

DECEMBER 2014

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

ESTABLISHMENT OF THE PROPOSED

LETHABO PHOTOVOLTAIC SOLAR ENERGY FACILITY

FREE STATE PROVINCE

AN INITIATIVE OF ESKOM HOLDINGS SOC LTD

BACKGROUND INFORMATION DOCUMENT

Eskom Holding SOC Ltd is proposing to establish a 75MW photovoltaic solar energy facility and associated infrastructure on a site within the Lethabo coal fired power station boundary, approximately 25 km north-east of Sasolburg in the Free State Province. Eskom Holdings SOC Limited has identified a favourable site within the power station boundary for consideration and evaluation of the project in terms of the requirements of the Environmental Impact Assessment (EIA) Regulations. The proposed facility will hereafter be referred to as the Lethabo Photovoltaic Solar Energy Facility, the nature and extent of which is explored in more detail in this document.

## AIM OF THIS BACKGROUND INFORMATION DOCUMENT

This document aims to provide you, as an interested and/or affected party (I&AP), with:

- » An overview of the proposed photovoltaic solar facility.
- » An overview of the EIA process (including a Scoping Phase and an EIA Phase) and the specialist studies being undertaken to assess the potential impacts associated with the proposed project.
- » Details of how you can become involved in the EIA process, receive information, or raise issues which may concern and/or interest you.

## NEED AND JUSTIFICATION FOR THE PROJECT

Internationally there is an increase in the deployment of renewable energy technologies for the generation of electricity due to concerns such as climate change and exploitation of non-renewable resources. Through the Integrated Resource Plan (IRP), the South African Government has set a target for renewable energy of 17 GWh renewable energy contributions to final energy consumption by 2030, to be produced mainly from biomass, wind, solar and small-scale hydro. Eskom has already successfully installed PV systems at offices and parking lots within Eskom-owned property to promote renewable energy awareness and to diversify their own energy mix. Furthermore, Eskom is looking at further reducing their self-consumption at their various owned or utilised sites by introducing Eskom's Ilanga PV Project Portfolio which aims to install 150MWp at their various power stations, offices and substations, which includes the proposed Lethabo Photovoltaic Solar Energy Facility. The solar PV facilities will promote the reduction of Eskom's carbon footprint and support the demand side management energy efficiency programme.

## SITE SELECTION PROCESS

The screening process undertaken by Eskom to assess potential for installing PV facilities at Eskom power stations in Gauteng, Free-State, Mpumalanga and KwaZulu-Natal regions provided an indication of the potential capacity, land availability, environmental constraints and electrical connection options for each of the power stations including Arnot, Duvha, Kendal, Kriel, Lethabo, Majuba, Matimba, Tutuka, Camden, Komati and Ingula. The five (5) power stations which Eskom is currently doing EA processes for are selected as the first targeted sites and this includes Arnot, Duvha, Lethabo, Majuba and Tutuka. The secondary objective of the screening process was to identify the second reference project, following Grootvlei power station<sup>1</sup> to build a solar PV facility. The power stations were assessed using the following criteria which are discussed below:

- » Technical feasibility - taking into account all electrical considerations including point of connection and electrical infrastructure available;
- » Land availability and environmental constraints; and
- » Power station stakeholder's acceptance of the Ilanga PV Portfolio.

At screening it was concluded by Eskom that the Lethabo power station has land available for a large PV facility. The land profile of the site is predominantly flat with little vegetation and trees and a minimal number of power lines running through some of the preferred site. The point of electrical

<sup>1</sup>Grootvlei power station is proceeding forward as the first reference project for the Ilanga PV Portfolio.

connection is situated in close proximity to the land area and there are no foreseen risks from an environmental perspective at a high level. The Lethabo PV site is outside the immediate power station fence but it is still located within the broader power station property on Eskom owned property.

## OVERVIEW OF THE PROPOSED PROJECT

The Lethabo Solar Energy Facility is proposed on Farm 1814 and the remaining portion of farm Brakfontein 9, in the jurisdiction of Fezile Dabi District Municipality and Metsimaholo Local Municipality within the Free State Province. The facility is proposed to include several arrays of photovoltaic (PV) solar panels with a generating capacity of approximately 75 MW and includes the following associated infrastructure:

- » Arrays of photovoltaic (PV) panels.
- » Mounting structures to support the PV panels.
- » Cabling between the project components.
- » Inverters/transformer enclosures.
- » An on-site substation or switching station.
- » A power line to facilitate the connection of the solar energy facility to a substation located within the Lethabo power station.
- » Internal access roads.
- » Buildings (which could include workshop area for maintenance and storage, and an on-site office)

The overall aim of the design and layout of the facility is to maximise electricity production through exposure to the solar radiation, while minimising infrastructure, operation and maintenance costs, and social and environmental impacts. The layout of the facility will be informed by the outcomes of the EIA process to be undertaken.

