




LEEUDORINGSTAD SOLAR PLANT (PTY) LTD

**Proposed Construction of the
Leeudoringstad 5MW Solar
Photovoltaic (PV) Power Plant and
associated infrastructure on the Portion
37 of Farm Leeuwbosch No. 44 near
Leeudoringstad, North West Province
Draft Basic Assessment Report**

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Document Title:	Proposed Construction of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power Plant and associated infrastructure on the Portion 37 of Farm Leeuwbosch No. 44 near Leeudoringstad, North West Province
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For:	SiVEST SA Pty (Ltd)

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File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.

Leeudoringstad Solar Plant (Pty) Ltd

prepared by: SiVEST SA (Pty) Ltd

Proposed Construction of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power plant and associated infrastructure near Leeudoringstad, North West Province: Draft BA Report

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15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

LEEUDORINGSTAD SOLAR PLANT (PTY) LTD

PROPOSED CONSTRUCTION OF THE LEEUDORINGSTAD 5MW SOLAR PHOTOVOLTAIC (PV) POWER PLANT AND ASSOCIATED INFRASTRUCTURE ON THE PORTION 37 OF FARM LEEUWBOSCH NO. 44 NEAR LEEUDORINGSTAD, NORTH WEST PROVINCE

DRAFT BASIC ASSESSMENT REPORT

Executive Summary

Leeudoringstad Solar Plant (Pty) Ltd (hereafter referred to as "*Leeudoringstad Solar Plant*") are proposing to construct two (2) 5MW Solar Photovoltaic (PV) Power Plants and associated infrastructure on Portion 22, 13 and 14 of the Farm Wildebeestkuil No. 59 and Portion 37 of the Farm Leeuwbosch No. 44, approximately 15km east of Leeudoringstad, North West Province. The proposed PV Plants are located within the Maquassi Hills Local Municipality. The overall objective of the project is to generate electricity to feed into the municipal electricity grid.

The generated electricity will be purchased by PowerX (Pty) Ltd (here after referred to as "PowerX"). One of the aims of PowerX is to enable electricity generation within local municipalities. PowerX hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and wheel the power using the national transmission and distribution network, to its customers. The purchased electricity will be sold directly to commercial and light industrial consumers within the Maquassi Hills Local Municipality and the customers electricity bill will get off-set by the Maquassi Hills Local Municipality.

Each PV Solar Plant will be developed under the same Special Purpose Vehicle (SPV). The SPV, *Leeudoringstad Solar Plant* is currently owned by Upgrade Energy South Africa (Pty) Ltd. Once Commercial Operation Date (COD) is accomplished, 100% of the *Leeudoringstad Solar Plant* shares will be transferred to the new owners of the proposed development SIG Energy (Pty) Ltd t/a SIG Energy Investments.

A Basic Assessment (BA) Process will be undertaken for each PV facility as they are located on separate properties which are approximately 1km apart. The BAs will be conducted in terms of the 2014 EIA Regulations promulgated in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), which came into effect on the 8th of December 2014. In terms of these regulations, Basic Assessments (BAs) will be required for each PV power plant. As such, two (2) separate BA processes will be undertaken, one for each proposed PV power plant. Although each PV power plant will be assessed separately, a single combined public participation process is being undertaken for both of the proposed projects. The potential environmental impacts associated with both

projects will be assessed separately during the BA process, as well as the assessment of the cumulative impacts.

This Basic Assessment is for the proposed development of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power Plant and associated infrastructure on Portion 37 of the Farm Leeuwbosch No. 44, approximately 15km east of Leeudoringstad, North West Province (hereafter referred to as the “proposed development”).

All relevant legislations and guidelines (including Equator Principles) will be consulted during the BA processes and will be complied with at all times. Upgrade Energy has therefore appointed SiVEST SA (Pty) Ltd (hereafter referred to as SiVEST) as the independent environmental assessment practitioner (EAP), to undertake the required BA processes in terms of the NEMA.

Typically, PV plants use semi-conductor materials to convert sunlight directly into electricity (Figure i). The solar panels can be fixed or they can be installed to track the sun.

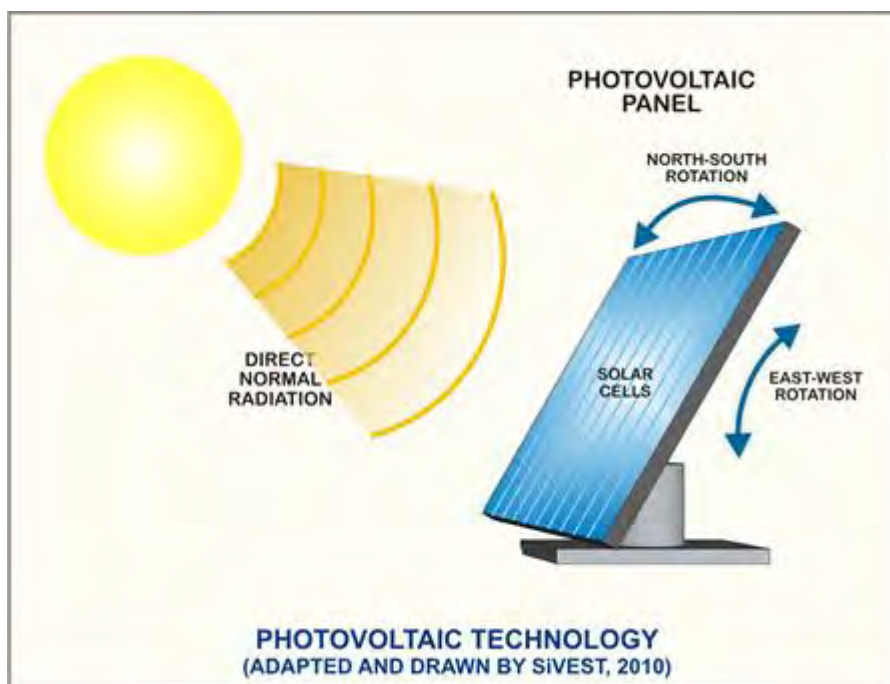


Figure i: Typical Solar PV Panel

The solar panels are generally configured in banks of arrays or sub-arrays depending on the number of PV panels used and the size of the arrays (Figure ii). The rows of PV panels are spaced both to allow access to vehicles during maintenance and to ensure that one array or one sub-array does not cast a shadow over the one behind. The electricity is cabled to inverters, which convert DC power to AC and synchronised to the electricity grid. The output is connected through various switchgear, protection devices and meters to local users and the grid. The inverters, switchgear and other electrical equipment are standard items as used for a wide range of industrial applications. The other major operating

component of the system is the inverter, which converts the DC power produced by the solar modules into AC power before being sent to the grid.

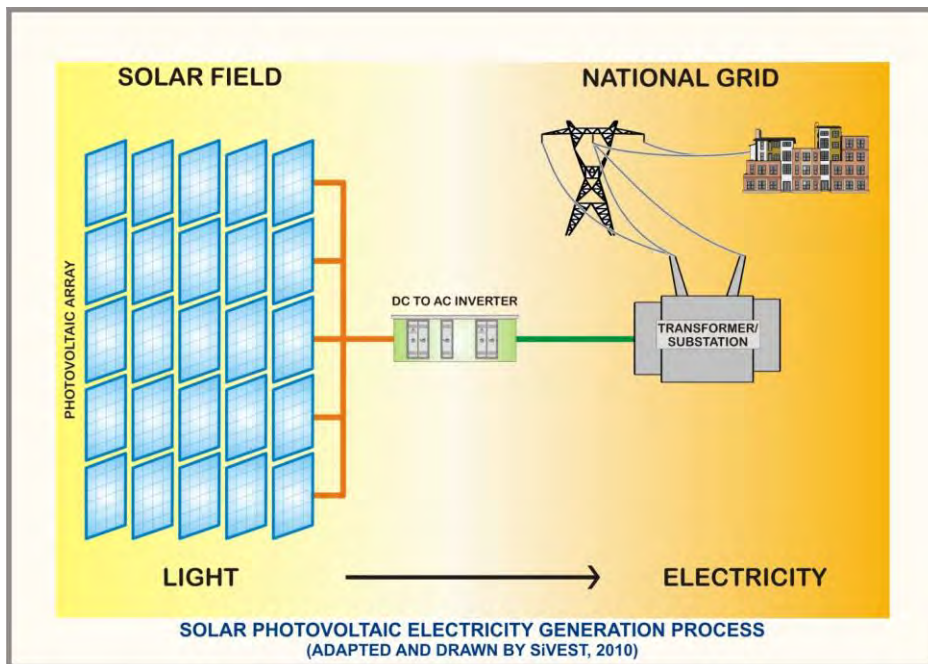


Figure ii: Conceptual illustration of the electricity generation process.

The proposed development will include the following key components are to be constructed on the authorized PV facility site:

- Solar PV Field;
- PV solar panels and arrays
- PV Panel mountings / single axis tracking
- DC-AC current inverters and transformers (10 x 500 kVA (2.5m x 1m) within the PV field);
- Mini Substations (3m x 2m within the PV field).

In terms of the associated infrastructure required for the proposed developments, the following is to be constructed:

- Coupling station (approximately 10m x 10m);
- 132kV power line from the Leeudoringstad 5MW Solar Photovoltaic (PV) Power Plant to Leeudoringstad 88/11kV Substation;
- Underground cabling (approximately 0,8 m x 0,6 wide);
- Small site office and storage facility (approximately 10m x 10m) - including security and associated facilities;
- Internal gravel roads (4m width);
- Site fencing.

The proposed development is located directly west of the existing Harvard Substation, where existing supply of electricity is connected. The proposed development will link into Leeudoringstad 88/11kV Substation.

The Department of Environmental Affairs (DEA) reference number will be provided in the Final Basic Assessment Report (FBAR).

The proposed development requires Environmental Authorisation (EA) from the DEA. However, the provincial authority will also be consulted (i.e. the North West Department of Rural, Environment and Agricultural Development (NW READ)). The Environmental Authorisation Process for the proposed development will be conducted in terms of the EIA Regulations promulgated in terms of Chapter 5 of the National Environmental Management Act (NEMA), which came into effect on the 8th of December 2014. In terms of these regulations, a Basic Assessment (BA) is required for the proposed project. All relevant legislations and guidelines (including Equator Principles) will be consulted during the BA process and will be complied with at all times.

The entire development site for the proposed PV facility is 120 ha in extent. As previously mentioned, the proposed development is located on the Farm Leeuwbosch 44, approximately 15km east of Leeudoringstad, North West Province.

A 500m wide corridor was assessed for the proposed power line and is shown below in **Figure v**. The final servitude will be routed within the 500m wide corridor, and it is expected that the servitude will not exceed 31 m. A Site Locality Map for the proposed project has been provided in **Figure iii** below. No alternatives were assessed for the power line corridor, however four (4) layout alternatives for the PV facility were assessed. The PV facility layout alternatives have been provided in **Figure iv** below.

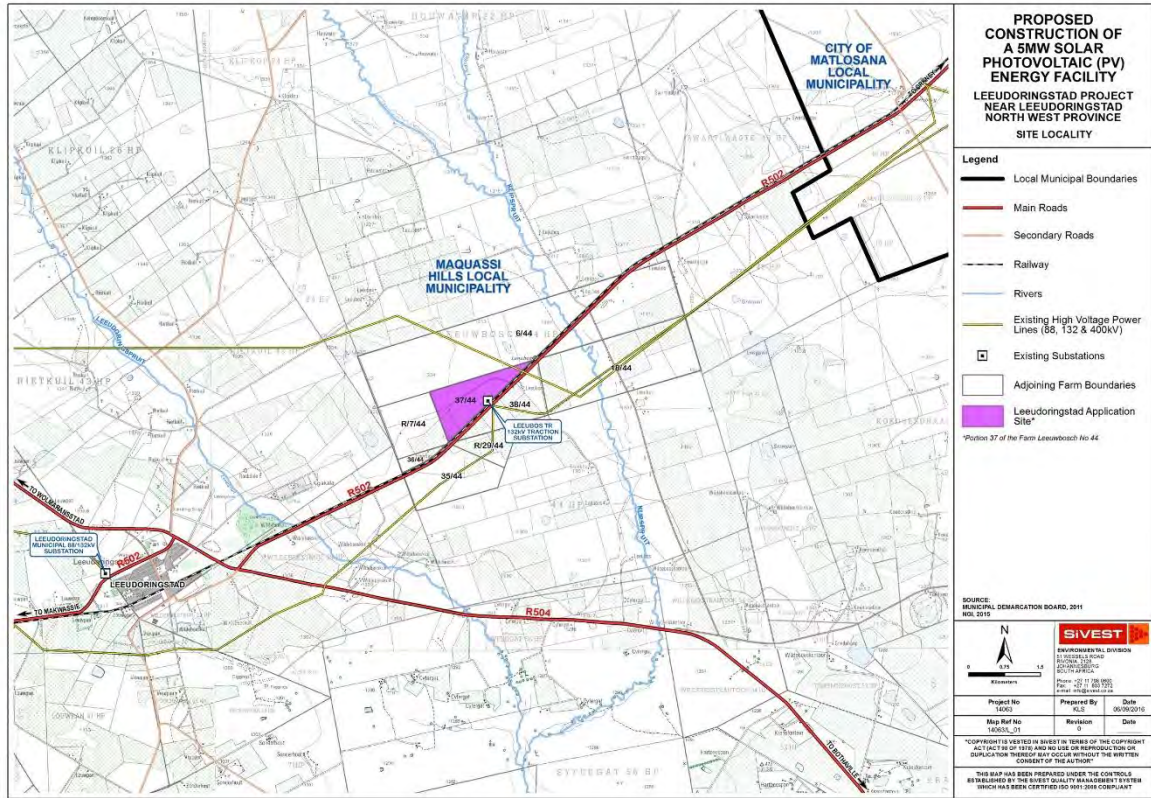


Figure iii: Site Locality Map

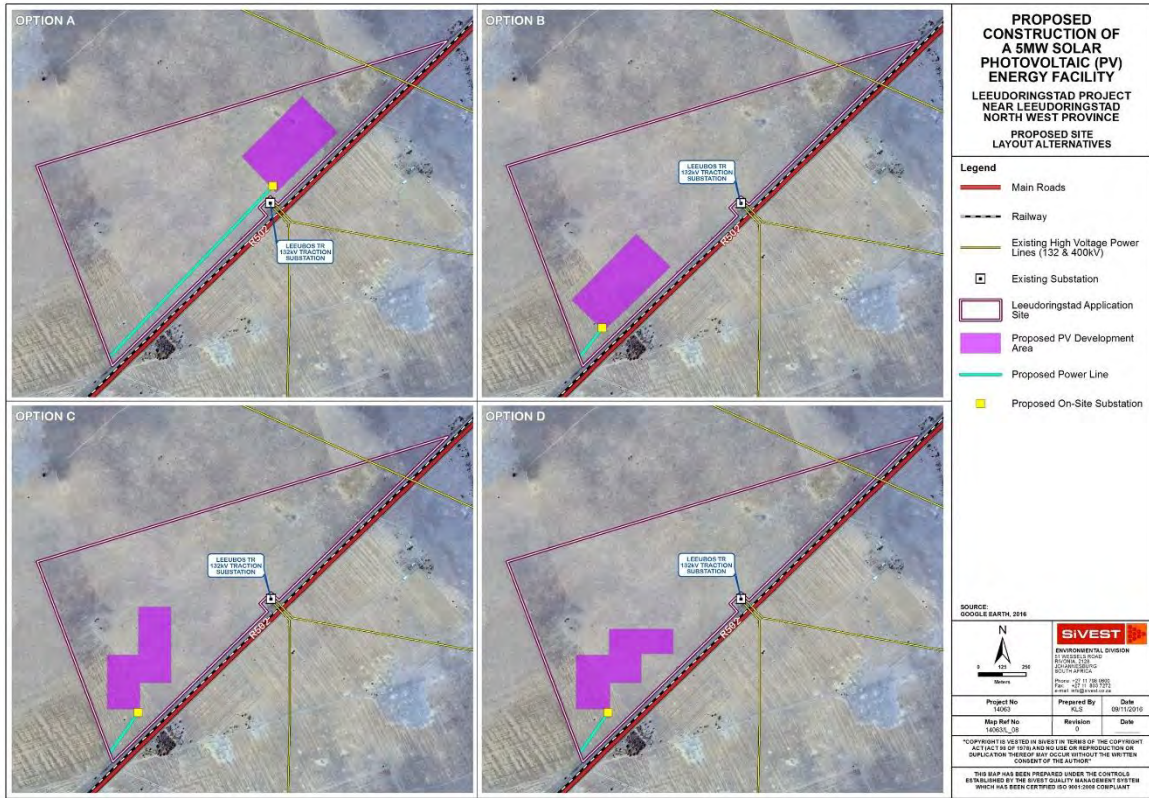


Figure iv: Layout Alternative Map

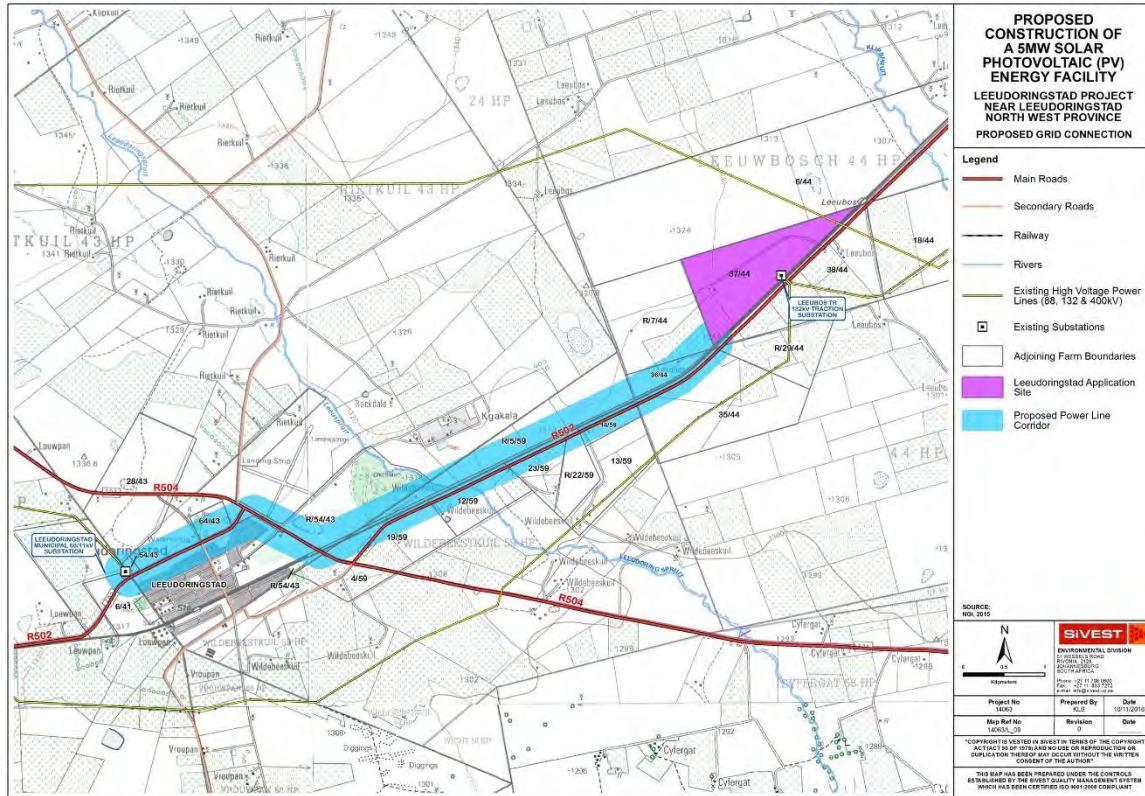


Figure v: Grid Connection Map

The proposed project is located within the North West Province approximately 15km east of Leeudoringstad, North West Province. It falls within the Maquassi Hills Local Municipality that forms part of the Dr. Kenneth Kaunda District Municipality. The proposed PV facility will be accessed by the R502, which is located on the Southeastern border of the property development site.

Several specialist studies were conducted during the BA process to identify environmental and social sensitivities and identifying any permits or compliance requirements associated with the proposed development. These include:

- Biodiversity Assessment (fauna and flora);
- Avifauna Assessment;
- Surface Water Assessment;
- Soils and Agricultural Potential Assessment;
- Heritage Assessment;
- Palaeontology Assessment;
- Desktop Visual Assessment; and
- Socio-Economic Assessment;

Table i: Specialist Findings Summary Table

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Environmental Parameter	Summary of Major Findings	Recommendations
Biodiversity	<ul style="list-style-type: none"> • Loss of indigenous natural vegetation during construction; • Impacts on protected plant species; • Impacts on sensitive habitats; • Mortality of populations of sedentary species during construction; • Displacement of populations of mobile non-flying species; • Displacement of listed bird species due to disturbance during construction; • Displacement of listed bird species due to habitat destruction during construction; • Collisions of listed bird species with overhead power lines; • Introduction and/or spread of declared weeds and alien invasive plants in terrestrial habitats. 	<ul style="list-style-type: none"> • Cumulative impacts of this project in combination with similar projects is likely to be of low significance. • Proposed mitigation measures include undertaking a summer survey of the vegetation to confirm the conservation value thereof, undertaking a small mammal survey (for Southern African Hedgehog and White-tailed Rat) and Giant Bullfrog survey to determine whether any of these species of concern occur on site or not, formalising a rehabilitation programme, undertaking a botanical walk-through survey, obtaining permits for any protected species that may be affected, undertaking a search and rescue of plants that can be rescued, compiling an alien plant management plan and undertaking regular monitoring. • Of the four proposed layout alternatives, Alternative B was preferred, although Alternatives C and D are both similar in their effect on the ecological receiving environment and can therefore also be considered as favourable. Alternative A was considered to be not preferred due to the fact that it affects the most amount of natural habitat classified as having MEDIUM-HIGH sensitivity and also would result in the loss of a small pan, which is designated here as being sensitive habitat. • The report concludes that the site is considered to have potentially high sensitivity or biodiversity value, although this needs to be confirmed during a summer survey. It is recommended that this follow-up survey be undertaken before any footprint area is approved for the project

Avifauna	<ul style="list-style-type: none"> • Impacts associated with the displacement of priority species due to disturbance associated with construction of the PV plant and associated infrastructure. • Impacts associated with the displacement of priority species due to habitat transformation associated with construction of the PV plant and associated infrastructure. • Impacts associated with the mortality of priority species due to collisions with solar panels • Impacts associated with the entrapment of large-bodied birds in the double perimeter fence • Impacts associated with the collisions of priority species with the proposed 132kV line. • Impacts associated with the displacement of priority species due to disturbance associated with de-commissioning of the PV plant and associated infrastructure. 	<ul style="list-style-type: none"> • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum. • The mitigation measures proposed by the vegetation specialist must be strictly enforced. • It is recommended that a single perimeter fence is used. • A walk-through exercise should be conducted by the avifaunal specialist once the tower positions have been finalised with the objective of demarcating the spans that need to be marked Bird Flight Diverters (BFDs).
Surface Water	<ul style="list-style-type: none"> • Impacts associated with the construction lay-down area in or near surface water resources • Vehicle and machinery degradation to surface water resources • Degradation and removal of soils and vegetation associated with the surface 	<ul style="list-style-type: none"> • It is strongly recommended that no access roads, PV arrays, buildings structures, substation and / or associated infrastructure are placed within any of the identified wetlands or drainage pathway and the associated buffer zones. Ideally, from a surface water perspective, the proposed PV layout area should be relocated to the far east of the PV study site where there are no surface water

	<p>water resources and the associated buffer zones</p> <ul style="list-style-type: none"> • Increased storm water run-off, erosion and increased sedimentation impacting on the surface water resources • Vehicle damage to the surface water resources • Human degradation to fauna and flora associated with the surface water resources • Storm Water run-off impacts to wetlands 	<p>resources. Additionally, the proposed power lines should be located alongside the R502 and existing roads up to the end connection point to the substation. The proposed power line is also to avoid the Leeudoringstad Golf Course man-made impoundment. The identified potential direct impacts can be largely avoided if implemented. As a result, only minimal implementation of mitigation measures will be required to ensure protection of the surface water resources.</p> <ul style="list-style-type: none"> • Generally, all existing roads should be used as far as possible. However, where new access / service roads are required, these are to be constructed around and outside of the surface water resources and the associated buffer zones. • Where direct impacts to the surface water resources are not avoidable, and / or components or infrastructure will need to be constructed within close proximity, the relevant water use license and triggered activities for environmental authorisation are to be applied for and obtained before construction is allowed to commence.
Agriculture	<ul style="list-style-type: none"> • None identified at this stage 	<ul style="list-style-type: none"> • The construction of the photovoltaic plant at the chosen site will have minimal impact on the loss of agricultural land, due to the small percentage of high potential agricultural land indicated by the Land Type survey information. • As far as the soils are concerned, there should not be any significant cumulative impacts occurring
Heritage	<ul style="list-style-type: none"> • The possibility of encountering previously unidentified heritage resources. As well as the impact on the identified archaeological sites • HIA identified 13 heritage resources. These 	<ul style="list-style-type: none"> • The design process and methodology followed by the developer for this project enabled the heritage assessment to provide input into the proposed layout before the impact assessment. This resulted in cognisance being taken of the positions of the heritage sites and thus the reduction of impacts at an early design

