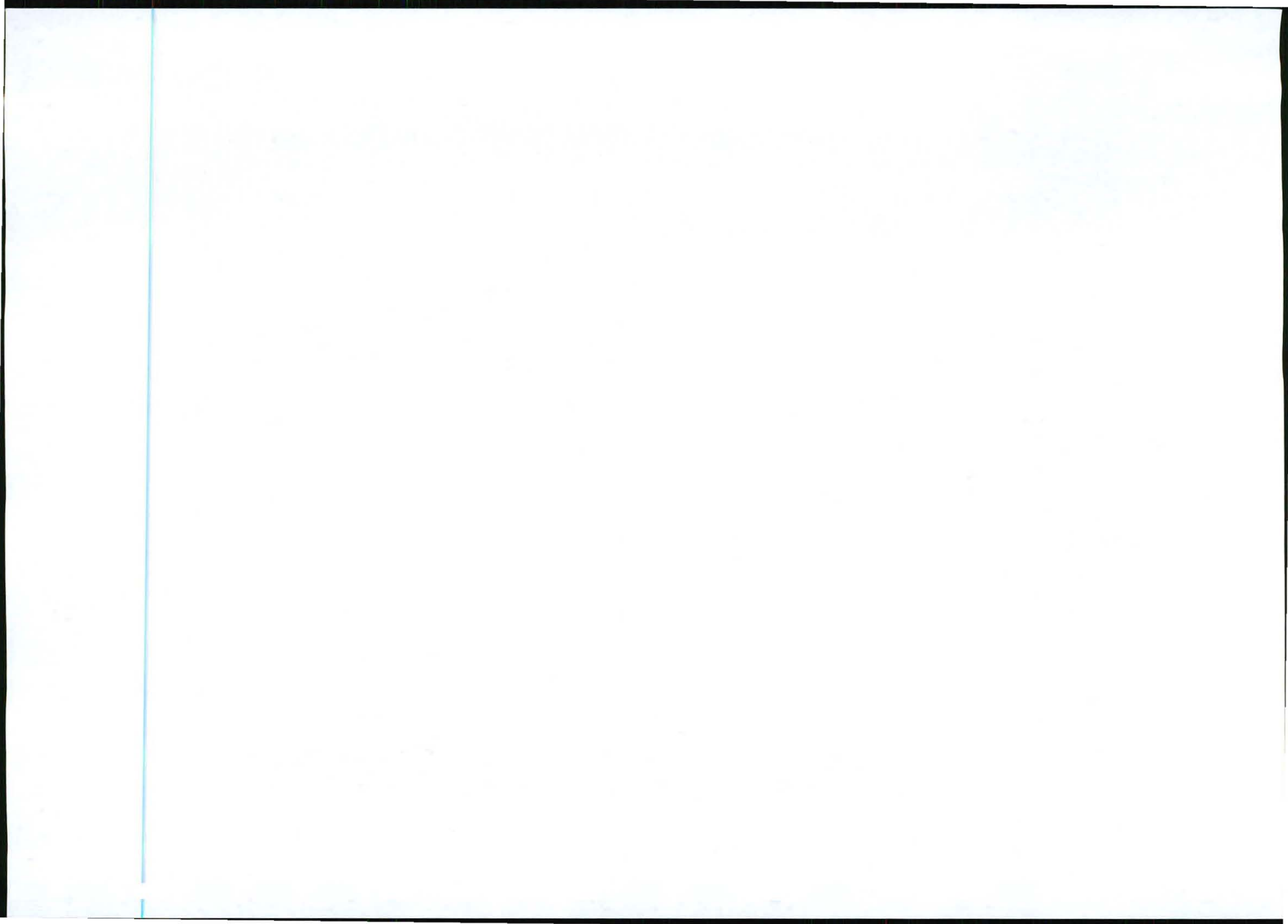


Figure 1: Locality Map for the proposed Valleydora 10MW solar facility project



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REGISTRASIE EN KOMMENTAAR-VORM

Basiese Bestekopname vir die voorgestelde Konstruksie, Installasie en Bedryf van 'n 10 MW Fotovoltaïese Sonkrag Projek (Valleydora Solar Park) op Plaas Knapdaar (Nr. 14), Plaas Kuilfontein (Nr. 195) en Plaas Hermanus Rust (Nr. 206) naby Springfontein, Vrystaat

Februarie 2012

**DEA Verwysingsnr.:
14/12/16/3/3/1/456**

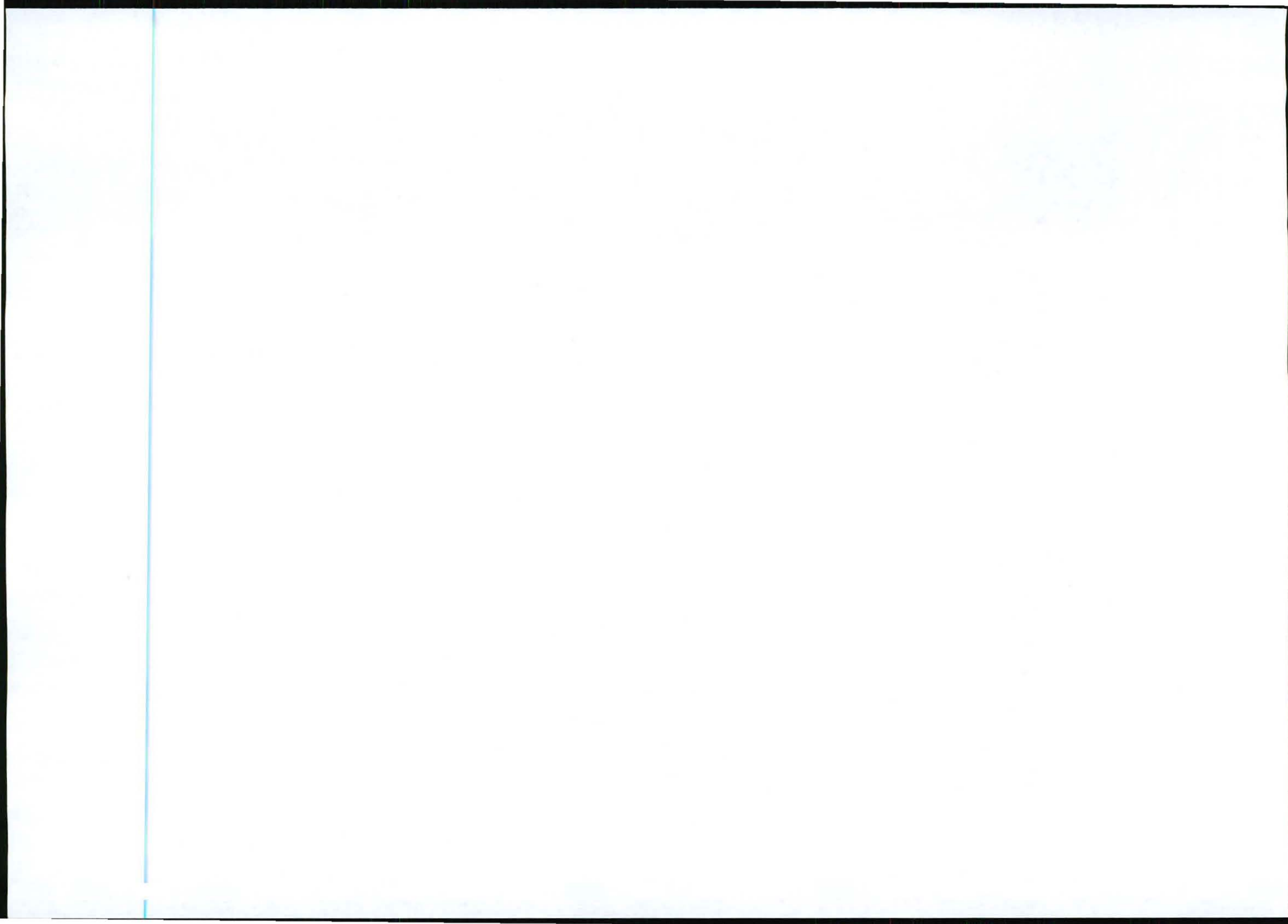
Verskaf asseblief u volledige kontakbesonderhede en stuur registrasie- en kommentaarvorm terug aan Samantha Naidoo teen 11 Maart 2012.

Naam:	Telefoon:
Organisasie:	Faks:
Benoeming:	Epos:
Huis/kantooradres:	Posadres:
Dui asseblief aan of u op die register vir Belanghebbendes en Geaffekteerdes geplaas wil word. Registrasie is 'n vereiste vir verdere kommunikasie en ontvangs van inligting tydens die Basiese Bestekopname proses.	
JA	NEE
Dui asseblief die aard aan van enige belange in verband met die voorgestelde projek (besigheid, finansieel, persoonlik, of ander):	
Beskryf asseblief u kommentaar of kammernisse wat na u mening in ag geneem moet word tydens die bestekbepaling en waardebepalingsprosesse in die Basiese Bestekopname proses.	
Voorsien asseblief inligting oor enige ander individue of organisasies wat betrek kan word:	

Stuur Registrasie- en Kommentaarvorm terug teen 11 Maart 2012 aan:



Me Samantha Naidoo
 E-pos: snaidoo5@csir.co.za
 Tel: 031 – 242 2397
 Faks: 031 – 261 2509
 Adres: CSIR, Posbus 17001,
 Congella, Durban, 4013



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REGISTRATION & COMMENTS FORM

Basic Assessment for the Proposed Construction, Installation and Operation of a 10 MW Photovoltaic Solar Power Project (Valleydora Solar Park) on Knapdaar Farm (No. 14), Kuilfontein Farm (No. 195) and Hermanus Rust Farm (No. 206) near Springfontein, Free State

February 2012

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

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

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

Please indicate if you want to register as an Interested and Affected Party. Registration is required in order to receive further correspondence during the BA process.

YES

NO

Please indicate if you have any interest (business, financial, personal or other) in the application for environmental authorisation:

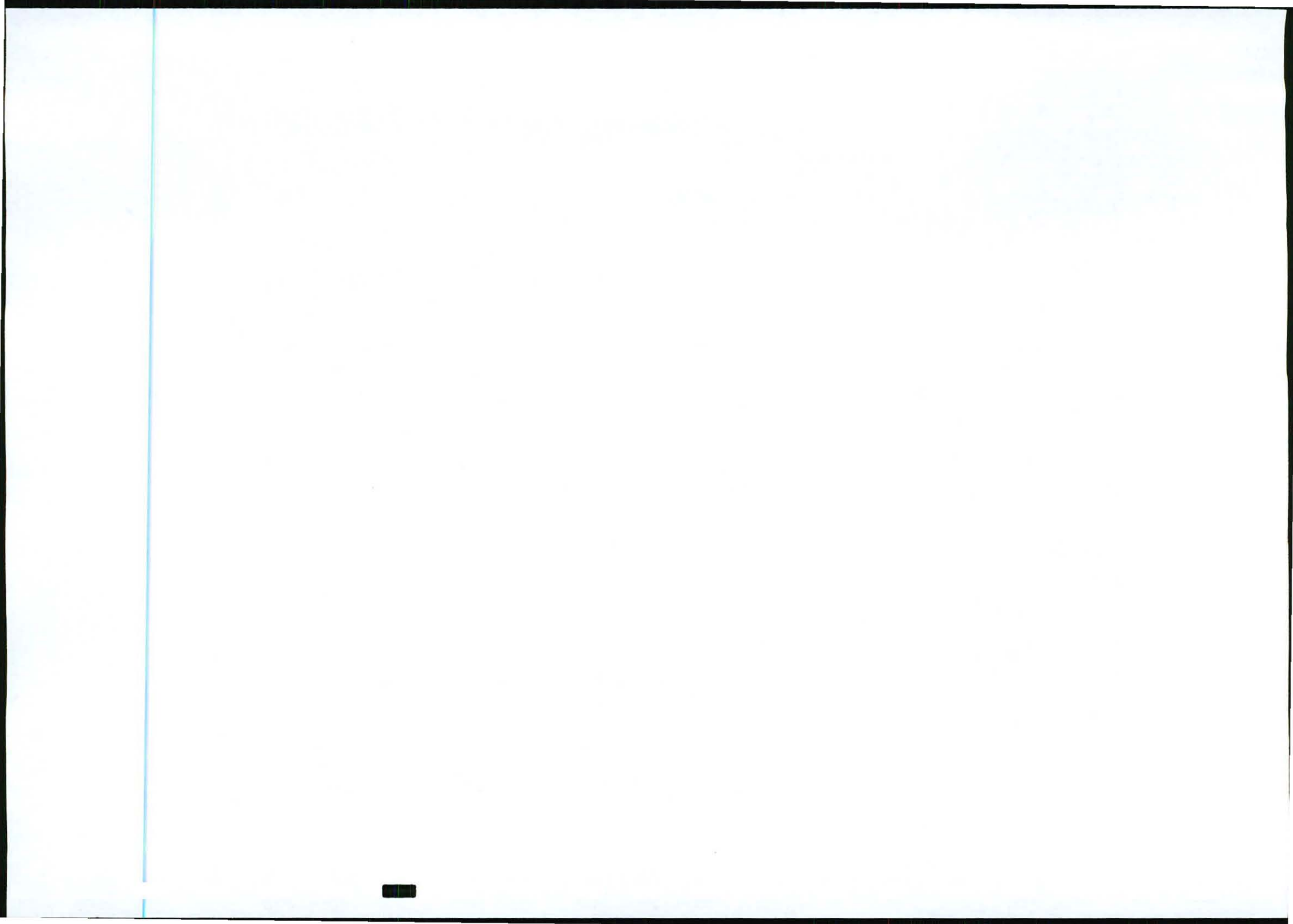
Please describe any issues or concerns you think should be considered during the basic assessment process.

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

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



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

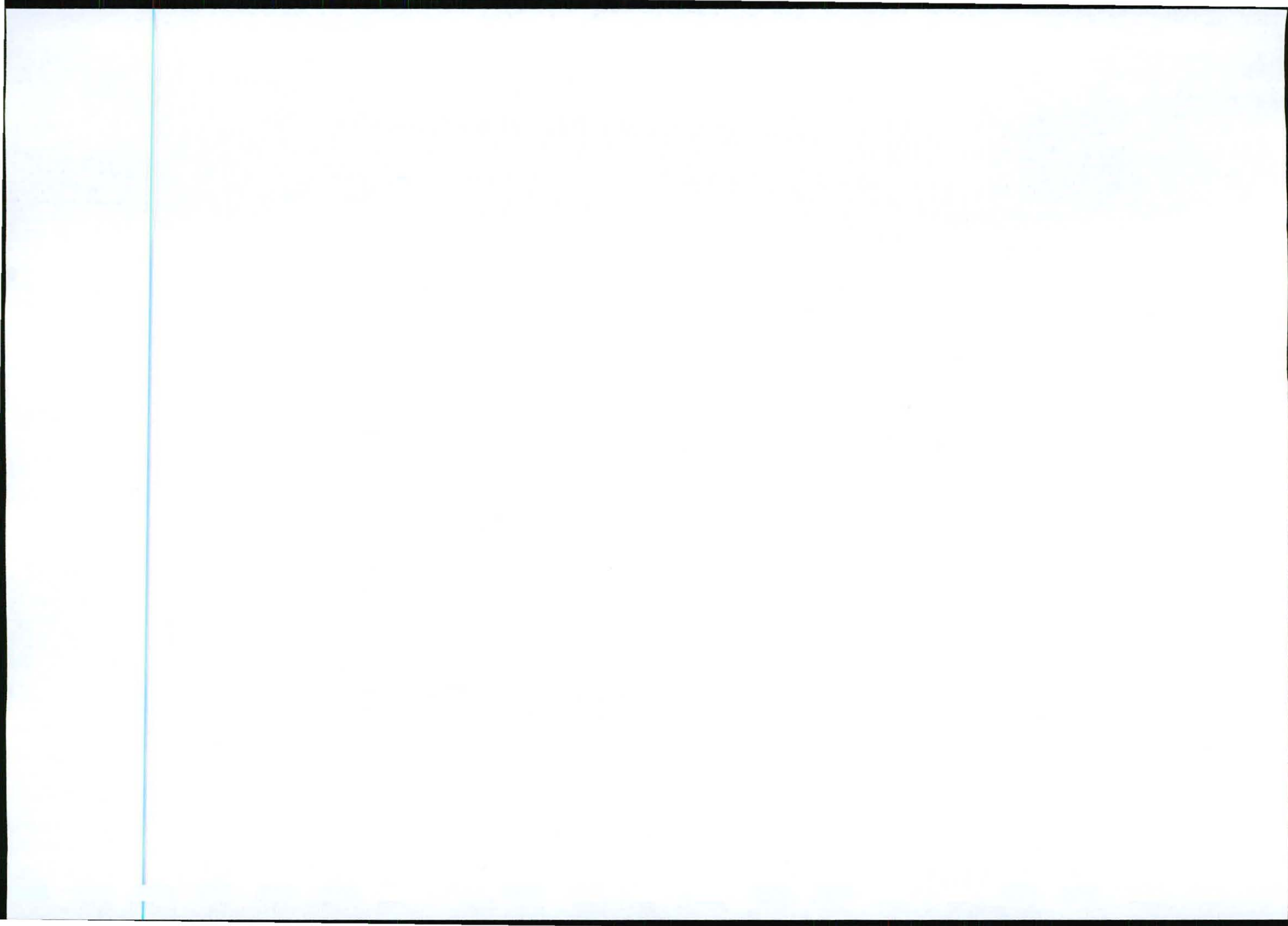


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Free State Province

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

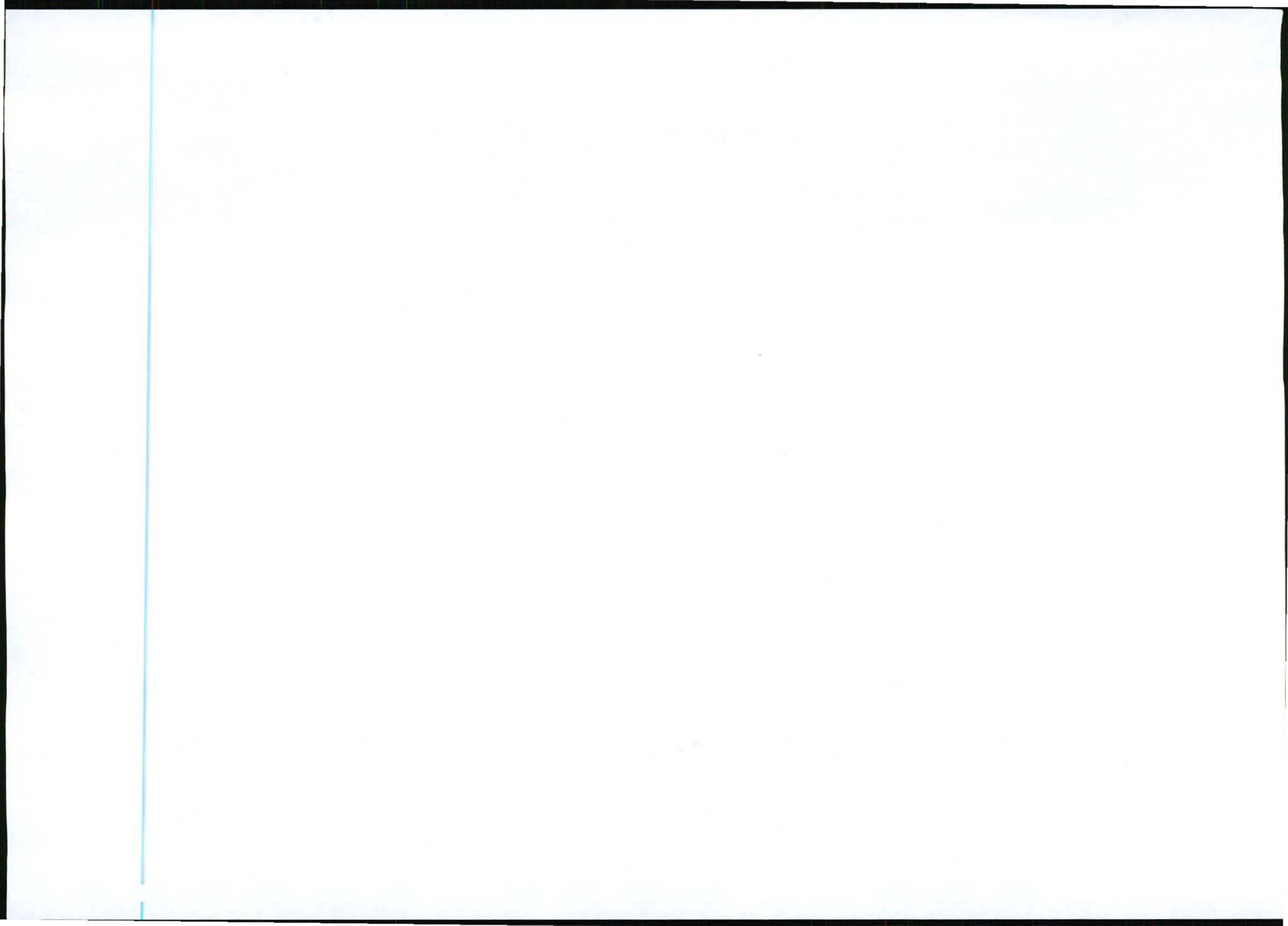
CONTACT PERSON	DESIGNATION AND DEPARTMENT	ORGANISATION
<i>Client</i>		
Grant Berndsen	Project Development Manager	Solaire Direct
<i>Landowner</i>		
Sandra Staples	Landowner	Staples Trust (IT1808/1997)
J.P. Staples	Landowner	Staples Trust (IT1808/1997)
<i>Department National</i>		
Anneliza Collett	Land Use and Soil Management	Department of Agriculture, Forestry & Fisheries
Nyiko Ngoveni	Chief Case Officer	Department of Environmental Affairs
Frans Vilakazi	Acting Director-General	Department of Water Affairs
Glenda Molo	Minister's Office	Department of Mineral Resources
Nnana Direro	Office of the Deputy Director General	Department of Energy
<i>Department Provincial - Free State</i>		
Ntai Mokhitli	Media Liaison Officer: Agriculture	Department of Agriculture and Rural Development
Willem Grobler	Deputy Director: Water Regulation	Department of Water Affairs
Tebogo Lioma	Deputy Director General	Department of Economic Development
Blair Vernon		Department of Water Affairs
Carlo Schrader	Technician	Department of Water Affairs
Izak Venter	Scientific Manager for Range and Forage Science	Department of Agriculture
Nosisa Ndumo	Case Officer	Department of Agriculture
Ikhraam Osman	Head of Department	Department of Economic Development, Tourism and Environmental Affairs
Thabo Makweya	Head of Special Projects	Department of Economic Development, Tourism and Environmental Affairs
Disebo Khunong	Secretary: Environmental Impact Management	Department of Economic Development, Tourism and Environmental Affairs
Grace Mkhosana	Deputy Director: Environmental Management	Department of Economic Development, Tourism and Environmental Affairs