## RENEWABLE ENERGY TECHNOLOGY PROPOSED FOR THE PROJECT

The use of solar irradiation for power generation is considered a non-consumptive use of a natural resource which produces zero greenhouse gas emissions. The generation of renewable energy will contribute to South Africa's electricity market which has, to date, been heavily dominated by coal-based power generation. The advancement of renewable energy is a priority for South Africa as defined by the Integrated Resource Plan, and in terms of international obligations regarding the reduction of greenhouse gases.

Solar energy facilities, such as those using PV technology use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. Simply speaking, this refers to photons of light knocking electrons into a higher state of energy to create electricity. PV facilities consist of the following components:

### Photovoltaic Cell

A photovoltaic cell is made of silicone which acts as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a PV panel. Arrays of PV panels are to be installed to form the PV facility over an area of approximately 112ha.

### Inverter

The photovoltaic effect produces electricity in direct current. Therefore an inverter must be used to change it to alternating current. Sections of the PV field will be wired to central inverters. The inverters will be housed in small buildings close to the point of connection to the panels.

### Support Structure

The PV panels will be fixed to support structures set at an angle to receive the maximum amount of solar radiation. The angle of the panel is dependent on the latitude of the proposed facility. In South Africa, panels are usually north facing and tilted between 30 and 33 degrees. The angle of the support structure may be adjusted in winter and summer to optimise summer or winter solar radiation characteristics.



Figure 1: Illustration of PV panels (solar-energy-systems1.blogspot.com)

The proposed development would consist of several PV arrays with a generating capacity of 75 MW of electricity. Construction would take approximately 18-24 months to complete and would include the following main activities:

- » Terrain levelling and vegetation clearance. Flat areas will be selected where possible to minimise the need for levelling. Vegetation will be cleared from the development footprint for the construction phase.
- » Construction and use of access roads. Existing roads will be used where possible to avoid/minimise the need for new road construction. The turning circle of trucks will however need to be taken into consideration when planning these internal roads. There will be minimal use of access roads once the plant is operational.
- » Trenching. All DC and AC wiring within the PV plant will be trenched (buried underground).
- » Foundations. Concrete foundations for panels could be cast or holes drilled into the ground for supporting a deep seated screw, depending on the mounting method to be used.

Following construction, the affected areas would be rehabilitated and vegetation will be re-established. The PV panels are designed to operate continuously, unattended and with low maintenance for approximately 20 years. During operation, maintenance of the facility is required to ensure optimal operation. This would include regular maintenance of the PV arrays, trimming of vegetation where this could interfere with the operation of the panels (through shading), and cleaning of the panels using water or compressed air.

### REQUIREMENT FOR AN ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GN R543 (Regulations 26-35), R544, R545 and R546 (as amended), a power generation facility with a generating capacity of 20MW or more, and which occupies an area of more than 20ha requires the undertaking of an Environmental Impact Assessment. Therefore, Eskom Holdings SOC Limited requires authorisation from the National Department of Environment Affairs (DEA) (in consultation with the Free State Department of Economic Development, Tourism and Environmental Affairs (DETEA)) for the undertaking of the proposed project. In order to obtain authorisation, comprehensive, independent environmental studies must be undertaken in accordance with the EIA Regulations. An application

for authorisation has been submitted to DEA, and the project has been registered under application reference number 14/12/16/3/3/2/753. The following listed activities have been applied for<sup>2</sup> -

GNR544 item 10(i);	An overheard power line and on-site substation will be constructed to connect the PV facility to the Eskom grid
GNR544 item 11(i)(ii)(x)(xi)	The PV facility will include the construction of buildings (workshop area and site office) and infrastructures (underground cabling, panels) within 32 metres of a watercourse.
GNR 544 item 18(i)	Construction of the PV facility may require the infilling or excavation and removal of soil of more than 5 cubic metres from a watercourse.
GNR 544 item 22(ii)	The facility will require construction of new access roads. These may exceed 8 metres in width.
GNR 544 item 29(ii)	The development footprint of the current Lethabo power station will be expanded by 1 hectare or more with the construction of the PV facility.
GN544 Item 47(ii)	The facility will require the widening/lengthening of existing access roads within the site.
GN545 Item 1	The proposed facility will consist of arrays of photovoltaic (PV) panels with an electricity output of 75MW.
GN545 Item 15	The development footprint of the solar energy facility would be in excess of 20ha.
GN546 Item 14(a)(i)	The proposed solar energy facility and associated infrastructure may require the clearance of an area of 5 hectares or more of vegetative cover where 75% or more may constitute indigenous vegetation, outside an urban area.