	<p>resources can be grouped in to four clusters. Two clusters consist of the remains of labourer housing, while the other two consist of a cattle kraal and a cemetery. With acknowledgement of the suggested mitigation measures outlined below, the impact can be rated as low</p>	<p>phase. Analysis of the impact matrix tables will reflect this.</p> <ul style="list-style-type: none"> • The comparative assessment of the alternatives has shown that an overall low impact on heritage is foreseen, as all the heritage resources identified are of a low to medium significance. • Assessing the possible impacts by the layout options on the identified heritage resources the Leeudoring A and B will have the least direct impact on the heritage resources. However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development. • The Leeudoringstad municipal cemetery is situated adjacent to the substation in the western end of the proposed corridor and should be avoided.
<p>Palaeontology</p>	<ul style="list-style-type: none"> • The possibility of encountering previously unidentified Palaeontology heritage resources (fossils) in the development footprint. • Identification of heritage resources LD07, LD09, LD10, LD11 LD12 (The concentration of structures is distributed of an area of 300x100 meters in the western section of the study area. Most of the structures consist of a square single stone packed foundation. A few small ash middens were identified close to each of the structures) • Identification of heritage resources LD02 (The resource is a burial ground 	<ul style="list-style-type: none"> • No Mitigation measures are required for palaeontological resources. • For archaeological resources, consultation with the local communities is required to determine who the previous inhabitants were and to determine the possibility of infant burials. In the extent that such burials are confirmed a grave relocation process must be initiated. • It is recommended that an archaeologist monitor the earth moving activities during construction. • It is recommended that the burial site LD02 be preserved and a buffer fence of 20 meters constructed around the site. Grave relocation must only be considered as last resort. A detailed relocation process must be followed and it is recommended that an experienced consultant be appointed to manage the relocation process • It is recommended that the site LD13 be documented by means of a layout drawing and photographic documentation after

	situated just south of the northern boundary fence of the study area. The burial ground consists of approximately 10 graves.)	which a destruction permit must be applied for from the North West Provincial Heritage Authority prior to destruction
Visual	<ul style="list-style-type: none"> • Visual impacts of the proposed on-site PV facility (including associated infrastructure) during construction • Visual impacts of the proposed on-site PV facility during operation • Visual impacts of the proposed on-site PV facility associated infrastructure during operation 	<ul style="list-style-type: none"> • Carefully plan to reduce the construction period. • Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. • Vegetation clearing should take place in a phased manner. • Maintain a neat construction site by removing rubble and waste materials regularly. • Make use of existing gravel access roads where possible. • Limit the number of vehicles and trucks travelling to and from the proposed site. • Ensure that dust suppression techniques are implemented on all gravel access roads. • Ensure that dust suppression is implemented in all areas where vegetation clearing has taken place. • Ensure that dust suppression techniques are implemented on all soil stockpiles. • Light fittings for security at the proposed substation at night should reflect the light toward the ground and prevent light spill. • The O&M buildings should not be illuminated at night. • If overhead power lines are required, align power lines to run parallel to other linear elements and the farm boundaries, where possible. • Bury cables under the ground where possible. • The O&M buildings should be painted with natural tones that fit with the surrounding environment. • Select the alternatives that will have the least impact on visual receptors

		<ul style="list-style-type: none"> • Limit the number of maintenance vehicles which are allowed to access the site. • Ensure that dust suppression techniques are implemented on gravel access roads, where possible. • Non-reflective surfaces should be utilised where possible. • Ensure that the associated infrastructure are not located within 500m from any of the surrounding farmhouses, in order to limit the visual impact on these dwellings.
Socio-Economic	<ul style="list-style-type: none"> • Construction, and to some degree maintenance, of the proposed PV facility and infrastructure in the relevant sectors as a result of direct, indirect, and induced effects. • The proposed PV facility and associated infrastructure employment opportunities in FTE-person years • The construction of the proposed PV facility and associated infrastructure will sterilise the land demarcated for the proposed development. All current activities taking place on the land will be discontinued. • The proposed PV facility and associated infrastructure will require operating expenditure to maintain and operate the plant and this will increase the size of the local utility sector and stimulate the economic production through multiplier effects. 	<ul style="list-style-type: none"> • The In order to optimise the stimulation of the local economy through direct, indirect and induced effects, the following should be applied where possible: • Procure construction materials, goods, and products from local and domestic suppliers if feasible • Employ local contractors where possible • The proposed mitigation measures will possibly increase the positive impact in the local economy; however, this will not affect the weighting thereof. • The following is recommended to increase the employment opportunities created in the local communities, where feasible: • Employ labour-intensive methods in construction, where feasible. • Employ local residents and communities, where possible. • Sub-contract to local construction companies, where possible. • Utilise local suppliers, where possible. • The proposed mitigation measures could increase the positive impact on the local economy but would not change the total impact; therefore, the ratings assigned for the impact before mitigations will not be affected. • Rehabilitation of land should take place at the end of the project's life to allow for the land to be used for commercial livestock farming after the project's closure.

	<ul style="list-style-type: none"> The proposed PV facility and associated infrastructure will create jobs to support the operation and maintenance of the PV plant. 	<ul style="list-style-type: none"> If possible, goods and services should be procured from local small businesses and local contractors should be utilised to maximise the benefit to the local community. Where feasible, all labour positions should be filled by people from the local community.
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The impact rating of the proposed development according to each environmental aspect are provided in the tables below.

Key

Low negative	Low positive
Medium negative	Medium positive
High negative	High positive

Table ii: Impact rating summary for the PV facility and associated infrastructure during the construction phase

Environmental Aspect	Environmental Impacts	Impact Rating without Mitigation	Impact Rating with Mitigation
Biodiversity	Loss of indigenous natural vegetation	-57 (high negative)	-45 (medium negative)
	Loss of individuals of protected plants	-11 (low negative)	-9 (low negative)
	Damage to sensitive habitats	-57 (high negative)	-45 (medium negative)
	Mortality of individuals of sedentary terrestrial fauna	-26 (low negative)	-11 (low negative)
	Displacement of individuals of mobile terrestrial fauna	-8 (low negative)	-8 (low negative)
	Displacement of listed bird species due to construction disturbance	-8 (low negative)	-7 (low negative)
	Displacement of listed avifauna due to habitat destruction	-10 (low negative)	-8 (low negative)
Avifauna	Displacement of priority species due to disturbance associated with construction of the PV plant and associated infrastructure.	-39 (Medium negative)	-36 (Medium negative)

	Displacement of priority species due to habitat transformation associated with construction of the PV plant and associated infrastructure.	-42 (Medium negative)	-24 (low negative)
Surface Water	Pre-construction Impacts related to the Construction Lay-down Area wetlands	- 33 (medium negative)	- 7(low negative)
	Vehicle and Machinery Degradation Impacts to wetlands	- 30 (medium negative)	- 14 (low negative)
	Human degradation to fauna and flora associated with the wetlands	- 22 (low negative)	- 6 (low negative)
	Degradation and removal of soils and vegetation associated with the wetlands and the Associated Buffer Zones	- 42 (medium negative)	- 24 (low negative)
	Increased storm water run-off, erosion and increased sedimentation impacts	- 42 (medium negative)	- 8 (low negative)
Soils and Agricultural Potential	Soil Resources	- 20 (low negative)	- 20 (low negative)
Heritage	The possibility of encountering previously unidentified heritage resources and specifically Stone Age archaeological sites. As well as the impact on the identified archaeological sites	-16 (low negative)	-16 (low negative)
Palaeontology	The possibility of encountering previously unidentified heritage resources and specifically Paleontological sites. As well as the impact on the identified paleontological sites	-28 (high negative)	-6 (low negative)

Visual	Visual impacts of the proposed on-site PV facility (including associated infrastructure) during construction	-24 (low negative)	-20 (low negative)
Social-economic	Economic Production: An activity that uses inputs of varied nature to produce goods and services	12 (low positive)	12 (low positive)
	Employment measured in FTE-person years	12 (low positive)	12 (low positive)
	Loss of agricultural production	-13 (medium negative)	-13 (medium negative)
	Increased production and employment	11 (low positive)	11 (low positive)

Table iii: Impact rating summary for the proposed PV facility during the operational phase

Environmental Aspect	Environmental Impacts	Impact Rating without Mitigation	Impact Rating with Mitigation
Biodiversity	Collisions of listed avifauna with overhead power lines	-12 (medium negative)	-11 (low negative)
	Establishment and spread of declared weeds	-28 (medium negative)	-11 (low negative)
Avifauna	Mortality of priority species due to collisions with solar panels	-22 (low negative)	-22 (low negative)
	Entrapment of large-bodied birds in the double perimeter fence	-24 (low negative)	-22 (low negative)
	Collisions of priority species with the proposed 132kV line.	-26 (low negative)	-24 (low negative)
Surface Water	Vehicle damage to the wetlands	-48 (medium negative)	-39 (medium negative)
	Storm-water Run-off Impacts to wetlands	-28 (low negative)	-11 (low negative)
Visual	Visual impacts of the proposed on-site PV facility during operation	-36 (medium negative)	-36 (medium negative)
	Visual impacts of the proposed on-site PV facility associated infrastructure during operation	-17 (low negative)	-15 (low negative)

Social-economic	Economic Production: An activity that uses inputs of varied nature to produce goods and services	26 (low positive)	26 (low positive)
	Employment	12 (low positive)	12 (low positive)
	Improved Municipal Service Delivery	26 (low positive)	26 (low positive)

Table iv: Impact rating summary for the proposed PV facility during the decommissioning phase

Environmental Aspect	Environmental Impacts	Impact Rating without Mitigation	Impact Rating with Mitigation
Avifauna	Displacement of priority species due to disturbance associated with decommissioning of the PV plant and associated infrastructure.	-11 (low negative)	-10 (low negative)

An impact assessment was conducted to ascertain the level of each identified impact, as well as mitigation measures which may be required to reduce the impact of negative impacts and enhance the effect of positive impacts. The potential positive and negative impacts associated within these studies have been evaluated and rated accordingly. The results of the specialist studies have indicated that no fatal flaws exist as a result of the proposed development.

Leeudoringstad Solar Plant aims to, under the Engineering, Procurement and Construction (EPC) agreement, to "try to subcontract as much as possible – of course within the limits of what is commercially possible – to companies that are youth owned / owned by previously disadvantaged communities that meet the necessary quality standards and can offer competitive market related pricing." It must be noted that "In the event that it would not be possible to grant (parts) of the subcontracting to companies that are youth owned / owned by previously disadvantaged communities, the contractor engages to pay for scholarships for disadvantaged youth for the total amount of 50 000€"

The SPV, *Leeudoringstad Solar Plant*, is currently owned by Upgrade Energy South Africa (Pty) Ltd. Once Commercial Operation Date (COD) is accomplished, 100% of the *Leeudoringstad Solar Plant* shares will be transferred to the new owners of the proposed development SIG Energy (Pty) Ltd t/a SIG Energy Investments. Based on the Operation and Maintenance (O&M) agreement between Upgrade Energy South Africa (Pty) Ltd and SIG Energy (Pty) Ltd t/a SIG Energy Investments, the Operation and Maintenance of the proposed development will occur under an ad hoc O&M company registered as K2016388572 (South Africa (Pty) Ltd. K2016388572 (South Africa (Pty) Ltd will be jointly owned by SIG Energy (Pty) Ltd t/a SIG Energy Investments as the Operation and Maintenance company for 51% of the shares and Upgrade Energy NV as the EPC contractor for 49% of the shares.

A thorough Public Participation Process (PPP) is underway as part of the BA. During this BA process on-going consultation is taking place with various key stakeholders and organs of state, which include provincial, district and local authorities, relevant government departments, parastatals and Non-Governmental Organisations (NGO's) as well as directly affected and adjacent landowners.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended and the Environmental Impact Assessment (EIA) Regulations, under Government Notices No R982, R983, R984 and R985 promulgated on 08 December 2014, the public is hereby notified that the Draft Basic Assessment Report (DBAR) will be made available in hard copy for review and comments at the venues below. The DBAR will also available on the SiVEST website <http://www.sivest.co.za/Download.aspx> and CD (on written request). The DBAR review and comment period is from **Monday 14th November 2016 to Wednesday 14th December 2016** (end of business) at:

VENUE	STREET ADDRESS	HOURS	CONTACT NO
Leeudoringstad Library	Smuts Street, Leeudoringstad, 2891	Monday – Friday: 8h00 – 16h00 Saturday: 8h30 – 13h30	Tel: 018 581 2005 Tel: 018 581 2026

Leeudoringstad Solar Plant (Pty) Ltd

prepared by: SiVEST SA (Pty) Ltd

Proposed Construction of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power plant and associated infrastructure near Leeudoringstad, North West Province: Draft BA Report

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It is the opinion of the EAP that the information and data provided in this DBAR is sufficient to enable the DEA to consider all identified potentially significant impacts and to make an informed decision on the application. Further, it is the opinion of the EAP that based on the findings identified by specialists and the recommended mitigation measures listed in this BA, the proposed project should be granted an EA and allowed to proceed, provided the following conditions are adhered to:

- All mitigation measures recommended by the various specialist should be implemented, where practically possible.
- The proposed PV arrays should be constructed within the environmentally preferred PV array area.
- The environmentally preferred laydown area should be utilised during construction.
- The substation and Operation and Maintenance buildings should be constructed within the environmentally preferred areas.
- All onsite roads should be located within the authorised area for the PV array.
- Final EMPr should be approved by DEA prior to construction

SiVEST as the EAP is therefore of the view that, through the implementation of mitigation measures, together with adequate compliance monitoring, auditing and enforcement thereof by the appointed ECO as well as competent authority, the potential detrimental impacts associated with the proposed PV facility and associated infrastructure can be mitigated to acceptable levels.

It is trusted that the DBAR provides the reviewing authority with adequate information to make an informed decision regarding the proposed project.

LEEUDORINGSTAD SOLAR PLANT (PTY) LTD

PROPOSED CONSTRUCTION OF THE LEEUDORINGSTAD 5MW SOLAR PHOTOVOLTAIC (PV) POWER PLANT AND ASSOCIATED INFRASTRUCTURE ON THE PORTION 37 OF FARM LEEUW BOSCH NO. 44 NEAR LEEUDORINGSTAD, NORTH WEST PROVINCE

DRAFT BASIC ASSESSMENT REPORT

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List of Abbreviations

ATNS	Air Traffic Navigation Services
BA	Basic Assessment
BAR	Basic Assessment Report
BFD	Bird Flight Diverter
C&RR	Comments and Response Report
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
FTE	Full-Time Equivalent
GIS	Geographic Information System
GN	Government Notice
OHL	Overhead line
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (Act No.107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NFA	National Forests Act, 1998 (Act No. 84 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NW READ	North West Department of Rural, Environment and Agricultural Development
PDP	Provincial Development Plan
PGDS	Provincial Growth and Development Strategy
PPP	Public Participation Process
PV	Photovoltaic
RE	Renewable Energy
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency SOC Limited
SDF	Spatial Development Framework

SG Surveyor General
SHEQ Safety, Health, Environment and Quality
VIA Visual Impact Assessment

LEEUDORINGSTAD SOLAR PLANT (PTY) LTD

PROPOSED CONSTRUCTION OF THE LEEUDORINGSTAD 5MW SOLAR PHOTOVOLTAIC (PV) POWER PLANT AND ASSOCIATED INFRASTRUCTURE ON THE PORTION 37 OF FARM LEEUWBOSCH NO. 44 NEAR LEEUDORINGSTAD, NORTH WEST PROVINCE

DRAFT BASIC ASSESSMENT REPORT

INTRODUCTION

Leeudoringstad Solar Plant (Pty) Ltd (hereafter referred to as "*Leeudoringstad Solar Plant*") are proposing to construct two (2) 5MW Solar Photovoltaic (PV) Power Plants and associated infrastructure on Farm Wildebeestkuil 59 and Farm Leeuwbosch 44, approximately 15km east of Leeudoringstad, North West Province. The proposed PV Plants are located within the Maquassi Hills Local Municipality. The overall objective of the project is to generate electricity to feed into the municipal electricity grid.

The generated electricity will be purchased by PowerX (Pty) Ltd (here after referred to as "PowerX"). One of the aims of PowerX is to enable electricity generation within local municipalities. PowerX hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and wheel the power using the national transmission and distribution network, to its customers. The purchased electricity will be sold directly to commercial and light industrial consumers within the Maquassi Hills Local Municipality and the customers electricity bill will get off-set by the Maquassi Hills Local Municipality.

Each PV Solar Plant will be developed under the same Special Purpose Vehicle (SPV). The SPV, *Leeudoringstad Solar Plant* is currently owned by Upgrade Energy South Africa (Pty) Ltd. Once Commercial Operation Date (COD) is accomplished, 100% of the *Leeudoringstad Solar Plant* shares will be transferred to the new owners of the proposed development SIG Energy (Pty) Ltd t/a SIG Energy Investments.

A Basic Assessment (BA) Processes will be undertaken for each PV facility as they are located on separate properties which are approximately 1km apart. The BAs will be conducted in terms of the 2014 EIA Regulations promulgated in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), which came into effect on the 8th of December 2014. In terms of these regulations, Basic Assessments (BAs) will be required for each PV power plant. As such, two (2) separate BA processes will be undertaken, one for each proposed PV power plant. Although each PV power plant will be assessed separately, a single combined public participation process is being undertaken for both of the proposed projects. The potential environmental impacts associated with both

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projects will be assessed separately during the BA process, as well as the assessment of the cumulative impacts.

This Basic Assessment is for the proposed development of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power Plant and associated infrastructure on Portion 37 of the Farm Leeuwbosch No. 44, approximately 15km east of Leeudoringstad, North West Province (hereafter referred to as the “proposed development”).

All relevant legislations and guidelines (including Equator Principles) will be consulted during the BA processes and will be complied with at all times. Upgrade Energy has therefore appointed SiVEST SA (Pty) Ltd (hereafter referred to as SiVEST) as the independent environmental assessment practitioner (EAP), to undertake the required BA processes in terms of the NEMA.

1. PROJECT DESCRIPTION

The proposed development will include the construction of a PV power plant and associated infrastructure.

The following key components are to be constructed for each PV Power Plant:

- Solar PV Field;
- PV solar panels and arrays
- PV Panel mountings / Single axis tracking
- DC-AC current inverters and transformers (10 x 500 kVA (2.5m x 1m) within the PV field);
- Mini Substations (3m x 2 m within the PV field).

Typically, PV plants use semi-conductor materials to convert sunlight directly into electricity (**Figure 1**). The solar panels can be fixed or they can be installed to track the sun.

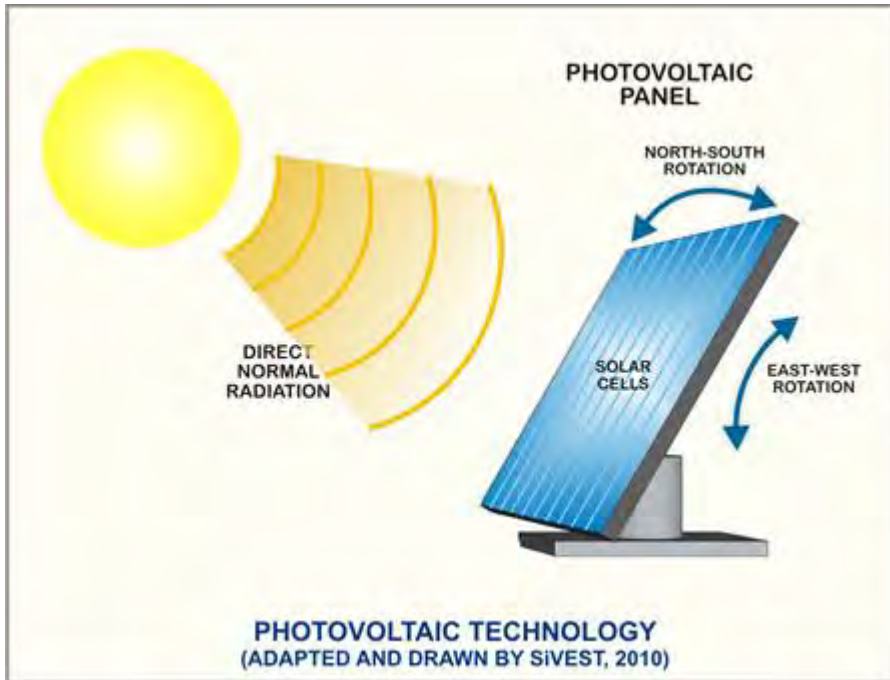


Figure 1: Typical Solar PV Panel

In terms of the associated infrastructure required for the proposed developments, the following is to be constructed:

- Coupling station (approximately 10m x 10m);
- 132kV power line from the Leeudoringstad 5MW Solar Photovoltaic (PV) Power Plant to Leeudoringstad 88/11kV Substation;
- Underground cabling (approximately 0,8 m x 0,6 wide);
- Small site office and storage facility (approximately 10m x 10m) - including security and associated facilities;
- Internal gravel roads (4m width);
- Site fencing.

The solar panels are generally configured in banks of arrays or sub-arrays depending on the number of PV panels used and the size of the arrays (**Figure 2**). The rows of PV panels are spaced both to allow access to vehicles during maintenance and to ensure that one array or one sub-array does not cast a shadow over the one behind. The electricity is cabled to inverters, which convert DC power to AC and synchronised to the electricity grid. The output is connected through various switchgear, protection devices and meters to local users and the grid. The inverters, switchgear and other electrical equipment are standard items as used for a wide range of industrial applications. The other major operating component of the system is the inverter, which converts the DC power produced by the solar modules into AC power before being sent to the grid.

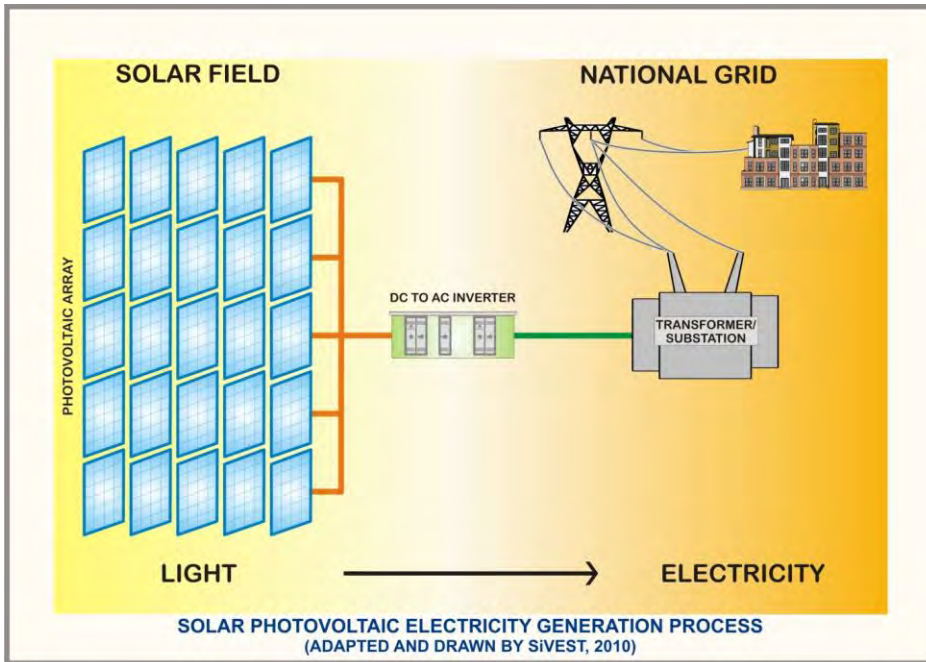


Figure 2: Conceptual illustration of the electricity generation process.

The proposed development is located on the Farm Leeuwbosch 44, approximately 15km east of Leeudoringstad, North West Province. The proposed PV Plant is located within the Maquassi Hills Local Municipality. The proposed development is located directly west of the existing Harvard Substation, where existing electricity supply is connected. The proposed developments will link into Leeudoringstad 88/11kV Substation.

A Site Locality Map for the proposed project has been provided in **Figure 3** below.