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Free State Province

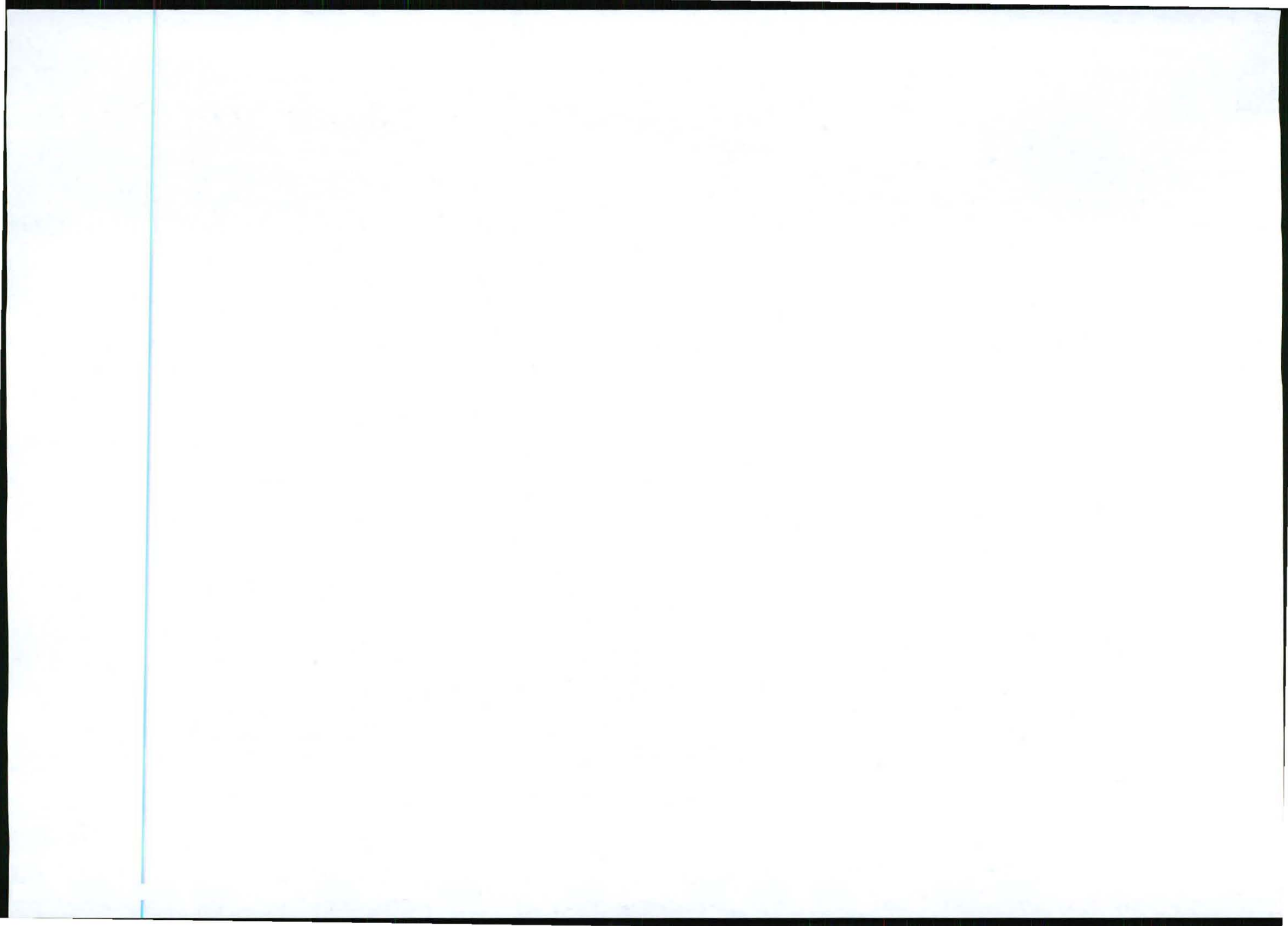
CONTACT PERSON	DESIGNATION AND DEPARTMENT	ORGANISATION
<i>Local Municipality: Kopanong Municipality</i>		
Katiso Sibusi	Director of Technical Services	Local Economic Development
L. Moletsane	Municipal manager	Kopanong Municipality
Peter Makau	Director of Community Services	Kopanong Municipality
X.T. Matwa	Mayor	Kopanong Municipality
Andrew Sola	Ward Councillor	Ward 5: Kopanong Municipality
<i>District Municipality: Xhariep District Municipality</i>		
Lucas Mkhwane	Municipal manager	Xhariep District Municipality
M. Seekoei	Planning and Development	Xhariep District Municipality
<i>Environmental Organisations and NGO's</i>		
Tronny Mutsenga	Environmental Officer	SANPARKS
Johan Taljaard	Park Manager	Golden Gate Highlands National Park
Leon Barkhuizen	Chairperson	WESSA
<i>Tourism Authority representing the Region</i>		
Ian Sieg	Director	Xhariep Tourism Information Centre
<i>Other Key Stakeholders</i>		
Andrew Salomon	Heritage Impact Assessor	South African Heritage Resources Agency (Cape Town - there is currently no functional office in the Free State)
Lizell Stroh	Obstacle specialist	Civil Aviation Authority
Iqbal Hoosen	Project Manager	SANRAL - Southern Region
C.J. Landman	Project Manager	SANRAL - Southern Region
Mariagrazia Galimberti	CEO Archaeology, Palaeontology & Meteorite Unit	SA Heritage Resources Agency (Cape Town)
Lerato Mokgwatheng	Environmental Adviser	Eskom Transmission
Andile Gxasheka	Renewable Energy Specialist	NERSA
Kevin Leask	Chief Engineer: Grid Planning Department	ESKOM
Ronald Marais	Strategic Grid Planning Manager	ESKOM



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	CONTACT PERSON	DESIGNATION AND DEPARTMENT	ORGANISATION
	Stephen Koopman	Energy Services Manager	ESKOM
	Irvan Damon	Chairperson	Sustainable Energy Society of Southern Africa (SESSA)
	Alwyn Smith	Administrator	Southern African Alternative Energy Association (SAAEA)
	Chris Haw	Chairperson	South African Photovoltaic Industry Association
	<i>Neighbours</i>		
	Botjie Hugy	Neighbour	Private
	Arnold Griesel	Neighbour	Grootzuurfontein Farming
	Wim Botha	Neighbour	Private
	Paul Jackson	Neighbour	Emerald Hill (Pty) Ltd



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SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

Appendix E.9 Comment received from Interested and Affected Parties (Mr. Wim Botha)



REGISTRASIE EN KOMMENTAAR-VORM


Basiese Bestekopname vir die voorgestelde Konstruksie, Installasie en Bedryf van 'n 10 MW Fotovoltaiese Sonkrag Projek (Valleydora Solar Park) op Plaas Knapdaar (Nr. 14), Plaas Kuilfontein (Nr. 195) en Plaas Hermanus Rust (Nr. 206) naby Springfontein, Vrystaat

Februarie 2012 DEA Verwysingsnr.: 14/12/16/3/1/456

Verskaf asseblief u volledige kontakbesonderhede en stuur registrasie- en kommentaarvorm terug aan Samantha Naidoo teen 11 Maart 2012.

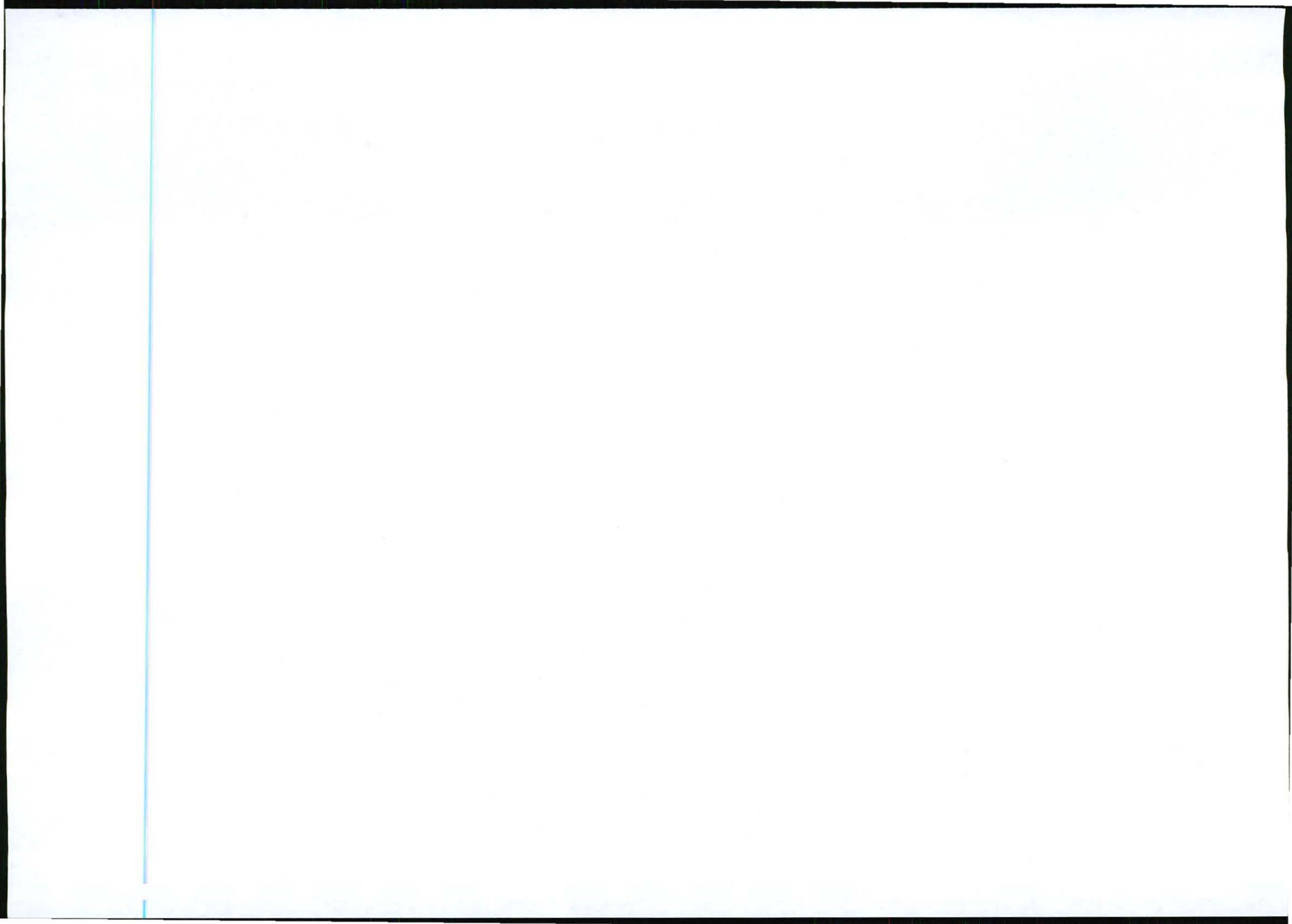
Naam: WIM BOTHA	Telefoon: 051782 - 1712
Organisasie:	Faks: SEL 0826984090
Benoeming: BOER	Epos:
Huis/kantooradres: DIEP FONTEIN SPRING FONTEIN 9917	Posadres: POSBUS 140 SPRING FONTEIN 9917
Dui asseblief aan of u op die register vir Belanghebbendes en Geaffekteerdes geplaas wil word. Registrasie is 'n vereiste vir verdere kommunikasie en ontvangs van inligting tydens die Basiese Bestekopname proses.	
<input checked="" type="checkbox"/> JA <input type="checkbox"/> NEE	
Dui asseblief die aard aan van enige belange in verband met die voorgestelde projek (besigheid, finansiël, persoonlik, of ander):	
PEERSONLIK (PLAAS MOOIPLAAS)	
Beskryf asseblief u kommentaar of kommissie wat na u mening in ag geneem moet word tydens die besteksbepaling en waardebeingsprosesse in die Basiese Bestekopname proses.	
IS SPIEGELS NAEELIG VIR OMGEWING?	
Voorsien asseblief inligting oor enige ander individue of organisasies wat betrek kan word:	
SPRING FONTEIN BOERE VERENIGING	

Stuur Registrasie- en Kommentaarvorm terug teen **11 Maart 2012** aan:



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Me Samantha Naidoo
E-pos: snaidoo5@csir.co.za
Tel: 031 - 242 2397
Faks: 031 - 261 2509
Adres: CSIR, Posbus 17001,
Congella, Durban, 4013



SECTION F: APPENDICES

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SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

Appendix E.10 Comment received from Free State Heritage Resource Authority (Ms. Loudine Philip)

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

Dear Samantha

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

Kind regards

Loudine

----- Original Message -----

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

Dear Loudine

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

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

Regards,
Samantha

Samantha Naidoo

Environmental Management Services (EMS)

CSIR Consulting and Analytical Services

PO Box 17001

Congella

4013

Tel: (031) 242 2397

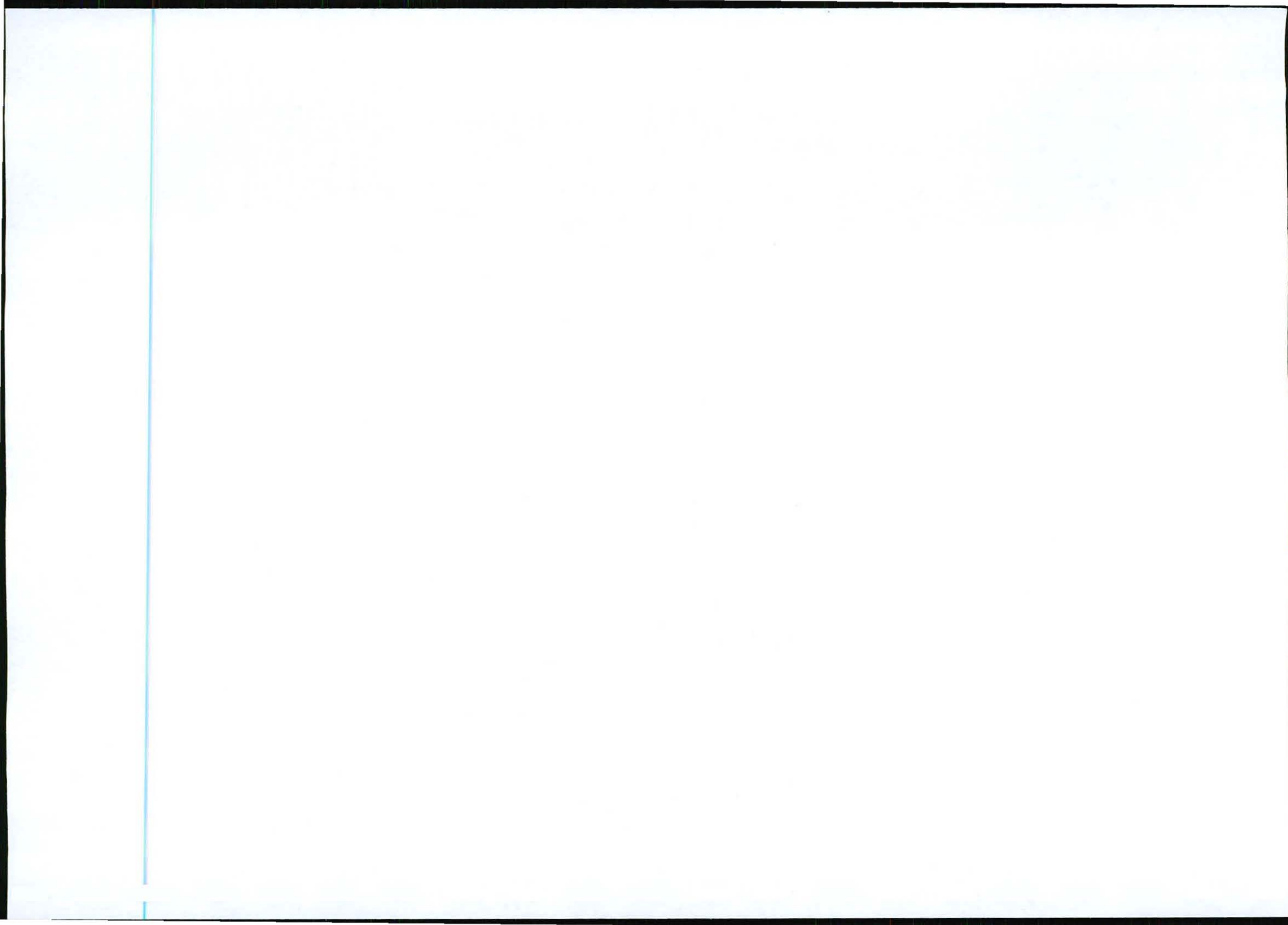
Fax: (031) 261 2509

Email: snaidoo5@csir.co.za

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>>> "Loudine Philip" <loudine.philip@nasmus.co.za> 07/03/2012 14:18 >>>

Dear Samantha



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

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

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

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

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

Regards

Loudine

----- Original Message -----

From: Samantha Naidoo

To: loudine.philip@nasmus.co.za

Cc: Malintja Molahloe

Sent: Wednesday, March 07, 2012 10:37 AM

Subject: Re: Valleydora Solar Power Project - Heritage Study Report

Hi Loudine

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

Regards,
Samantha

Samantha Naidoo

Environmental Management Services (EMS)

CSIR Consulting and Analytical Services

PO Box 17001

Congella

4013

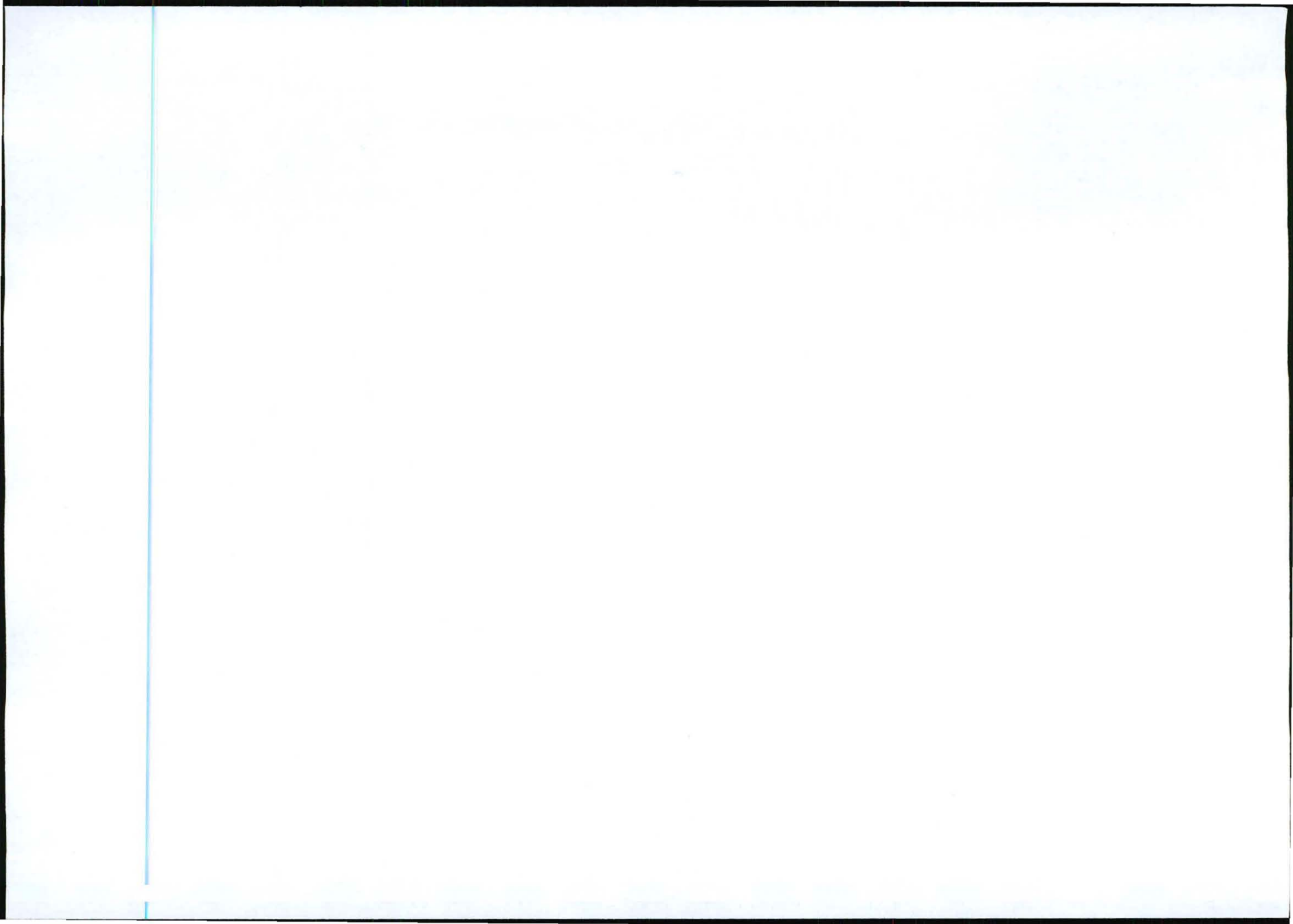
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Fax: (031) 261 2509

Email: snaidoo5@csir.co.za

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SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