In terms of the above activities, a Scoping & EIA Process is required to be undertaken. Potential impacts will be assessed in two phases as follows:

1. A Scoping Phase, where potential issues associated with both projects will be identified, described and evaluated as part of a desktop study. Areas of sensitivity within the broader site are identified and delineated in order to identify an appropriate portion of the site for the proposed development.
2. An EIA Phase, which involves a detailed assessment of potentially significant impacts identified in the Scoping Phase. Practical and achievable mitigation and management measures will be recommended within Draft Environmental Management Programmes (EMPr).

Eskom Holdings SOC Ltd has appointed Savannah Environmental, as the independent environmental consultants, to undertake the required EIA process. As part of this process, I&APs will be actively involved through the public involvement process being undertaken by Savannah Environmental.

<sup>2</sup>It must be noted that a precautionary approach has been taken in determining the list of relevant Listed Activities such that all possible activities relevant to the project have been included in the application. This list may be refined during the course of the EIA process and listed activities may be removed or added as applicable depending on the findings of the EIA process.

## WHAT ARE THE POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED PROJECT?

Although a solar facility utilises a renewable resource to generate electricity, the construction and operation of the proposed facility has the potential to impact on the environment in both a positive and negative manner. A number of potential environmental impacts associated with the proposed solar facility have been identified at this stage. These potential impacts will be assessed through the following specialist studies:

- » Ecology, fauna and flora - the construction of the facility and the associated disturbance of vegetation may affect the ecology and biodiversity of the site.
- » Avifauna - The impact of the power line and PV facility on birds using the area will be assessed.
- » Wetlands - the construction of the facility and the associated disturbance of wetland systems in the area.
- » Soil erosion - the construction of the proposed facility may result in soil degradation and/or increased erosion potential.
- » Agricultural potential - solar facilities typically result in whole-scale disturbance of the development footprint and therefore the impact on the agricultural potential of the identified site must be assessed.
- » Heritage sites and palaeontology - disturbance to or destruction of heritage sites and fossils may result during the construction phase through excavation activities.
- » Visual aesthetics - the establishment of an industrial facility of this nature has the potential to affect the visual aesthetics within the area.
- » Social - the construction and operation of the facility may result in positive socio-economic opportunities in terms of local employment as well as negative impacts in terms of safety and security and land use characteristics.

Specialist studies will be informed by existing information, field observations and input from the public participation process. As an I&AP, your input is considered an important part of this process, and we urge you to become involved.

## PUBLIC PARTICIPATION PROCESS

The sharing of information forms the basis of the public participation process and offers you the opportunity to become actively involved in the EIA Process from the outset. Comments and inputs from I&APs during the Scoping and the EIA Phases are encouraged in order to ensure that potential impacts are considered within the ambit of the study. The public participation process aims to ensure that:

- » Information that contains all the relevant facts in respect of the application is made available to I&APs for review.
- » I&AP participation is facilitated in such a manner that they are provided with a reasonable opportunity to comment on the proposed project.
- » Adequate review periods are provided for I&APs to comment on the findings of the draft Scoping and EIA Reports.

In order to ensure effective participation, the public participation process includes the following:

- » Distribution of this Background Information Document at the start of the process.
- » Identification of I&APs including adjacent landowners and relevant Organs of State.
- » Placement of site notices at the affected properties.
- » Placement of advertisements in local and/or regional newspapers.
- » Compilation of an I&AP database which is updated throughout the EIA Process. All registered I&APs are personally notified at milestones in the EIA process through a stakeholder letter.
- » Release of the Draft Scoping and EIA Reports for public review.

- » Holding public meetings, and focus group meetings with I&APs to further facilitate the participation process.

## YOUR RESPONSIBILITIES AS AN I&AP

In terms of the EIA Regulations, your attention is drawn to your responsibilities as an I&AP:

- » In order to participate in this EIA process, you must register yourself on the project database.
- » You must ensure that any comments regarding the proposed project are submitted within the stipulated timeframes.
- » You are required to disclose any direct business, financial, personal or other interest which that you may have in the approval or refusal of the application for the proposed solar energy facility.

## HOW TO BECOME INVOLVED

1. By responding by phone, fax or e-mail to the invitation for your involvement which has been advertised in local newspapers.
2. By returning the reply form to the relevant contact person.
3. By attending the meetings to be held during the course of the process. As a registered I&AP you will automatically be invited to attend these meetings. Dates for public meetings will also be advertised in local newspapers.
4. By contacting the consultants with queries or comments.
5. By reviewing and commenting on the draft Scoping and EIA Reports within the stipulated 30-day review periods.