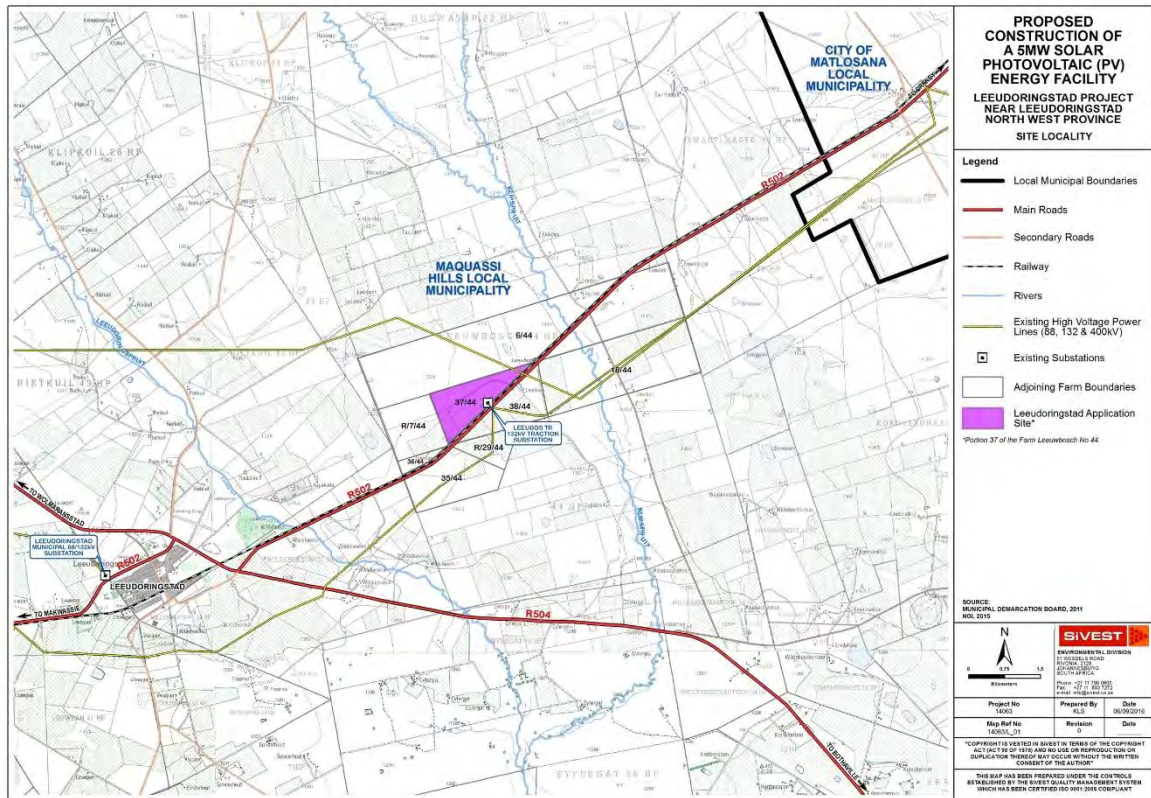


Figure 3: Site Locality Map

A 500m wide corridor was assessed for the proposed power line. The final servitude will be routed within the 500m wide corridor, and it is expected that the servitude will not exceed 31 m. No alternatives were assessed for the power line corridor, which is shown in **Figure 5** below, however four (4) layout alternatives for the PV facility were assessed. The PV facility layout alternatives have been provided in **Figure 4** below.

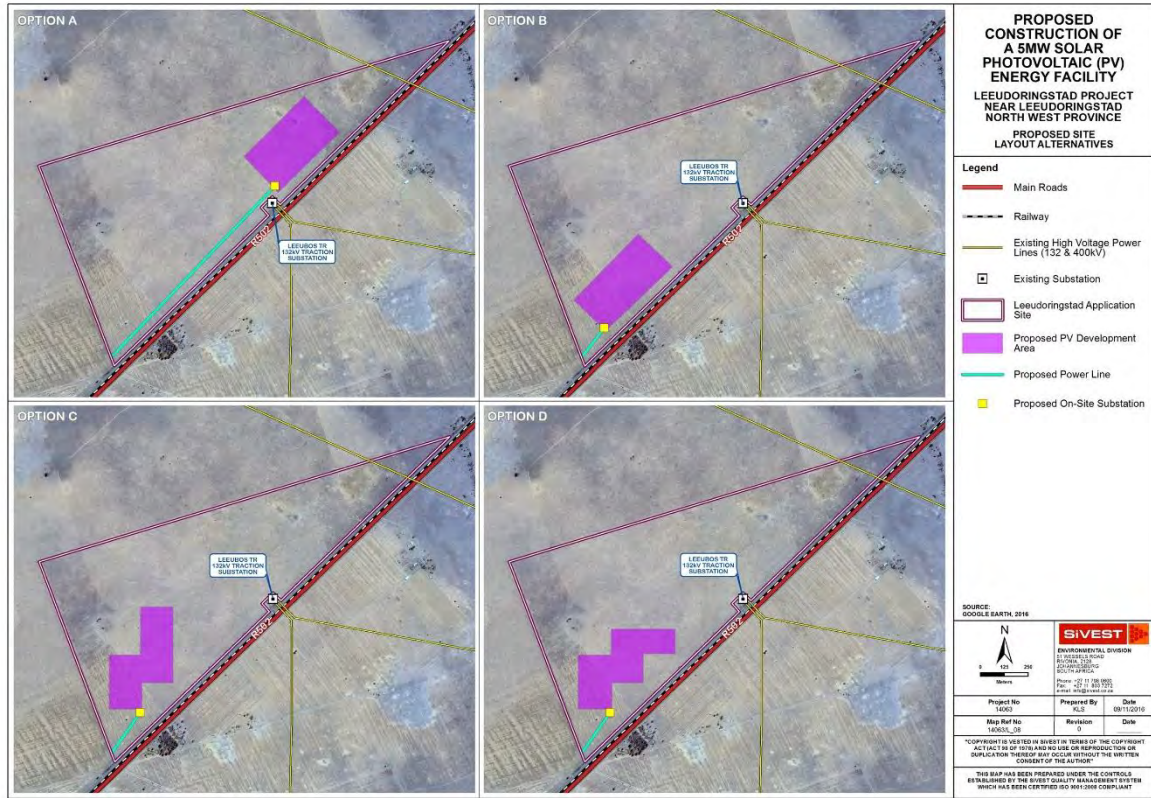


Figure 4: PV Facility Layout Alternatives Map

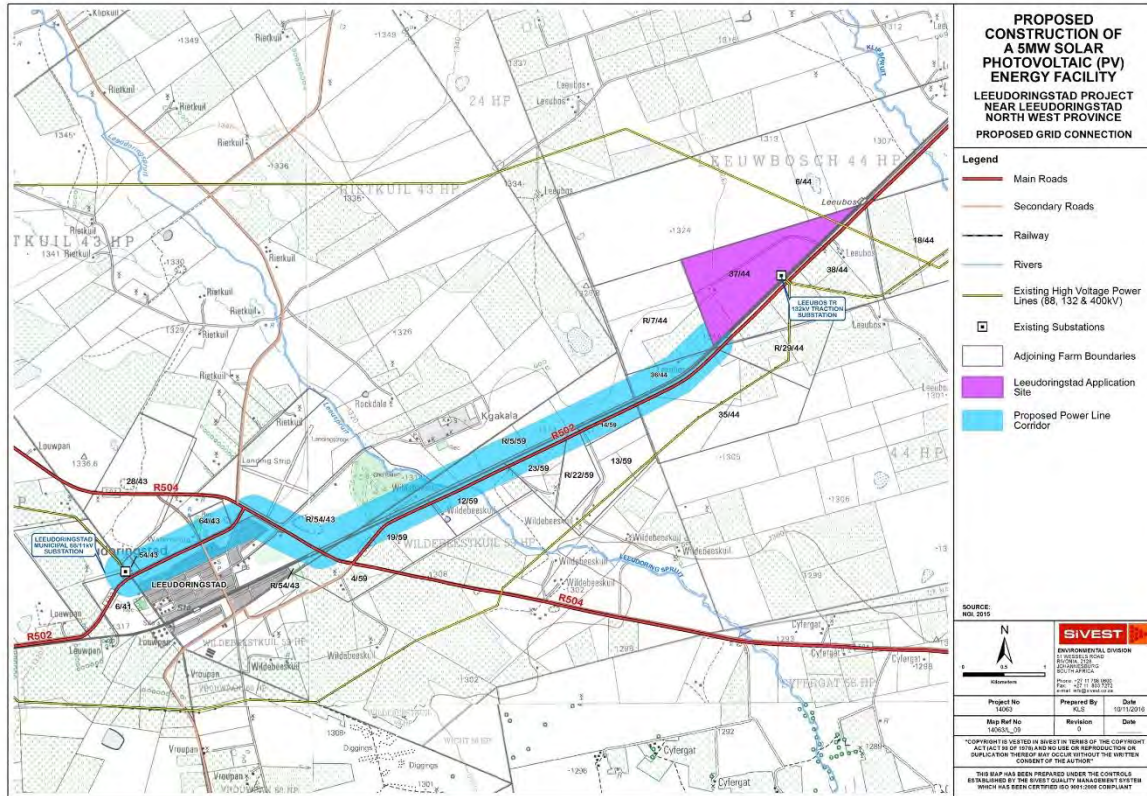


Figure 5: Grid Connection Map

2. BRIEF DESCRIPTION OF THE RECEIVING ENVIRONMENT

The proposed project is located within the North West Province approximately 15km east of Leeudoringstad, North West Province (hereafter referred to as the “proposed development”). A regional context map has been provided in **Figure 6** below. The proposed PV Plant is located within the Maquassi Hills Local Municipality. The proposed development is located directly west of the existing Harvard Substation, where existing electricity supply is connected. The proposed developments will link into Leeudoringstad 88/11kV Substation.

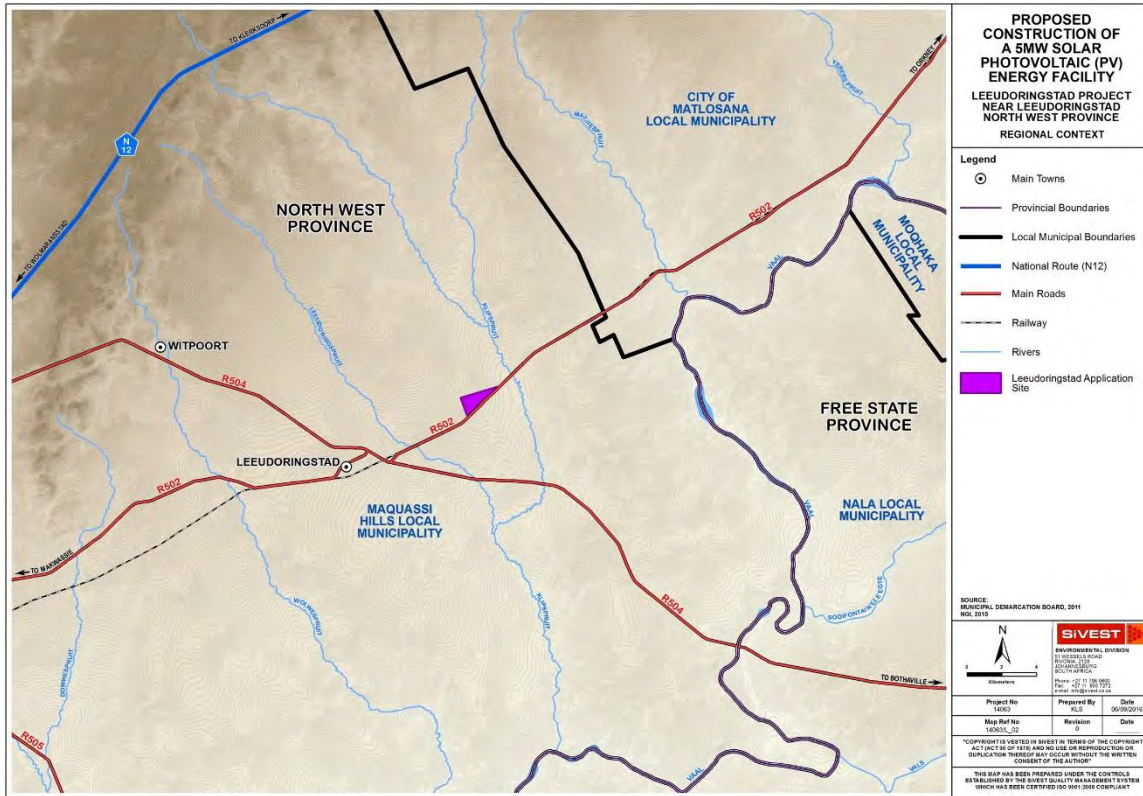


Figure 6: Regional Locality Map

3. EXPERTISE OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

The proposed development requires Environmental Authorisation (EA) from the Department of Environmental Affairs (DEA). However, the provincial authority will also be consulted (i.e. the NW READ). The BA for the proposed development will be conducted in terms of the EIA Regulations promulgated in terms of Chapter 5 NEMA (National Environmental Management Act), which came into effect on the 8th of December 2014. In terms of these regulations, a full BA is required for the proposed project. All relevant legislations and guidelines (including Equator Principles) will be consulted during the BA process and will be complied with at all times.

SiVEST has considerable experience in the undertaking Environmental Authorisation processes. Staff and specialists who have worked on this project and contributed to the compilation of this Scoping Report are detailed in Table 1 below.

Table 1: Project Team

Name and Organisation	Role
Andrea Gibb – SiVEST	EAP, Senior Environmental Practitioner and Visual specialist

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Name and Organisation	Role
Veronique Evans - SiVEST	Environmental Consultant / Public Participation Practitioner
Stephan Jacobs - SiVEST	Environmental Consultant / Public Participation Practitioner, Visual and Surface Water assistant
Simon Todd Consulting - Simon Todd	Biodiversity specialist
Chris van Rooyen Consulting – Chris van Rooyen	Avifauna specialist
Shaun Taylor - SiVEST	Surface Water specialist
Garry Paterson - Agricultural Research Council (ARC): Institute for Soil, Climate and Water	Agricultural Potential and Soils specialist
Wouter Fourie - PGS	Heritage and Palaeontology specialist
Elena Broughton - Urban Econ	Socio-Economic specialist
Kerry Schwartz – SiVEST	GIS and Mapping and Visual technician

As per the requirements of the NEMA (2014), the details and level of expertise of the persons who prepared the DBAR are provided in Table 2 below.

Table 2: Expertise of the EAP

Environmental Practitioner	SiVEST (Pty) Ltd – Andrea Gibb
Contact Details	andrea@sivest.co.za
Qualifications	BSc Landscape Architecture and BSc (Hons) Environmental Management
Expertise to carry out the EMP	<p>Andrea has 8.5 years' work experience and specialises in undertaking and managing Environmental Impact Assessments (EIAs) and Basic Assessment (BAs), primarily related to energy generation and electrical distribution projects. She also specialises in undertaking visual impact and landscape assessments, by making use of ArcGIS technology and field surveys. She has extensive experience in overseeing public participation and stakeholder engagement processes and has been involved in environmental baseline assessments, fatal flaw / feasibility assessments and environmental negative mapping / sensitivity analyses. From a business and administrative side, Andrea is actively involved in maintaining good client relationships, mentoring junior staff and maintaining financial performance of the projects she leads.</p> <p>Environmental Impact Assessments and Basic Assessments:</p> <ul style="list-style-type: none"> ▪ EIA for the proposed construction of a 75MW Solar Photovoltaic (PV) Power Plant near Dennenilton, Limpopo Province. ▪ EIA for the proposed development of the Dwarsrug Wind Farm near Loeriesfontein, Northern Cape Province. ▪ BA for the proposed construction of two 132kV power lines and associated infrastructure from the Redstone Solar Thermal Power Project site to the Olien MTS near Lime Acres, Northern Cape Province.

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	<ul style="list-style-type: none"> ▪ BA for the proposed construction of two 132kV power lines and associated infrastructure from Silverstreams DS to the Olien MTS near Lime Acres, Northern Cape Province. ▪ BA for the proposed Construction of the SSS1 5MW Solar Photovoltaic (PV) Plant on the Western Part of Portion 6 (Portion of Portion 5) of Farm Spes Bona 2355 near Bloemfontein, Free State Province. ▪ BA for the proposed Construction of the SSS2 5MW Solar Photovoltaic (PV) Plant on the Eastern Part of Portion 6 (Portion of Portion 5) of Farm Spes Bona 2355 near Bloemfontein, Free State Province. ▪ BA for the proposed Mookodi Integration Phase 2: Proposed Construction of a 132kV power line from the proposed Bophirima Substation to the existing Schweizer-Reneke Substation, North West Province. ▪ BA for the proposed Mookodi Integration Phase 2: Proposed Construction of a 132kV power line from the Mookodi Substation to the existing Magopela Substation, North West Province. ▪ BA for the proposed Mookodi Integration Phase 2: Proposed Construction of the Mookodi - Ganyesa 132kV power line, proposed Ganyesa Substation and Havelock LILO, North West Province. ▪ Amendment of the Final Environmental Impact Report for the Proposed Mookodi 1 Integration Project near Vryburg, North West Province. ▪ BA for the proposed 132kV power line and associated infrastructure for the proposed Redstone Solar Thermal Energy Plant near Lime Acres, Northern Cape Province. ▪ BA for the proposed construction of a 132kV power line and substation associated with the 75MW Photovoltaic (PV) Plant on the Farm Droogfontein (PV 3) in Kimberley, Northern Cape Province. ▪ BA for the proposed establishment of a Learning and Development Retreat and an Executive Staff and Client Lodge at Mogale's Gate, Gauteng Province. ▪ Amendment application in order to increase the output of the proposed 40MW PV Facility on the farm Mierdam to 75MW, Northern Cape Province. ▪ BA for the proposed construction of a power line and substation near Postmasburg, Northern Cape Province. ▪ BA for the proposed West Rand Strengthening Project – 400kV double circuit power line and substation extension in the West Rand, Gauteng. ▪ EIA for the proposed construction of a wind farm and PV plant near Prieska, Northern Cape Province. ▪ Public Participation assistance as part of the EIA for the proposed Thyspunt Transmission Lines Integration Project – EIA for the proposed construction of 5 x 400kV transmission power lines between Thyspunt to Port Elizabeth, Eastern Cape Province.
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	<ul style="list-style-type: none"> ▪ EIA assistance for the proposed construction of three Solar Power Plants in the Northern Cape Province. ▪ Public Participation as part of the EIA for the proposed Delareyville Kopela Power Line and Substation, North West Province. ▪ Public Participation as part of the EIA for the Middelburg Water Reclamation Project, Mpumalanga Province.
Environmental Consultant	SiVEST (Pty) Ltd – Veronique Evans
Contact Details	veronique@sivest.co.za
Qualifications	BSc Environmental Conservation and Ecology, Zoology and Geography, BSc (Hons), Environmental Science in Conservation and Ecology, MSc Environmental Science in Conservation and Ecology
Expertise to carry out the EMPr	<p>Veronique has 5 years of experience and has been involved with the public participation aspect on numerous projects including Environmental Impact Assessments, Water Use License applications and amendment impact assessments. She has been involved in the compilation of Environmental Impact Assessment (EIA) and Basic Assessments (BA) and Environmental Management Plans primarily related to energy generation and electrical distribution projects. She also assists and undertakes visual impact assessments, by making use of ArcGIS technology and undertaking field surveys.</p> <p>Environmental Impact Assessments and Basic Assessments:</p> <ul style="list-style-type: none"> ▪ Basic Assessment (BA) and Environmental Management Plan (EMPr) for the Ermelo-Richards Bay Coal Line Upgrade Project: Proposed Development of the Duma 400kv Main Transmission Station and Associated 88kv and 400kv turn in Power Lines Near Ulundi, Kwazulu-Natal Province (2013/2015) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the Ermelo-Richards Bay Coal Line Upgrade Project: Proposed Development of the New Nzalo (Mqwabe) 400/88 Kv, 160mva Substation With Associated 88kv And 400kv Turn-In Power Lines East of Vryheid, Kwazulu-Natal, South Africa (2013/2015) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the Ermelo-Richards Bay Coal Line Upgrade Project: Proposed Development of the Vryheid Traction Station and the Associated Eskom Turn In Power Lines In Kwazulu- Natal, South Africa (2013/2015) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the Ermelo-Richards Bay Coal Line Upgrade Project: Proposed Development of the Sheepmoor Traction Station and Two New

	<p>Associated 88/25kv Turn In Lines with 20mva Transformer Bays, Mpumalanga Province, South Africa (2013/2015) SiVEST - Graduate Environmental Consultant;</p> <ul style="list-style-type: none"> ▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the Ermelo-Richards Bay Coal Line Upgrade Project: Proposed Rebuild of the 88kv Power Line from Uitkoms Substation to Antra T-Off, Approximately 3.5km in length, Mpumalanga Province, South Africa (2013/2015) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the Ermelo-Richards Bay Coal Line Upgrade Project: Proposed Upgrade of the 24 Km Twin Wolf Power Lines from Normandie To Hlungwana Substation in Mpumalanga and Kwazulu-Natal, South Africa (2013/2015) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the Ermelo-Richards Bay Coal Line Upgrade Project: Proposed Upgrade of 11.27km of the Umfolozi to Eqwasha Twin Wolf Eskom Power Line and 0.5km of the Umfolozi to Dubula Twin Wolf Eskom Power Line in Kwazulu-Natal, South Africa (2013/2015) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the proposed construction of a 132kv Power Line, Substation and the extension of Homestead Substation associated with the Concentrating Photovoltaic (CPV) / Photovoltaic (Pv) Plant (PV 3) on the Farm Droogfontein in Kimberley, Northern Cape Province (2012/2013) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental Management Programme (EMPr) for the Proposed Mookodi Integration Phase 2 132kv Power Lines and Ganyesa Substation Near Vryburg, North West Province (2012) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) for the upgrade of the Silver Lakes outfall sewer pipeline (2012) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental Management Programme (EMPr) for the Proposed construction of the Sheepmoor traction substation with two 20MVA transformer bays and a new associated 88kV turn-in power line, Mpumalanga Province (2013) SiVEST - Graduate Environmental Consultant; ▪ Basic Assessment (BA) and Environmental Management Programme (EMPr) for the Proposed rebuild of the 88kV power line from Uitkoms substation to Antra T-off, Mpumalanga Province (2013) SiVEST - Graduate Environmental Consultant; ▪ EIA for the proposed 25 MW Community Wind Farm in St Helena Bay, Western Cape Province. The EIA includes the scoping process and detailed environmental impact assessment. The project includes
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	<p>detailed specialist studies such as social, visual and biophysical as well as a full public participation process. Junior Environmental Scientist. Just Energy, 2011 -2012, closed.</p> <ul style="list-style-type: none"> ▪ EIA for the proposed 300 MW Caledon Wind Farm, Western Cape Province. The EIA includes the scoping process and detailed environmental impact assessment. The project includes detailed specialist studies such as social, visual and biophysical as well as a full public participation process. Junior Environmental Scientist, GIBB. Caledon Wind, 2011 – 2012, closed. ▪ EIA and EMP for the proposed South African Nuclear Energy Corporation (Necsa) Dedicated Isotope Production Reactor (DIPR) at the Pelindaba Site near Hartebeespoort in the North West Province. The EIA includes the scoping process and detailed environmental impact assessment. The project includes detailed specialist studies such as social, visual and air quality as well as a full public participation process. Junior Environmental Scientist, GIBB. Necsa, 2011 -current. ▪ BA for the proposed 25 MW Community Wind Farm in St Helena Bay, Western Cape Province. The BA includes the scoping process and detailed environmental impact assessments. The project includes detailed specialist studies such as social, visual and biophysical as well as a full public participation process. Junior Environmental Scientist, GIBB. Just Energy, 2012 - current.
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4. BASIC ASSESSMENT REPORT STRUCTURE

- **Section A** describes the activity and technical project components, including the proposed alternatives, location and physical size of the activity. This section also provides an activity motivation by describing the need and desirability for the proposed project. Section A expands on the legal ramifications applicable to the project and describes relevant development strategies and guidelines. Finally the section explains the infrastructural requirements of the proposed project such as waste, effluent, emission water use and energy efficiency.
- **Section B** provides a description of the site and region in which the proposed development is intended to be located. Although the chapter provides a broad overview of the region, it is also specific to the application.
- **Section C** describes the Public Participation Process (PPP) undertaken during the Basic Assessment and tables issues and concerns raised by Interested and Affected Parties (I&APs).
- **Section D** identifies potential issues associated with the proposed project by outlining the impacts that may result from the planning, design, construction, operational, decommissioning and closure phases. Section D also provides a description of the mitigation and management measures for each potential impact. The section concludes with an Environmental Impact Statement which summarises the impacts that the proposed development may have on the environment.
- **Section E** outlines the recommendations of the Environmental Assessment Practitioner (EAP).

The content requirements of a Basic Assessment Report (BAR) as detailed in Appendix 1 of the EIA Regulations, 2014, as well as details of the section within this report that fulfils these requirements, are shown in **Table 3** below.