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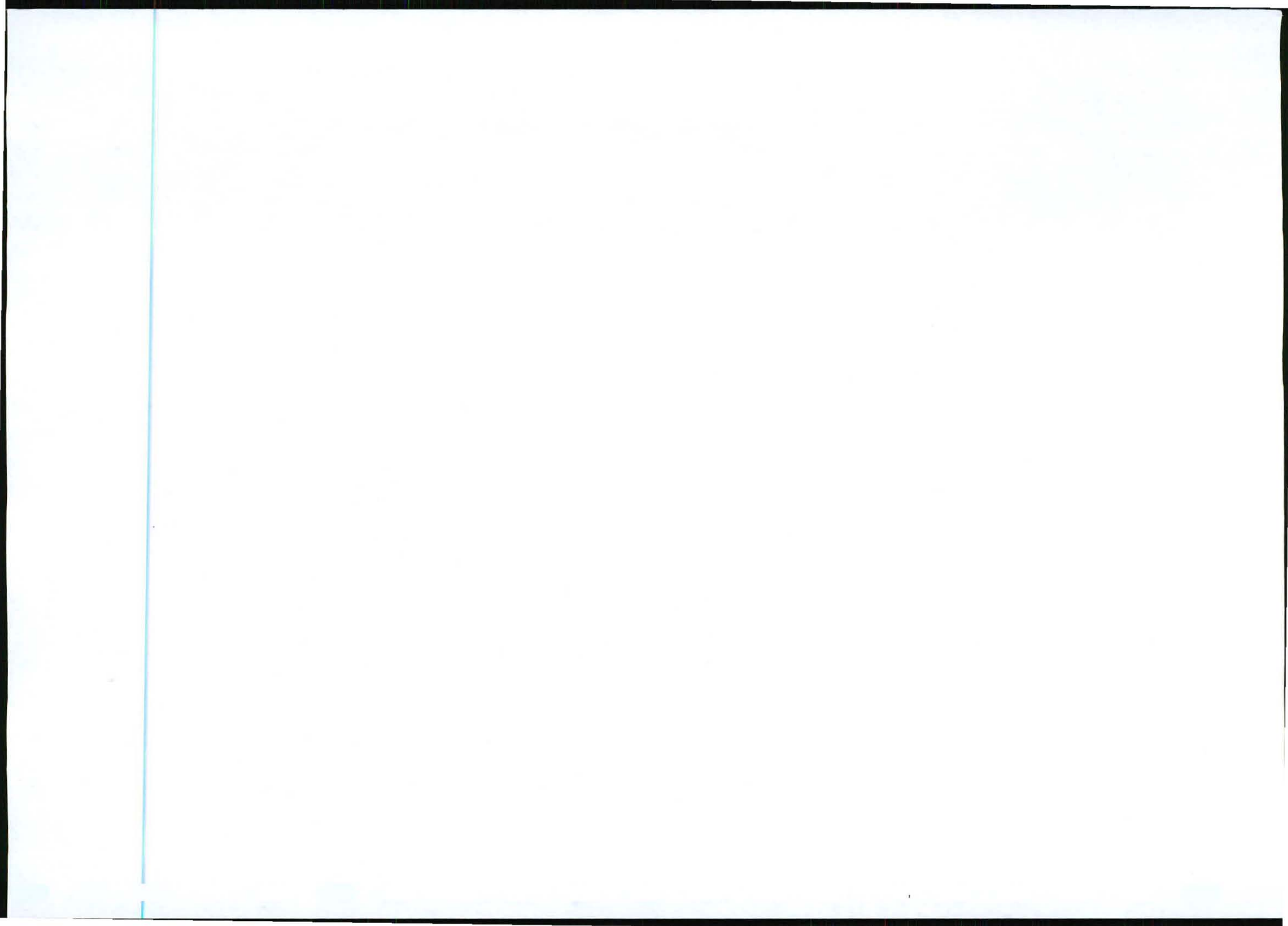
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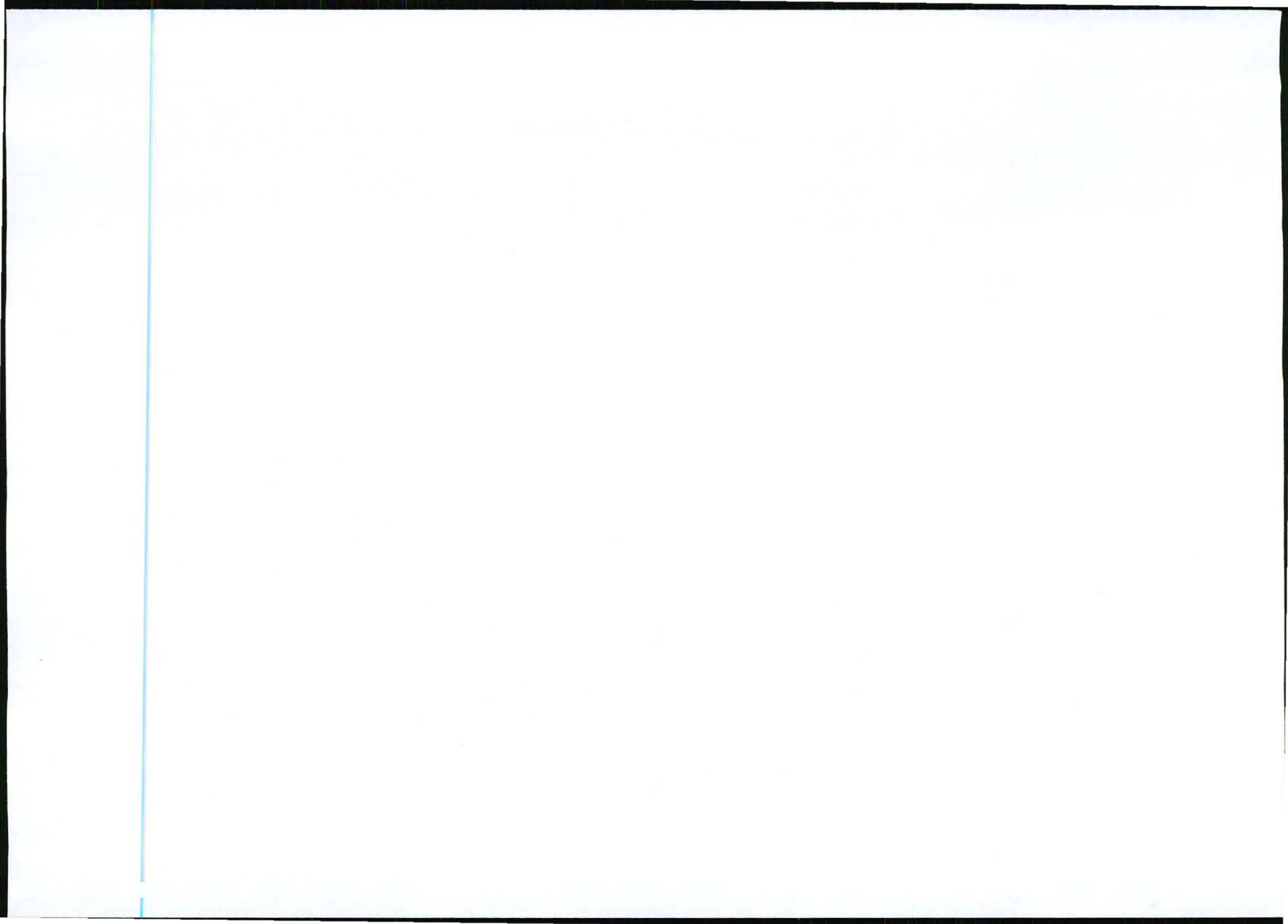


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APPENDIX F: Environmental Management Programme(EMPr)

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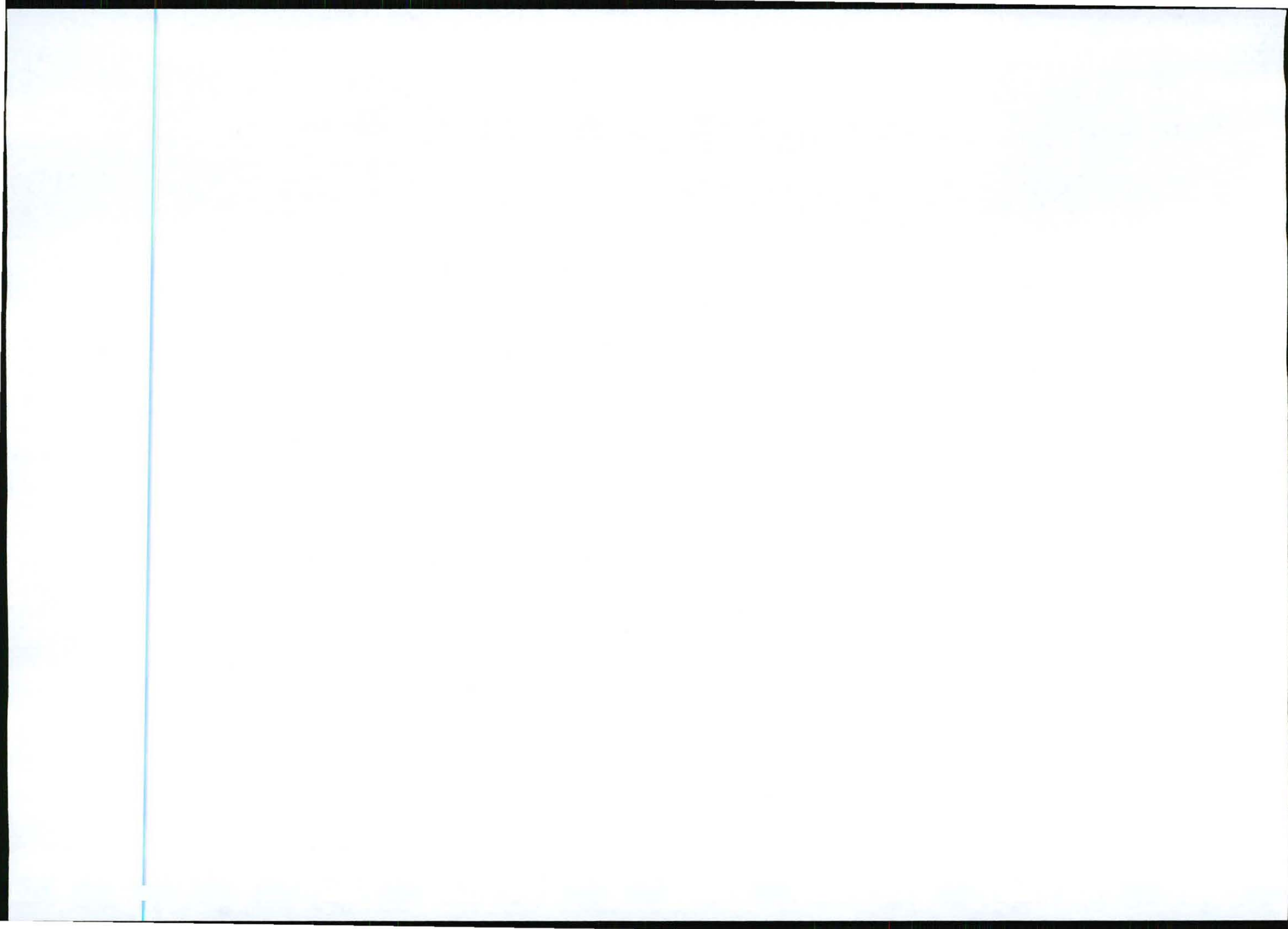
EXECUTIVE SUMMARY

SolaireDirect Southern Africa (Pty) Ltd. proposes to establish a Photovoltaic (PV) Solar Facility of 10MW on Remainder of the Farm Knapdaar (No. 2163) 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 phase: medium)
- Alien plant invasion (operational phase: medium)
- Soil erosion (construction phase: high; operational phase: medium)
- Soil compaction and disturbance (construction phase: very low)
- Soil contamination (construction phase: medium; and operational phase: low)
- Redistribution of sunlight, temperature and rainwater by solar panels (operational phase: low)
- Temporary decrease in air quality from dust (construction phase: low)
- Loss of habitat for fauna and livestock (construction phase: medium; operational phase: low)
- Loss of grazing land, agricultural land and change in land-use (construction and operation phases: low)
- Disruption of landscape connectivity for fauna (construction and operational phases: medium)
- Temporary noise disturbance during construction (construction phase: low)
- Visual intrusion/impact (planning and design, construction, operational phases: medium)
- Water consumption (construction and operational phases: low)
- Generation of grey water (construction phase: medium; operational phase: low)
- Generation of solid waste (operational phase: low; construction and decommissioning phase: medium)
- Potential disturbance and damage to freshwater features/ecosystems (planning and design phase: high)
- Disturbance of potential drainage lines (construction phase: medium)
- Contamination of downstream water bodies (construction phase: medium; operational phases: medium-high)
- Effects on areas of recharge that support wetlands/streams on-site (operational phase: medium-high)
- Potential disturbance and damage to Heritage and Archaeological Artefacts (construction phase: low)
- Potential disturbance and damage to Palaeontological Features (construction phase: low-medium)
- Traffic impacts (construction phase: medium; operational phase: low; decommissioning phase: medium)
- Disturbance or use of no-go areas (decommissioning phase: high)
- Termination of employment (decommissioning phase: low)



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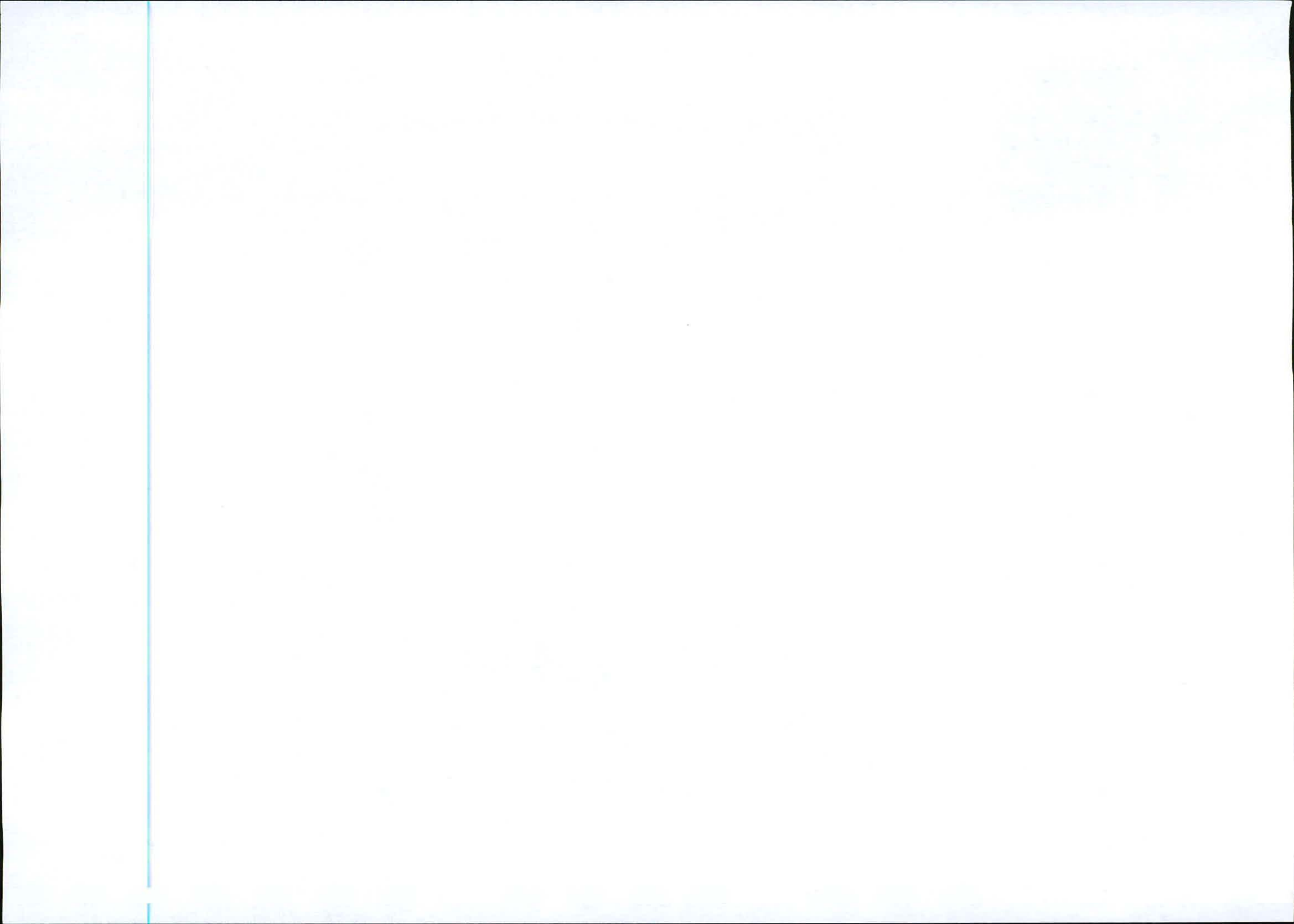
Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by SolaireDirect at Knapdaar Farm (No. 14) near Springfontein, Free State Province

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

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

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

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



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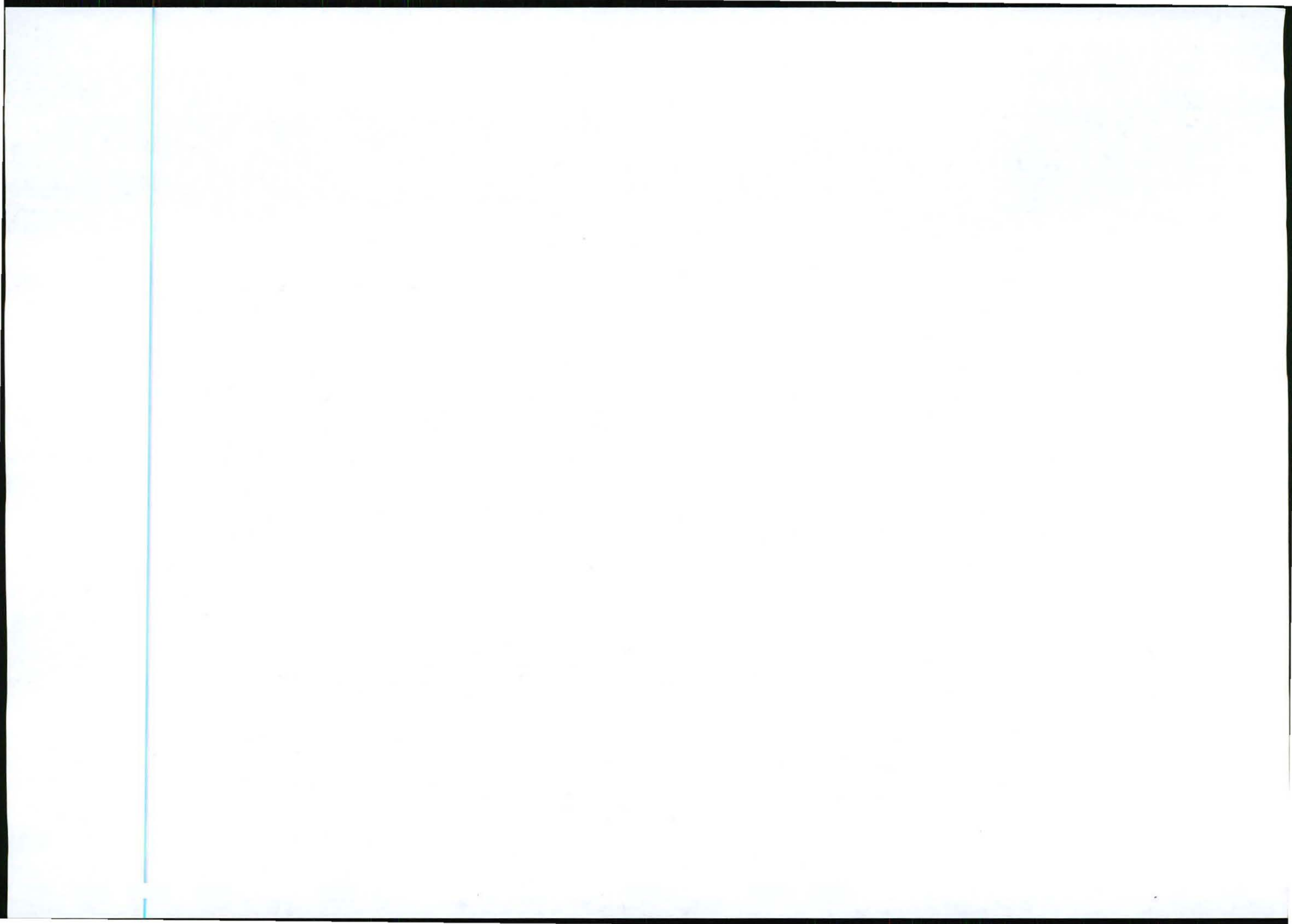
1. INTRODUCTION

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. 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 of the Basic Assessment Report).

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

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

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



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2 PROJECT DESCRIPTION

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

The project involves the construction of a solar facility wherein solar panels will be erected on support structures. For the proposed 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:

2.1 SITE CLEARING AND PREPARATION

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

2.2 CIVIL WORKS

The main civil works are:

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

Access and inside roads/paths - Existing roads/paths will be used were possible. A safety firebreak band and roadway will be constructed around the perimeter of the site. On the same principle, road design will be determined within detailed engineering in accordance with SABS



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standards and South African road regulation requirements (e.g. compacted road layer works and crushed stone surfacing).

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

2.3 TRANSPORTATION AND INSTALLATION OF PV PANELS INTO AN ARRAY

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

2.4 CONNECTION TO ARRAY ENCLOSURES

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

2.5 WIRING TO CENTRAL INVERTERS/TRANSFORMERS

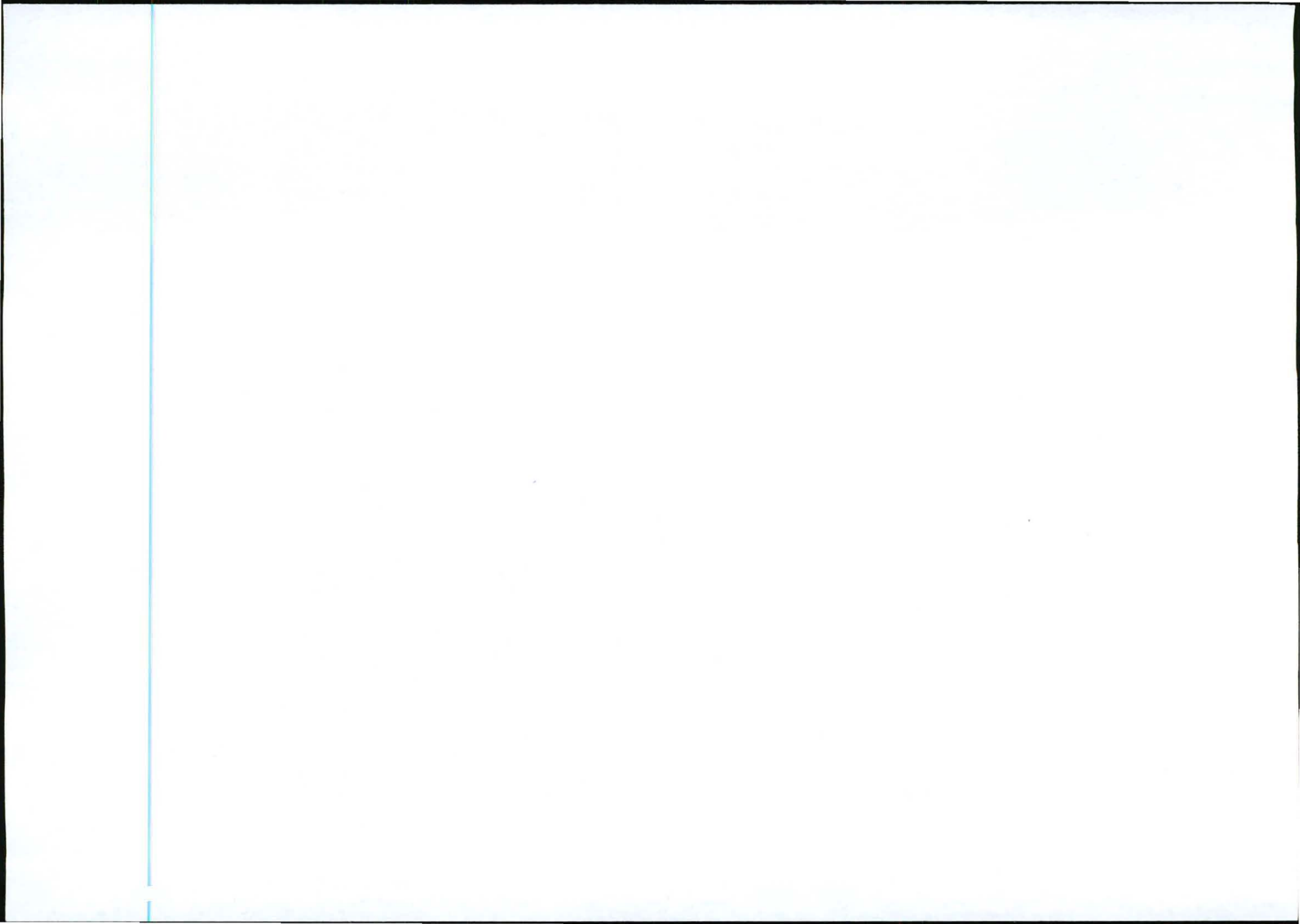
Array enclosures are wired to central inverters/transformer enclosures which can have a rated power of 630Kw each at peak operation. A typical 630kw central inverter/transformer has an approximate width of 2.5-3m and a breadth of 2.7-3.3.m. A total of up to sixteen central inverters/transformers will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

2.6 CONNECTION TO THE GRID

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

2.7 AUXILIARY ELECTRICAL INFRASTRUCTURE

Apart from the essential components of a solar power facility required for effective power generation, the installation of numerous other auxiliary electrical infrastructure is integral in ensuring optimal operation of the plant. In the case of the proposed Valleydora solar facility, these include diesel generator sets that will supply power to security and monitoring systems in



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the event of a grid failure, a security system including fencing and access control, a fire detection system and weather monitoring equipment, plant monitoring equipment, and associated telecommunication links. In addition, air-conditioning equipment will be installed inside inverter/transformer enclosures to regulate their operating temperatures.