Table 3: Content requirements for a BAR

Content Requirements	Applicable Section
(a) details of- (i) the EAP who prepared the report; and	Page ii Section 3
(ii) the expertise of the EAP, including a curriculum vitae;	Section 3 Appendix H
(b) the location of the activity, including- (i) the 21 digit Surveyor General code of each cadastral land parcel;	Section B
(ii) where available, the physical address and farm name;	Section B
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	N/A
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-	Executive Summary Section 1
(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	Section A(2)(a)
(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	N/A
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered and applied for; and	Section A(1)(b)
(ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Section A(1)(a)
(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section A(11)

(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section A(10)
(g) a motivation for the preferred site, activity and technology alternative;	Section D(2)
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including:	Section D(2)
(i) details of all the alternatives considered;	Section (A)(2)(a)
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section (C) Appendix E
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section C(3) Appendix E(3)
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section D(1) Appendix F
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section D(1) Appendix F
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Appendix F
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section D(1) Appendix F
(viii) the possible mitigation measures that could be applied and level of residual risk;	Section E Appendix F
(ix) the outcome of the site selection matrix;	Section D(2)
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	N/A
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section E

<p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including-</p> <ul style="list-style-type: none"> (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures; 	<p>Section D(1) Appendix F</p>
<p>(j) an assessment of each identified potentially significant impact and risk, including-</p> <ul style="list-style-type: none"> (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated; 	<p>Appendix F</p>
<p>(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;</p>	<p>Appendix F</p>
<p>(l) an environmental impact statement which contains-</p> <ul style="list-style-type: none"> (i) a summary of the key findings of the environmental impact assessment; 	<p>Section E</p>
<ul style="list-style-type: none"> (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives; 	<p>Section D(1)</p>
<p>(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;</p>	<p>Section E</p>
<p>(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;</p>	<p>Section E</p>

(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 5
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section E
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	Section E
(r) an undertaking under oath or affirmation by the EAP in relation to: <ul style="list-style-type: none"> (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties. 	Appendix H
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t) any specific information that may be required by the competent authority; and	No specific information has been required by the competent authority.
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	All requirements in terms of section 24(4)(a) and (b) of the Act have been met in this report.

5. ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations have been taken into account when compiling this DBAR:

- It is assumed that all technical information provided by Upgrade Energy is technically acceptable and accurate;
- The proposed development is still in the planning stages and therefore some of the specific technical details are not available;
- The following assumptions, uncertainties and gaps in knowledge were encountered by various specialists:

○ **Biodiversity**

- A desktop scoping study to broadly describe and characterise the study area in terms of:
 - Vegetation types and/or habitats;
 - Red Data (threatened and endangered) flora and fauna species (excluding avifauna and bats);
 - The potential presence of trees protected according to the National Forests Act and fauna and flora protected under the National Environmental Management: Biodiversity Act;
 - Critical Biodiversity Areas (CBAs);
 - The general status of vegetation on site; and
 - Potential impact on biodiversity, sensitive habitats and ecosystem functioning.
- Red List species are, by their nature, usually very rare and difficult to locate. Compiling the list of species that could potentially occur in an area is limited by the paucity of collection records that make it difficult to predict whether a species may occur in an area or not. The methodology used in this assessment is designed to reduce the risks of omitting any species, but it is always possible that a species that does not occur on a list may be unexpectedly located in an area.

○ **Avifauna**

- The focus of the study is primarily on the potential impacts on priority species which were defined as follows:
 - South African Red Data species;
 - South African endemics and near-endemics;
 - Waterbirds; and
 - Raptors
- The impact of solar installations on avifauna is a new field of study, with only one scientific study published to date (McCrary et al. 1986), and one unpublished scientific study on the impact of PV facilities on avifauna in South Africa (Visser 2016). Strong reliance was therefore placed on expert opinion and data from existing monitoring programmes at solar facilities in the USA which have recently (2013 - 2015) commenced with avifaunal monitoring. The pre-cautionary principle was applied throughout as the full extent of impacts on avifauna at solar facilities is not presently known.
- The assessment of impacts is based on the baseline environment as it currently exists at the proposed development area.
- Cumulative impacts include all solar PV projects within a 30km radius that currently have open applications or have been approved by the Competent Authority.
- Conclusions in this study are based on experience of these and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will be valid under all circumstances.

- The preliminary findings of this study will be subject to a ground-truthing exercise when the site is visited in November 2016.
- **Surface Water**
 - This study has focused on a short term study whereby the identification, delineation and assessment of surface water resources found within the study site has been undertaken. A detailed in-field delineation of all surface water resources in the wider area has not been undertaken. Additionally, given the short term nature of the study, the study should not be undertaken to be a comprehensive study of vegetation and faunal species occurrence for the surface water resources on the study site.
 - A Global Positioning System (GPS) device was used to groundtruth surface water resources as well as for delineation purposes. The GPS is expected to be accurate from 5m up to 15m depending on meteorological conditions.
 - It must be noted that the Present Ecological Status (PES) was not assessed in this study for the artificial wetlands. The WET Health methodology (Macfarlane et al., 2009) focuses on natural wetlands and assessing the deviation from the reference natural condition. Artificial wetlands are created and therefore do not have a reference condition from which to assess since they are created for specific purposes and are not naturally occurring systems.
 - The WET-EcoServices (Kotze et al., 2009) methodology is limited to wetlands. This was not applied to any watercourses (including riparian habitats and drainage lines) identified.
 - Groundwater, hydrology, aquatic studies of fish, invertebrates, amphibians etc. have also not been included in this study.
 - As an avifaunal component to the biodiversity assessment is being carried out for this project, impacts as related to avi-fauna are not included in this report. It is assumed that potential impacts to avifauna are included in the biodiversity assessment.
- **Soils and Agricultural Potential**
 - No assumptions and limitations were presented by the Soils and Agricultural Potential Specialist.
- **Heritage and Paleontology**
 - Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the development area. Various factors account for this, including the subterranean nature of some archaeological sites. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.
- **Visual**
 - A high level landscape characterisation has been undertaken and potentially sensitive visual receptors that could possibly be impacted by the proposed development have been identified. A detailed Visual Impact Assessment (VIA) has

not been undertaken and no viewsheds have been prepared. The need for a detailed VIA will be determined by the public participation process

- Given the nature of the receiving environment and the height of the proposed PV panels, the study area or visual assessment zone is assumed to encompass a zone of 5km from the proposed PV energy facility – i.e. all areas within a 5km radius of the application site. The 5km radius was assigned as distance is a critical factor when assessing visual impacts and although the proposed development may still be visible from areas outside the 5km radius, the degree of visual impact would diminish considerably. Thus the need to assess the impact on potential receptors outside the visual assessment zone would not be warranted.
- Due to the extensive number of farmsteads and residential dwellings located within 5km of the application site, which could potentially be sensitive to the proposed development, the identification and impact assessment rating on potentially sensitive visual receptor locations was based on a desktop assessment as well as field-based observation. Google Earth imagery was used to identify potentially sensitive receptor locations within the study area.
- It should be noted that the ‘experiencing’ of visual impacts is subjective and largely based on the perception of the viewer or receptor. A number of broad assumptions were made in terms of the sensitivity of the receptors to the proposed development. This is usually dependent on the use of the facility and the economic dependency on the natural / untransformed quality of views from the facility. Sensitive receptor locations typically include sites that are likely to be adversely affected by the visual intrusion of the proposed development. They include; tourism facilities and residential dwellings within natural / rural settings. Therefore, not all receptor locations would necessarily perceive the proposed development in a negative way.
- No viewsheds were generated during this visual study, as the topography within the study area is relatively flat. Within this context, minor topographical features, vegetative screening, or man-made structures would be important factors which would influence the degree of visibility and which would not be factored in by the viewsheds.
- Visualisation modelling has not been undertaken for the proposed development as it was not deemed to be necessary. Should the need for visualisation modelling be proven by stakeholder / I&AP feedback, then this will be able to be incorporated into this assessment.
- No feedback regarding the visual environment has been received from the public participation process to date. Any feedback relevant to the visual environment received will be incorporated into further drafts of this report.
- Operational and security lighting will be required for the PV facility and on-site switching substation proposed within the development footprint. At the time of undertaking the visual study no information was available regarding the type and intensity of lighting required and therefore the potential impact of lighting at night has not been assessed at a detailed level. General measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been provided.

o **Socio-Economic**

- Project-related information supplied by the environmental practitioner and the client for the purpose of the analysis is assumed to be reasonably accurate.
- The secondary data sources used to compile the socio-economic baseline (demographics, dynamics of the economy) although not exhaustive, can be viewed as being indicative of broad trends within the study area.
- Possible impacts, as well as stakeholder responses to these impacts, cannot be predicted with complete accuracy, even when circumstances are similar and these predictions are based on research and years of experience, taking the specific set of circumstance into account.
- Limited timeframes were allocated for the study. However, it is believed that the data gathered from various I&APs is sufficient to confidently predict the potential socio-economic impacts of the proposed project and objectively evaluate their significance. This is assuming that:
 - Questions asked during the interviews were answered accurately and truthfully by respondents and to the best of their abilities and knowledge.
 - That the attitudes of the respondents towards the project will remain reasonably stable over the short- to medium-term.
 - The focus on the primary data collection was on those parties that were perceived to be most sensitive to the proposed project. As such, it is believed that the study was able to identify the most significant impacts and assess the most pertinent issues.

SECTION A: ACTIVITY INFORMATION

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

YES/

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

Leeudoringstad Solar Plant (Pty) Ltd (Hereafter referred to as "*Leeudoringstad Solar Plant*") are proposing to construct one (1) 5MW Solar Photovoltaic (PV) Power Plant and associated infrastructure on Farm Leeuwbosch 44, approximately 15km east of Leeudoringstad, North West Province (hereafter referred to as the "proposed development"). The proposed PV Plant is located within the Maquassi Hills Local Municipality. The overall objective of the project is to generate electricity to feed into the municipal electricity grid.

The generated electricity will be purchased from Leeudoringstad Solar Plant by PowerX (Pty) Ltd (here after referred to as "PowerX"). One of the aims of PowerX is to enable electricity generation within local municipalities. PowerX hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and wheel the power using the national transmission and distribution network, to its customers. The purchased electricity will be sold directly to commercial and light industrial consumers within the Maquassi Hills Local Municipality and the customers' electricity bill will get off-set by the Maquassi Hills Local Municipality.

The PV Solar Plant will be developed under a separate Special Purpose Vehicle (SPV) and requires Environmental Authorisation. The SPV, Leeudoringstad Solar Plant (Pty) Ltd is currently owned by Upgrade Energy South Africa (Pty) Ltd. Once Commercial Operation Date (COD) is accomplished, 100% of the Leeudoringstad Solar Plant (Pty) Ltd shares will be transferred to the new owners of the proposed development SIG Energy (Pty) Ltd t/a SIG Energy Investments.

The following key components are to be constructed for each PV Power Plant:

- Solar PV field;
- PV solar panels and arrays
- PV panel mountings / Single axis tracking
- DC-AC current inverters and transformers (10 x 500 kVA (2.5m x 1m) within the PV field);
- Mini substations (3m x 2 m within the PV field).

In terms of the associated infrastructure required for the proposed development, the following is to be constructed:

- Coupling station (approximately 10m x 10m);
- 132kV power line from the Leeudoringstad 5MW Solar Photovoltaic (PV) Power Plant to Leeudoringstad 88/11kV Substation;

Leeudoringstad Solar Plant (Pty) Ltd

prepared by: SiVEST SA (Pty) Ltd

Proposed Construction of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power plant and associated infrastructure near Leeudoringstad, North West Province: Draft BA Report

Revision No. 1

15 November 2016

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- Underground cabling (approximately 0,8 m x 0,6 wide);
- Small site office and storage facility (approximately 10m x 10m) - including security and associated facilities;
- Internal gravel roads (4m width);
- Site fencing.

The proposed power line will consist of a series of towers located approximately 200m to 250m apart. The type of power line towers will be determined during the final design stages of the power line. The height will vary based on the terrain, but will ensure minimum overhead line (OHL) line clearances with buildings and surrounding infrastructure. The exact location of the towers will be determined during the final design stages of the power line.

A power line corridor of approximately 500m wide is being proposed to allow flexibility when determining the final route alignment. The final servitude will be determined during the BA process, but it is expected that the servitude will not exceed 31 m

The length of the power line will be approximately 8km. The proposed development is located west of the Harvard Substation, where existing supply is taken. The proposed development will link into Leeudoringstad 88/11kV Substation.

Four (4) Layout alternatives are proposed for the PV facility and will be assessed during the Basic Assessment Process.

b) Provide a detailed description of the listed activities associated with the project as applied for

Detailed description of listed activities associated with the project	
Listed activity as described in GN R 983, 984 and 985	Description of project activity that triggers listed activity
<p>GN R. 983 Item 1: <i>The development of facilities or infrastructure for the generation of electricity from a renewable resource where –</i></p> <p><i>(ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare;</i></p> <p><i>excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area.</i></p>	<p>The proposed project will entail the development of a 5MW PV power plant. It is proposed that the development area will be in excess of 1ha and is located outside and urban area.</p>
<p>GN R. 983 Item 11: <i>The development of facilities or infrastructure for the</i></p>	<p>An onsite substation is required to connect the PV energy facility to the national grid. The proposed</p>

<p><i>transmission and distribution of electricity-</i></p> <p><i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts</i></p>	<p>Substation will be located outside an urban area and will have a voltage capacity of 132kV. The power will be evacuated to the Leeuwdoringstad substation, length of the proposed 132kV power line is approximately 8.1km</p>
<p>GN R. 983 Item 12: <i>The development of:</i></p> <p><i>x) buildings exceeding 100 square metres in size;</i></p> <p><i>xii) infrastructure or structures with a physical footprint of 100 square metres or more;</i></p> <p><i>where such development occurs-</i></p> <p><i>(a) within a watercourse;</i></p> <p><i>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</i></p>	<p>The proposed project will entail the development of buildings and other infrastructure exceeding 100 square metres in size. The surface water assessment revealed that there are surface water features located within the proposed development area.</p>
<p>GN R. 983 Item 19: <i>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-</i></p> <p><i>(i) a watercourse;</i></p> <p><i>but excluding where such infilling, depositing, dredging, excavation, removal or moving-</i></p> <p><i>(a) will occur behind a development setback;</i></p> <p><i>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or</i></p> <p><i>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.</i></p>	<p>The surface water assessment revealed that there are surface water features located within the proposed development area. Should construction activities take place within a watercourse soil is likely to be removed and a WUL will be required</p>
<p>GN R. 983 Item 27: <i>The clearance of an area of 1 ha or more, but less than 20 ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</i></p> <p><i>(i) the undertaking of a linear activity; or</i></p>	<p>The proposed project will clear vegetation. The extent of this clearance will be determined during the Basic Assessment, but at this stage it is expected to be greater than 1 ha</p>

<p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	
<p>GN R. 983 Item 28: Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development:</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;</p> <p>excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</p>	<p>Internal access will be constructed. The proposed project site is currently used for farming, and the proposed project will result in an area greater than 1 hectare being transformed into an industrial land use.</p>
<p>GN R. 985 Item 4: The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(e) In the North West Province</p> <p>i Outside urban areas, in:</p> <p>(ee) Critical biodiversity areas (Terrestrial Type 1 and 2) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p>	<p>The project is located within a critical biodiversity area (CBA). Refer to the CBA map in Appendix A.</p>
<p>GN R. 985 Item 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(a) In the North West Province</p> <p>ii. Within critical biodiversity areas identified in bioregional plans</p>	<p>More than 300 square metres of vegetation would need to be cleared for the proposed solar PV energy facility and associated infrastructure. The project is located within a critical biodiversity area (CBA). Refer to the CBA map in Appendix A.</p>
<p>GN R. 985 Item 14: The development of-</p> <p>(x) buildings exceeding 10 square metres in size;</p> <p>(xii) infrastructure or structures with a physical footprint of 10 square metres or more;</p>	<p>The proposed project will entail the development of buildings and other infrastructure exceeding 100 square metres in size. The surface water assessment revealed that there are surface water features located within the proposed development area. The project is located within a critical</p>

<p><i>where such development occurs-</i></p> <p><i>(a) within a watercourse;</i> <i>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse</i></p> <p><i>(e) In the North West Province</i></p> <p><i>i Outside urban areas, in:</i></p> <p><i>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p>	<p>biodiversity area (CBA). Refer to the CBA map in Appendix A.</p>
<p>GN R. 985 Item 18: <i>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</i></p> <p><i>(e) In the North West Province</i></p> <p><i>i Outside urban areas, in:</i></p> <p><i>(ee) Critical biodiversity areas (Terrestrial Type 1 and 2) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p>	<p>Existing access roads will need to be upgraded in order to access the site. The access roads will be located within a critical biodiversity area (CBA). Refer to the CBA map in Appendix A.</p>

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account

of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report, the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Leeudoringstad PV Application Site (Preferred)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Corner Point co-ordinates L_01 (NW)	S27° 12' 5.494"	E26° 17' 44.344"
Corner Point co-ordinates L_02 (NE)	S27° 11' 44.632"	E26° 19' 2.500"
Corner Point co-ordinates L_03 (S)	S27° 12' 39.532"	E26° 17' 58.463"
Alternative 2 (Preferred)		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):
Power Line Grid Connection		
• Starting point of the activity (Leeudoringstad application site boundary)	S27° 12' 38.357"	E26° 17' 57.588"
• Middle/Additional point of the activity	S27° 13' 40.035"	E26° 15' 48.352"
• End point of the activity (Leeudoringstad 88/11kV Substation)	S27° 14' 7.667"	E26° 13' 36.811"

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

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

Full coordinate spreadsheets, are included in Appendix J2.

b) Lay-out alternatives

Alternative A		
Description	Lat (DDMMSS)	Long (DDMMSS)
Installation close to the existing entrance, tracker axis following road orientation (11.80 ha)	S27° 12' 2.103"	E26° 18' 32.481"
Alternative B		
Description	Lat (DDMMSS)	Long (DDMMSS)
Installation close to the well, orientation following the land, construction of an access road from the train station, interconnection at the closest point (11.68 ha)	S27° 12' 25.402"	E26° 18' 5.834"
Alternative C		
Description	Lat (DDMMSS)	Long (DDMMSS)
Installation all around the well, tracker axis orientated North/South, construction of an access road from train station, interconnection at the closest point (11.70 ha)	S27° 12' 22.213"	E26° 18' 3.827"
Alternative D		
Description	Lat (DDMMSS)	Long (DDMMSS)
Installation close to the existing entrance and well, tracker axis orientated North/South (12.15 ha)	S27° 12' 23.396"	E26° 18' 5.893"

c) Technology alternatives

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3

e) No-go alternative

The 'no-go' alternative is the option of not establishing the proposed Solar PV Facility. South Africa is currently under immense pressure to generate electricity to accommodate for the additional demand, which has been identified.

The generated electricity will be purchased from Leeudoringstad Solar Plant by PowerX (Pty) Ltd (here after referred to as "PowerX"). One of the aims of PowerX is to enable electricity generation within local municipalities. PowerX hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and wheel the power using the national transmission and distribution network, to its customers. The purchased electricity will be sold directly to commercial and light industrial consumers within the Maquassi Hills Local Municipality and the customers electricity bill will get off-set by the Maquassi Hills Local Municipality.

The gap between electricity supply and demand has over the last 2 years increased due to the declining Energy Available Factor (EAF) and delays in new build programs. In addition to that, the medium term risk mitigation plan (MTRMP) which is part of the IRP 2010-30 has not materialised to the extent anticipated therefor resulting in load shedding and extended use of diesel generators.

If the proposed development was not constructed (i.e. implementing the no-go alternative), this would have negative implications in the area as the power supplied by the PV plant would not be able to be sold to commercial and light industrial consumers within the Maquassi Hills Local Municipality. In addition, the no-go alternative would prevent the socio-economic benefits that the proposed development would have for the local community, such as job creation and economic production.

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

3. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:

- PV Facility Alternative A¹
- PV Facility Alternative B
- PV Facility Alternative C
- PV Facility Alternative D

Size of the activity:

	11.80 ha
	11.68 ha
	11.70 ha
	12.15 ha

or, for linear activities:

Alternative:

- Proposed grid connection A (preferred activity alternative)

Length of the activity:

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

Alternative:

- Alternative 1²

Size of the site/servitude:

	31 m
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¹ "Alternative A.." refer to activity, process, technology or other alternatives.

² "Alternative A.." refer to activity, process, technology or other alternatives.

4. SITE ACCESS

Does ready access to the site exist?

If NO, what is the distance over which a new access road will be built

YES/	
	N/A

Describe the type of access road planned:

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

5. LOCALITY MAP

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

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

An A3 locality map is included in Appendix A.

6. LAYOUT/ROUTE PLAN

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

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;

Leeudoringstad Solar Plant (Pty) Ltd

prepared by: SiVEST SA (Pty) Ltd

Proposed Construction of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power plant and associated infrastructure near Leeudoringstad, North West Province: Draft BA Report

Revision No. 1

15 November 2016

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- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

An A3 layout/route plan map is included in Appendix A.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

An A3 sensitivity map is included in Appendix A.

8. SITE PHOTOGRAPHS

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

Site photographs are included in Appendix B.

9. FACILITY ILLUSTRATION

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

Facility Illustrations are included in Appendix C.

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	YES/		Please explain
<p>The project in question is for the proposed construction of a 5MW PV facility and associated infrastructure. A change in land use will not be required and the servitude will be considered as special use within the existing land use.</p>			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES/		Please explain
<p>The proposed project falls within the North West Province. The main aim of the Spatial Development Framework (SDF) for the North West Province is to improve the quality of life for the population, particularly the disadvantaged poor within the North West Province. The SDF is one of the fundamental implementation instruments, which provides the spatial dimensions for achieving the strategies of the province. One such, strategy includes the recently adopted ten-year growth and development goal, which seeks to fight poverty and unemployment by promoting economic growth (SDF North West Province, 2005). In this way, the proposed development is aligned with the provincial SDF.</p>			
(b) Urban edge / Edge of Built environment for the area		NO/	Please explain
<p>The proposed development would fall outside the urban edge. Although the proposed development does not entirely fit the surrounding area, the proposed development is in close proximity to the Leeubos Traction Substation (which is located on the proposed development site) as well as being located directly west of the existing Harvard Substation, where existing supply is connected. The proposed development will link into Leeudoringstad 88/11kV Substation.</p>			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES/		Please explain
<p>According to the Maquassi Hill LM Integrated Development Plan (IDP) (2013 – 2016), states that the LM urgently needs to designed Local Economic Development strategy, which will create and environment for all people to access economic opportunities. Additionally, Economic growth needs to be the central focus in the development of the town, in an effort to enlarge the LM revenue base. The LM IDP also states that they are aimed at developing and maintaining the existing infrastructure in an effort to improve and realize an effective electrification program. The IDP states that this can only be achieved through the bulk supply of electricity which includes for the purpose of such supply, the transmission, distribution and where applicable the generation of electricity. It further states that the LM needs to regulate, control and maintain the electricity reticulation, as well as upgrading the existing electrical network. To provide an affordable and sustainable electricity supply to the community.</p>			
<p>The LM's Spatial Development Framework (SDF) is not available from its website. The IDP though, includes a summary of this SDF, of 2010/2011. The IDP also provides some feedback on the spatial development strategies set out in the 2010/2011 SDF. The main aim of the SDF is to promote a consistent urban development policy approach for effective urban reconstruction and development, to</p>			

guide development policies, strategies and action of all stakeholders in the urban development process and to steer them towards the achievements of collective vision. Additionally, the LM SDF summary mentions the need to promote the sustainable use of the land resources in the country.

The SDF identifies that the existing electricity network has aged and that the LM needs a massive injection of resources to upgrade it. The SDF states that this can be achieved by engaging with role players such as like Department of Minerals and Energy affairs and others with the intention of securing resources to resuscitate their infrastructure. Additionally, the SDF states that the LM needs to stimulate economic development opportunities in rural and urban areas.

Although no mention is made of the potential for Renewable Energy (RE) projects within the Maquassi Hill LM, the inference is that the implementation and operation of the proposed Leeudoringstad Solar PV project will assist in the extension and strengthening of the electrical network in the region and beyond, thereby aiding in ensuring that the LM is able to accommodate the envisioned growth and development.

(d) Approved Structure Plan of the Municipality		Please explain
The development is being proposed by an Independent Power Producer (IPP) and therefore will not have any bearing on the Municipalities' Structure Plans.		
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES/	Please explain
<p>The North West Provincial Spatial Development Framework and Environmental Management Plan (PSDF – EMP) of 2008, is closely aligned to the National Spatial Development Perspective, and as such places key importance on economic growth and poverty eradication. The spatial rationale is centred on the need to address issues related to; spatial planning, socio-economic development, infrastructure, and the sustainable and conservative use of natural resources. The PSDF – EMP highlights the fact that the legacy of the Apartheid-era policy is the key issue, with parts of the Province being significantly underdeveloped.</p> <p>Although the PSDF – EMP does not include any land use or bioregional mapping, it does provide information on the required natural resources and socio-economic issues that must be addressed. The most prominent natural resource problems include; inadequate water resources (impacting future development), bush encroachment and alien invasive species, land and soil degradation, and overgrazing. The most significant socio-economic issues highlighted in the PSDF – EMP are as follows (Department of Economic Development, Environment, Conservation, and Tourism, 2008):</p> <ul style="list-style-type: none"> • The creation of employment opportunities - including increased economic opportunities for the youth and women. • The eradication of poverty. • Attraction investment into the Province. • Achieving sustainable economic growth. • The fight against, and prevention of HIV/Aids and other diseases. 		

- Achieving food security.
- Improved physical infrastructure, including the availability of industrial land.
- Decreasing the Province's illiteracy levels.
- Development of the Province's tourism potential.
- Managing population growth, urbanisation, and migration.

The proposed project therefore supports the objectives of the PSDF – EMP.

(f) Any other Plans (e.g. Guide Plan)

YES/

Please explain




The North West Provincial Development Plan (2030) is shaped from the National Development Plan (NDP) and attempts to align with the NDP's vision, objectives and priorities for a united South Africa in 2030. The key focus areas of the PDP are based on the main challenges hampering growth in the North West Province, and are similar to that of the NDP, with a focus on the rural economy, and the upgrading, provision, and maintenance of economic infrastructure in the Province. Furthermore, the Province is focused on the transformation of human settlements and the eradication of corruption. The PDP states that RE, especially solar, and waste/biomass initiatives, is seen as being increasingly important in the Province, as its contribution to provincial energy consumption is envisaged to increase over the next two decades (North West Planning Commission, 2013).



The North West Provincial Growth and Development Strategy (PGDS) (2004 – 2014) identifies a small private sector as one of the key developmental challenges in the Province. Other challenges include low population densities, inadequate infrastructure and service delivery backlogs, a predominantly poor population with low literacy levels, substantial inequalities between rich and poor, as well as disparities between urban and rural communities, and the HIV/Aids pandemic. Considering this, the objectives of the PGDS are addressing poverty and unemployment, and simultaneously improving the low level of skills and expertise in the Province (North West Province: Office of the Premier, 2004).

The PGDS identifies the following pillars of economic development:

- Growth and Investment,
- Agricultural and Rural Development,
- Mining and Energy,
- Manufacturing,
- Tourism,
- Construction and Infrastructure,
- Small Medium and Micro Enterprises (SMMEs), and
- Training and Skills Development.

Importantly, RE and Solar technologies are not addressed within the Mining and Energy pillar, or in the PGDS. Focus is, however, on provision for a more diversified future economy

<p>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</p>	<p>YES/</p>		<p>Please explain</p>
<p>As previously mentioned, the LM's Spatial Development Framework (SDF) is not available from its website. The IDP though, includes a summary of this SDF, of 2010/2011. The IDP also provides some feedback on the spatial development strategies set out in the 2010/2011 SDF. The main aim of the SDF is to promote a consistent urban development policy approach for effective urban reconstruction and development, to guide development policies, strategies and action of all stakeholders in the urban development process and to steer them towards the achievements of collective vision. Additionally, the LM SDF summary mentions the need to promote the sustainable use of the land resources in the country.</p> <p>The SDF identifies that the existing electricity network has aged and that the LM needs a massive injection of resources to upgrade it. The SDF states that this can be achieved by engaging with role players such as like Department of Minerals and Energy affairs and others with the intention of securing resources to resuscitate their infrastructure. Additionally, the SDF states that the LM needs to stimulate economic development opportunities in rural and urban areas.</p>			
<p>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</p>	<p>YES/</p>		<p>Please explain</p>
<p>The proposed development could improve the lives of the local communities by assisting the Local Government in providing electricity to them. Local employment benefit would result during the construction of the PV plant. The development would act as catalysed promoting economic growth, thus providing future opportunities for the surrounding communities by improving education and helping reverse urbanisation. The PV facility would also contribute to municipal electricity security, which would benefit the Municipality at large, including the local community.</p>			
<p>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	<p>YES/</p>		<p>Please explain</p>
<p>Yes, there is currently adequate capacity for the construction and operation of the PV facility and associated infrastructure. All relevant local and district municipalities have been provided with the opportunity to comment on the proposed development as well as this DBAR.</p>			

<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	<p>YES/</p>		<p>Please explain</p>
<p>The development will contribute to the service infrastructure, through the provision of electricity within the municipality. According to the LM's SDF, the main aim of the SDF is to promote a consistent urban development policy approach for effective urban reconstruction and development, to guide development policies, strategies and action of all stakeholders in the urban development process and to steer them towards the achievements of collective vision. All relevant local and district municipalities have been provided with the opportunity to comment on the proposed development as well as this DBAR.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>YES/</p>		<p>Please explain</p>
<p>Yes, the project is intrinsically linked to the construction of the Leeudoringstad PV energy facility, which is an issue of national concern or importance. The National Energy Act (Act no, 34 of 2008), promulgated in 2008, has, as one of its key objectives, the promotion of diversity of supply of energy and its sources. From this standpoint, the Act directly references the importance of the RE sector, with a mention of the solar energy sector included. The aim is to ensure that the South African economy is able to grow and develop, fast tracking poverty alleviation, through the availability of a sustainable, diverse energy mix. Moreover, the goal is to provide for the increased generation and consumption of RE (Republic of South Africa, 2008).</p> <p>The 2003 White Paper on Renewable Energy elaborates on the South African Government's policy principles, and strategic goals and objectives for promotion and implementation of the RE sector in the country. The White Paper, which acts as a supplement to the White Paper on Energy Policy, identifies the long- and medium-term potential of RE in South Africa.</p> <p>As a signatory to the Kyoto Protocol, the country has made commitments to achieve greenhouse gas emissions reduction targets. Considering the high reliance of South Africa on coal-fired power stations for electricity generation, the government's commitment to the development of a framework for the establishment and operation of a national RE framework is vital to the achievement of the emission reduction targets. Moreover, the development of a national RE framework will aid in increasing energy security in South Africa over time, through the diversification of supply. In this regard, the government's long-term goal is the establishment of a renewable energy industry, with RE energy carriers that are capable of offering a sustainable, non-subsidised alternative to fossil fuels (Department of Minerals and Energy, 2003).</p> <p>The Integrated Resource Plan (IRP), for Electricity (2010 – 2030) final report provides for the disaggregation of RE technologies to differentiate and display solar photovoltaic (PV), concentrated solar power (CSP), and wind options clearly. The following policy considerations assisted in arriving at this version of the IRP:</p> <ul style="list-style-type: none"> • The installation of RE technologies brought forward in order to accelerate a local industry. 			

- To provide for the uncertainties associated with the cost of renewables and fuels, a nuclear fleet was included.
- The emissions constraint of 275 million tons of carbon dioxide per year after 2024 was maintained.
- Energy efficiency demand side management measures were maintained.

The key conclusions from a review of the IRP, relevant to the RE sector, is that the accelerated roll out of RE technologies must be allowed and promoted in order to derive the benefits of localisation in these RE technologies. Moreover, it places emphasis on the establishment of a Solar PV programme (Republic of South Africa, 2011).

8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES/		Please explain
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Much of the study area is characterised by, grasslands and rural areas with low densities of human settlement. Agriculture is the dominant land use, which has transformed the natural vegetation in some areas. However, a large portion of the study area has retained a natural appearance due to the presence of the low shrubs and grasslands. The most prominent anthropogenic elements in these areas include the R502 main road, the proposed Wildebeestkuil PV Facility, the existing Harvard Substation and Leeubos Traction Substation and other linear elements, such as existing power lines, telephone poles, communication poles and farm boundary fences.

The presence of this infrastructure is an important factor in this context, as the introduction of the proposed PV facility and associated infrastructure would result in less visual contrast where other anthropogenic elements are already present. As such, the proposed development supports the land use and infrastructure within the study area.

9. Is the development the best practicable environmental option for this land/site?	YES/		Please explain
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Although the proposed development does not entirely fit the surrounding area, the proposed development is in close proximity to the Leeudoringstad PV Facility as well as being located directly west of the existing Harvard Substation, where existing supply is taken. The proposed developments will link into Leeubos Traction Substation. As such, the proposed development is a suitable development within this technically feasible context. The development will conform to the typical visual character and pattern of elements that make up the landscape form.

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES/		Please explain
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The absence of the proposed solar PV plant would mean that the power supply in the area would not be increased. This will have negative implications on new customers (needing electricity) in the area which will in turn have a negative impact on overall development and economic growth. The socio economic benefits of the proposed project are considered to outweigh the negative environmental impacts identified (Section D: Impact Assessment). If the proposed development does not go forward there would be negative consequences for the renewable energy targets in the country. The positive impacts relate to job creation would also not be realised. The socio economic benefits of the proposed project are considered to outweigh the negative environmental impacts identified

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		NO/	Please explain
Infrastructure for electricity provision, as proposed, may set a precedent for similar activities in the area at large, however the national grid has a limit to how much incoming power it can accommodate. Similar Solar PV projects have been undertaken and approved by the DEA in the North West Province. For these two reasons the proposed project would not create a precedent.			
12. Will any person's rights be negatively affected by the proposed activity/ies?		NO/	Please explain
The proposed development will impact on individuals where the substation or a proposed tower structure is to be constructed on the land on which they are residing. The majority of the proposed infrastructure will occur on the farm Leeuwbosch 44. The landowners preferred use of the farm land for any other purpose either recreation or commercial may be impacted upon, however the landowner would be compensated by the developer through a lease agreement. Surrounding landowners have been notified personally of the proposed BA, and will have an opportunity through the PPP process to raise any concerns or objections to the proposed development. The other way in which people will be impacted is the visual impact of the proposed project. However, as previously mention, the presence of the Wildebeestkuil PV Facility as well as being located directly west of the existing Harvard Substation and Leeubos Traction Substation, and the presence of existing power lines, the R502, telephone poles, communication poles and farm boundary fences are important factors in this context. As the introduction of the proposed development and associated infrastructure would result in less visual contrast where other anthropogenic elements are already present.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		NO/	Please explain
Infrastructure for service provision, as proposed, would not alter the urban edge.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?		YES/	Please explain
The Strategic Integrated Projects (SIPs) have been identified based on a spatial analysis of South Africa's needs. The proposed development would contribute to SIP 4, which involves unlocking the economic opportunities in the North West Province. Amongst others, the project seeks to facilitate further mining development by promoting a reliable supply of transmission infrastructure. The proposed development would also contribute to SIP 8, Green Energy in support of the South African economy. The proposed development would also contribute to SIP 9, electricity generation to support socioeconomic development, and SIP 10, electricity transmission and distribution for all.			
15. What will the benefits be to society in general and to the local communities?	Please explain		
<p>The proposed construction of the PV Facility forms part of the country's strategies to meet future energy consumption requirements by increasing electricity supply in the region.</p> <p>The proposed development will benefit society by improving the reliability of the electricity supply in the area and the surrounding townships. A stable electricity supply will have a positive impact for the in the area and promote economic growth. The benefit to the local community is uncertain; however, certain mitigation measures can be implemented by the project proponent, which would maximise the benefit to the local community.</p>			

16. Any other need and desirability considerations related to the proposed activity?	Please explain
As mentioned above the project is needed in order to improve the electricity supply in the area and to promote economic growth.	
17. How does the project fit into the National Development Plan for 2030?	Please explain
The National Development Plan 2010 – 2030 (NDP 2030) aims to eliminate poverty and reduce inequality by 2030. At the same time it is geared towards achieving economic growth by expanding opportunities, building capabilities, reducing poverty, and involving communities in their own development, all leading to an increase in living standards of these communities. The NDP 2030 recognises nine key challenges that need to be addressed. Although all challenges are seen to be important, the priority areas can be identified as job creation and improvement of the quality of national education. Managing the transition towards a low carbon economy is also one of the nine key national challenges; in line with this, the expansion and acceleration of a commercial RE sector is seen as a key intervention strategy. The NDP 2030 seeks to ensure that half of all electricity generation capacity is provided by renewable resources (National Planning Commission, 2011). The proposed PV facility is therefore in line with the goals of the NDP.	
18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	
In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the required BA and public participation process (PPP) was undertaken for the proposed PV facility and associated infrastructure, in order to investigate and assess any potential environmental impacts associated with the development prior to implementation. As part of the BA process several specialist studies were conducted to evaluate the actual and potential impact that the proposed development could have on the biophysical environment, socio-economic conditions and cultural heritage within the study area. In line with the general objectives of Integrated Environmental Management, the risks and consequences of the various alternatives were assessed and mitigation measures were recommended by each specialists in order to minimise the negative impacts and maximise the benefits of the proposed project. In addition, a thorough PPP was undertaken as part of the BA, which involved consultation with various key stakeholders and organs of state, including provincial, district and local authorities, relevant government departments, parastatals and NGO's.	
19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.	
The principles of environmental management as set out in section 2 of the NEMA require that environmental management must place people and their needs at the forefront of development and that development must be socially, environmentally and economically sustainable. As described above; these principles have been taken into account by undertaking a thorough PPP in order to ensure that all Interested and Affected Parties (I&APs) are given the opportunity to be involved in the BA process and ultimately that their comments are taken into consideration by the DEA when reviewing the application. Several specialist studies were also undertaken to ensure that the development is sustainable and that disturbance to the environment is avoided where possible, minimised through appropriate mitigation measures and remedied via appropriate measures.	

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	In terms of the NEMA the proposed development must be considered, investigated and assessed prior to implementation.	Department of Environmental Affairs (DEA)	1998
Environment Conservation Act (ECA) No 73 of 1989 Amendment Notice No R1183 of 1997	The ECA states that the development must be environmentally, socially and economically sustainable	Department of Environmental Affairs (DEA)	1989
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	In terms of section 38 of the NHRA, the responsible heritage resources authority can call for a Heritage Impact Assessment (HIA) where a solar PV facility is being proposed.	South African Heritage Resources Authority (SAHRA)	1999
National Water Act, 1998 (Act 36 of 1998)	If the development may need to take place within a 500m radius of a delineated wetland a water use license is likely to be required with regards to water uses (c) and (i) of the NWA.	Department of Water Affairs (DWA)	1998
National Environmental Management: Biodiversity Act, 2004 (Act No10. of 2004)	Under the NEMBA the project proponent is required to take appropriate reasonable measures to limit the impacts on biodiversity, to obtain permits if required and to invite SANBI to provide commentary on any documentation resulting from the proposed development.	Department of Environmental Affairs (DEA) and South African National Biodiversity Institute (SANBI)	2004
National Forests Act, 1998 (Act 84 of 1998) (NFA)	The proposed project may result in the disturbance or damage to a tree protected under the NFA.	Department of Agriculture, Forestry and Fisheries (DAFF)	1998

Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) as amended in 2001 (CARA)	The construction of the solar PV facility may impact on agricultural resources and vegetation on the site. The CARA prohibits the spreading of weeds and prescribes control measures that need to be complied with in order to achieve this.	Department of Agriculture, Forestry and Fisheries (DAFF)	1983
National Road Traffic Act, 1996 (No. 93 Of 1996)	All the requirements stipulated in the NRTA regarding traffic matters will need to be complied with during the construction and operational phases of the proposed development.	South African National Roads Agency Limited (SANRAL)	1996
Regulations			
NEMA EIA 2014 Regulations	In terms of the EIA 2014 Regulations, a basic assessment process is required for this proposed project.	Department of Environmental Affairs (DEA)	2014
Guidelines			
North West Provincial Spatial Development Framework. Support to Environment and Sustainable Development in the North West Province, September 2008	The SDF is one of the fundamental implementation instruments, which provides the spatial dimensions for achieving the strategies of the province. The proposed development should be aligned with the provincial SDF.	North West Provincial Government	2008
North West Province Growth and Development Strategy (2004 – 2014)	The objectives of the PGDS are addressing poverty and unemployment, and simultaneously improving the low level of skills and expertise in the Province	North West Provincial Government	2004
Dr. Kenneth Kaunda DM's Integrated Development Plan (IDP) 2013/2014	States its mission as providing a developmental municipal governance system for a better life for all in the Dr. Kenneth Kaunda DM.	Dr. Kenneth Kaunda DM.	2013/2014

Maquassi Hills LM Third Generation Integrated Development Plan (IDP) (2013-2016)	The IDP also states the existing electricity network has aged and that the LM needs a massive injection of resources to upgrade it. Additionally, the SDF states that the LM needs to stimulate economic development opportunities in rural and urban areas.	Maquassi Hills LM.	2013
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12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

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

YES/

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

unknown

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

All solid waste collected shall be disposed of at registered/licensed landfill site, Leeudoringstad registered landfill site. Skip waste containers and waste collection bins will be maintained on site and the contractor will arrange for them to be collected regularly and transported to the landfill site.

Under no circumstances will waste be burned or buried on site.

Hazardous materials and contaminants will be stored carefully to prevent contamination until being disposed of at a licensed landfill site.

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

All solid waste will be disposed of at the Leeudoringstad registered landfill site or any other registered landfill site which is close by, should space not be available at the Leeudoringstad registered landfill site.

Will the activity produce solid waste during its operational phase?

YES/

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

unknown

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

All solid waste will be collected and disposed of at the Leeudoringstad registered landfill site or any other registered landfill site which is close by, should space not be available at the Leeudoringstad registered landfill site. Waste separation and recycling will take place where possible.

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

All solid waste will be disposed of at the Leeudoringstad resisted landfill site or any other registered landfill site which is close by, should space not be available at the Leeudoringstad registered landfill site.

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

The waste will be disposed of at nearby registered landfill sites.

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

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? **NO** **NO**

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

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

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

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

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

m³

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

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

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

If YES, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:	Cell:		
E-mail:	Fax:		

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

Waste water will not be generated by the activity.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

	NO/
YES	NO

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

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

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

Other than exhaust emissions and dust associated with construction phase activities, the activity will not release emissions into the atmosphere.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

	NO/
--	------------

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?

YES/	
	NO/

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

Describe the noise in terms of type and level:

Noise will be generated during the construction phase. This impact is transient and is unlikely to be heard by many noise receptors due to the limited human habitation in the area. The impact of the project on noise does therefore not warrant a specialist noise impact assessment.

During the operational phase the power line will generate a low hissing noise, known as corona. This noise will vary depending on the weather conditions and in dry conditions; the noise level will be comparative with the usual ambient noise level in the environment. This impact is of low significance due to the limited human habitation in the area.

13. WATER USE

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

Municipal	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
------------------	-------------	-------------	----------------------------	-------	---------------------------------

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

litres
Unknown at this stage

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

A water use license may be required in terms of the NWA as indicated by the surface water specialist report stating that there are two (2) depression wetlands on the study site. In terms of NEMA (1998) and the EIA Regulations (2014), the proposed development will Activities 12 and 19 of Government Notice 983. The proposed development may also trigger Section 21 (c) and (i) in terms of National Water Act, 1998. The above identified activities and water uses will however be confirmed once a final layout is available and in consultation with the Department of Water and Sanitation.

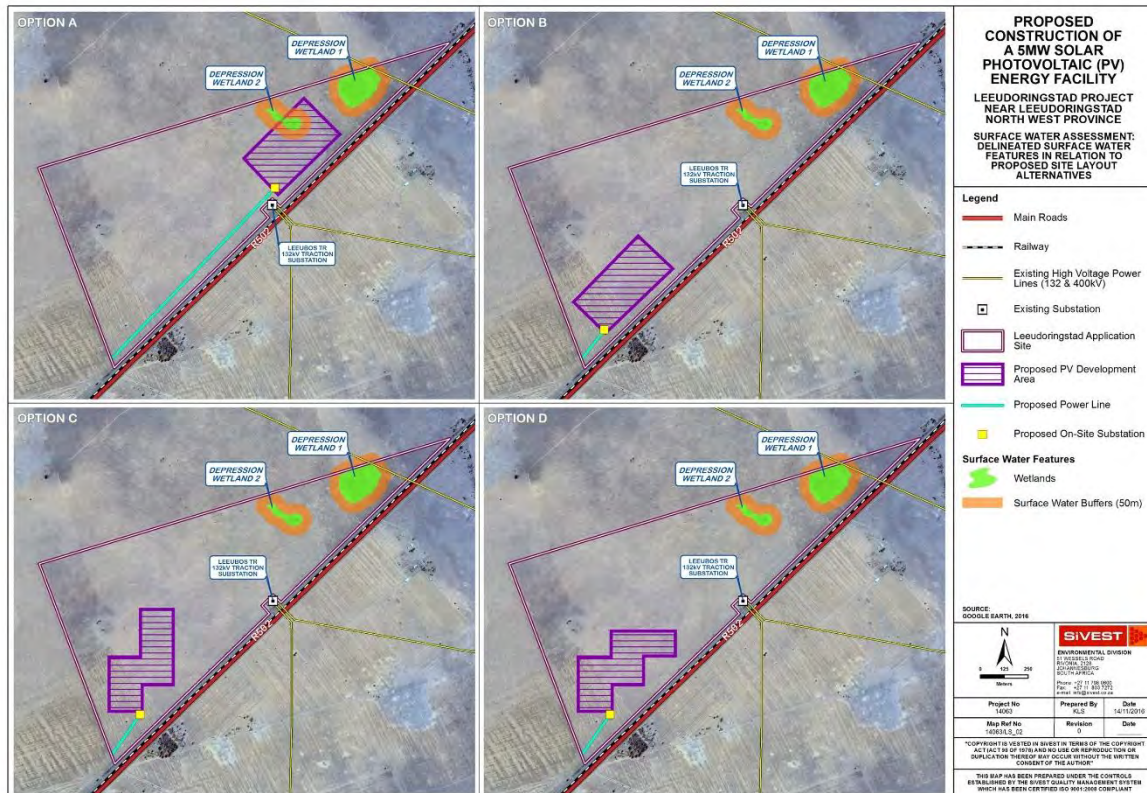


Figure 7. Surface Water Map

14. ENERGY EFFICIENCY

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

The proposed development would not consume power.

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

Energy efficiency measures are not applicable to this proposed project. The proposed development is for a solar PV power generation facility made up of highly efficient, well proven and bankable components to generate electricity in the most efficient way available.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

- Has a specialist been consulted to assist with the completion of this section? **YES/**
- If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

A 'specialist declaration of interest' for each specialist is included in Appendix I and all specialist reports are contained in Appendix D.

Property description/physical address:

Province	North West Province
District Municipality	Dr Kenneth Kaunda District Municipality
Local Municipality	Maquassi Hills Local Municipality
Ward Number(s)	6
Farm name and number	Leeuwbosch Farm No. 44
Portion number	Portion 37
SG Code	T0IP0000000003100025

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

The land is zoned agriculture.

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

Is a change of land-use or a consent use application required? **YES/**

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative A:

Flat/	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
-------	-------------	-------------	-------------	--------------	-------------	------------------

Alternative B:

Flat/	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Alternative C:

Flat/	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Alternative D:

Flat/	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Most of the terrain in the study area is flat. An A3 Slope Classification Map and Topography Map are included in Appendix A.