2.8 SUPPORTING INFRASTRUCTURE

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

3 THE APPROACH TO THE EMP

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

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

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

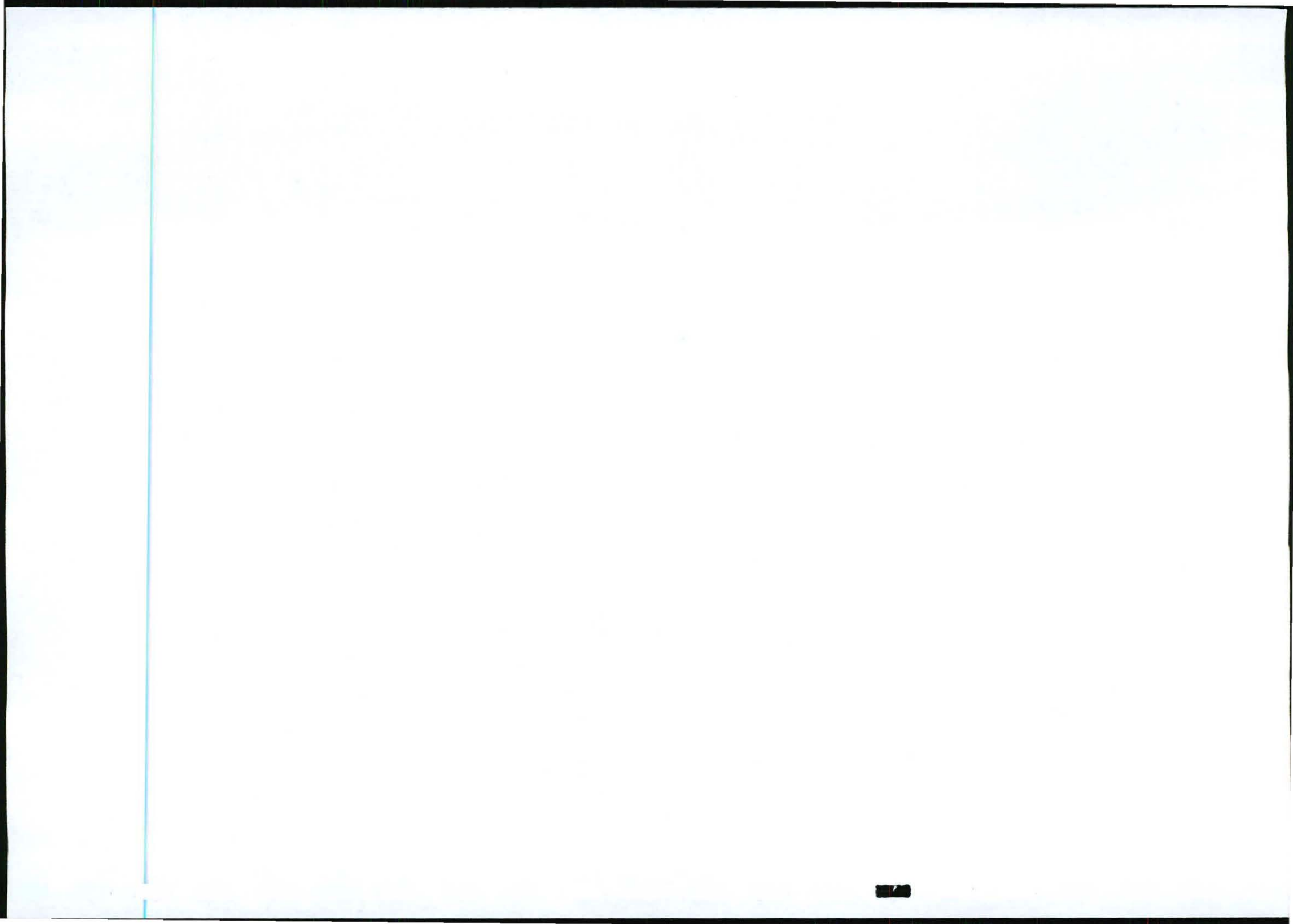
- Description of the activity taking place;
- The potential impacts associated with that activity;
- Significance of the impact prior to mitigation;
- The appropriate mitigation measures;
- Significance of the impact post-mitigation;
- The responsible party; and
- Monitoring frequency.

3.1 ROLES AND RESPONSIBILITIES

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

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

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



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i. PROJECT DEVELOPER

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

ii. ENVIRONMENTAL CONTROL OFFICER (ECO)

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

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

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

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

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

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

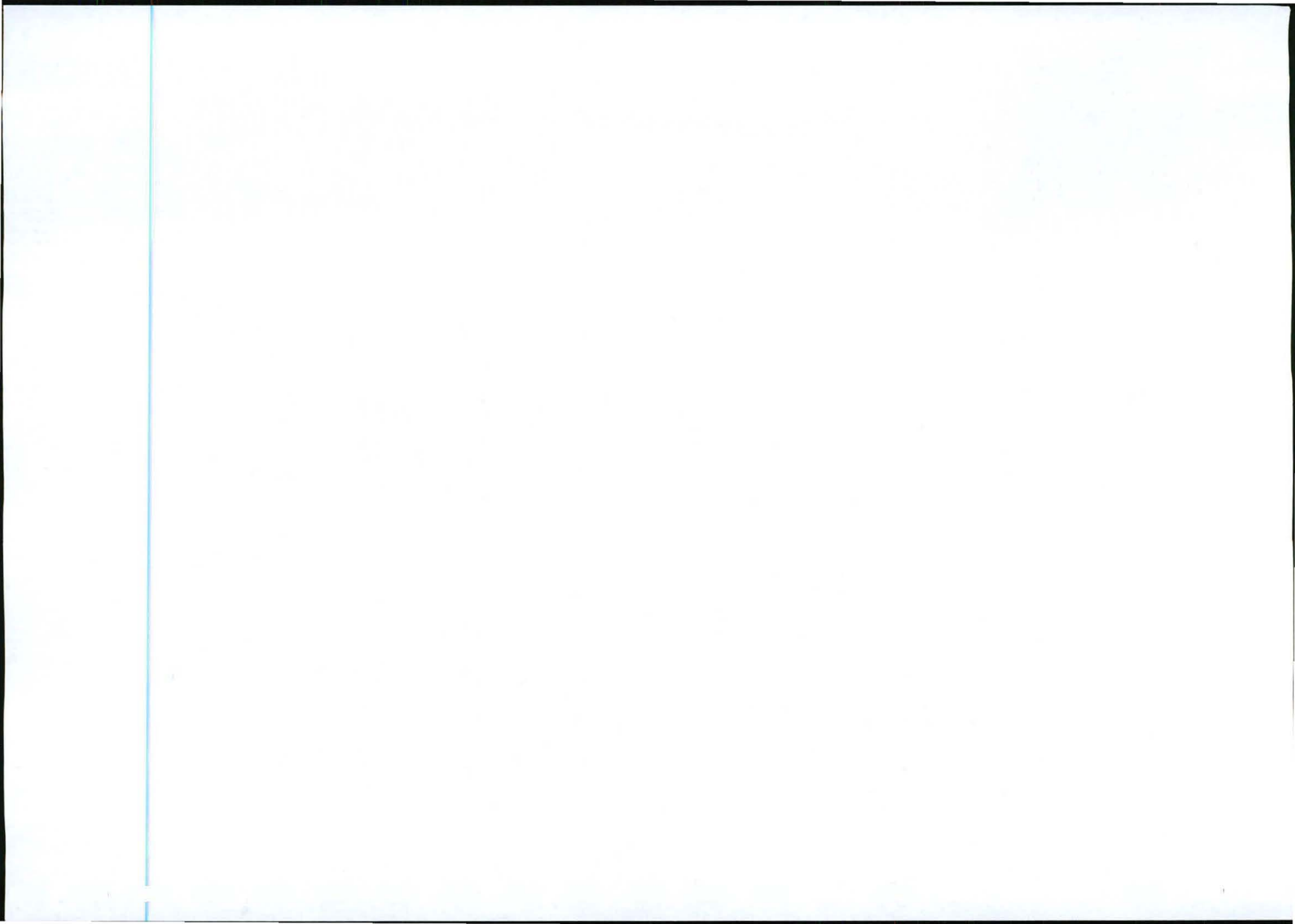
- Overseeing the implementation of the EMP for the decommissioning phase;
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

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

iii. LEAD CONTRACTOR

The lead contractor will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction for the solar project.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project management related to project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment.



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

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

iv. OPERATIONS MANAGER

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

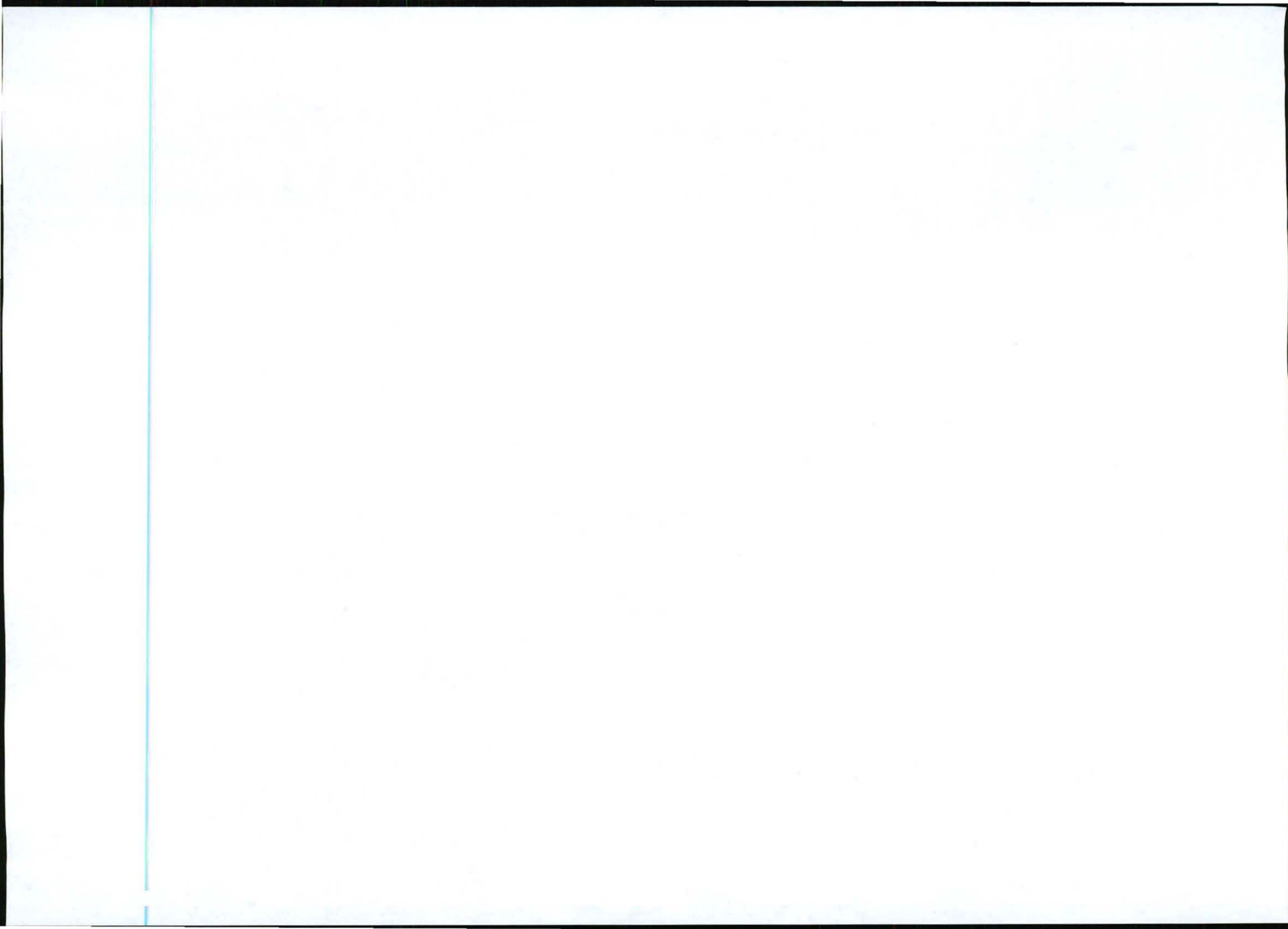
- Operation of the solar energy facility.
- Required maintenance of the panels, cabling and control room facilities.

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

4 MANAGEMENT ACTIONS FOR THE DETAILED PLANNING AND DESIGN PHASE

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

The potential impacts resulting from development of the "preferred" and "alternative" sites during the planning and design phase of the activity are provided below. All differences (if any) in potential impacts between the two sites will be highlighted accordingly in the sections to follow.

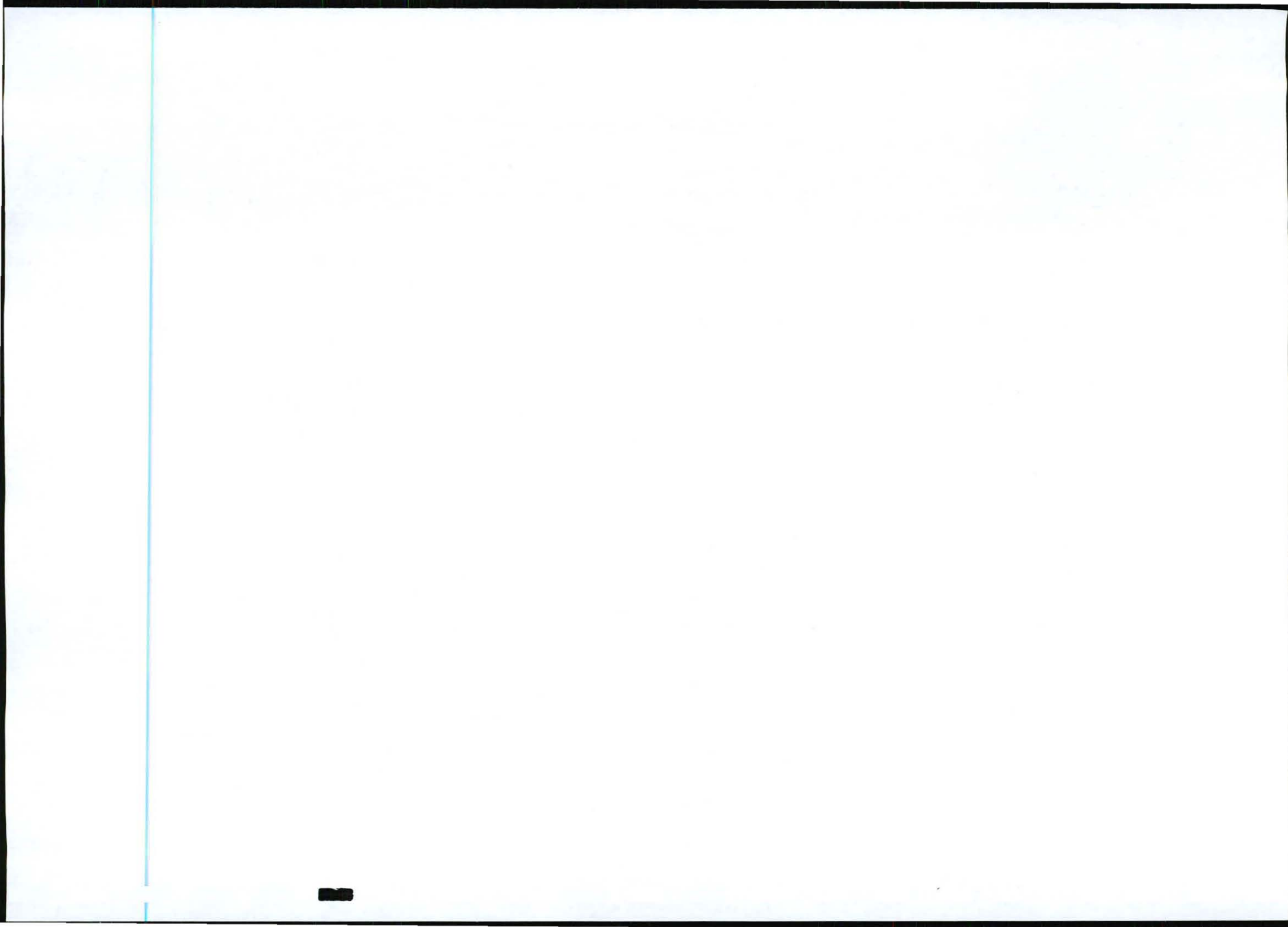


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TABLE 1: MANAGEMENT PLAN FOR THE PLANNING AND DESIGN PHASE

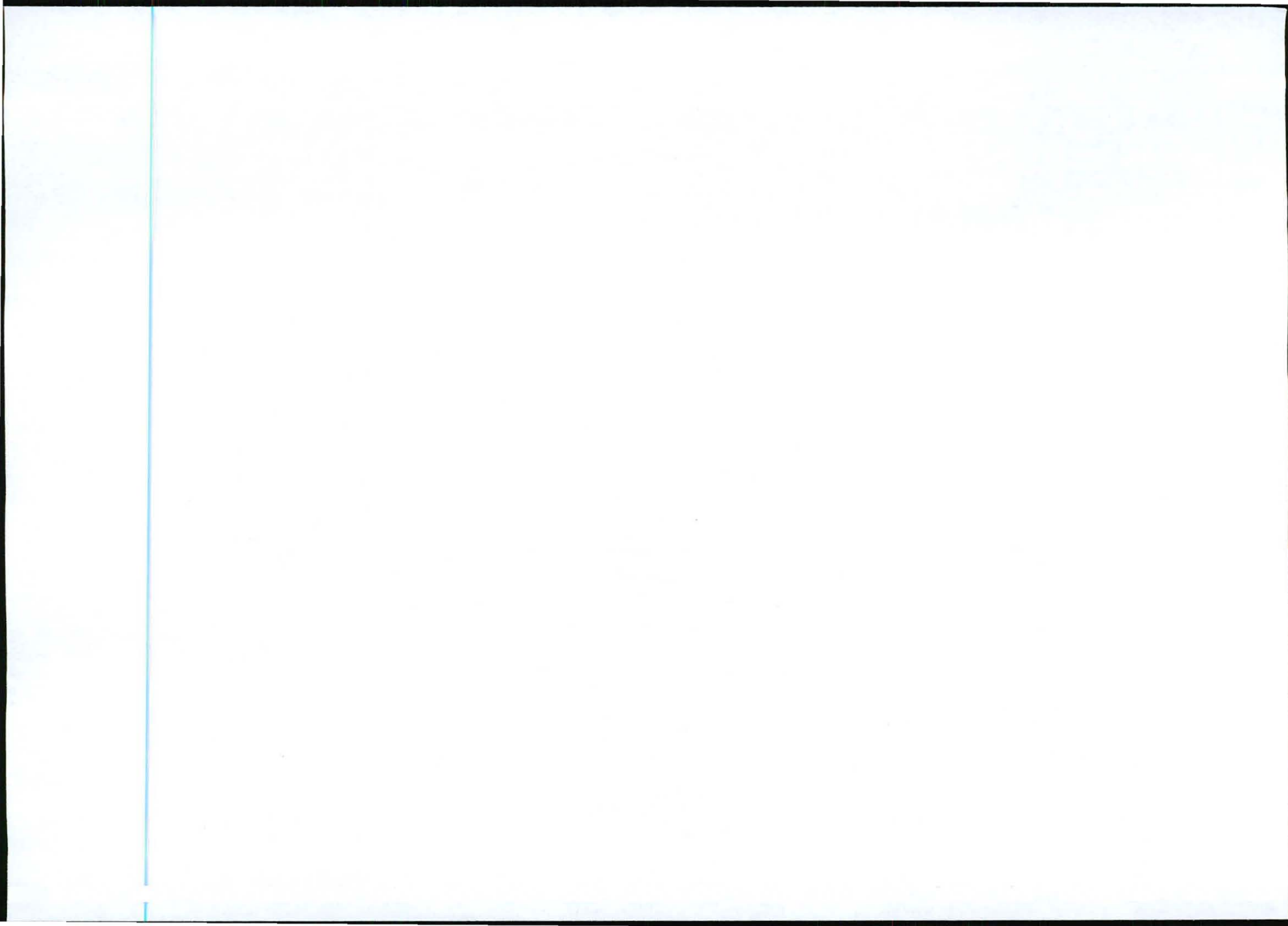
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	PREVENTATIVE MEASURES	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
<i>Planning and designing of the project</i>	Potential disturbance and damage to freshwater features/ecosystems	Medium (Negative)	<p>Water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



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ACTIVITY		POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	PREVENTATIVE MEASURES	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
				A detailed stormwater management system must be developed, that clearly indicates how attenuation of stormwater volumes and velocities is to be achieved upstream of existing water courses – this includes the ephemeral stream mapped in the freshwater ecosystems report.			
		Visual Impacts	Medium (Negative)	<p>The visual impact resulting from the 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>	Project Developer	Low – Medium (Negative)	Restricted to the Planning and Design phase of the activity



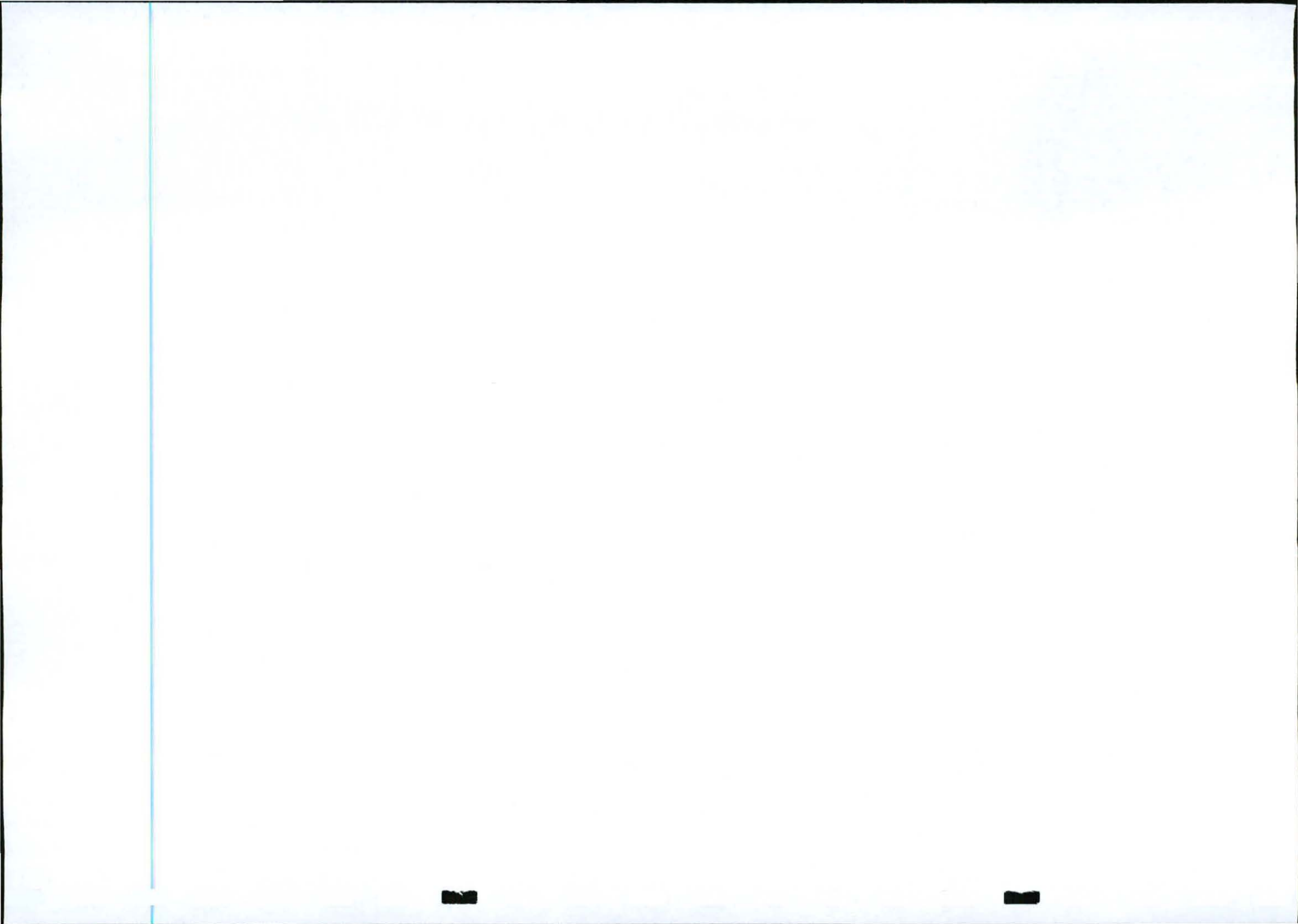
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5 MANAGEMENT PLAN FOR THE CONSTRUCTION PHASE

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

The potential impacts resulting from development of the "preferred" and "alternative" sites during the construction phase of the activity are provided below. All differences in potential impacts (if any) between the two sites will be highlighted accordingly in the sections to follow.

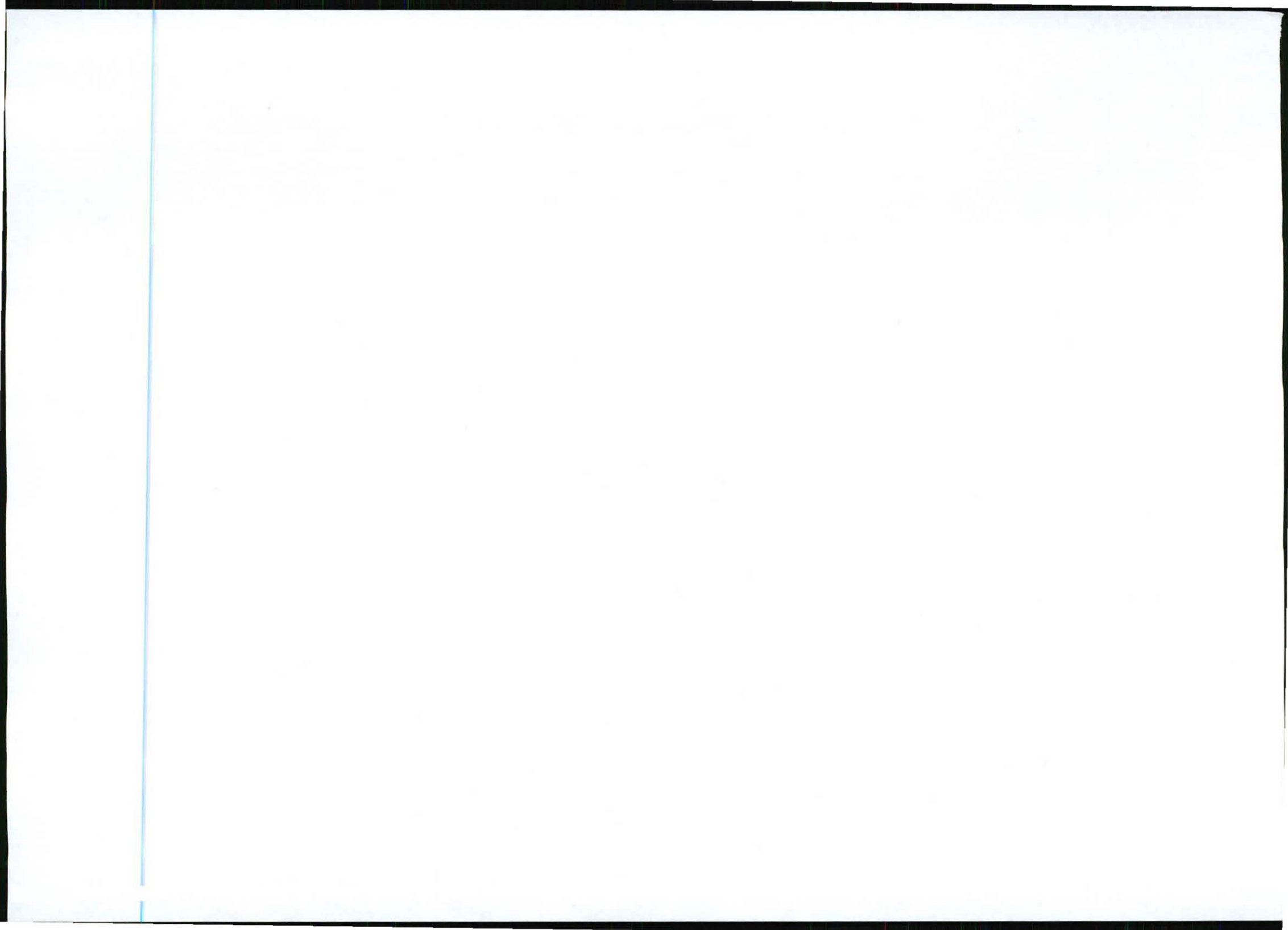


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TABLE 2: MANAGEMENT PLAN FOR THE CONSTRUCTION PHASE

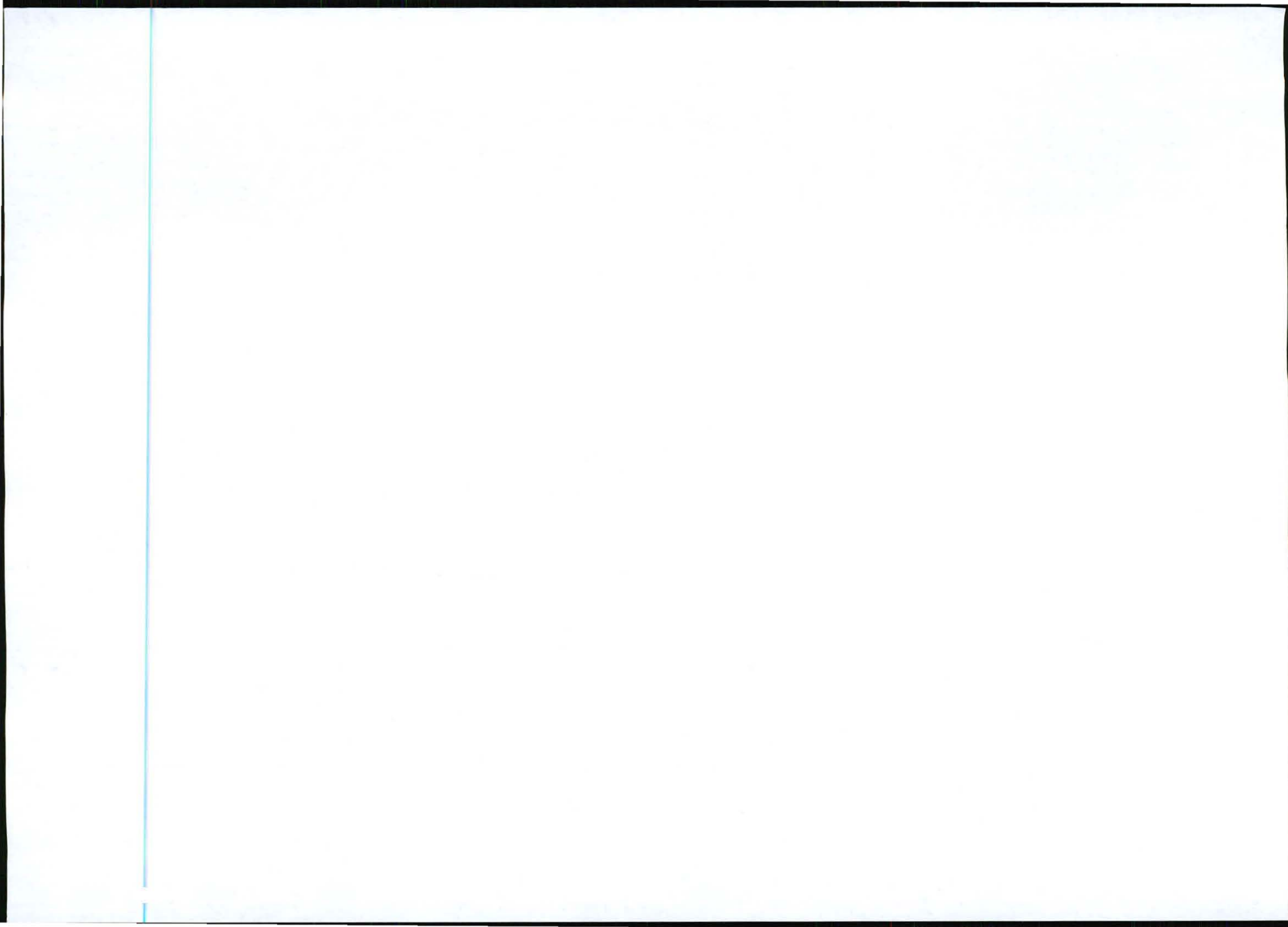
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
Site clearing and construction camp establishment	Uncontrolled access to the site camp and security concerns.	Medium (Negative)	<p>Once the site camp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



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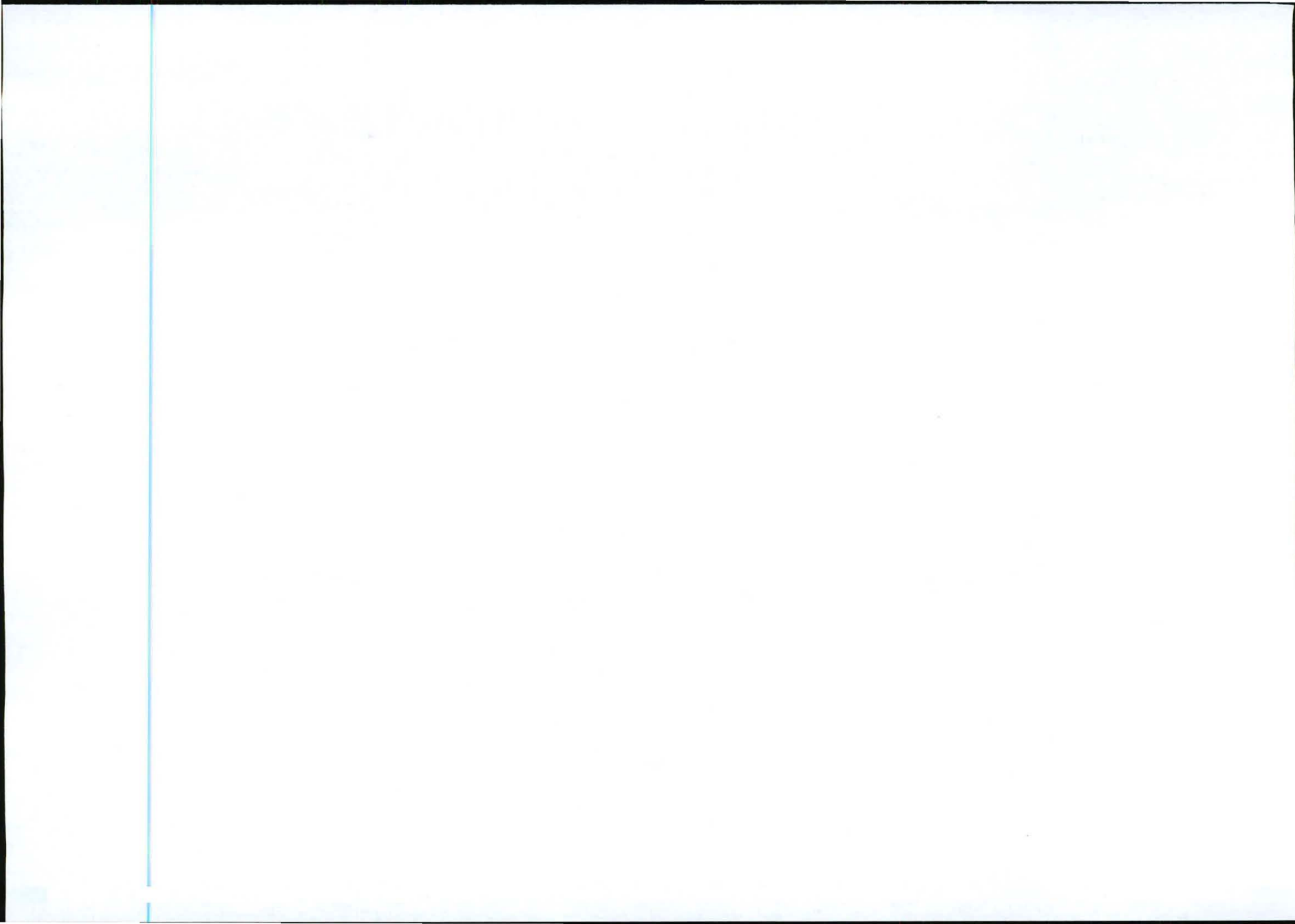
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			A suitable control measure (such as a fine system) must be implemented to discourage infringement by contractors.			
	Increased erosion risk		Only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



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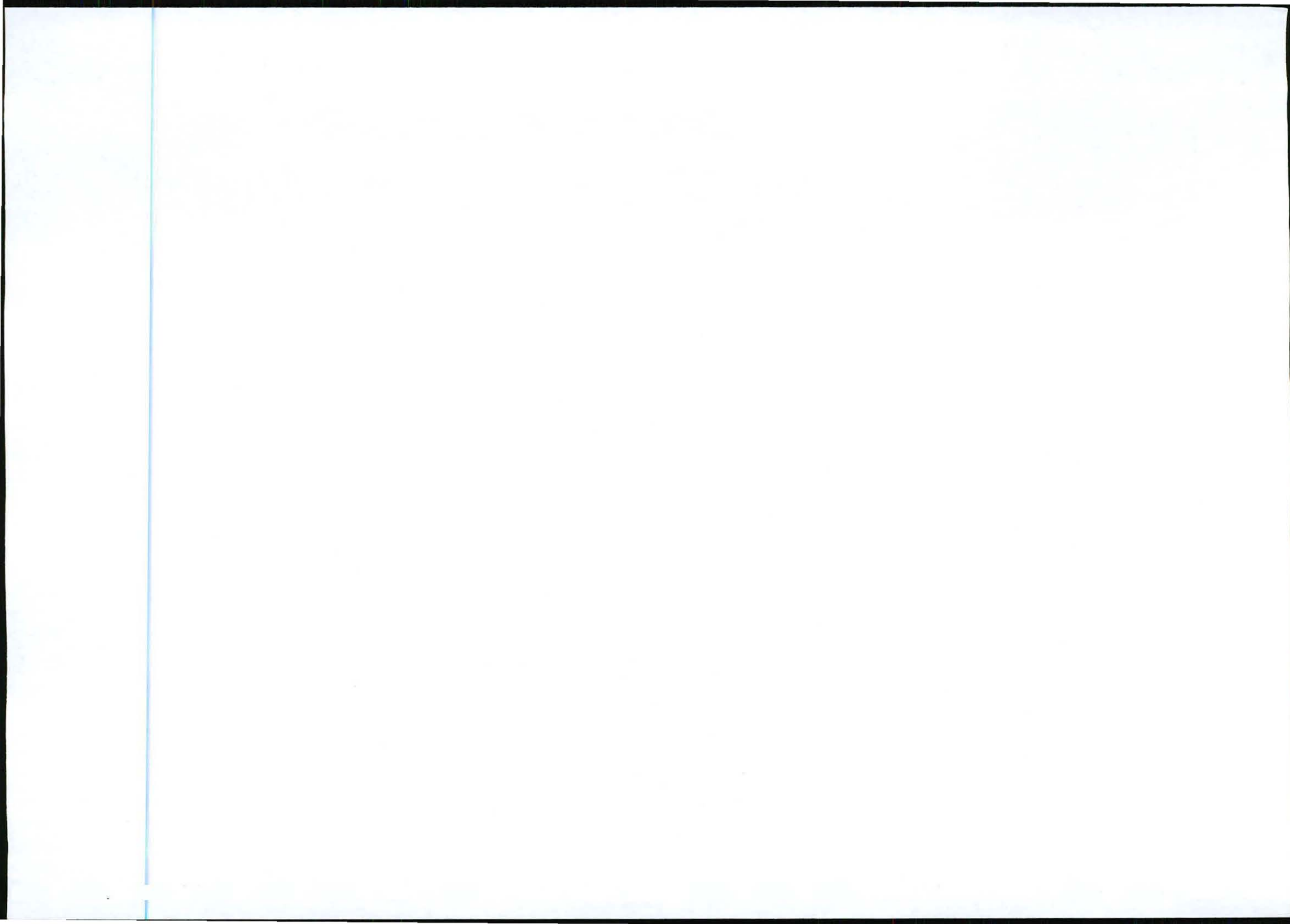
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			No construction vehicles should be allowed to drive around the veld. All construction vehicles should remain on properly demarcated roads.			
	Compaction and disturbance of soil		Traffic should be prevented on wet soil, a condition expected more during rainy season.	Lead Contractor		Monthly
	1. "Preferred site"	Medium – High (Negative)	No construction vehicles should be allowed to drive around the veld. All construction vehicles should remain on properly demarcated roads.		Low – Medium (Negative)	
	2. "Alternative site"	Medium			Low (Negative)	
	Temporary decrease in air quality	Low (Negative)	Speed of construction vehicles must be restricted, as defined by the Lead Contractor and ECO. Vehicles and equipment used for construction activities must be maintained in good working condition to prevent unnecessary emissions. Dust emissions to be limited by: <ul style="list-style-type: none"> • Minimising the presence of construction vehicles in and around the site. • Using soil stabilizing agents or water for dust control purposes. 	Lead Contractor and ECO	Low (Negative)	Monthly
	Faunal habitat destruction, alteration and physical disturbance	Medium (Negative)	Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO. The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden.	Lead Contractor and ECO	Medium (Negative)	Monthly



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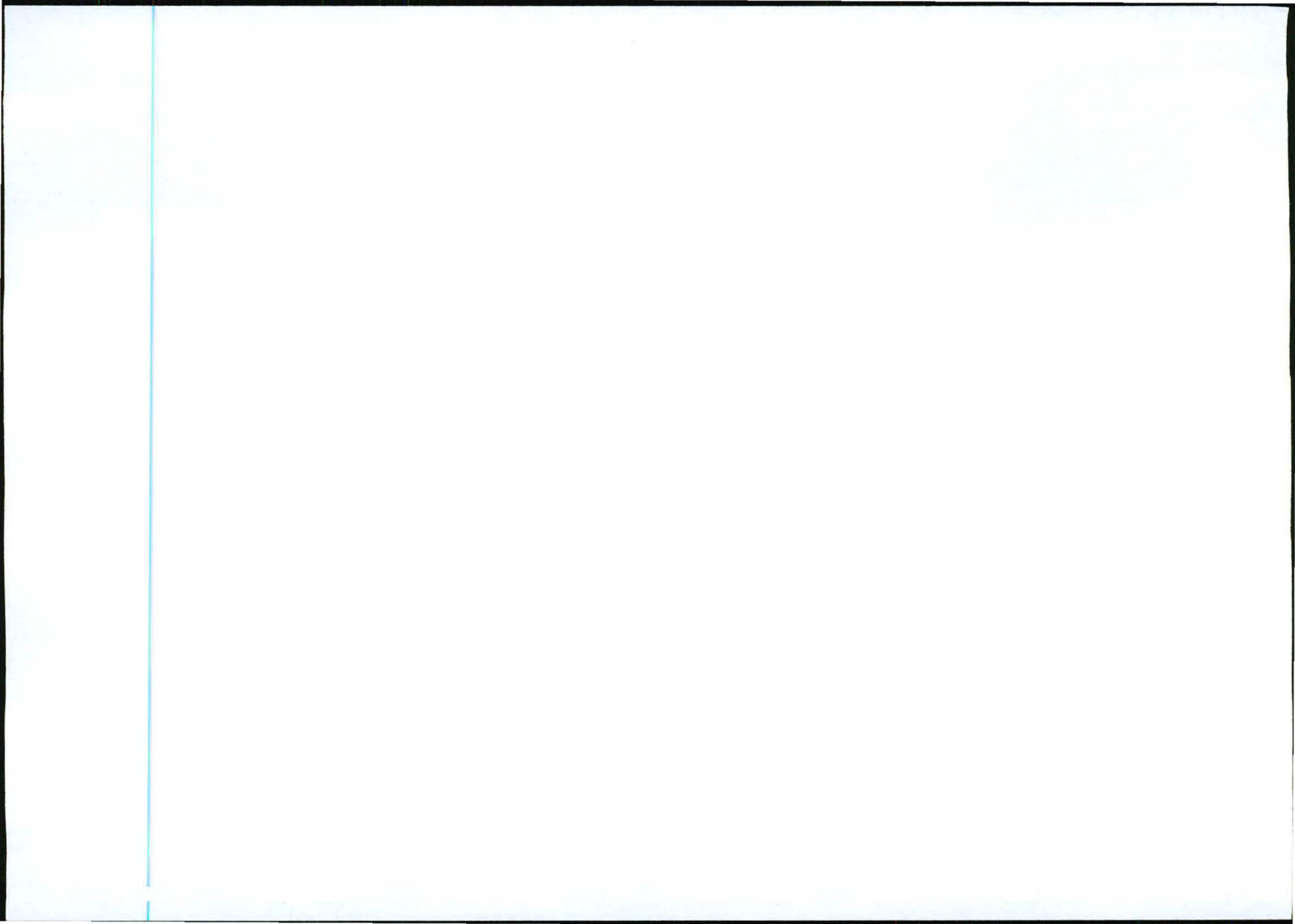
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			<p>Fires should only be allowed within fire-safe demarcated areas, otherwise prohibited. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the construction phase.</p> <p>Fire fighting equipment must be made available at various appropriate locations on the construction site.</p> <p>No fuelwood collection should be allowed on-site.</p> <p>No dogs should be allowed on site.</p> <p>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</p>			
	Temporary Visual Intrusion	Medium (Negative)	All construction equipment and materials must be kept within the boundaries of the site camp which is to be located away from direct view of any sensitive receptors.	Lead Contractor	Low (Negative)	Monthly
	Decrease in soil agricultural suitability	Low (Negative)	For all excavations (e.g. for mounting foundations, buried cables etc) and other direct disturbance of the soil surface (e.g. for roads, buildings) that are to be returned to agricultural use, the upper 20cm of the top soil must be stripped, stockpiled, and then re-spread over the surface of the backfilled excavation or disturbed surface. Also, the project should	Lead Contractor	Low (Negative)	Initially at the start of erecting the solar panels of the PV facility