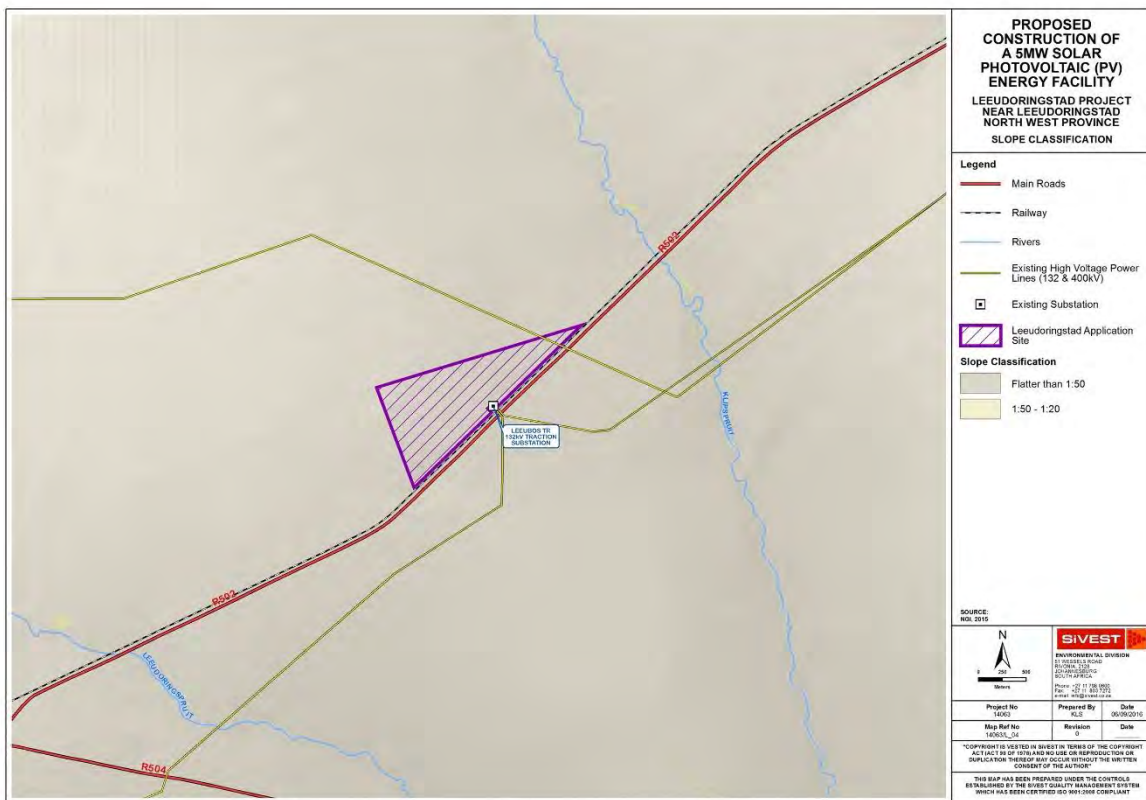


Figure 8: Slope Classification Map

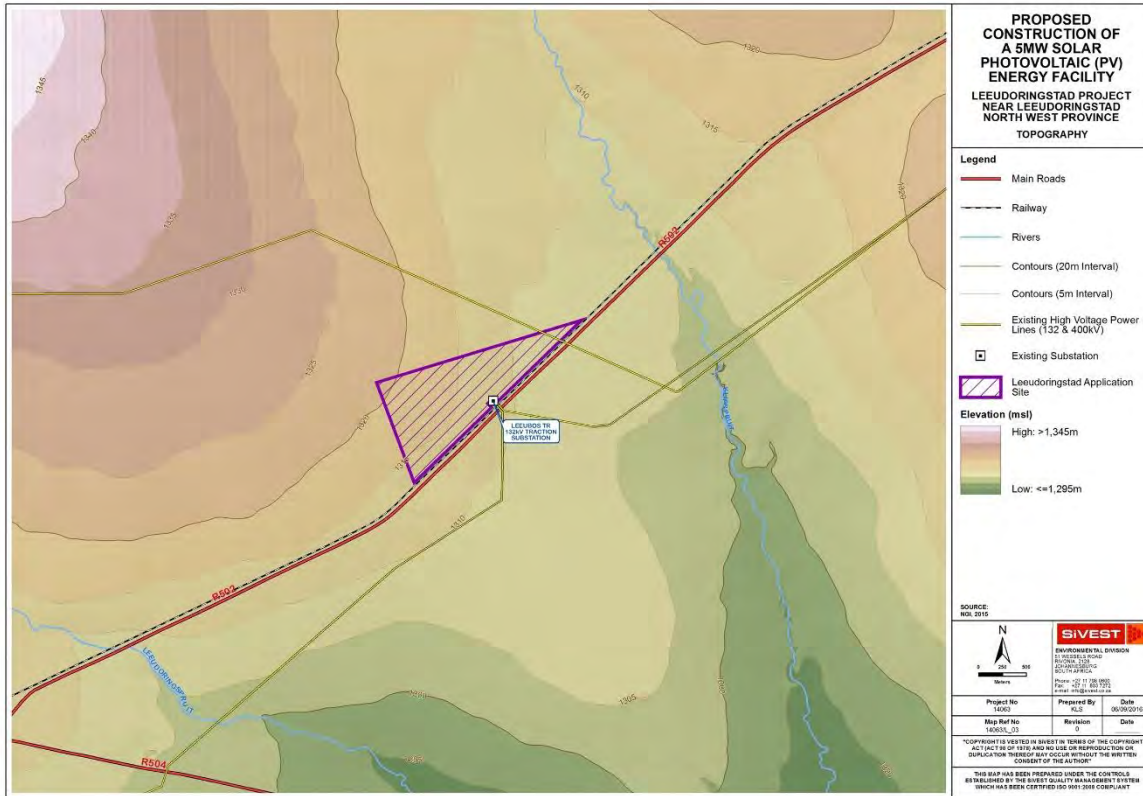


Figure 9: Topography Map

2. LOCATION IN LANDSCAPE

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

2.1 Ridgeline		2.4 Closed valley		2.7 Undulating plain / low hills	
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain	<input checked="" type="checkbox"/>	2.9 Seafront	
2.10 At sea					

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Alternative A	Alternative B	Alternative C	Alternative D
Shallow water table (less than 1.5m deep)	NO/	NO/	NO/	NO/
Dolomite, sinkhole or doline areas	NO/	NO/	NO/	NO/
Seasonally wet soils (often close to water bodies)	NO/	NO/	NO/	NO/

Unstable rocky slopes or steep slopes with loose soil	NO/	NO/	NO/	NO/
Dispersive soils (soils that dissolve in water)	NO/	NO/	NO/	NO/
Soils with high clay content (clay fraction more than 40%)	NO/	NO/	NO/	NO/
Any other unstable soil or geological feature	NO/	NO/	NO/	NO/
An area sensitive to erosion	NO/	NO/	NO/	NO/

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

A specialist soils and agricultural potential study was undertaken by Garry Paterson from ARC-Institute for Soil, Climate and Water and is included in Appendix D4.

4. GROUND COVER

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

Natural veld - good condition^E	Natural veld with scattered aliens^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

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

A specialist biodiversity study was undertaken by David Hoare and is included in Appendix D1.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES	NO	UNSURE
Non-Perennial River	YES	NO	UNSURE
Permanent Wetland	YES	NO	UNSURE
Seasonal Wetland	YES	NO	UNSURE
Artificial Wetland	YES	NO	UNSURE

Estuarine / Lagoonal wetland	YES	NO	UNSURE
------------------------------	-----	-----------	--------

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

There are two (2) depression wetlands on the study site.

A specialist surface water study was undertaken by Shaun Taylor from SiVEST and is included in Appendix D3.

6. LAND USE CHARACTER OF SURROUNDING AREA

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

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

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

Not applicable

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

Not applicable

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

Not applicable

An A3 Land Use Map is included in Appendix A.

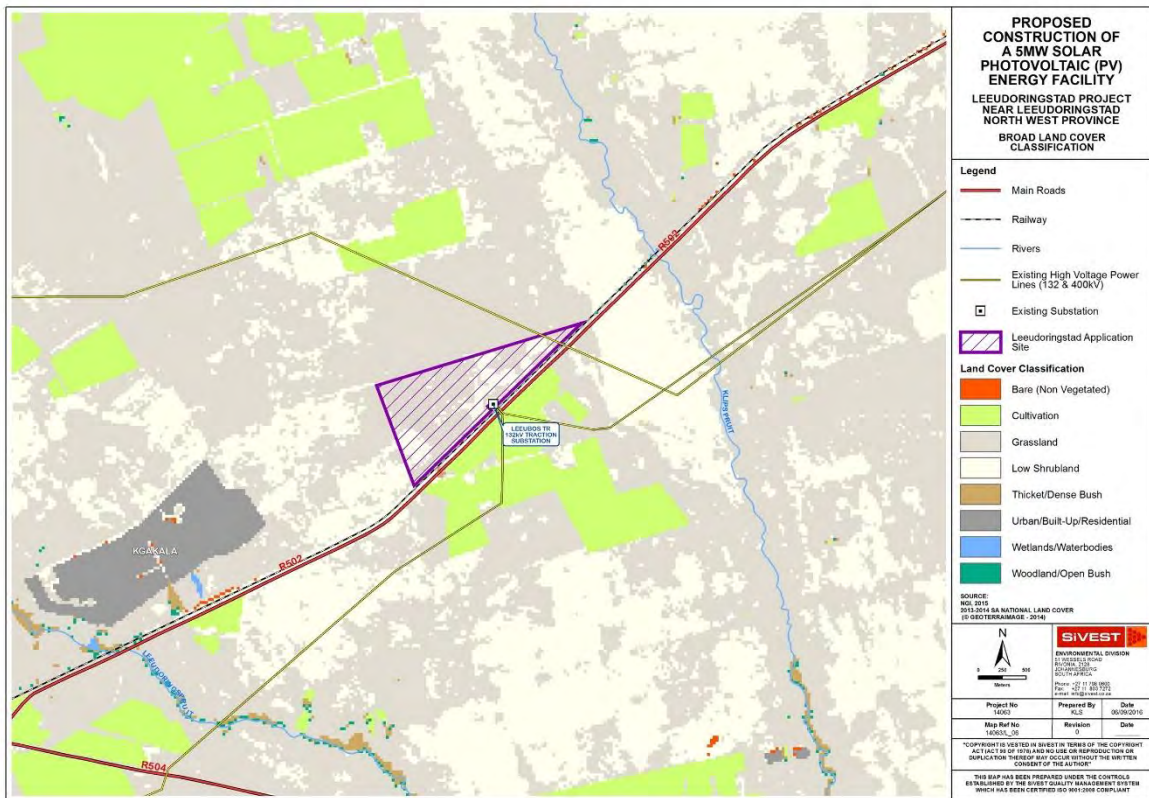


Figure 10: Land Use Map

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	YES/	
Core area of a protected area?		NO/
Buffer area of a protected area?	YES/	
Planned expansion area of an existing protected area?	YES/	
Existing offset area associated with a previous Environmental Authorisation?		NO/
Buffer area of the SKA?		NO/

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

The vegetation on the proposed development site is Vaal-Vet Sandy Grassland and is listed as Endangered in the scientific literature and in the National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011). The site is also within an area included as part of the National Parks Area Expansion Strategy and is within a CBA Corridor area, a CBA Node Area and an ESA Wetland buffer zone in the Provincial Conservation Plan.

Leeudoringstad Solar Plant (Pty) Ltd

prepared by: SiVEST SA (Pty) Ltd

Proposed Construction of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power plant and associated infrastructure near Leeudoringstad, North West Province: Draft BA Report

Revision No. 1

15 November 2016

Page 52

P:\14000\14063 LEEUDORING 2 X 5 MW PV PLANTS\ENVIRONMENTAL\Reports\R3 Assessment\DBAR\Leeuwosch DBAR\14063_Leeuwosch DBAR_rev1 15 Nov 2016 VE.docx

The power line corridor is mostly outside the NPAES focus area , with some edges affected by the outside edge of the corridor.
 A map indicating the Critical Biodiversity Areas (CBA's) is included in Appendix A.

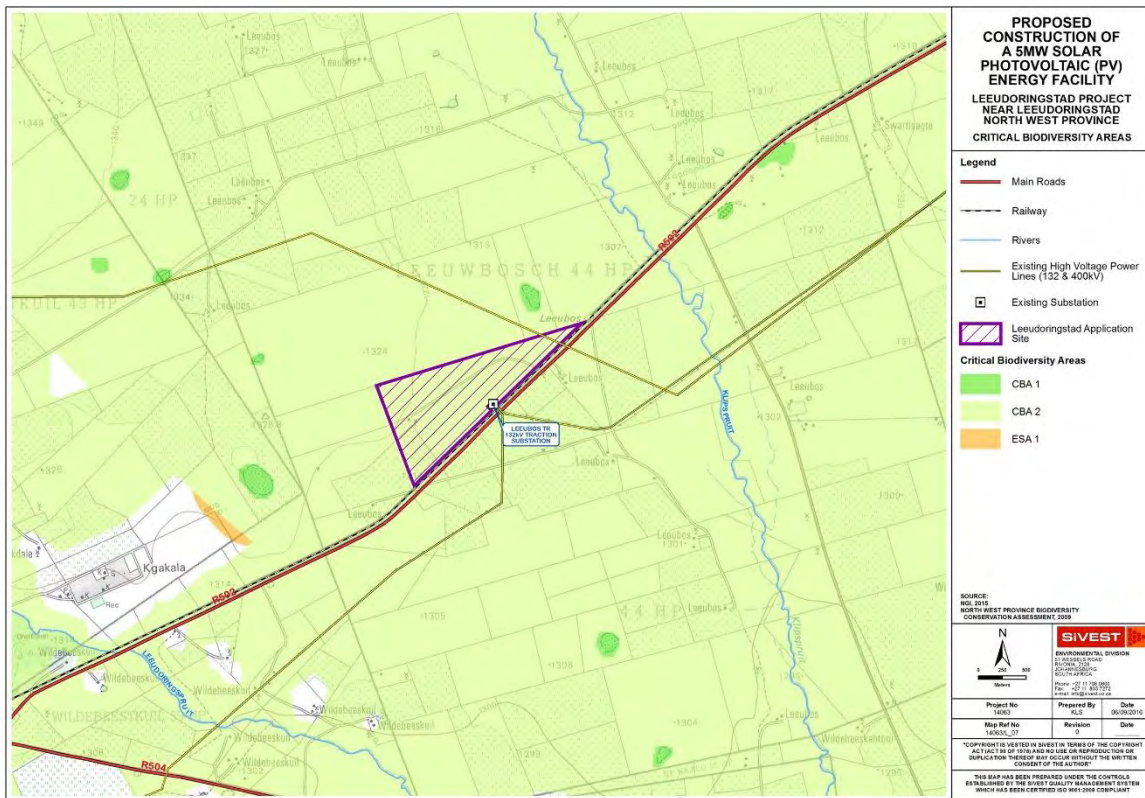


Figure 11: Critical Biodiversity Areas (CBAs) Map

7. CULTURAL/HISTORICAL FEATURES

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

Uncertain/

A heritage study was conducted by Wouter Fourie from PGS Heritage and a palaeontological study was conducted by Banzai Environmental (Pty) Ltd. A composite report covering heritage and palaeontology is included in Appendix D5. 13 Heritage features were found on the site of the proposed PV facility. These resources can be grouped in to four clusters. Two clusters consist of the remains of labourer housing, while the other two consist of a cattle kraal and a cemetery

In terms of palaeontology, the whole extent of the development footprint was not considered sensitive in terms of palaeontology resources. Archaeological sites were identified on the proposed development site. However further consultation with the local communities is required to determine who the previous inhabitants were and to determine the possibility of infant burials. In the extent that such burials are confirmed a grave relocation process must be initiated. It is recommended that an archaeologist monitor the earth moving activities during construction.

It is recommended that the burial site LD02 be preserved and a buffer fence of 20 meters constructed around the site. Grave relocation must only be considered as last resort. A detailed relocation process must be followed and it is recommended that an experienced consultant be appointed to manage the relocation process

It is recommended that the site LD13 be documented by means of a layout drawing and photographic documentation after which a destruction permit must be applied for from the North West Provincial Heritage Authority prior to destruction.

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

In terms of palaeontology, the whole extent of the development footprint was not considered sensitive in terms of palaeontology resources. In terms of palaeontological resources, no mitigation measures are required.

Archaeological sites were identified on the proposed development site. However further consultation with the local communities is required to determine who the previous inhabitants were and to determine the possibility of infant burials. In the extent that such burials are confirmed a grave relocation process must be initiated. It is recommended that an archaeologist monitor the earth moving activities during construction.

It is recommended that the burial site LD02 be preserved and a buffer fence of 20 meters constructed around the site. Grave relocation must only be considered as last resort. A detailed relocation process must be followed and it is recommended that an experienced consultant be appointed to manage the relocation process

It is recommended that the site LD13 be documented by means of a layout drawing and photographic documentation after which a destruction permit must be applied for from the North West Provincial Heritage Authority prior to destruction.

Will any building or structure older than 60 years be affected in any way?

YES/

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES/

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Demographic Profile:

The population of Maquassi Hills Local Municipality is estimated to be 98 007 in 2016 and constitutes 11.9% of the Dr Kenneth Kaunda District Municipality and only 2.2% of the North West Province's population (Urban-Econ calculations based on Quantec 2015). Evidently, the Maquassi Hills LM, from a provincial and district context, houses a relatively small population. The average growth rate over the past ten years has been 1.5%, which is slightly above the national and provincial growth rates by 0.2% and 0.3%, respectively. A recorded 20 330 households resided in the Maquassi Hills LM in 2015 and thus comprise of 2.2% of all households in the Province. This indicates a significantly small residential footprint from a provincial level. The average household size in the LM is 4.8; whereas the average provincial household size is 4.7 (Stats SA, 2015). Thus, the household size is similar to that of the province.

Approximately 52 604 residents of the Maquassi LM's population are between the ages of 15 and 64 and therefore comprise of the working age population (Stat SA, 2015). This makes up 61% of the LM's population. In terms of gender distribution, there is a 1% difference between males and females with males dominating.

Economic profile of local municipality:

The economy of Maquassi Hills LM was valued at R2 804,7 million in current prices. The tertiary sector accounts for 66% of the LM's Gross Domestic Product (GDP), followed by the primary sector and secondary sector with 20% and 14% contributions, respectively. The general government sector particularly contributes close to a fifth of the local economy's production. The second largest contributing sector is the wholesale and retail trade with a contribution of R398 million in current prices.

Based on constant 2005 prices, the Maquassi Hills LM grew at a relatively small rate of 0.8% CAGR over the ten-year period spanning 2003-2013. The growth was driven by the increasing performance of the agriculture sector, which grew by 9% over the same period. Other sectors that contributed to the growth over the same ten-year period included the community, social and personal services with 9% and the Trade sector at 8%. However, the growth of the above-mentioned sectors was offset by the decline observed in the other industries, resulting in a notably lower performance of the economy over the years

Level of education:

According to the 2011 National Census, the weighted average household income in the Maquassi Hills LM was R4 836 in basic prices. About 2 973 or 14.5% of the LM's households had no regular income in 2011. In total 77.2% of LM's households are surviving on an income less than R3 200 per month in current prices. One fifth (20.6%) of the population are in the middle-income category. In this light, the LM can be considered as dominantly relatively poor. This status can be attributed to the education levels of the LM.

Just over a fifth of the population aged over 20 in the LM have no schooling, 18% have acquired a matric qualification, and 4.5% have acquired a higher education qualification. On the provincial level, 11.5% of the population aged over 20 do not have schooling, whilst a quarter have acquired a matric and 7% have acquired a higher education qualification. From this, it can be deduced that the education levels are low and less than a quarter of the population over 20 have successfully completed formal schooling.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R7.5 Million
What is the expected yearly income that will be generated by or as a result of the activity?	Not applicable, the development will not generate income.
Will the activity contribute to service infrastructure?	YES
Is the activity a public amenity?	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Approximately 100 people at any given time
What is the expected value of the employment opportunities during the development and construction phase?	Unknown
What percentage of this will accrue to previously disadvantaged individuals?	100%
How many permanent new employment opportunities will be created during the operational phase of the activity?	3 jobs
What is the expected current value of the employment opportunities during the first 10 years?	Unknown at this stage
What percentage of this will accrue to previously disadvantaged individuals?	51%

PLEASE NOTE:

Leeudoringstad Solar Plant aims to, under the Engineering, Procurement and Construction (EPC) agreement for the proposed development, "try to subcontract as much as possible – of course within the limits of what is commercially possible – to companies that are youth owned / owned by previously disadvantaged communities that meet the necessary quality standards and can offer competitive market related pricing." It must be noted that "In the event that it would not be possible to grant (parts) of the subcontracting to companies that are youth owned / owned by previously disadvantaged communities, the contractor engages to pay for scholarships for disadvantaged youth for the total amount of 50 000€"

The SPV, Leeudoringstad Solar Plant (Pty) Ltd is currently owned by Upgrade Energy South Africa (Pty) Ltd. Once Commercial Operation Date (COD) is accomplished, 100% of the Leeudoringstad Solar Plant (Pty) Ltd shares will be transferred to the new owners of the proposed development SIG Energy (Pty) Ltd t/a SIG Energy Investments. Based on the Operation and Maintenance (O&M) agreement between Upgrade Energy South Africa (Pty) Ltd and SIG Energy (Pty) Ltd t/a SIG Energy Investments, the Operation and Maintenance of the proposed development will occur under an ad hoc O&M company registered as K2016388572 (South Africa (Pty) Ltd. K2016388572 (South Africa (Pty) Ltd will be jointly owned by SIG Energy (Pty) Ltd t/a SIG Energy Investments as the Operation and Maintenance company for 51% of the shares and Upgrade Energy NV as the EPC contractor for 49% of the shares

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

- a) **Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA) ✓	Ecological Support Area (ESA) ✓	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	Vaal-Vet Sandy Grassland is listed as Endangered in the scientific literature and in the National List of Ecosystems that are Threatened and need of protection <u>CBA nodes</u> : Nodes of Provincial-level biodiversity corridor network aimed at retaining connectivity between geographical areas. <i>The entire study area falls within this biodiversity node area.</i>
				CBA corridor: Provincial-level biodiversity corridor network aimed at retaining connectivity between geographical areas. <i>Two-thirds of the study area falls within this biodiversity corridor area.</i>
				<u>ESA Wet</u> : Ecological support area for wetlands. A buffer zone for a pan north of the site is indicated as an ESA in the eastern third of the site . Note that the conservation plan fails to detect the small pan in the centre of the site, which would likely be indicated as CBA wetland area and a buffer zone of the central part of the site would probably have been indicated.

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	83.8%	Grasslands and pan depressions. Very dry due to end of winter season, and may be overgrazed (vegetation is very short and sparse)
Near Natural (includes areas with low to moderate level of alien invasive plants)	2.5%	Pan area that has been disturbed by cultivation or borrow activities
Degraded (includes areas heavily invaded by alien plants)	13.1%	Previously cultivated area, now with secondary grassland.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	0.6%	Site of Eskom substation

c) Complete the table to indicate:

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems		
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)	Estuary	Coastline
	Endangered/			
	Vulnerable			
	Least Threatened			
	YES/		NO/	NO/

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

The study site is situated in an area with relatively flat topography adjacent to the main road and a railway line. Natural habitat on site has been affected by previous cultivation in a part of the site, although this could not be confirmed from species composition at the time of the field survey and needs to be confirmed during a summer survey. There is one regional vegetation type occurring in the project

study area, Vaal-Vet Sandy Grassland, and Highveld Salt Pans occurring in nearby areas. Vaal-Vet Sandy Grassland is listed as Endangered in the scientific literature and in the National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011). The site is also within an area included as part of the National Parks Area Expansion Strategy and is within a CBA Corridor area, a CBA Node Area and an ESA Wetland buffer zone in the Provincial Conservation Plan. The remaining natural vegetation on site therefore has potentially high conservation value.

There are two plant species listed as Declining (*Crinum bulbispermum* and *Eucomis autumnalis* subsp. *clavata*) that could potentially occur on site, but these are both widespread species that are naturally rare where they are found. There are also two plant species protected according to National legislation (*Crinum bulbispermum* and *Harpagophytum procumbens*) that could potentially occur in the geographical area, but these are also very widespread species. In all cases the loss of some individuals, if they are found to occur on site, would not affect the conservation status of any of the species. However, permits would be required for their removal.

There are a small number of fauna species of conservation concern that were assessed as having a possibility of occurring on site. These are the Brown Hyaena (Near Threatened), Honey Badger (Near Threatened), Southern African Hedgehog (Near Threatened), White-tailed Rat (Endangered), Giant Bullfrog (Near Threatened, protected), White-backed Vulture (Endangered, protected), Martial Eagle (Endangered, protected), Tawny Eagle (Endangered, protected), African Marsh Harrier (Endangered, protected), Black Harrier (Endangered), Burchell's Courser (Vulnerable), Lanner Falcon (Vulnerable), Secretarybird (Vulnerable), Blue Crane (Near Threatened, protected), Red-footed Falcon (Near Threatened), Pallid Harrier (Near Threatened), European Roller (Near Threatened), Abdim's Stork (Near Threatened). None of these have a high likelihood of occurring on site. They are also mostly highly mobile species that are unlikely to be affected by any activities on site. Of those that are more sedentary (Southern African Hedgehog, White-tailed Rat and Giant Bullfrog), it is worth undertaking targeted surveys to confirm whether they occur on site or not.

SECTION C: PUBLIC PARTICIPATION

A Public Participation Report has been compiled, outlining the detailed public participation process undertaken as part of this basic assessment. The Public Participation Report is included in Appendix E.

1. ADVERTISEMENT AND NOTICE

Publication name	The Hills Community Newspaper	
Date published	17 th November 2016	
Site notice position	Latitude	Longitude
	27°14'09.20"S	26°14'10.70"E
	27°13'14.10"S	26°15'54.20"E
	27°13'12.60"S	26°16'58.60"E
Date placed	4 th November 2016	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

Proof of the Advertisements and Site notices are included in Appendix E1

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

Refer to Appendix E for further details of the measures taken to notify all potential I&APs of the proposed project

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Please refer to Appendix E5	Please refer to Appendix E5	To be requested directly from SiVEST (Pty) Ltd

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

Proof that the key stakeholder received written notification of the proposed activities is included in Appendix E2.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

No issues have been recorded as yet. All issues raised by I&APs will be included in the FBAR.

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

This will be included in the FBAR once comments have been received.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Please refer to Appendix E5, full contact details can be requested directly from SiVEST (Pty) Ltd					

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

Proof that the Authorities and Organs of State received written notification of the proposed activities will be included in the FBAR.