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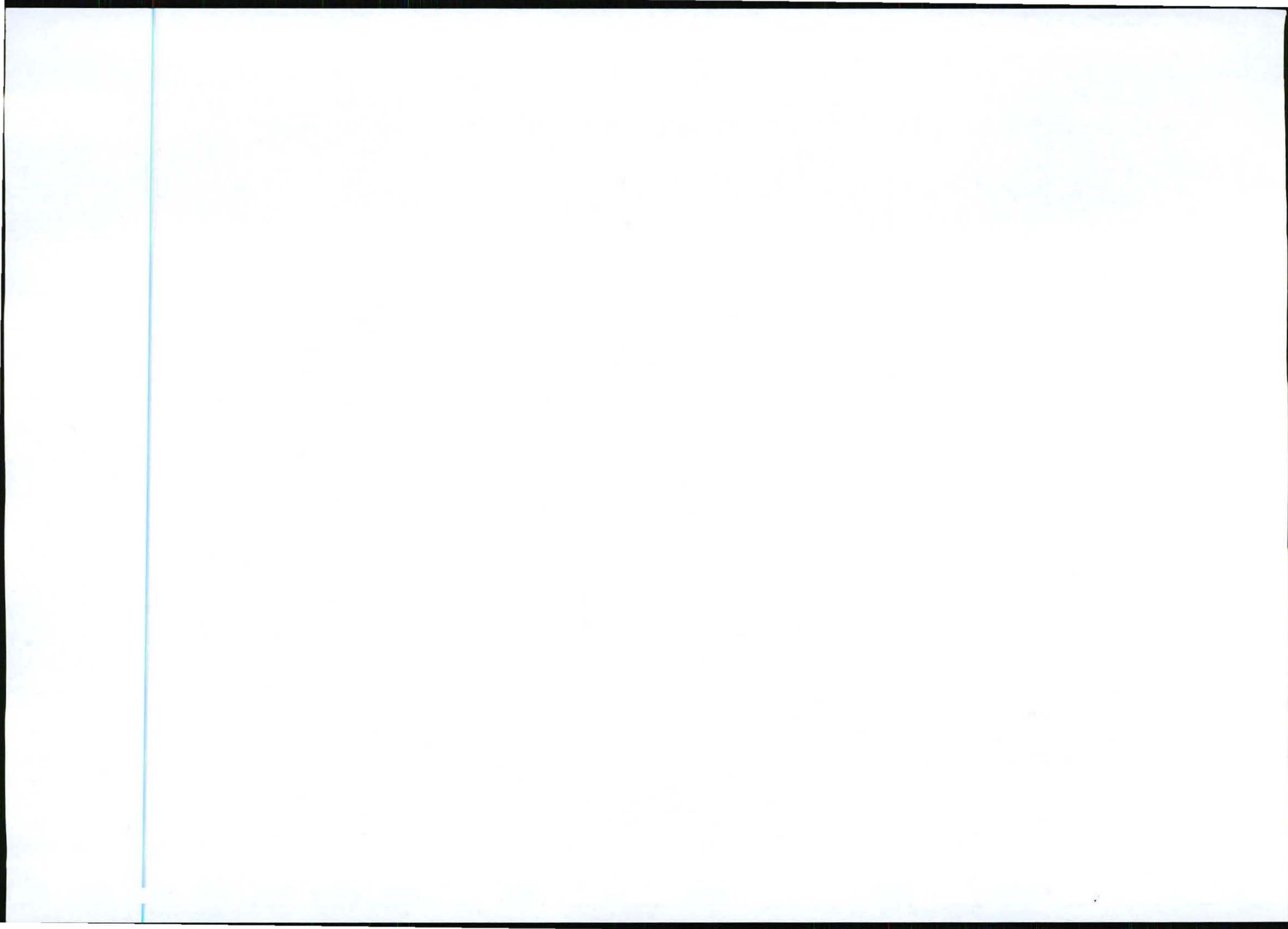
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			utilise existing roads wherever possible and the length of any new roads should be minimised.			
<i>Establishment of the solar facility</i>	Change in Land-use	Low (Negative)	Only areas within the demarcated construction site must be cleared and developed.	Lead Contractor and ECO	Low (Negative)	Monthly
	Change in sense of place	Low (Negative)	None.	N/A	N/A	N/A
	Loss of grazing and agricultural land	Low (Negative)	Only areas within the demarcated construction site must be cleared and developed.	Lead Contractor and ECO	Low (Negative)	Monthly
	Loss of connectivity and habitat fragmentation for fauna	Medium (Negative)	Fencing should be constructed in a manner which allows for the passage of small and medium sized mammals. Steel palisade fencing (20 cm gaps min) is a good option in this regard as it allows most medium sized mammals to pass between the bars, but remains an effective obstacle for humans. Alternatively the lowest strand or bottom of the fence should be elevated to at least 15 cm above the ground at strategic places to allow for fauna to pass under the fence. If electrified strands are to be used, there should be no strands within 30 cm of the ground as tortoises retreat into their shells when electrocuted and eventually succumb from repeated shocks.	Lead Contractor and ECO	Low (Negative)	Monthly
	Visual impact	Medium (Negative)	Security lighting should make use of down-lights to minimise glare and sky glow, and motion detectors where possible so that lighting at night is minimised. Care should be taken with the layout of the security lights to prevent motorists on the adjacent and nearby	Project Developer, Lead Contractor and ECO	Low (Negative)	Initially at the start of erecting the solar panels of the PV facility



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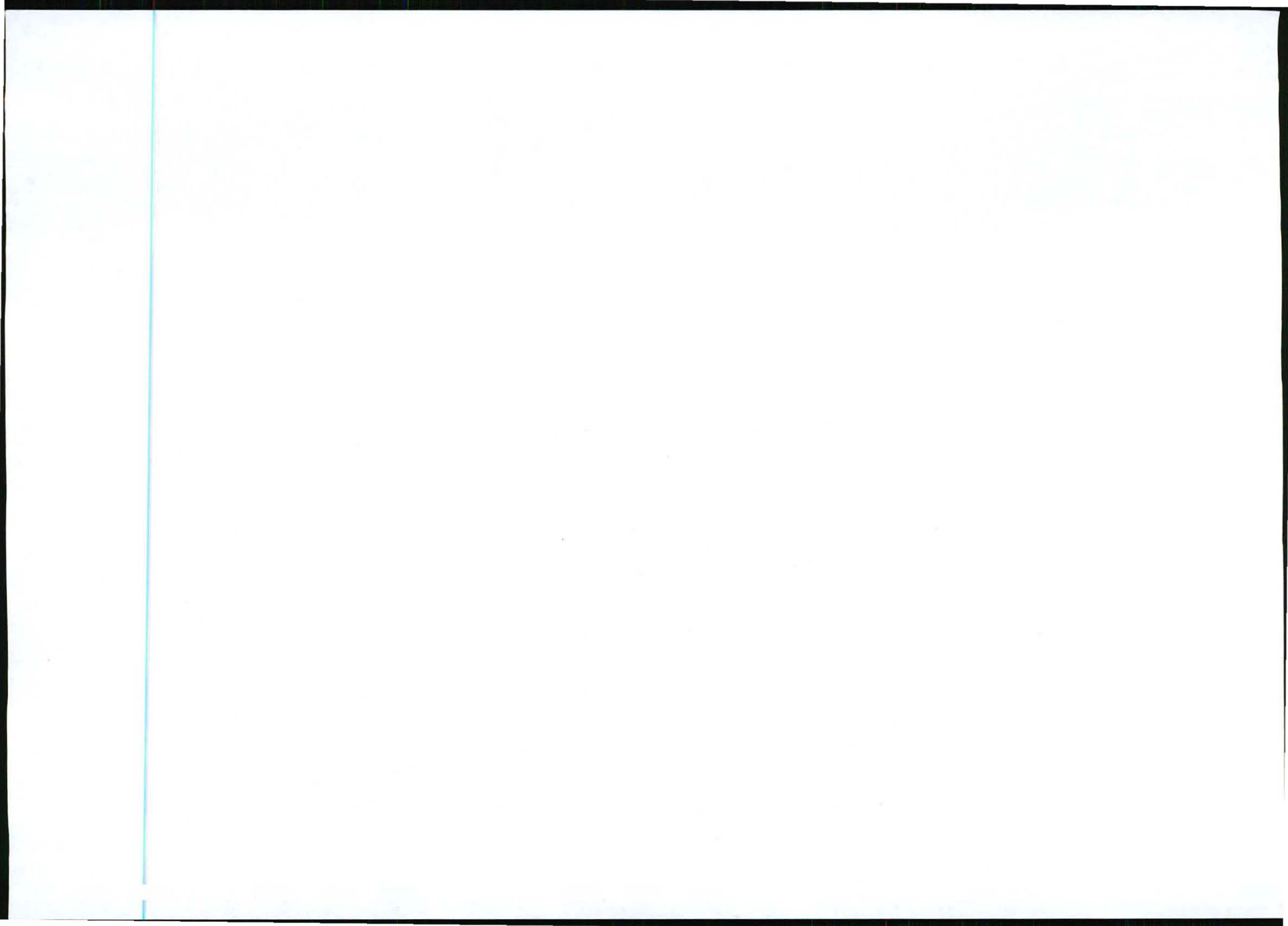
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			<p>roads from being blinded by lights.</p> <p>Vegetation clearing should be limited during the construction phase, and cleared areas should be rehabilitated.</p> <p>A landscape architect, horticulturist or botanist should be consulted in order to select the best screening option should there be a reflection problem. If plants are to be used for screening they will be consulted closer to the time to select the most appropriate vegetation. There are a number of tree species that would do well in that area, however the availability of plants at the time of construction will also dictate the species selected.</p> <p>Alternatively it may be possible to erect berms and to plant it with suitable shrubs.</p>			
<p style="text-align: center;"><i>Day to day construction activities</i></p>	<p style="text-align: center;">Disturbance and damage to Heritage and Archaeological Artefacts</p>	<p style="text-align: center;">Low (Negative)</p>	<p>The construction team must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all construction activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted.</p> <p>The contact details for SAHRA are:</p> <p>Telephone: 021 462 4502 Fax: 021 462 4509 Email: mgalimberti@sahra.org</p>	<p>Project Developer, Lead Contractor and ECO</p>	<p style="text-align: center;">Low (Negative)</p>	<p style="text-align: center;">Monthly</p>



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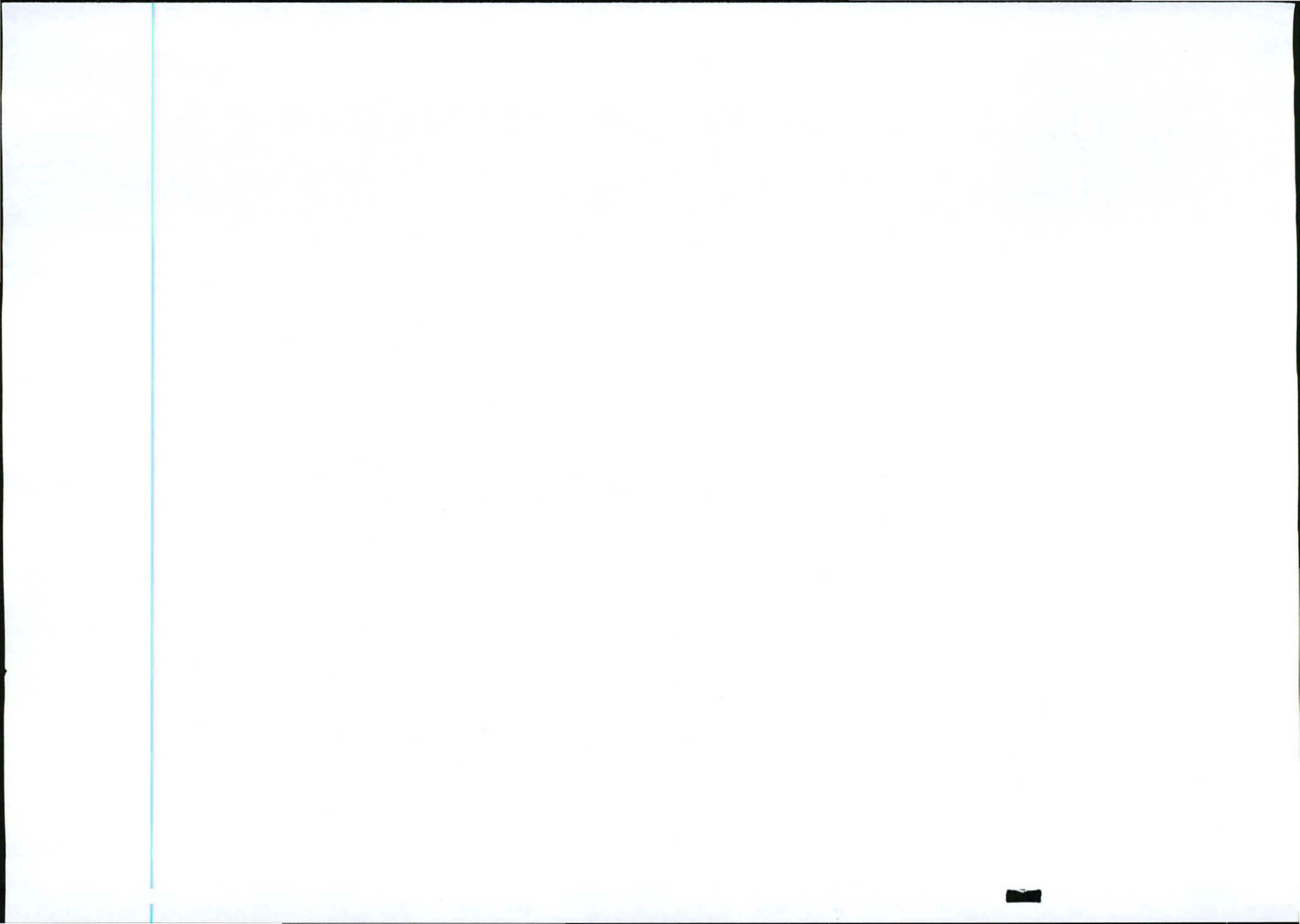
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
	Disturbance and damage to Palaeontological Features	Low – Medium (Negative)	<p>The construction team must be briefed on the potential uncovering of palaeontological features and what actions are then required. In the event that artefacts of palaeontological significance are discovered, all construction activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted.</p> <p>The contact details for SAHRA are:</p> <p>Telephone: 021 462 4502 Fax: 021 462 4509 Email: mgalimberti@sahra.org</p> <p>Fresh exposures and bedrock excavations into potential fossil-bearing strata must be monitored during the construction phase of the proposed activity. Inspection of fresh excavations must be undertaken by a professional palaeontologist in order to determine whether, as is probable, palaeontological remains or features are exposed <i>in situ</i>.</p>	Project Developer, Lead Contractor and ECO	Low (Negative)	Monthly
	Temporary Noise Disturbance	Low (Negative)	Construction activities should be limited to working hours. As there are no nearby receptors, it is unlikely that notice will need to be given to neighbours should work continue beyond regular working hours.	Lead Contractor and ECO	Low (Negative)	Monthly
	Presence and operation of construction vehicles	Low (Negative)	Construction vehicles to be present on-site only when necessary as they create a physical impact as well as generate noise, pollution and other forms of disturbance at the site.	Lead Contractor and ECO	Low (Negative)	Monthly



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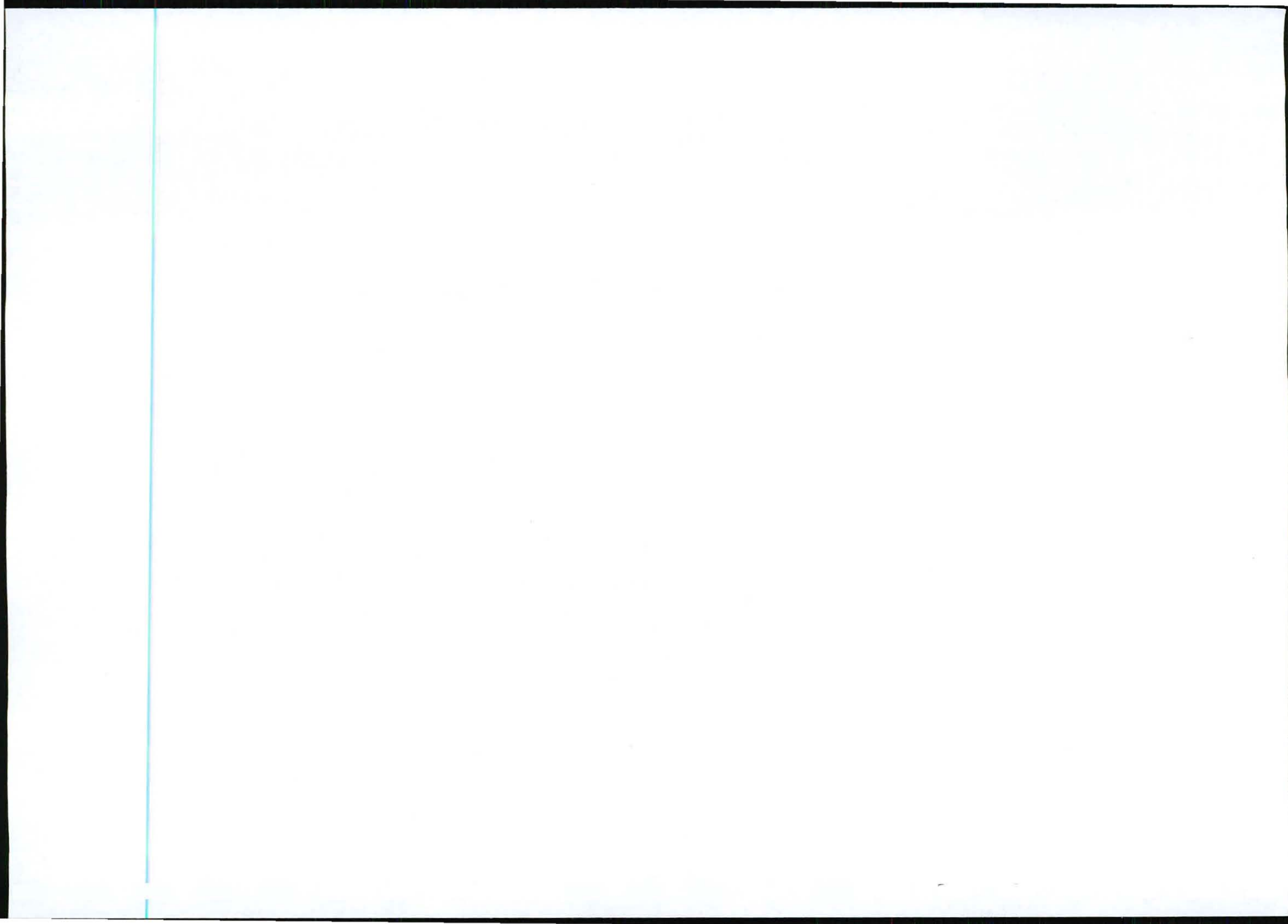
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
	<p style="text-align: center;">Disturbance of sensitive drainage lines, resulting in increased vulnerability to erosion</p> <p style="text-align: center;">&</p> <p style="text-align: center;">Contamination of downstream water bodies as a result of receipt of contaminated water from construction activities (e.g. runoff containing oils, sediments, cement)</p>	Medium (Negative)	<p>All ephemeral drainage lines (including the braided flow paths marked in the freshwater report) should be demarcated as no-go areas during construction; they should be marked with temporary fencing, located 50m from the edge of the drainage line.</p> <p>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>Temporary sediment collection ponds should be created between the construction zone and the demarcated ephemeral drainage lines, in which runoff from the disturbed site can collect before passing into the downstream catchment.</p> <p>Measures to dissipate the velocities of runoff from the site into adjacent water courses should be outlined in detailed Method Statements and implemented on site prior to the start of any activities that will disturb existing surface conditions.</p> <p>No wash water or water that is in any way contaminated by construction or other materials should be passed into natural watercourses – arrangements should be made for the containment and separate disposal of water used for ablutions or cooking during construction.</p>	Lead contractor and ECO	Low (Negative)	Weekly
	Soil Contamination	Medium (Negative)	Spill kits must be present at various appropriate locations on the construction site and appropriate corrective actions	Lead Contractor and ECO	Low (Negative)	Monthly



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



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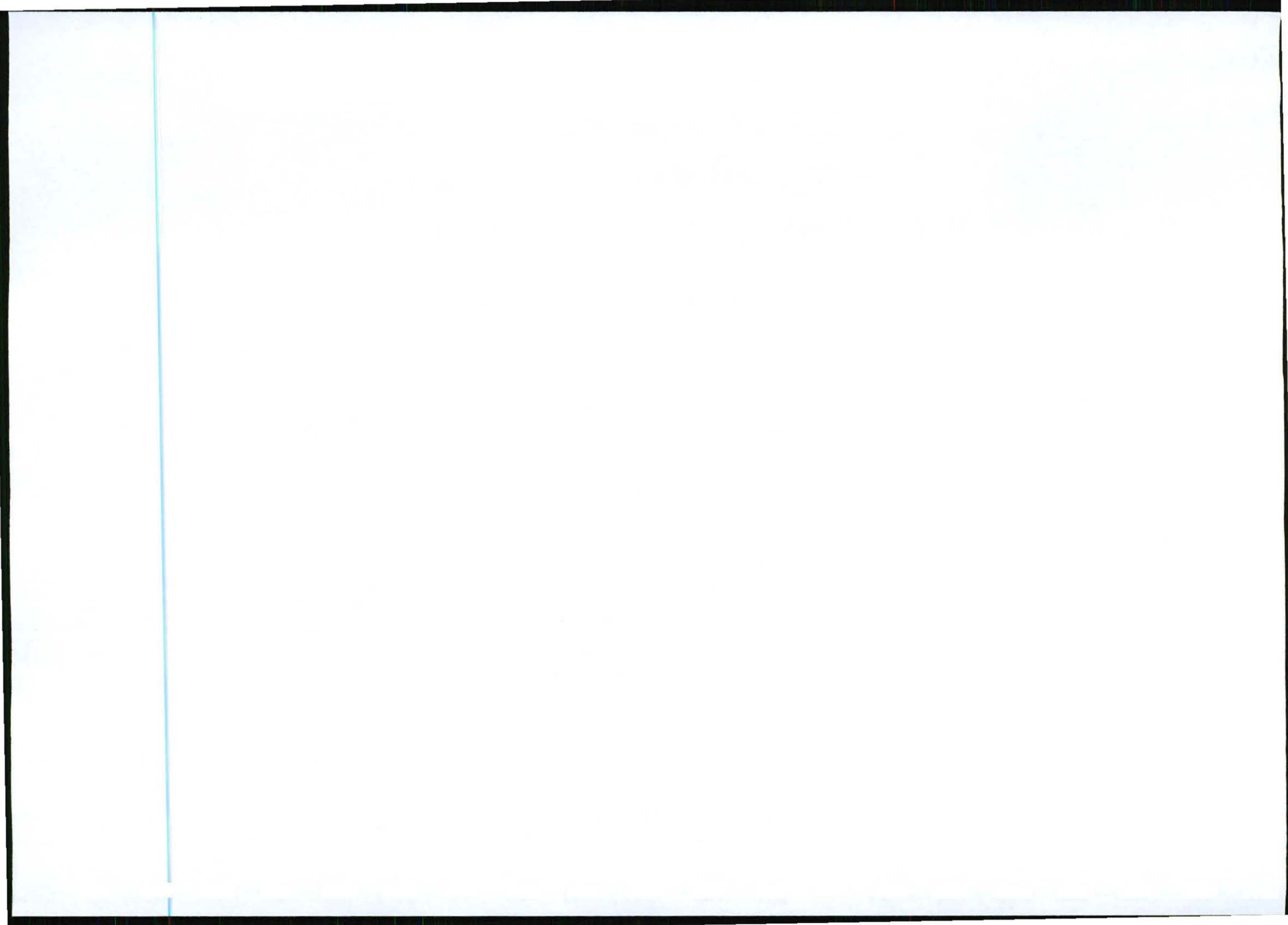
Draft Basic Assessment Report for a Photovoltaic (PV) Solar Facility Proposed by SolaireDirect at Knapdaar Farm (No. 14) near Springfontein,
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ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	RESPONSIBLE PARTY	STATUS & SIGNIFICANCE WITH MITIGATION	MONITORING FREQUENCY
			water must be re-used.			
	Negligence by construction workers resulting in unforeseen impacts	Medium (Negative)	Staff training and awareness of environmental impacts should be provided.	Lead Contractor and ECO	Low (Negative)	Monthly
<i>General construction activities</i>	Temporary Employment and Other economic Benefits	N/A	Wherever possible, local workers and suppliers should be employed or contracted to undertake the construction of the solar facility.	Project Developer	Low (Positive)	Monthly

General Recommendation:

1. Implementation of a construction phase Environmental Management Programme

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



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6 MANAGEMENT PLAN FOR THE OPERATIONAL PHASE

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

The potential impacts resulting from development of the "preferred" and "alternative" sites during the operational phase of the activity are provided below. All differences (if any) in potential impacts between the two sites will be highlighted accordingly in the sections to follow.

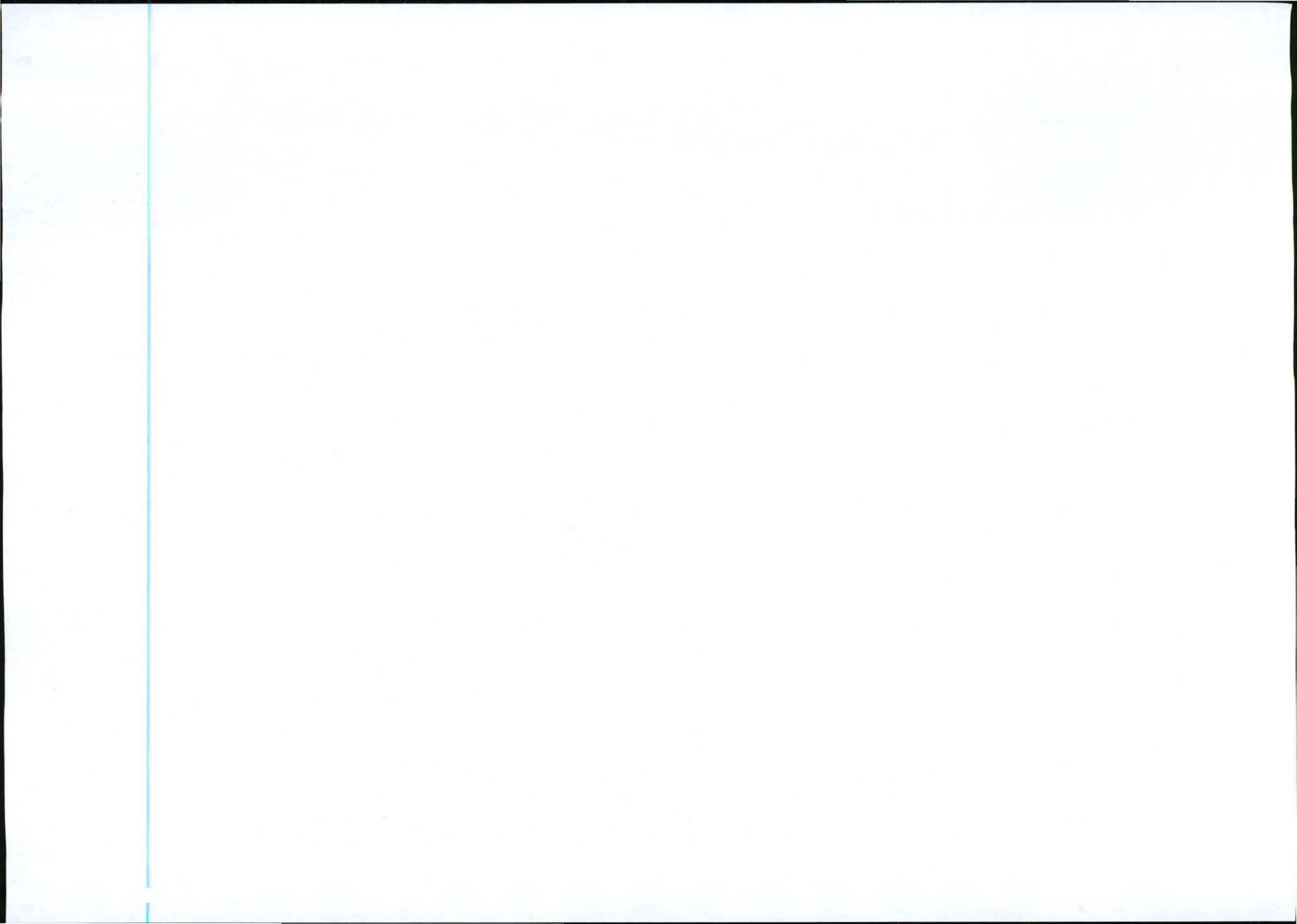


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TABLE 3: MANAGEMENT PLAN FOR THE OPERATIONAL PHASE

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
Post-construction of the solar facility	Alien plant invasion	Low (Negative)	Regular monitoring to ensure that alien plants are not increasing as a result of all the disturbance that has taken place. A long-term alien maintenance plan must be designed and implemented in conjunction with a suitably qualified expert. All alien plants present at the site should be controlled annually using the best practice methods for the species present.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Increased erosion risk		Regular visual monitoring for erosion is required to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. If erosion occurs, the necessary changes to the drainage system must be noted. All erosion problems observed should be rectified as soon as possible. All maintenance vehicles to remain on the demarcated roads.		Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	1. "Preferred site"	Medium – High (Negative)		Low – Medium (Negative)		
	2. "Alternative site"	Medium (Negative)		Low (Negative)		
Ongoing operation of the solar facility	Faunal habitat destruction, alteration and physical disturbance	Low (Negative)	Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO. No unauthorized persons should be allowed onto the site. The collection, hunting or harvesting of any plants or animals at the site should be strictly	Low (Negative)	Project Developer, Operational Manager and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project



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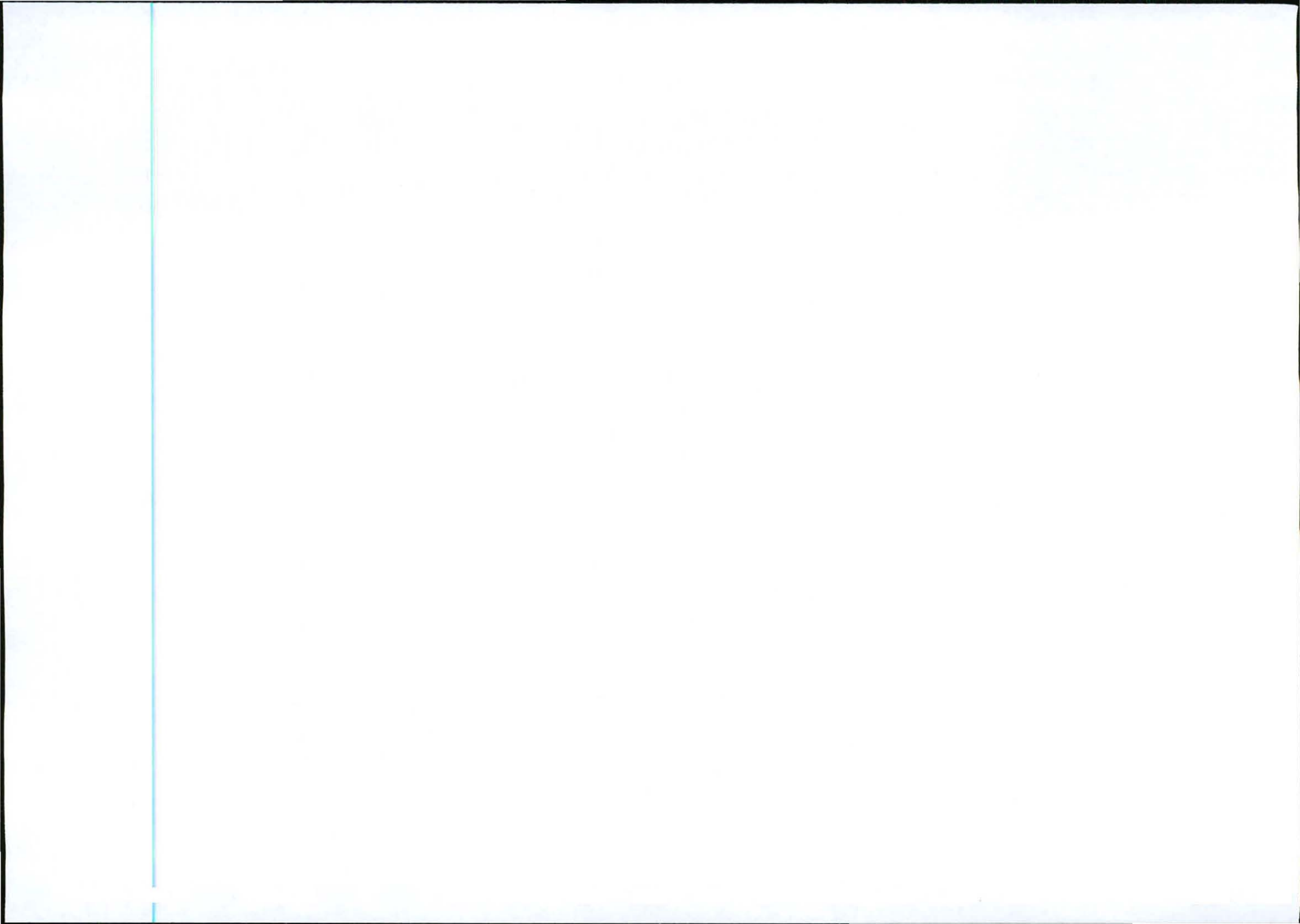
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
			<p>forbidden.</p> <p>Fires should only be allowed within fire-safe demarcated areas, otherwise prohibited. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the construction phase.</p> <p>Fire fighting equipment must be made available at various appropriate locations on the construction site.</p> <p>No fuelwood collection should be allowed on-site.</p> <p>No dogs should be allowed on site.</p> <p>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</p>			
	<p>Redistribution of sunlight, temperature and rainwater</p>	<p>Low (Negative)</p>	<p>The accumulation of rain water of a runoff area on a small area is the basic principle of Infield Rain-Water Harvesting (IRWH) developed at Glen Agricultural Research Station. Soil removed from the foundation pits of the panels can be used to build a small horizontal ridge and basins can be made next to the ridge by hand. The water accumulating in the ridges will boost vegetative growth in and around the basins. In spite of reduced growth under the panels due to limited rain, the grazing capacity may be increased by IRWH.</p> <p>Groundwater recharge potential will be</p>	<p>Low (Positive)</p>	<p>Project Developer and Operational Manager</p>	<p>Monthly monitoring, with annual reporting during the operational lifetime of the project</p>



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ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
			increased by limiting erosion and techniques like IRWH.			
	Loss of connectivity & habitat fragmentation for fauna	Medium (Negative)	Ensure that no larger fauna enter and become trapped within the fenced-off area, either by leaving a gate open so that animals can move freely between the site and the adjacent farm or by keeping all gates closed to ensure that they are excluded.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Discharge of polluted water into downstream areas, or water with a different salinity to natural systems & Affects on areas of recharge that would support wetlands / streams on the site	Medium - High (Negative)	<p>Sources of potential pollution would include any grey water discharges, car park or road runoff, and wash water when solar panels are periodically cleaned.</p> <p>A stormwater management system must be designed, implemented and maintained so as to ensure that runoff from the site does not result in the passage of concentrated flows into drainage lines, does not result in any bank or bed erosion in these systems, does not necessitate their being lined or otherwise artificially stabilised and does not result in droughting of natural systems through diversion of flows into adjacent water courses.</p> <p>The stormwater management plan should specifically address runoff from areas likely to generate high volumes of water during rainfall events, including car parks, roofs and the solar panels themselves.</p> <p>The use of measures that will contribute to the filtration of potentially contaminated water from car parks or other sources of contamination should be included in the stormwater</p>	Medium (Negative)	Operational Manager and ECO	Annual inspection, with annual reporting during the operational lifetime of the project



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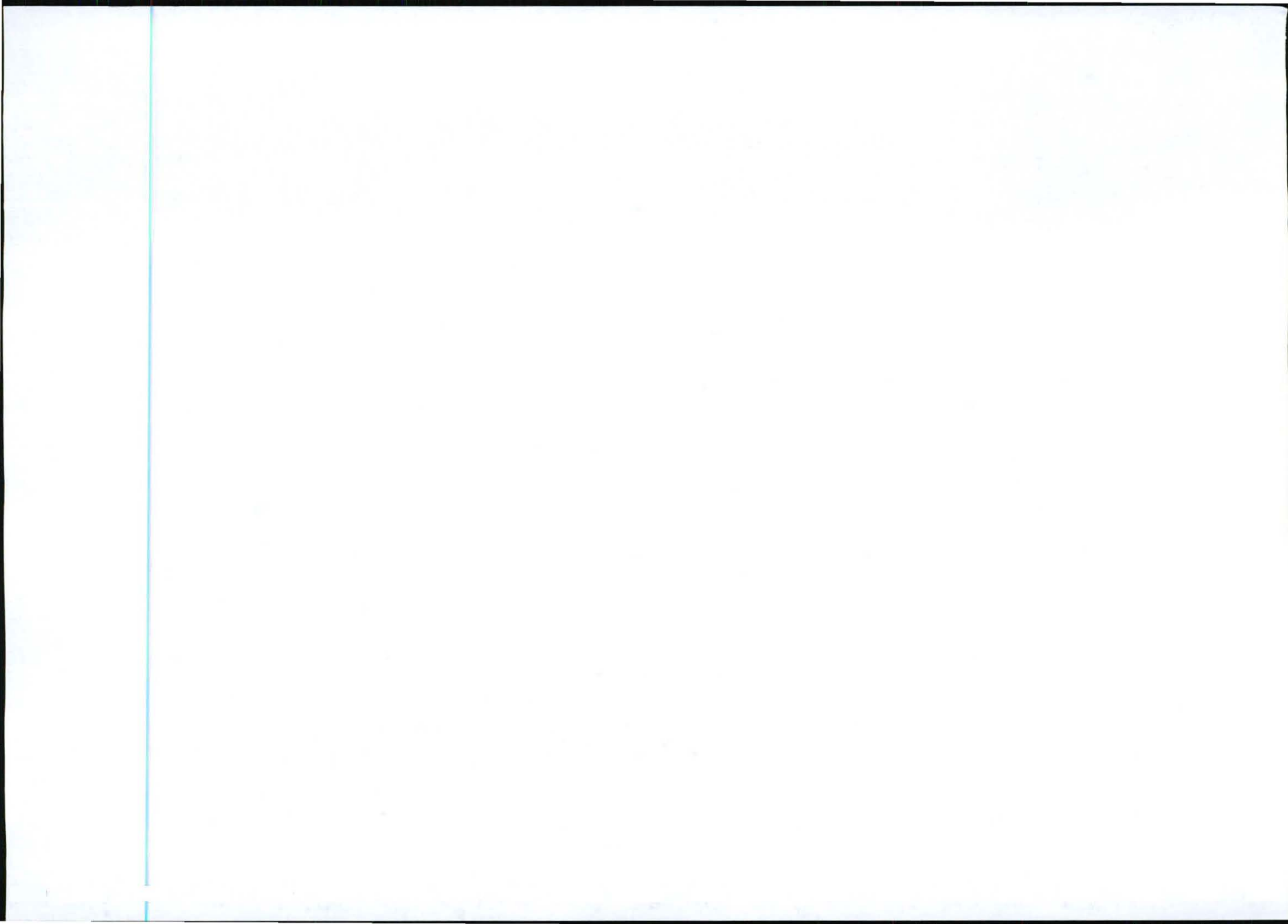
ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
			<p>management system; examples of appropriate measures include gravel filtration beds, vegetated swales (assuming that vegetation will be sustained, given the dry climate of the area).</p> <p>Wash water from the panels should be directed through settlement / filtration areas upstream of its passage into any watercourse, or ideally filtered, stored and recycled for subsequent washing activities.</p> <p>Septic tanks should not be used for the management of sewage on site, given the close proximity of drainage lines and shallow subsurface systems directly into water courses</p>			
	Increased Water Consumption	Low (Negative)	Water conservation must be strongly encouraged. Where possible water must be re-used.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Generation of General Waste	Medium (Negative)	Suitable receptacles must be provided for the temporary storage of general waste until removed to the nearest licensed landfill. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types.	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Change in Land-use	Low (Negative)	None.	N/A	N/A	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Loss of grazing and agricultural land	Low (Negative)	None.	N/A	N/A	Monthly monitoring, with annual reporting during the operational lifetime of the project



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ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
	Visual impact	Medium (Negative)	Areas subject to vegetation clearing should be rehabilitated.	Medium (Negative)	Operational Manager and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Traffic impacts	Low (Negative)	Impacts associated with the higher traffic volumes can be accommodated by proper site management, e.g. controlling the size of orders that would be transported to the site at any given time, and by notifying the public through local and regional media centres when large freight-carrying vehicles will be on the roads.	Low (Negative)	Lead Contractor	Weekly
	Soil Contamination	Low (Negative)	Spill kits must be present at various appropriate locations on the site and appropriate corrective actions must be taken as soon as possible. Spilled substances must be cleaned up as soon as possible.	Low (Negative)	Lead Contractor and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Generation of Grey Water	Low (Negative)	It must be ensured that all grey water generated as a result of operational activities is properly disposed to avoid soil and subsequent water contamination.	Low (Negative)	Lead Contractor and ECO	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Generation of Waste and Sewage	Medium (Negative)	Suitable receptacles must be provided for the temporary storage of general waste until removed to the nearest licensed landfill. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types. It is proposed that the contracting company supplying the ablution facilities will also be responsible for the removal and treatment thereof. It is the responsibility of the applicant to ensure that the contractor hired is accredited and has the necessary permits to remove the	Low (Negative)	Operational Manager	Monthly monitoring, with annual reporting during the operational lifetime of the project



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ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
			sewage. The sewage will be treated in accordance with the municipal sewage works policies and guidelines.			
	Generation of additional electricity	N/A	None.	Low (Positive)	N/A	Monthly monitoring, with annual reporting during the operational lifetime of the project
	Permanent Employment	N/A	The developer needs to ensure that all employment contracts comply with the relevant South African labour laws and staff needs to be informed of and adhere to any applicable codes of conduct or terms of employment.	Low (Positive)	Project Developer	Monthly monitoring, with annual reporting during the operational lifetime of the project



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7 MANAGEMENT PLAN FOR THE DECOMMISSIONING PHASE

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

The potential impacts resulting from development of the "preferred" and "alternative" sites during the decommissioning phase of the activity are provided below. All differences (if any) in potential impacts between the two sites will be highlighted accordingly in the sections to follow.



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TABLE 4: MANAGEMENT PLAN FOR THE DECOMMISSIONING PHASE

ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
<i>Disassembly of the solar facility</i>	Generation of Waste	Medium (Negative)	<p>Suitable receptacles must be provided for the temporary storage of various waste types such as scrap metal and concrete, until it is removed to the nearest licensed landfill. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types.</p> <p>The panels contain materials that may be hazardous in nature if released into the environment. If the panels are intact, there will be no risk of exposure. Therefore the panels need to be disposed of appropriately.</p> <p>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.</p> <p>Any hazardous waste must be disposed of at a hazardous waste disposal site.</p>	Low (Negative)	Lead Contractor	Weekly, during the decommissioning phase
	Disturbance or use of no-go areas for the stockpiling of disassembled	High (Negative)	All areas identified as no-go areas with reference to ecological, soil and land use, visual, heritage and freshwater features within the site should not be disturbed or used for	Low (Negative)	Lead Contractor	Weekly, during the decommissioning phase



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ACTIVITY	POTENTIAL IMPACT	STATUS & SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	STATUS & SIGNIFICANCE WITH MITIGATION	RESPONSIBLE PARTY	MONITORING FREQUENCY
	structures or other materials		the stockpiling/temporary storage of disassembled structures or other materials.			
<i>Decommissioning of the solar facility</i>	Traffic impacts	Medium (Negative)	Impacts associated with the higher traffic volumes can be accommodated by proper site management, e.g. controlling the quantity of materials that would be transported to the landfill, and by notifying the public through local and regional media centres when large waste-carrying vehicles will be on the roads.	Low (Negative)	Lead Contractor	Weekly, during the decommissioning phase
	Termination of Employment	Low (Negative)	Training may be considered during the employment term to aid staff in finding alternative employment once the solar facility has been decommissioned.	Low (Positive)	Project Developer	At the discretion of the Project Developer



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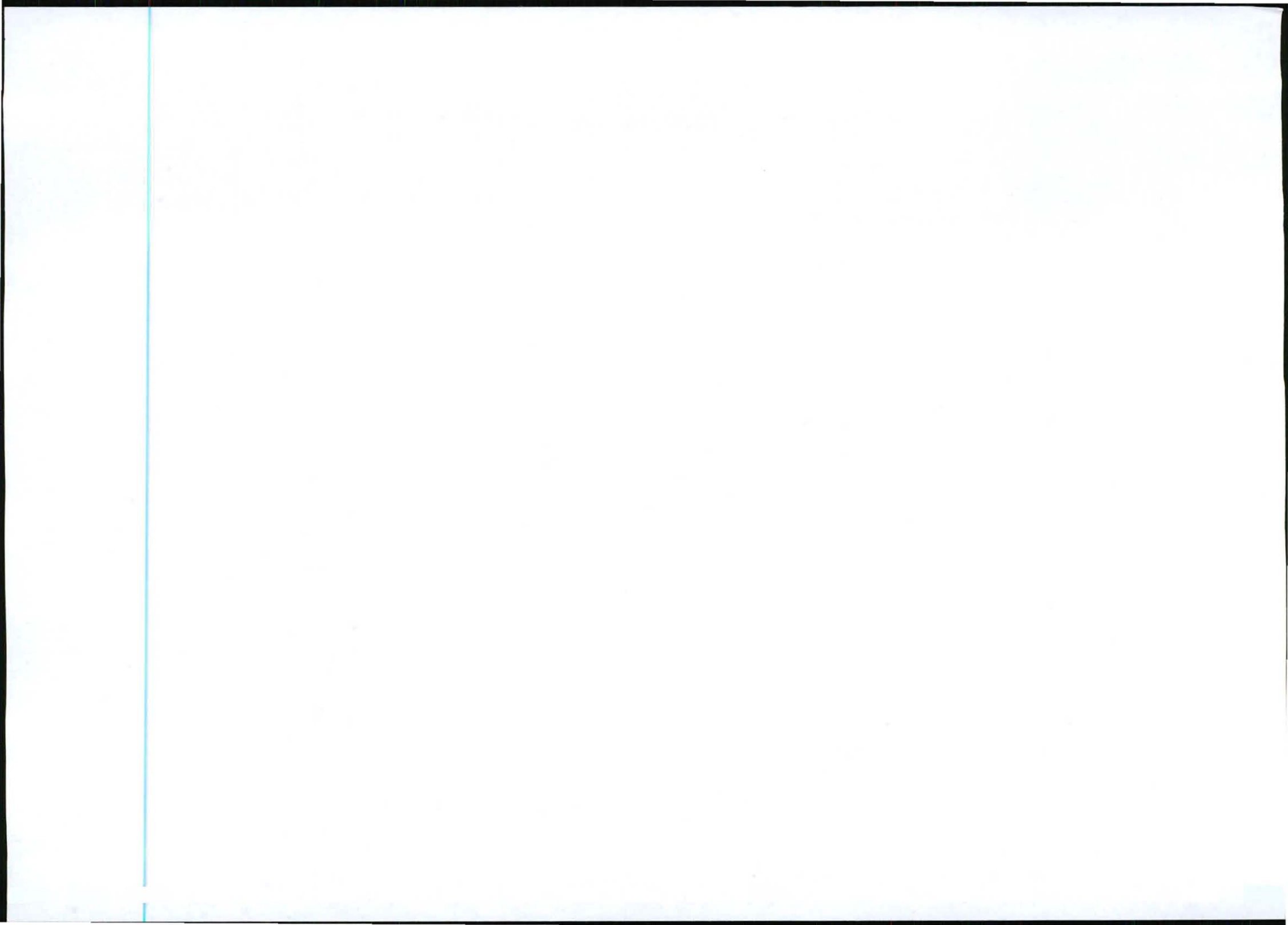
8 SITE REHABILITATION