6. CONSULTATION WITH OTHER STAKEHOLDERS

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

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

<p>A list of registered I&APs is included in Appendix E5. Full detail of the correspondence and minutes of meetings will be included in the FBAR.</p>
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SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

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

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

Activity	Impact summary	Significance	Proposed mitigation
Biodiversity	Direct impacts:		
	Loss of indigenous natural vegetation	High negative impact expected.	<p>It is not possible to completely avoid impacts on indigenous vegetation for this project. The following mitigation measures would help to limit impacts:</p> <ul style="list-style-type: none"> • Undertake a summer season vegetation survey to properly document diversity on site and properly assess the primary status of the vegetation on site. The post-mitigation impact rating assumes that areas on site are identified that have reduced biodiversity value. • Restrict impact to development footprint only and limit disturbance creeping into surrounding areas. • As far as possible, locate infrastructure within areas that have been previously disturbed or in areas with lower sensitivity scores. • Avoid sensitive features and habitats when locating infrastructure. • Undertake detailed field surveys of the proposed footprint of infrastructure to locate any sensitive species and/or ecological features. If necessary, shift

Activity	Impact summary	Significance	Proposed mitigation
			<p>infrastructure to avoid impacts on species or specific features.</p> <ul style="list-style-type: none"> • Compile a Rehabilitation Plan. • Compile an Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas. • Where possible, access roads should be located along existing farm and district roads. • Access to sensitive areas should be limited during construction. • Undertake monitoring to evaluate whether further measures would be required to manage impacts.
	Loss of individuals of protected plants	Low negative impact expected.	<p>It is possible to a limited extent to avoid some impacts on protected species for this project. The following mitigation measures would help to avoid and limit impacts:</p> <ul style="list-style-type: none"> • It is a legal requirement to obtain permits for specimens that will be lost. • A pre-construction walk-through survey will be required during a favourable season to locate any protected plants. This survey must cover the footprint of all proposed infrastructure, including internal access roads. • Plants lost to the development can be rescued and planted in appropriate places in rehabilitation areas. This will reduce the irreplaceable loss of resources as well as the cumulative effect. • A Plant Rescue Plan must be compiled to be approved by the appropriate authorities. • Where large populations of affected species are encountered, consideration should be given to shifting infrastructure to avoid such areas.

Activity	Impact summary	Significance	Proposed mitigation
	Damage to sensitive habitats	High negative impact expected.	<p>It is not possible to completely avoid impacts on indigenous vegetation for this project. The following mitigation measures would help to limit impacts:</p> <ul style="list-style-type: none"> • Undertake a summer season vegetation survey to properly document diversity on site and properly assess the primary status of the vegetation on site. The post-mitigation impact rating assumes that areas on site are identified that have reduced biodiversity value. • Restrict impact to development footprint only and limit disturbance creeping into surrounding areas. • As far as possible, locate infrastructure within areas that have been previously disturbed or in areas with lower sensitivity scores. • Avoid sensitive features and habitats when locating infrastructure. • Undertake detailed field surveys of the proposed footprint of infrastructure to locate any sensitive species and/or ecological features. If necessary, shift infrastructure to avoid impacts on species or specific features. • Compile a Rehabilitation Plan. • Compile an Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas. • Where possible, access roads should be located along existing farm and district roads. • Access to sensitive areas should be limited during construction. • Undertake monitoring to evaluate whether further measures would be required to manage impacts.

Activity	Impact summary	Significance	Proposed mitigation
	Mortality of populations of sedentary species, the Southern African Hedgehog, the White-tailed Rat and the Giant Bullfrog	Low negative impact expected.	The following mitigation measures would help to avoid or limit impacts: <ul style="list-style-type: none"> • Where necessary undertake targeted small mammal and amphibian assessments to determine whether any of these species do or could occur on site or not. • If any of the species are found to occur on site, the habitat requirements of the species on site needs to be determined. Infrastructure must then avoid sensitive areas or else measures must be put in place to minimise impacts.
	Loss of populations of sedentary animals; mobile fauna, Brown Hyaena and Honey Badger	Low negative impact expected.	None Required
	Displacement of listed bird species due to construction disturbance	Low negative impact expected.	<ul style="list-style-type: none"> • Restrict construction activities to construction footprint only - no access to the remainder of the property. • Implement measures to control noise and dust. • Make maximum use of existing access roads - construction of new roads should be kept to a minimum.
	Displacement of listed bird species due to habitat destruction	Low negative impact expected.	<p>It is not possible to completely avoid impacts on indigenous vegetation for this project. The following mitigation measures would help to limit impacts:</p> <ul style="list-style-type: none"> • Undertake a summer season vegetation survey to properly document diversity on site and properly assess the primary status of the vegetation on site. The post-mitigation impact rating assumes that areas on site are identified that have reduced biodiversity value. • Restrict impact to development footprint only and limit disturbance creeping into surrounding areas. • As far as possible, locate infrastructure within areas that have been previously

Activity	Impact summary	Significance	Proposed mitigation
			<p>disturbed or in areas with lower sensitivity scores.</p> <ul style="list-style-type: none"> • Avoid sensitive features and habitats when locating infrastructure. • Undertake detailed field surveys of the proposed footprint of infrastructure to locate any sensitive species and/or ecological features. If necessary, shift infrastructure to avoid impacts on species or specific features. • Compile a Rehabilitation Plan. • Compile an Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas. • Where possible, access roads should be located along existing farm and district roads. • Access to sensitive areas should be limited during construction. <p>Undertake monitoring to evaluate whether further measures would be required to manage impacts.</p> <p>The following mitigation measures would help to avoid or limit impacts:</p> <ul style="list-style-type: none"> • Undertake targeted small mammal and amphibian assessments to determine whether any of these species do or could occur on site or not. • If any of the species are found to occur on site, the habitat requirements of the species on site needs to be determined. Infrastructure must then avoid sensitive areas or else measures must be put in place to minimise impacts.
	Collision of listed avifauna with overhead power lines	Medium negative impact expected	<ul style="list-style-type: none"> • Locate new power lines in close proximity to existing power lines. • Use bird flappers or similar devices to reduce collision probability along high-risk sections of power line, where feasible. • Avoid placing power lines anywhere within 200 m of any water point.
	Indirect impacts:		
	Establishment and spread of declared	Medium negative	<i>It is possible to avoid impacts due to alien plant invasions by undertaking the following mitigation measures:</i>

Activity	Impact summary	Significance	Proposed mitigation
	weeds and alien invader plants	impact expected.	<ul style="list-style-type: none"> • Undertake a comprehensive alien plant species survey to determine which species occur on site and where they are located. • Compile and implement an alien management plan, which highlights control priorities and areas and provides a programme for long-term control. • Undertake regular monitoring to detect alien invasions early so that they can be controlled. • Implement control measures. • Undertake regular monitoring to detect alien invasions early so that they can be controlled. Implement control measures.
Cumulative impacts:			
<p>There is one known solar PV development that has been proposed or authorised in the region within a 25 km radius of the current project area, but there are various other projects that could also lead to impacts on habitats and species. Assuming that there are other similar impacts nearby, an assessment of cumulative impacts has been done. The proposed project will affect such a small amount of natural habitat that any cumulative impacts associated with the project are likely to be negligible.</p>			
Cumulative impacts on indigenous natural vegetation	Low negative impact expected	<p>The regional terrestrial vegetation types in the broad study area are listed as Endangered. This is the same vegetation type that will be affected by any other projects that would take place in the area. Loss of habitat will definitely occur, but this will be a small area in comparison to the total area of the vegetation type. The vegetation type occupies an area of 22 743 km², of which more than 63% has been altered, so approximately 8 400 km² remains. The total loss of habitat due to a number of projects together will be greater than for any single project, so a cumulative effect will occur. However, the area lost in total will be small compared to the total area of the vegetation type and will not result in a change in the conservation status of the vegetation type.</p>	
Cumulative impacts on listed plant species	No cumulative effect expected	<p>There are two listed plant species that may occur in the study area, all of which are relatively widespread. An increased</p>	

Activity	Impact summary	Significance	Proposed mitigation
			number of projects increases the likelihood of individuals being affected, but unless large numbers of individuals are directly affected,
	Cumulative impacts on protected trees	Low negative impact expected	There is one protected tree species that could occur on site, <i>Vachellia erioloba</i> . With each additional project that is constructed there will be an increasing likelihood of individuals being affected and the number of individuals affected will increase. There is therefore a cumulative effect. The significance of this effect is, however, likely to be low due to the high number of individuals of each of these species that occurs over their entire geographical range and the low number that are likely to be affected by any single project.
	Cumulative impacts on populations of sedentary fauna	Low negative impact expected	There are three species of sedentary fauna that could potentially be impacted by the current project, the Southern African Hedgehog, the White-tailed Rat and the Giant Bullfrog. All have a relatively wide geographical distribution and loss of some habitat in part of their range will have a minimal effect on the species. The combination of a number of projects will have a cumulative effect
	Cumulative impacts on mobile fauna	Low negative impact expected	Construction activities, loss of habitat, noise, dust and general activity associated with the construction phase of the project are likely to cause all mobile species to move away from the site. This effect will be increased if there are a number of projects being constructed at the same time or in quick succession, so the effect is likely to be cumulative. However, the geographical ranges of the species of concern is wide
	Cumulative impacts on listed avifauna	Low negative impact expected	Construction activities, loss of habitat, noise, dust and general activity associated with the construction phase of the project are likely to cause all mobile species to move away from the site. Collisions with overhead power lines will result in mortality of some individuals. These

Activity	Impact summary	Significance	Proposed mitigation
			effects will be increased if there are a number of projects being constructed at the same time or in quick succession, so the effect is likely to be cumulative. However, the geographical ranges of the species of concern is wide
	Cumulative impacts due to spread of declared weeds and alien invader plants	Low negative impact expected	There is a moderate possibility that alien plants could be introduced to areas within the footprint of the proposed infrastructure from surrounding areas in the absence of control measures. The greater the number of projects, the more likely this effect will happen, therefore the effect is cumulative. For the current site, the impact is predicted to be low due to existing impacts on site and the high ability to control any additional impact. The significance will therefore be low, especially if control measures are implemented
Avifuana	Direct impacts:		
	Displacement of priority species due to disturbance associated with construction of the PV plant and associated infrastructure.	Medium negative impact expected	<ul style="list-style-type: none"> • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
	Mortality of priority species due to collisions with solar panels	Low negative impact expected	<ul style="list-style-type: none"> • Due to the very low significance of the anticipated impact, no mitigation measures are deemed necessary.
	Entrapment of large-bodied birds in the double perimeter fence	Low negative impact expected	<ul style="list-style-type: none"> • It is recommended that a single perimeter fence is used.
	Collisions of priority species with the proposed 132kV line.	Low negative impact expected	<ul style="list-style-type: none"> • A walk-through exercise should be conducted by the avifaunal specialist once the tower positions have been finalised with the objective of

Activity	Impact summary	Significance	Proposed mitigation
			demarcating the spans that need to be marked Bird Flight Diverters (BFDs).
Indirect impacts:			
	Displacement of priority species due to habitat transformation associated with construction of the PV plant and associated infrastructure.	Medium negative impact expected	<ul style="list-style-type: none"> • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum. • The mitigation measures proposed by the vegetation specialist must be strictly enforced.
	Displacement of priority species due to disturbance associated with de-commissioning of the PV plant and associated infrastructure.	Low negative impact expected	<ul style="list-style-type: none"> • De-commissioning activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum. • The mitigation measures proposed by the vegetation specialist must be strictly enforced.
Cumulative impacts:			
	Displacement of priority species due to habitat transformation and disturbance	Low negative impact expected	The difficulties associated with the quantification of cumulative impacts of the renewable energy facilities have already been explained above. Stock farming, is not displacing any priority species although it may be that periodic overgrazing might have an impact on the

Activity	Impact summary	Significance	Proposed mitigation
			<p>habitat and therefore the densities of some species. However, that cannot be categorically confirmed without more research. However, the extensive habitat transformation due to the cultivation of agricultural crops has a catastrophic impact on the natural grassland (Harrison et al. 1997). As far as potential future impacts are concerned, the cumulative impact of habitat transformation due to the combined effect of all the proposed solar facilities in the area is currently low, due to the small number and small size of proposed developments.</p>
	<p>Potential mortality due to collisions with the proposed photovoltaic panels</p>	<p>Low negative impact expected</p>	<p>Collisions with the solar PV panels are a possible threat to priority species known to potentially occur at the development area. As far as potential future impacts are concerned, the cumulative impact of PV collision mortality due to the combined effect of all the proposed solar facilities in the area is currently low, due to the small number and small size of proposed developments.</p>
	<p>Potential mortality due to entrapment in the double perimeter fence</p>	<p>Low negative impact expected</p>	<p>Entrapment in the double perimeter fence is a possible threat to large-bodied priority species known to potentially occur at the development area. As far as potential future impacts are concerned, the cumulative impact of entrapment due to the combined effect of all the proposed solar facilities in the area is currently low, due to the small number and small size of proposed developments.</p>
	<p>Potential mortality due to collisions with the proposed 132kV grid connection</p>	<p>Low negative impact expected</p>	<p>Collisions with the 132kV grid connection are a possible threat to priority species known to potentially occur at the development area. As far as potential future impacts are concerned, the cumulative impact of powerline collision mortality due to the combined effect of all the existing and future powerlines in the area is currently moderate, as the area</p>

Activity	Impact summary	Significance	Proposed mitigation
			contains a fair number of high voltage lines.
Surface Water	Direct impacts:		
	There are there are two (2) depression wetlands on the proposed development site for the proposed PV facility and associated infrastructure.		
	Impacts associated with the construction lay-down area in or near surface water resources	Medium negative impact expected	<ul style="list-style-type: none"> • Location of the Lay-down Area – The construction lay-down area must not be placed within 50m nor directly within any of the identified and delineated surface water resources unless absolutely necessary. Where this is absolutely required, the relevant environmental authorization and water licenses must be obtained before construction is allowed to commence. Where obtained, the stipulated conditions and any further mitigation measures are to be adhered to accordingly. • Preventing Indirect Erosion, Sedimentation and Run-off Impacts – In general, adequate structures must be put into place (temporary or permanent where necessary in extreme cases) to deal with increased/accelerated run-off and sediment volumes. The use of silt fencing and potentially sandbags or hessian “sausage” nets can be used to around the lay-down area to prevent run-off from the cleared proposed construction lay-down area flowing into the surrounding area and possibly, any nearby wetlands. This will additionally assist with preventing consequent erosion and sedimentation in susceptible surrounding areas. • Preventing Fire Risks – Operational fire extinguishers are to be available in the case of a fire emergency. Given the dry seasons and strong winds that the region experiences, it is recommended that a fire management and emergency plan compiled by a suitably qualified health and safety officer be compiled

Activity	Impact summary	Significance	Proposed mitigation
	Vehicle and machinery degradation to surface water resources	Low negative impact expected	<p>and implemented for the proposed development.</p> <ul style="list-style-type: none"> • Preventing Physical Degradation of the Wetlands – No construction is to take place within 50m nor directly within any of the identified and delineated surface water resources unless absolutely necessary. The delineated surface water resources are to be clearly demarcated as highly sensitive, and no access into these areas is to be allowed. • Limiting Physical Degradation to Surface Water Resources – Where construction directly within and / or in close proximity (50m) to surface water resources is absolutely required, the relevant environmental authorization and water licenses must be obtained before construction is allowed to commence. Where obtained, the stipulated conditions and any further mitigation measures are to be adhered to accordingly. • Should an Environmental Authorization and / or WUL permit be issued for construction within or in close proximity to the surface water resources, a single access route or “Right of Way” (RoW) is to be established through or in the desired construction area in the surface water resources. The environmentally authorized and water use license permitted construction area is to be demarcated and made clearly visible. The establishment of the RoW likewise must be demarcated and made visible. The width of the RoW must be limited to the width of the vehicles required to enter the wetland (no more than a 3m width). An area around the locations of the proposed development structures and any other associated infrastructure will be required in order for construction vehicles and machinery to operate/maneuver, only where

Activity	Impact summary	Significance	Proposed mitigation
			<p>required. This too must be limited to the smallest possible area and made clearly visible by means of demarcation.</p> <ul style="list-style-type: none"> • Construction workers are only allowed in the designated construction areas of the proposed development and not into the surrounding surface water resources. Highly sensitive areas are to be clearly demarcated prior to the commencement of construction and no access beyond these areas is to be allowed unless in RoW areas. • Preventing Soil Contamination – No vehicles are to be allowed in the highly sensitive areas unless authorised. Should vehicles be authorised in highly sensitive areas, all vehicles and machinery are to be checked for oil, fuel or any other fluid leaks before entering the required construction areas. All vehicles and machinery must be regularly serviced and maintained before being allowed to enter the construction areas. No fuelling, re-fuelling, vehicle and machinery servicing or maintenance is to take place in the highly sensitive areas. The study site is to contain sufficient spill contingency measures throughout the construction process. These include, but are not limited to, oil spill kits to be available, fire extinguishers, fuel, oil or hazardous substances storage areas must be bunded to prevent oil or fuel contamination of the ground and/or nearby wetland or the associated buffer zone.
	<p>Degradation and removal of soils and vegetation associated with the surface water resources and the associated buffer zones</p>	<p>Medium negative impact expected</p>	<ul style="list-style-type: none"> • Avoiding Direct Impacts to the Surface Water Resources – In determination of the layout, all components and infrastructure are to avoid the surface water resources as well as the associated buffer zones. • Reducing Impacts to the Surface Water Resources – Should this not be able to be undertaken, and should the required

Activity	Impact summary	Significance	Proposed mitigation
			<p>Environmental Authorization and / or WUL permit be issued for construction within or in close proximity to the various surface water resources, the permitted construction area is to be established as a RoW area to be established through or in the desired construction area in the surface water resources. The environmentally authorized and water use license permitted construction area is to be demarcated and made clearly visible. The establishment of the RoW likewise must be demarcated and made visible. The extent of the RoW must be limited to the absolute minimum.</p> <ul style="list-style-type: none"> • Construction workers are only allowed in the designated construction areas of the proposed development and not into the surrounding surface water resources. Highly sensitive areas are to be clearly demarcated prior to the commencement of construction and no access beyond these areas is to be allowed unless in RoW areas. • Preservation of Surface Water Resources as a Result of Powerline Construction – Excavations for power line towers must be undertaken by hand as far as practically possible to limit vehicles inside of the surface water resources. Where any soils are to be removed from surface water resource areas, these are to be stockpiled. Top soil must be stockpiled separately from the sub-soil types. All soil stockpiles from general construction activities in or within 50metres from the delineated surface water resource must be adequately bunded by suitable materials. Bunding materials can include a brick layer (three bricks in height) boundary around the soil stockpile. Alternatively, wooden planks approximately 40-50cm high fixed with pegs can be used. Sand bags may also

Activity	Impact summary	Significance	Proposed mitigation
			<p>potentially be used. This will prevent soil run-off and potential sedimentation pollution (environmental incident) impacting on the surface water resource.</p> <ul style="list-style-type: none"> Rehabilitation of RoW Areas – Ideally, the affected RoW zones in the sensitive areas must be re-instated with the soils removed from the surface water resource(s), and the affected areas must be levelled, or appropriately sloped and scarified to loosen the soil and allow seeds contained in the natural seed bank to re-establish. However, given the aridity of the study area, it is likely that vegetation recovery will be slow. Rehabilitation areas will need to be monitored for erosion until vegetation can re-establish where prevalent. If affected areas are dry and no vegetation is present, the soil is to be re-instated and sloped.
	<p>Increased storm water run-off, erosion and increased sedimentation impacting on the surface water resources</p>	<p>Medium negative impact expected</p>	<ul style="list-style-type: none"> Preventing Increased Run-off and Preventing Increased Run-off and Sedimentation Impacts – Vegetation clearing should take place in a phased manner, only clearing areas that will be constructed on immediately. Vegetation clearing must not take place in areas where construction will only take place in the distant future. An appropriate storm water management plan formulated by a suitably qualified professional must accompany the proposed development to deal with increased run-off in the designated construction areas. In general, adequate structures must be put into place (temporary or permanent where necessary in extreme cases) to deal with increased/accelerated run-off and sediment volumes. The use of silt fencing and potentially sandbags or hessian “sausage” nets can be used to prevent erosion in susceptible construction areas. All impacted areas

Activity	Impact summary	Significance	Proposed mitigation
			<p>are to be adequately sloped to prevent the onset of erosion.</p> <ul style="list-style-type: none"> Importantly, special attention must be given and implemented at the recommendation of the ECO for site specific erosion, sedimentation and run-off mitigation measures at the edge of the buffer zones of the surface water resources if and where required.
	<p>Vehicle damage to the surface water resources</p>	<p>Medium negative impact expected</p>	<ul style="list-style-type: none"> Minimising Vehicle Damage to the Surface Water Resources – Potential impacts can be completely avoided by the routing of access roads outside of and away from the surface water resources and the associated buffer zones. Additionally, existing roads are to be used as far as practically possible. This is particularly so for the proposed power line to be routed along the R502 in order to limit damage to the Leeudoringspruit. However, where access through surface water resources are unavoidable and absolutely required, it is recommended that any road plan and associated structures be submitted to the relevant environmental and water departments for approval prior to implementation. The access roads that are environmentally authorised and have been permitted in terms of water use licensing in the highly sensitive area will have to be regularly monitored and checked for erosion. Monitoring should be conducted once every month in the rainy season (October to March). Additionally, after short or long periods of heavy rainfall or after long periods of sustained rainfall, the roads will need to be checked on an ad hoc basis for erosion. Rehabilitation measures will need to be employed should erosion be identified. Where erosion begins to take place, this must be dealt with immediately to

Activity	Impact summary	Significance	Proposed mitigation
			<p>prevent significant erosion damage to the wetland. Should large scale erosion occur, a rehabilitation plan will be required. Input, reporting and recommendations from a suitably qualified wetland/surface water specialist must be obtained in this respect.</p>
Indirect impacts:			
	<p>Human degradation to fauna and flora associated with the surface water resources</p>	<p>Low negative impact expected</p>	<ul style="list-style-type: none"> • Minimising Human Physical Degradation of Sensitive Areas – Construction workers are only allowed in designated construction areas and not into the wetlands designated as highly sensitive, unless the environmental authorisation and respective water use license authorize them to do so in established RoW areas. • No animals on the construction site or surrounding areas are to be hunted, captured, trapped, removed, injured, killed or eaten. Should any party be found guilty of such an offence, stringent penalties should be imposed. The appointed environmental control officer (ECO) is to be contacted should removal of any fauna be required during the construction phase. • No “long drop” toilets are allowed on the study site. Suitable temporary chemical sanitation facilities are to be provided. Temporary chemical sanitation facilities must be placed at least 100m from the wetland where these are required. Temporary chemical sanitation facilities must be placed over a bunded or a sealed surface area and adequately maintained to prevent pollution impacts. • No water is to be extracted unless a water use license is granted for specific quantities for a specific water resource. • No hazardous or building materials are to be stored or brought into the highly sensitive areas. Should a designated storage area be required, the storage

Activity	Impact summary	Significance	Proposed mitigation
			<p>area must be placed at the furthest location from the highly sensitive area. Appropriate safety measures as stipulated above must be implemented.</p> <ul style="list-style-type: none"> No cement mixing is to take place in the the surface water resources or the associated buffer zones. In general, any cement mixing should take place over a bin lined (impermeable) surface or alternatively in the load bin of a vehicle to prevent the mixing of cement with the ground. Importantly, no mixing of cement directly on the surface is allowed in the highly sensitive area.
	Storm Water run-off impacts to surface water resources	Low negative impact expected	<ul style="list-style-type: none"> Any hardstand area or building within 50m proximity to a wetland must have energy dissipating structures in an appropriate location to prevent increased run-off and sediments contained in the run-off entering adjacent areas or wetlands. This can be in the form of hard concrete structures or soft engineering structures (such as grass blocks for example). Alternatively, a suitable operational storm water management design or plan can be compiled and implemented that accounts for the use of appropriate alternative structures or devices that will prevent increased run-off and sediment entering adjacent areas or surface water resources
Cumulative impacts:			
None identified.			
Agriculture	Direct impacts:		
	Loss of agriculturally productive land	Low negative impact expected	<ul style="list-style-type: none"> Ensuring that the minimum area possible is set aside for the project infrastructure, so that the natural vegetation is undisturbed and grazing of livestock can continue on site post-construction.
Indirect impacts:			
None identified at this stage.			
Cumulative impacts:			
None identified at this stage.			
Heritage	Direct impacts:		

Activity	Impact summary	Significance	Proposed mitigation
	The possibility of encountering previously unidentified heritage resources. As well as the impact on the identified archaeological sites	Low negative impact expected.	<ul style="list-style-type: none"> For sites LD01, LD03, LD04, LD05, LD06 and LD07, LD09, LD10, LD11 LD12 It is recommended that further consultation with local communities on the previous inhabitants of these areas be initiated to determine the possibility of infant burials. In the event that such burial is confirmed a grave relocation process must be initiated. It is further recommended that an archaeologist monitor the earth moving activities during construction It is recommended that the burial site LD02 be preserved and a buffer fence of 20 meters constructed around the site. Grave relocation must only be considered as last resort. A detailed relocation process must be followed and it is recommended that an experienced consultant be appointed to manage the relocation process. It is recommended that the site LD13 be documented by means of a layout drawing and photographic documentation after which a destruction permit must be applied for from the North West Provincial Heritage Authority prior to destruction.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	None identified.		
Palaeontology	Direct impacts: The possibility of encountering previously unidentified Palaeontology heritage resources (fossils) in the development footprint.	High negative impact expected.	<ul style="list-style-type: none"> Mitigation of the inevitable damage and destruction of fossil within the proposed development area would involve the surveying, recording, description and collecting of fossils within the development footprint by a professional palaeontologist. This work should take place after initial vegetation clearance has taken place but before the ground is levelled for construction Impacts on fossil heritage are generally irreversible. Well-documented records and further

Activity	Impact summary	Significance	Proposed mitigation
			<p>palaeontological studies of any fossils exposed during construction would represent a positive impact from a scientific perspective. The possibility of a negative impact on the palaeontological heritage of the area can be reduced by the implementation of adequate damage mitigation procedures. If damage mitigation is properly undertaken the benefit scale for the project will lie within the beneficial category.</p> <ul style="list-style-type: none"> • Not deemed necessary, as the Allanridge Formation is unfossiliferous.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	None identified.		
Visual	<p>Direct impacts:</p> <p>Visual impacts of the proposed on-site PV facility (including associated infrastructure) during construction</p>	<p>Low negative impact expected.</p>	<ul style="list-style-type: none"> • Carefully plan to reduce the construction period. • Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. • Vegetation clearing should take place in a phased manner. • Maintain a neat construction site by removing rubble and waste materials regularly. • Make use of existing gravel access roads where possible. • Limit the number of vehicles and trucks travelling to and from the proposed site. • Where possible, ensure that dust suppression techniques are implemented on gravel access roads being utilised during construction. • Ensure that dust suppression is implemented in all areas where vegetation clearing has taken place. • Ensure that dust suppression techniques are implemented on all soil stockpiles. • Re-vegetate all reinstated cable trenches with the same vegetation that existed prior to the cable being laid.

Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> Temporarily fence-off the construction site (for the duration of the construction period). Establish erosion control measures on areas which will be exposed for long periods of time. This is to reduce the potential impact heavy rains may have on the bare soil.
	Visual impacts of the proposed on-site PV facility during operation	Medium negative impact expected.	<ul style="list-style-type: none"> Light fittings for security at night should reflect the light toward the ground and prevent light spill. As far as possible, limit the amount of security and operational lighting present on site. As far as possible, limit the number of maintenance vehicles which are allowed to access the site. Where possible ensure that dust suppression techniques are implemented on gravel access roads being utilised for maintenance purposes. Only clear vegetation on site and adjacent to the site which is required to be cleared for the correct operation of the facility..
	Visual impacts of the proposed on-site PV facility associated infrastructure during operation	Low negative impact expected.	
Indirect impacts:			
None identified.			
Cumulative impacts:			
None identified.			
Socio-Economic	Direct impacts: Construction, and to some degree maintenance, of the proposed PV facility and infrastructure in the relevant sectors as a result of direct, indirect, and induced effects.	Medium positive impact expected.	<p>In order to optimise the stimulation of the local economy through direct, indirect and induced effects, the following should be applied where possible:</p> <ul style="list-style-type: none"> Procure construction materials, goods, and products from local and domestic suppliers if feasible Employ local contractors where possible <p>The proposed mitigation measures will possibly increase the positive impact in the local economy; however, this will not affect the weighting thereof.</p>

Activity	Impact summary	Significance	Proposed mitigation
	The proposed PV facility and associated infrastructure employment opportunities in FTE-person years	Low positive impact expected.	The following is recommended to increase the employment opportunities created in the local communities, where feasible: <ul style="list-style-type: none"> • Employ labour-intensive methods in construction, where feasible. • Employ local residents and communities, where possible. • Sub-contract to local construction companies, where possible. • Utilise local suppliers, where possible. The proposed mitigation measures could increase the positive impact on the local economy but would not change the total impact; therefore, the ratings assigned for the impact before mitigations will not be affected.
	The construction of the proposed PV facility and associated infrastructure will sterilise the land demarcated for the proposed development. All current activities taking place on the land will be discontinued.	Low negative impact expected.	Rehabilitation of land should take place at the end of the project's life to allow for the land to be used for commercial livestock farming after the project's closure.
Indirect impacts:			
	The proposed PV facility and associated infrastructure will require operating expenditure to maintain and operate the plant and this will increase the size of the local utility sector and stimulate the economic production through multiplier effects.	Medium positive impact expected.	If possible, goods and services should be procured from local small businesses and local contractors should be utilised to maximise the benefit to the local community.

Activity	Impact summary	Significance	Proposed mitigation
	The proposed PV facility and associated infrastructure will create jobs to support the operation and maintenance of the PV plant.	Medium positive impact expected.	Where feasible, all labour positions should be filled by people from the local community.
	Investment into the power line will lead to the increase in business sales of the directly and indirectly affected businesses, leading to the creation or support of jobs	Low positive impact expected.	Encourage contractors to employ labourers from the local community
Cumulative impacts:			
None identified.			
No-go option			
Direct impacts:			
<p>The 'no-go' alternative is the option of not establishing the proposed Solar PV Facility. South Africa is currently under immense pressure to generate electricity to accommodate for the additional demand, which has been identified.</p> <p>The generated electricity will be purchased from Leeudoringstad Solar Plant by PowerX (Pty) Ltd (here after referred to as "PowerX"). One of the aims of PowerX is to enable electricity generation within local municipalities. PowerX hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and wheel the power using the national transmission and distribution network, to its customers. The purchased electricity will be sold directly to commercial and light industrial consumers within the Maquassi Hills Local Municipality and the customers electricity bill will get off-set by the Maquassi Hills Local Municipality.</p> <p>If the proposed development was not constructed (i.e. implementing the no-go alternative), this would have negative implications in the area as the power supplied by the PV plant would not be able to be sold to commercial and light industrial consumers within the Maquassi Hills Local Municipality.</p>			
Indirect impacts:			
If the proposed solar PV plant and associated infrastructures is not constructed this would have negative implications in terms of preventing the socio-economic benefits that the proposed development would have for the local community, such as job creation and economic production.			
Cumulative impacts:			

Activity	Impact summary	Significance	Proposed mitigation
	None identified.		

A complete impact assessment in terms of Regulation 19(3) of GN 733 must be included as Appendix F.

Due to the generic nature of the study area and the fact that the substation alternatives are in close proximity to each other the impacts for each proposed alternative are relatively similar. A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 is included in Appendix F.

2. ENVIRONMENTAL IMPACT STATEMENT

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

Proposed PV Facility Alternative A and associated infrastructure

Biodiversity	<ul style="list-style-type: none"> This Alternative is not preferred. Entire footprint is within areas of MEDIUM-HIGH sensitivity, including a pan. Longest power line distance. Far distance from water-point.
Avifauna	<ul style="list-style-type: none"> All the alternatives are acceptable from an avifaunal perspective because they are practically the same size and all are in identical habitat.
Surface Water	<ul style="list-style-type: none"> PV layout Alternative A is placed inside Depression Wetland 2. Constructing the PV array field in the wetland will result in direct physical impact and transformation of the wetland. Essentially, half of the wetland will be lost. This alternative is therefore not preferred.
Agriculture	<ul style="list-style-type: none"> There is no preference in layout alternatives. Similar natural resources with minimal impacts
Heritage	<ul style="list-style-type: none"> This Alternative is preferred. Assessing the possible impacts by the layout options on the identified heritage resources the Leeudoring A and B will have the least direct impact on the heritage resources. However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development.
Palaeontology	<ul style="list-style-type: none"> This Alternative is preferred. Assessing the possible impacts by the layout options on the identified heritage resources the Leeudoring A and B will have the least direct impact on the heritage resources. However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development.
Visual	<ul style="list-style-type: none"> There is no preference in layout alternatives.

	<ul style="list-style-type: none"> All the alternatives are acceptable from a visual perspective because they are practically the same size and will have similar visual impacts and visual receptors.
Socio-Economic	<ul style="list-style-type: none"> There is no preference in layout alternatives. No differentiation between this and the other options in terms of the majority of socio-economic impacts; but will result in lower electricity production than Alternative C and D

Proposed PV Facility Alternative B and associated infrastructure

Biodiversity	<ul style="list-style-type: none"> This Alternative is preferred. Of all the alternatives, this one affects the smallest amount of natural habitat of MEDIUM-HIGH sensitivity, has short power line distance and is close to the water-point.
Avifauna	<ul style="list-style-type: none"> All the alternatives are acceptable from an avifaunal perspective because they are practically the same size and all are in identical habitat.
Surface Water	<ul style="list-style-type: none"> This alternative is not placed within any wetland or other surface water resources. The nearest surface water resource is the drainage pathway located on the opposite side of the R502 (which acts as a physical barrier), located approximately 330m away to the south west. The next nearest surface water resource is Depression Wetland 2 which is approximately 770m away, to the east. The possibility of indirect impacts on these two surface water resources is a likely but minimal. Should adequate mitigation measures be implemented, the potential impact will be negligible. This alternative is preferred.
Agriculture	<ul style="list-style-type: none"> There is no preference in layout alternatives. Similar natural resources with minimal impacts
Heritage	<ul style="list-style-type: none"> This Alternative is preferred. Assessing the possible impacts by the layout options on the identified heritage resources the Leeudoring A and B will have the least direct impact on the heritage resources. However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development.
Palaeontology	<ul style="list-style-type: none"> This Alternative is preferred. Assessing the possible impacts by the layout options on the identified heritage resources the Leeudoring A and B will have the least direct impact on the heritage resources. However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development.
Visual	<ul style="list-style-type: none"> There is no preference in layout alternatives. All the alternatives are acceptable from a visual perspective because they are practically the same size and will have similar visual impacts and visual receptors.
Socio-Economic	<ul style="list-style-type: none"> There is no preference in layout alternatives. No differentiation between this and the other options in terms of the majority of socio-economic impacts; but will result in lower electricity production than Alternative C and D

Proposed PV Facility Alternative C and associated infrastructure

Biodiversity	<ul style="list-style-type: none"> This Alternative is favourable. Similar to Alternative B, but affects slightly more natural habitat of MEDIUM-HIGH sensitivity.
Avifauna	<ul style="list-style-type: none"> All the alternatives are acceptable from an avifaunal perspective because they are practically the same size and all are in identical habitat.
Surface Water	<ul style="list-style-type: none"> This alternative is not placed within any wetland or other surface water resources. The nearest surface water resource is the drainage pathway located on the opposite side of the R502 (which acts as a physical barrier), located approximately 330m away to the south west. The next nearest surface water resource is Depression Wetland 2 which is approximately 770m away, to the east. The possibility of indirect impacts on these two surface water resources is a likely but minimal. Should adequate mitigation measures be implemented, the potential impact will be negligible. This alternative is preferred.
Agriculture	<ul style="list-style-type: none"> There is no preference in layout alternatives. Similar natural resources with minimal impacts
Heritage	<ul style="list-style-type: none"> This Alternative is favourable. However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development.
Palaeontology	<ul style="list-style-type: none"> This Alternative is favourable. However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development.
Visual	<ul style="list-style-type: none"> There is no preference in layout alternatives. All the alternatives are acceptable from a visual perspective because they are practically the same size and will have similar visual impacts and visual receptors.
Socio-Economic	<ul style="list-style-type: none"> There is no preference in layout alternatives. No differentiation between this and the other options in terms of the majority of socio-economic impacts; but will result in lower electricity production than Alternative C and D

Proposed PV Facility Alternative D and associated infrastructure

Biodiversity	<ul style="list-style-type: none"> This Alternative is favourable. Similar to Alternative B, but affects slightly more natural habitat of MEDIUM-HIGH sensitivity.
Avifauna	<ul style="list-style-type: none"> All the alternatives are acceptable from an avifaunal perspective because they are practically the same size and all are in identical habitat.
Surface Water	<ul style="list-style-type: none"> This alternative is not placed within any wetland or other surface water resources. The nearest surface water resource is the drainage pathway located on the opposite side of the R502 (which acts as a physical barrier), located approximately 330m away to the south west. The next nearest surface water resource is Depression Wetland 2 which is approximately 770m away, to the east. The possibility of indirect impacts

	on these two surface water resources is a likely but minimal. Should adequate mitigation measures be implemented, the potential impact will be negligible. This alternative is preferred.
Agriculture	<ul style="list-style-type: none"> • There is no preference in layout alternatives. • Similar natural resources with minimal impacts
Heritage	<ul style="list-style-type: none"> • This Alternative is favourable.
Palaeontology	<ul style="list-style-type: none"> • However, with the implementation of the recommended management measures it is our opinion that all four alternatives will be acceptable for development.
Visual	<ul style="list-style-type: none"> • There is no preference in layout alternatives. • All the alternatives are acceptable from a visual perspective because they are practically the same size and will have similar visual impacts and visual receptors.
Socio-Economic	<ul style="list-style-type: none"> • There is no preference in layout alternatives. • No differentiation between this and the other options in terms of the majority of socio-economic impacts; but will result in lower electricity production than Alternative C and D

No-go alternative (compulsory)

The “no-go” alternative assumes that the proposed activity does not go-ahead, implying a continuation of the current situation or the status quo. The “no-go” or “no-action” alternative is regarded as a type of alternative that provides the means to compare the impacts of project alternatives with the scenario of a project not going ahead. In evaluating the “no-go” alternative it is important to take into account the implications of foregoing the benefits of the proposed project.

The generated electricity will be purchased from Leeudoringstad Solar Plant by PowerX (Pty) Ltd (here after referred to as “PowerX”). One of the aims of PowerX is to enable electricity generation within local municipalities. PowerX hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and wheel the power using the national transmission and distribution network, to its customers. The purchased electricity will be sold directly to commercial and light industrial consumers within the Maquassi Hills Local Municipality and the customers electricity bill will get off-set by the Maquassi Hills Local Municipality.

The gap between electricity supply and demand has over the last 2 years increased due to the declining Energy Available Factor (EAF) and delays in new build programs. In addition to that, the medium term risk mitigation plan (MTRMP) which is part of the IRP 2010-30 has not materialized to the extent anticipated therefor resulting in load shedding and extended use of diesel generators.

Although the impacts identified, such as visual impacts, would not occur if the project did not go ahead, the socio economic benefit of the proposed project should not be overlooked. The No-Go alternative has thus been eliminated as the power supplied by the PV plant would not be able to be sold to commercial and light industrial consumers within the Maquassi Hills Local Municipality. In addition, the identified environmental impacts can be suitably mitigated and not building the project, would result in the socio-economic benefits being lost, such as job creation and economic production.

SECTION E: RECOMMENDATION OF PRACTITIONER

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

YES/

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

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

Recommendations of the Biodiversity Specialist

- **Vegetation survey during growing season:** The field survey for this assessment was undertaken in mid-September, which is an inappropriate time of the year to document species diversity and composition on site. A detailed vegetation survey should be undertaken during the height of the growing season in order to properly document these vegetation attributes. This will also provide information on whether parts of the site consist of secondary vegetation or not, i.e. whether parts of the site have been previously cultivated. If such secondary areas can be identified, then infrastructure can be located within such areas to avoid impacts on primary vegetation.
- **Targeted small mammal and amphibian survey:** Undertake a small mammal survey (for Southern African Hedgehog and White-tailed Rat) and Giant Bullfrog survey to determine whether any species of concern occur on site or not. Further measures would be based on the outcomes of such surveys.
- **Rehabilitation Programme:** A Rehabilitation Programme should be established before operation. The programme must address the rehabilitation of the existing habitats as well as rehabilitation after closure. This Rehabilitation Programme must be approved by the relevant government departments.
- **Botanical walk-through survey:** This is a requirement only to ensure legal compliance. A pre-activity walk-through survey should be undertaken to list the identity and location of all listed and protected species within the footprint of the proposed infrastructure. The results of the walk-through survey should provide an indication of the number of individuals of each listed species that are likely to be impacted by the proposed development. If possible, areas of concentrations of species of concern should be avoided.
- **Obtain permits for protected plants:** It is a legal requirement that permits will be required for any species protected according to National or Provincial legislation. The identity of species affected by such permit requirements can only be identified during the walk-through survey (previous mitigation measure). It is common practice for the authorities that issue the permits to require search and rescue of affected plants.
- **Search and rescue:** Search and rescue operation of all listed species within the activity footprint. For each individual plant that is rescued, the plant must be photographed before removal, tagged with a unique number or code and a latitude longitude position recorded using a hand-held GPS device. The plants must be planted into a container to be housed within a temporary nursery on site or immediately planted into the target habitat. If planted into natural habitat, the position must

be marked to aid in future monitoring of that plant. Rescued plants housed in temporary nursery may be used in one of two ways: (1) transplanted into suitable natural habitats near to where they were rescued, or (2) used for replanting in rehabilitation areas. Receiver sites must be matched as closely as possible with the origin of the plants and, where possible, be placed as near as possible to where they originated.

- **Alien plant management plan:** It is recommended that a monitoring programme be implemented to enforce continual eradication of alien and invasive species, especially within the riparian habitat. An Alien Invasive Programme is an essential component to the successful conservation of habitats and species. Alien species, especially invasive species are a major threat to the ecological functioning of natural systems and to the productive use of land. In terms of the amendments of the regulations under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), landowners are legally responsible for the control of alien species on their properties. The protection of our natural systems from invasive species is further strengthened within Sections 70-77 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). This programme should include monitoring procedures.
- **Undertake regular monitoring:** Monitoring should be undertaken to evaluate the success of mitigation measures.

Recommendations of the Avifauna Specialist

- There is very little to choose from an avifaunal impact perspective between the different alternatives as far as the PV facility itself is concerned as the major driver relates to the footprint, which are all equal, and in identical habitat. All the different alternatives are acceptable from a bird impact assessment perspective.
- The cumulative impact of the solar PV facility and associated grid connection on priority avifauna within a 30km radius around the proposed development (considering all current impacts on avifauna) is assessed to be low, mainly due to the small size of the proposed development.

Recommendations of the Surface Water Specialist

- It is strongly recommended that no access roads, PV arrays, buildings structures, substations or infrastructure are placed within any of the identified wetlands, the applied buffer zones as well as outside of the desktop identified unchannelled valley bottom wetland 500m aquatic buffer (NWBCA, 2008). The identified potential direct impacts can be largely avoided if this is implemented. As a result, only minimal implementation of mitigation measures will be required to ensure protection of the wetlands.
- Existing roads should be used as far as possible. However, it should be planned that new access roads are constructed around and outside of the wetlands and the associated buffer zones. There is an opportunity for the existing roads through the wetlands to be rehabilitated and the functionality of the wetlands to be improved. However, a wetland rehabilitation plan will be required to implement this. Alternatively, over the long term, the system can recover naturally to a degree if left alone.
- Where direct impacts to wetlands is not avoidable, and / or components or infrastructure will need to be within close proximity to the wetlands, the relevant water use license and triggered activities for environmental authorisation are to be applied for before construction is allowed to commence.
- All the identified triggered activities and water uses identified should be confirmed with the relevant government authoritative departments.

Recommendations of the Agricultural Potential and Soils Specialist

- The construction of the photovoltaic plant at the chosen site will have minimal impact on the loss of agricultural land, due to the small percentage of high potential agricultural land indicated by the Land Type survey information.
- As far as the soils are concerned, there should not be any significant cumulative impacts occurring

Recommendations of the Heritage Specialist

- HIA identified 13 heritage resources. These resources can be grouped in to four clusters. Two clusters consist of the remains of labourer housing, while the other two consist of a cattle kraal and a cemetery. With acknowledgement of the suggested mitigation measures outlined below, the impact can be rated as low.
- The design process and methodology followed by the developer for this project enabled the heritage assessment to provide input into the proposed layout before the impact assessment. This resulted in cognisance being taken of the positions of the heritage sites and thus the reduction of impacts at an early design phase. Analysis of the impact matrix tables will reflect this.
- No Mitigation measures are required for paleontological resources.
- For archaeological resources, consultation with the local communities is required to determine who the previous inhabitants were and to determine the possibility of infant burials. In the extent that such burials are confirmed a grave relocation process must be initiated.
- It is recommended that an archaeologist monitor the earth moving activities during construction.
- It is recommended that the burial site LD02 be preserved and a buffer fence of 20 meters constructed around the site. Grave relocation must only be considered as last resort. A detailed relocation process must be followed and it is recommended that an experienced consultant be appointed to manage the relocation process
- It is recommended that the site LD13 be documented by means of a layout drawing and photographic documentation after which a destruction permit must be applied for from the North West Provincial Heritage Authority prior to destruction.

Recommendations of the Visual Specialist

- Carefully plan to reduce the construction period.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Vegetation clearing should take place in a phased manner.
- Maintain a neat construction site by removing rubble and waste materials regularly.
- Make use of existing gravel access roads where possible.
- Limit the number of vehicles and trucks travelling to and from the proposed site.
- Ensure that dust suppression techniques are implemented on gravel access roads, where possible.
- Ensure that dust suppression is implemented in all areas where vegetation clearing has taken place.
- Ensure that dust suppression techniques are implemented on all soil stockpiles.
- Re-vegetate all reinstated cable trenches with the same vegetation that existed prior to the cable being laid.
- Temporarily fence-off the construction site (for the duration of the construction period).
- Establish erosion control measures on areas which will be exposed for long periods of time. This is to reduce the potential impact heavy rains may have on the bare soil.
- Light fittings for security at the proposed substation at night should reflect the light toward the ground and prevent light spill.
- The O&M buildings should not be illuminated at night.

- If overhead power lines are required, align power lines to run parallel to other linear elements and the farm boundaries, where possible.
- Bury cables under the ground where possible.
- The O&M buildings should be painted with natural tones that fit with the surrounding environment.
- Select the alternatives that will have the least impact on visual receptors
- Limit the number of maintenance vehicles which are allowed to access the site.
- Ensure that dust suppression techniques are implemented on gravel access roads, where possible.
- Non-reflective surfaces should be utilised where possible.
- Ensure that the associated infrastructure are not located within 500m from any of the surrounding farmhouses, in order to limit the visual impact on these dwellings.

Recommendations of the Socio- Economic Specialist

- The In order to optimise the stimulation of the local economy through direct, indirect and induced effects, the following should be applied where possible:
 - Procure construction materials, goods, and products from local and domestic suppliers if feasible
 - Employ local contractors where possible
- The proposed mitigation measures will possibly increase the positive impact in the local economy; however, this will not affect the weighting thereof.
- The following is recommended to increase the employment opportunities created in the local communities, where feasible:
 - Employ labour-intensive methods in construction, where feasible.
 - Employ local residents and communities, where possible.
 - Sub-contract to local construction companies, where possible.
 - Utilise local suppliers, where possible.
- The proposed mitigation measures could increase the positive impact on the local economy but would not change the total impact; therefore, the ratings assigned for the impact before mitigations will not be affected.
- Rehabilitation of land should take place at the end of the project's life to allow for the land to be used for commercial livestock farming after the project's closure.
- If possible, goods and services should be procured from local small businesses and local contractors should be utilised to maximise the benefit to the local community.
- Where feasible, all labour positions should be filled by people from the local community.

General Recommendations of the EAP

It is the opinion of the EAP that the information and data provided in this DBAR is sufficient to enable the DEA to consider all identified potentially significant impacts and to make an informed decision on the application. Further, it is the opinion of the EAP that based on the findings of the BA that the proposed project should be granted an EA and allowed to proceed provided the following conditions are adhered to:

- All mitigation measures recommended by the various specialist should be implemented, where practically possible.
- The proposed PV arrays should be constructed within the environmentally preferred PV array area.
- The environmentally preferred laydown area should be utilised during construction.
- The substation and Operation and Maintenance buildings should be constructed within the environmentally preferred areas.

- All onsite roads should be located within the authorised area for the PV array.
- Final EMPr should be approved by DEA prior to construction
- The final power line and access road alignment should be submitted to the DEA for approval prior to commencing with the activity.

SiVEST as the EAP is therefore of the view that, through the implementation of mitigation measures, together with adequate compliance monitoring, auditing and enforcement thereof by the appointed ECO as well as competent authority, the potential detrimental impacts associated with the proposed PV facility and associated infrastructure can be mitigated to acceptable levels.

It is trusted that the DBAR provides the reviewing authority with adequate information to make an informed decision regarding the proposed project.

Is an EMPr attached?

YES/

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

**The EMPr is included in Appendix G.
 Details of the EAP who compiled the BAR are included in Appendix H.
 The declaration of interest for each specialist is included in Appendix I.
 Any other information relevant to this application and not previously include is in Appendix J.
 This includes the following:**

- **Competent Authority Consultation (Appendix J1)**
- **Coordinate Spreadsheets (Appendix J2)**

Andrea Gibb

NAME OF EAP



SIGNATURE OF EAP

15 November 2016

DATE

Leeudoringstad Solar Plant (Pty) Ltd

prepared by: SiVEST SA (Pty) Ltd

Proposed Construction of the Leeudoringstad 5MW Solar Photovoltaic (PV) Power plant and associated infrastructure near Leeudoringstad, North West Province: Draft BA Report

Revision No. 1

15 November 2016

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SECTION F: APPENDICES

The following appendices must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information