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

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

9 CONCLUSION

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

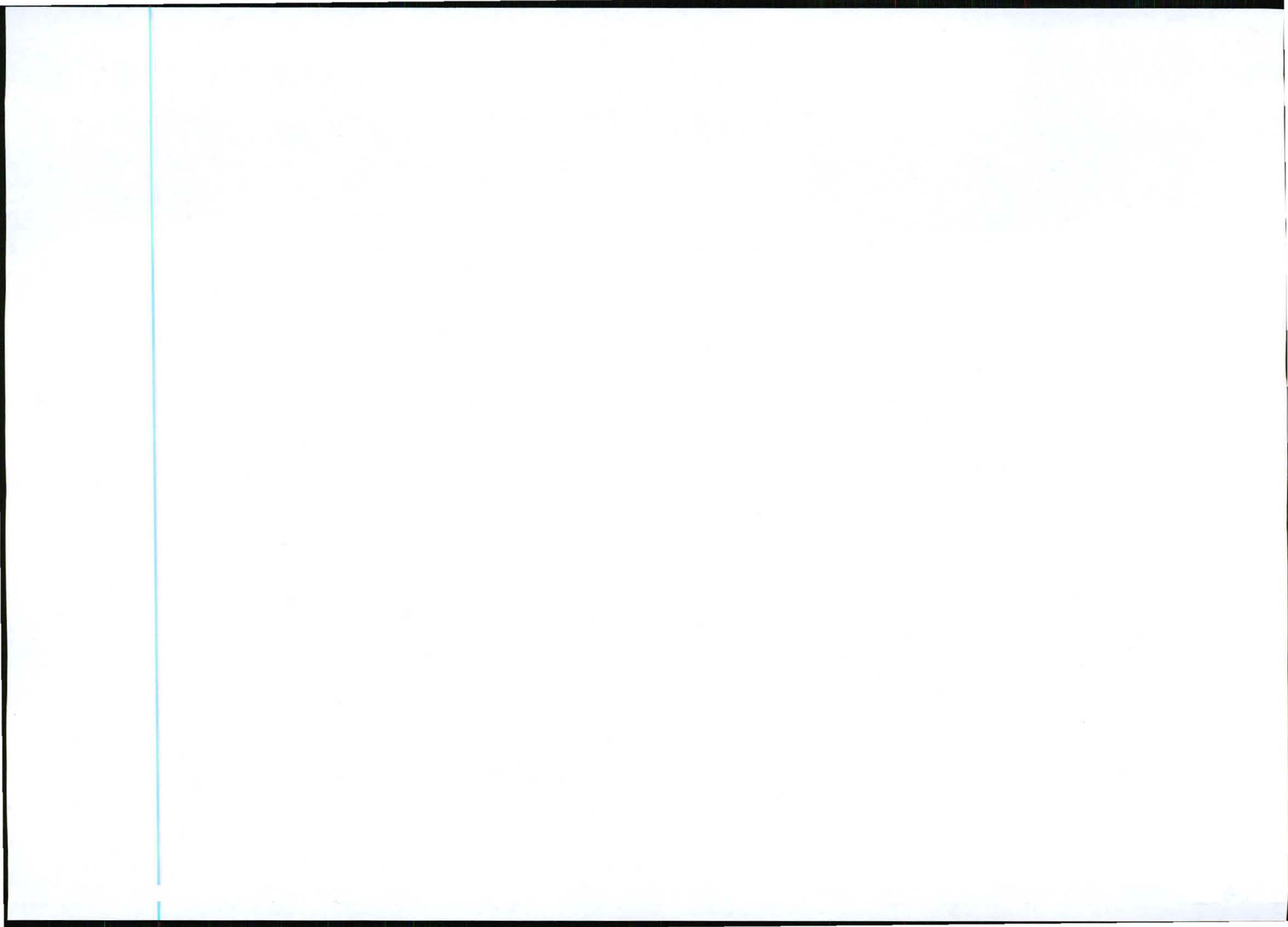


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APPENDIX G: Other information

Appendix G.1	Application form submitted by CSIR to DEA (Dated: 24/01/2012). _____	88
Appendix G.2	Letter from DEA acknowledging receipt of the Application (Dated: 14/02/2012). _____	101
Appendix G.3	Letter from DEA acknowledging receipt of letter (Dated: 01/03/2012). _____	109
Appendix G.4	Letter from SAHRA acknowledging receipt of the Application. _____	111
Appendix G.5	Letter from the Free State Heritage Resources Authority acknowledging receipt of Notice of Basic Assessment process. _____	114
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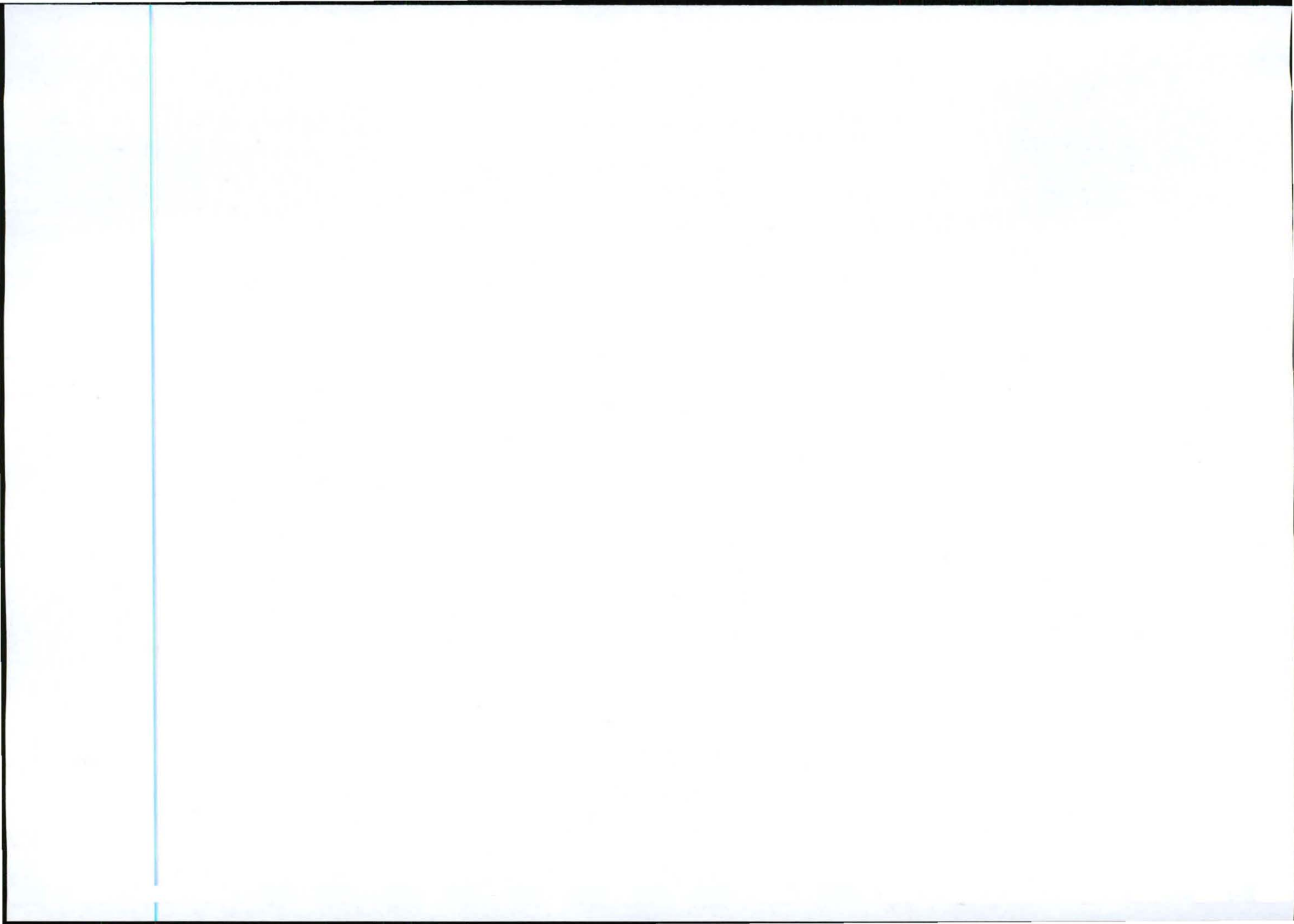


SECTION F: APPENDICES

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

Next page/...



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



PO Box 17001 Congella Durban 4001 South Africa
Tel: +27 31 242 2397
Fax: +27 31 261 2509
Email: snaidoo5@csir.co.za

24 January 2012

Attention: Director: Environmental Impact Evaluation

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

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

Dear Sir/Madam

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

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

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

Yours sincerely,

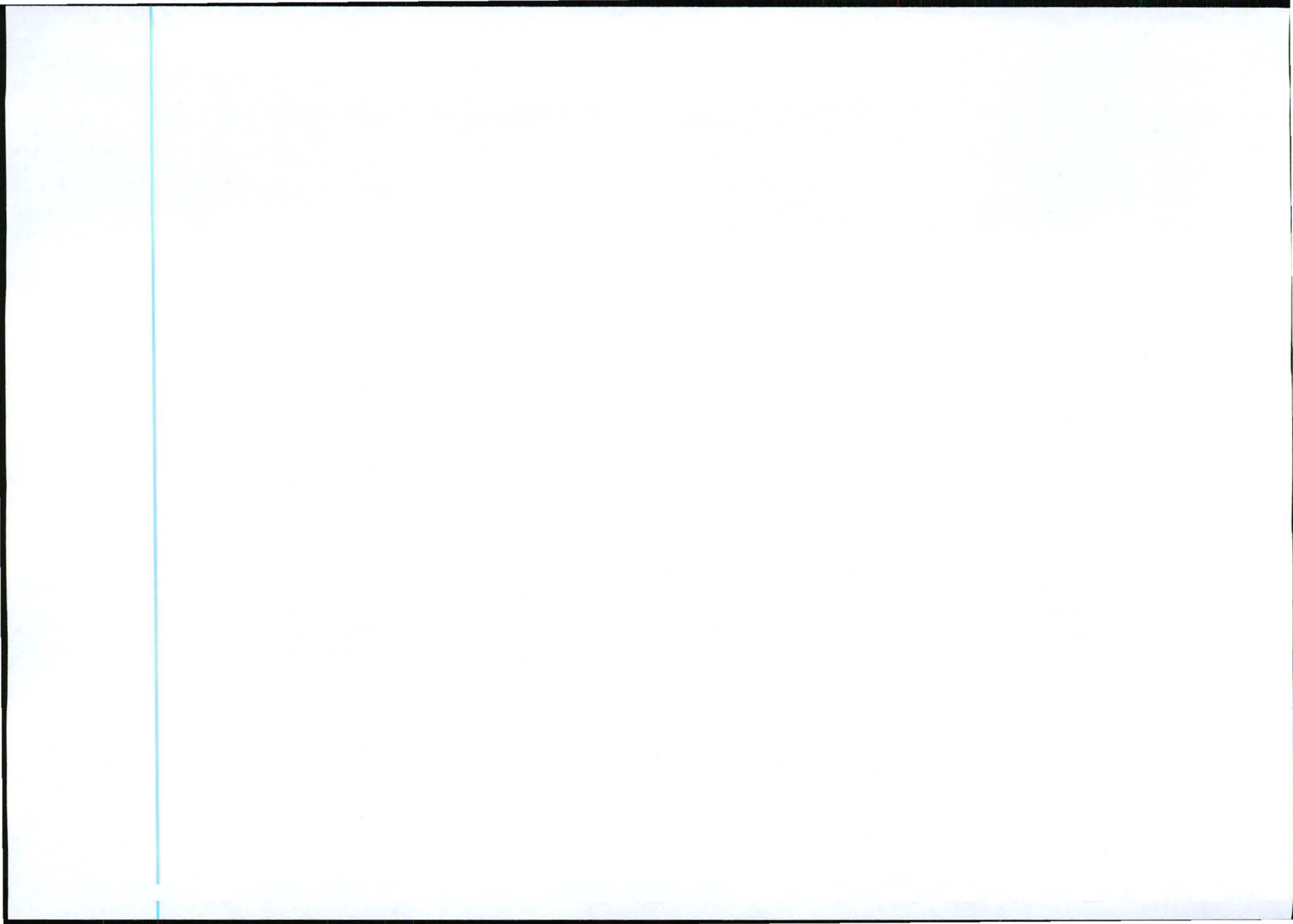
A handwritten signature in black ink, appearing to read 'Snaidoo'.

Samantha Naidoo
CSIR Project Manager
Environmental Management Services (EMS)

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

Ms N Shikwane (Chairperson), Prof C de la Rey, Dr N Dlamini,
Dr N Msomi, Dr FW Petersen, Prof MJ Wingfield, Dr S Sibisi

www.csir.co.za



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



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

APPLICATION FORM FOR ENVIRONMENTAL AUTHORISATION

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

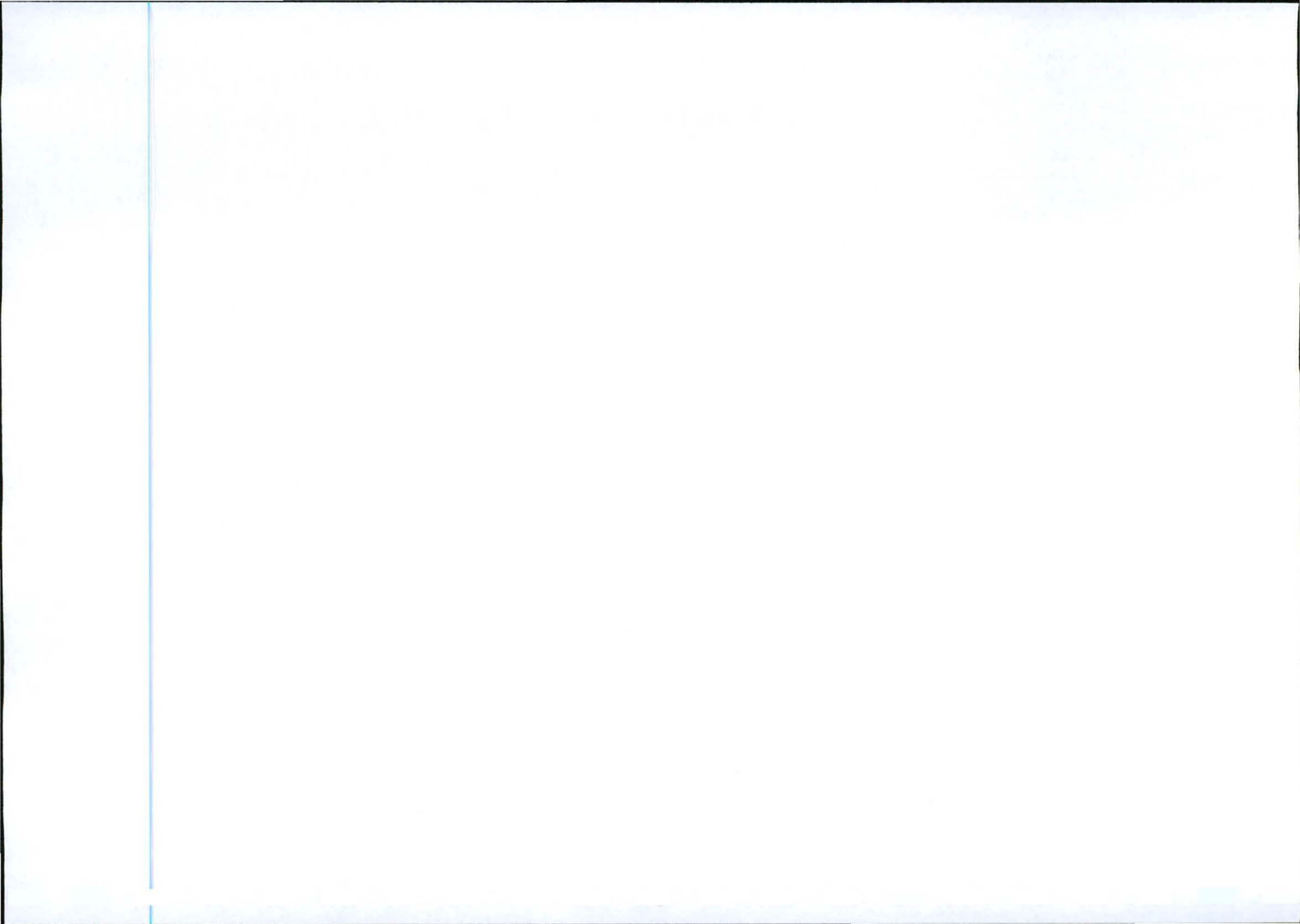
Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010

PROJECT TITLE

Solaire Direct Valleydora Solar Photovoltaic Facility of 10MW near Springfontein, Free State

Kindly note that:

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



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

Queries must be addressed to the contact hereunder:

Departmental Details

Postal address:

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

Physical address:

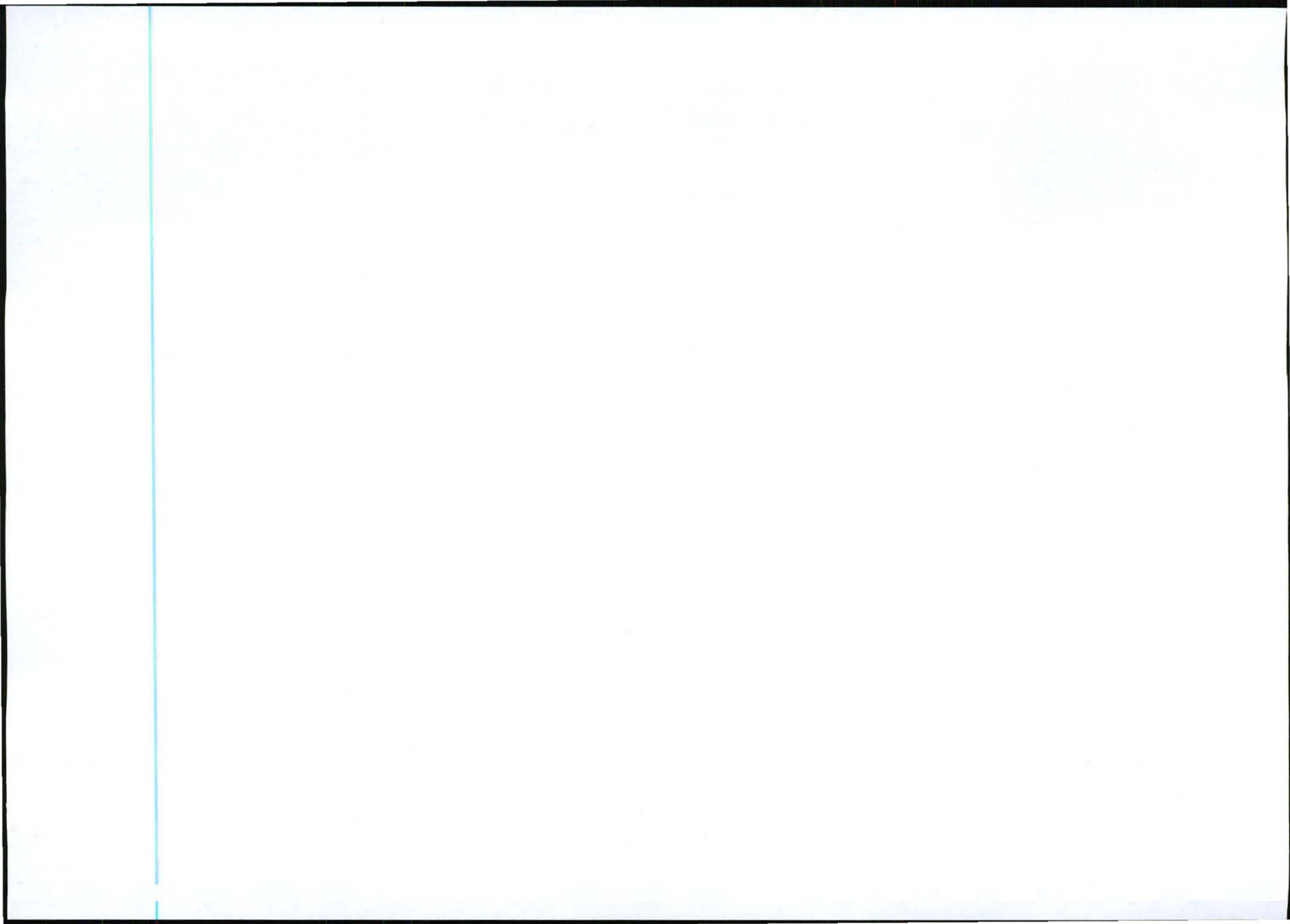
Department of Environmental Affairs
Fedure Forum Building (corner of Pretorius and Van der Walt Streets)
2nd Floor North Tower
315 Pretorius Street
Pretoria
0002

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

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

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

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



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

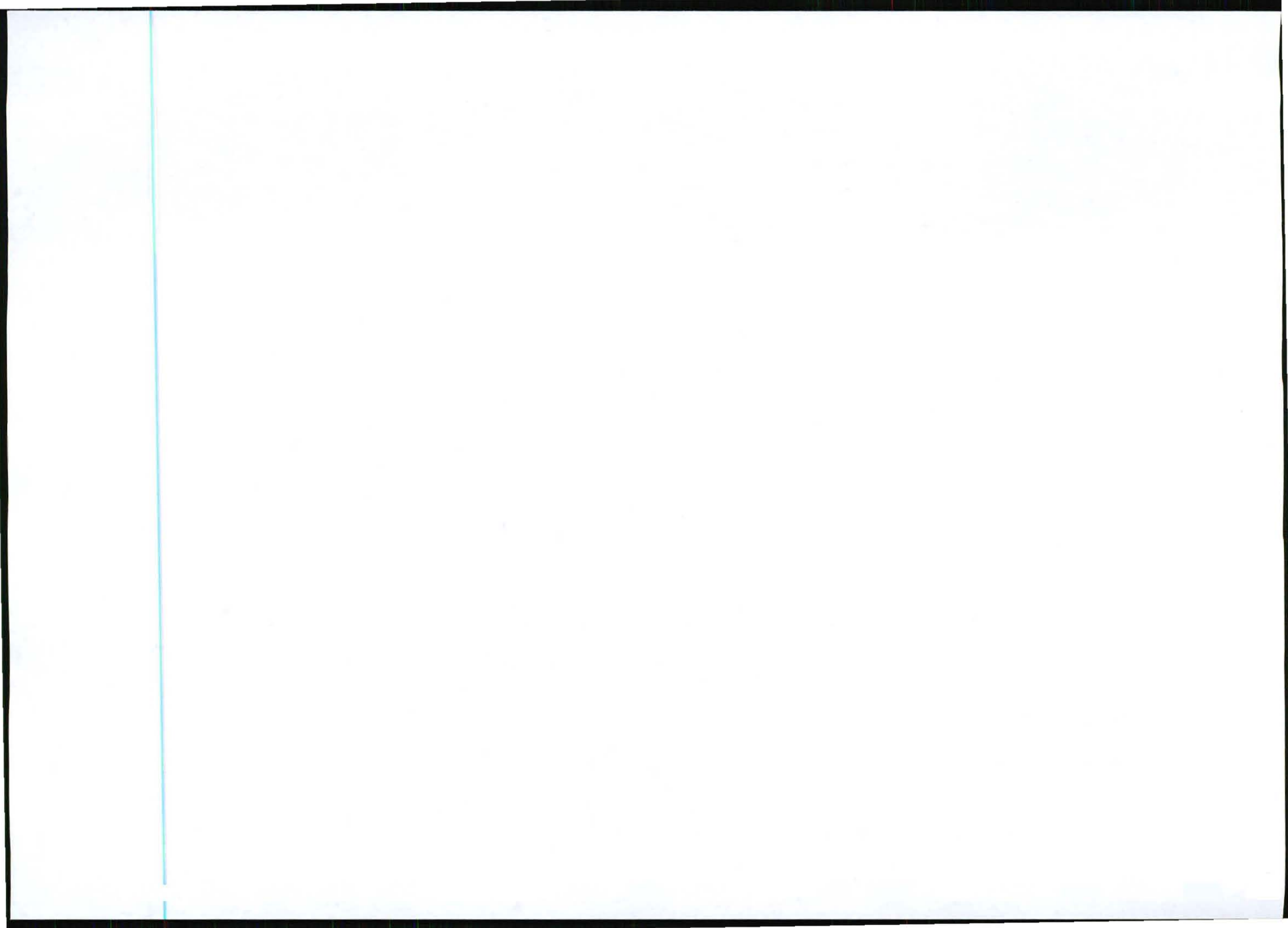
SITE IDENTIFICATION AND LINKAGE

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

F	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0

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

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



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

PROJECT TITLE

Solaire Direct Valleydora Solar Photovoltaic Facility of 10MW near Springfontein, Free State
--

1. BACKGROUND INFORMATION

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

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

Landowner:	Staples Trust (IT1808/1997)		
Contact person:	Sandra Staples		
Postal address:	PO Box 92, Springfontein		
Postal code:	9917	Cell:	083 283 7522
Telephone:	083 283 7522	Fax:	
E-mail:	meercat@lantic.net		

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

Local authority in whose jurisdiction the proposed activity will fall:	Kopanong Municipality
--	-----------------------

Nearest town or districts:	Bloemfontein		
Contact person:	Katiso Sibusi		
Postal address:	PO Box 23, Trompsburg		
Postal code:	9913	Cell:	+27 83 634 8950
Telephone:	+27 51 713 0036	Fax:	+27 51 713 0076
E-mail:	Technical.kopanong@vodamail.co.za		

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