If you consider yourself an I&AP for this project, we urge you to make use of the opportunities created by the public participation process to provide comment, raise issues and concerns which affect and/or interest you or request further information. Your input into this process forms a key element of the EIA process.

By completing and submitting the accompanying reply form, you automatically register yourself as an I&AP for this project, and are ensured that your comments, concerns or queries raised regarding the project will be noted.

## COMMENTS AND QUERIES

Direct all comments, queries or responses to:

Gabriele Wood of Savannah Environmental  
PO Box 148, Sunninghill, Johannesburg, 2157

Phone: 011 656 3237

Fax: 086 684 0547

E-mail: [gabriele@savannahsa.com](mailto:gabriele@savannahsa.com)














To view project documentation, visit

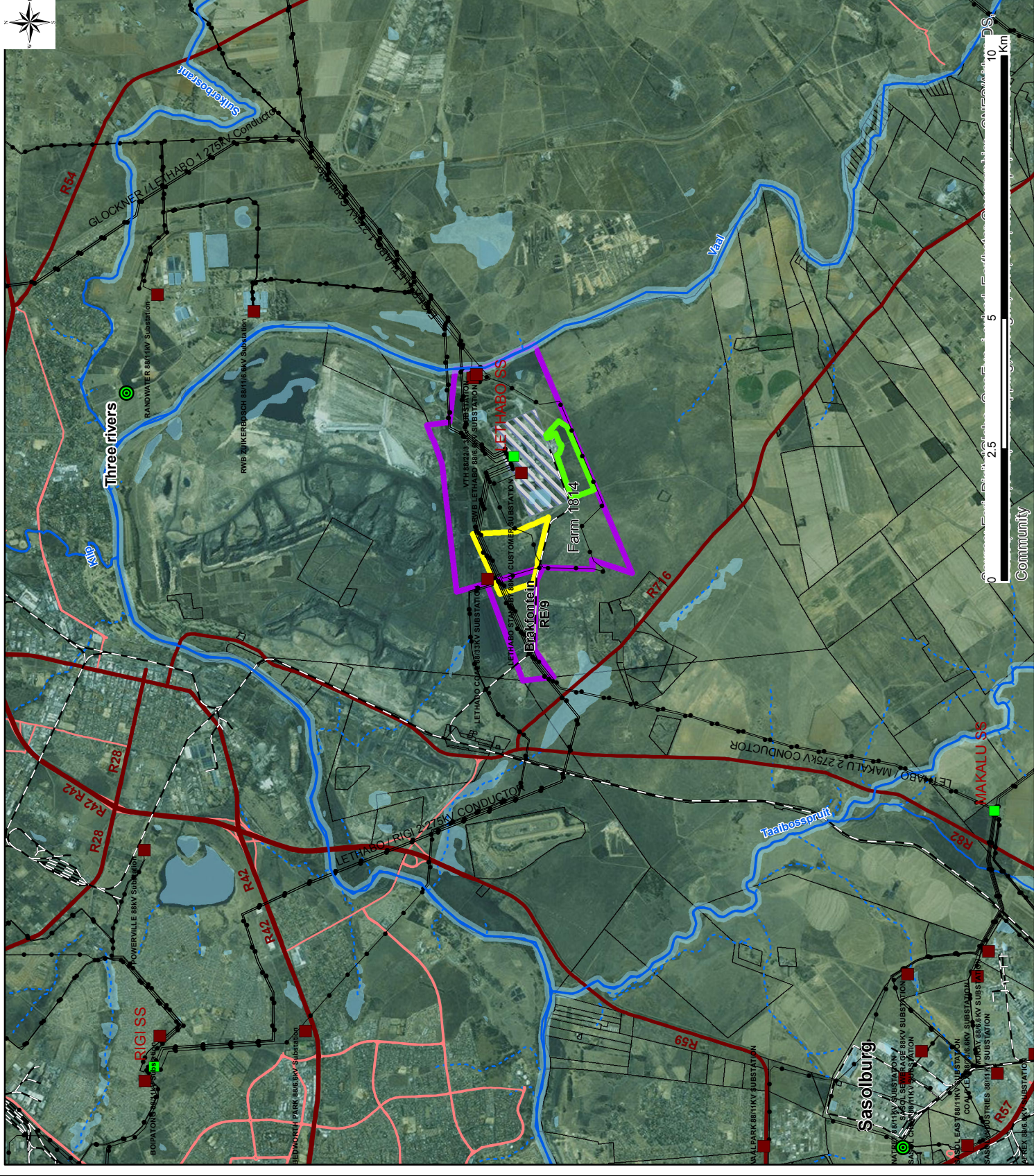
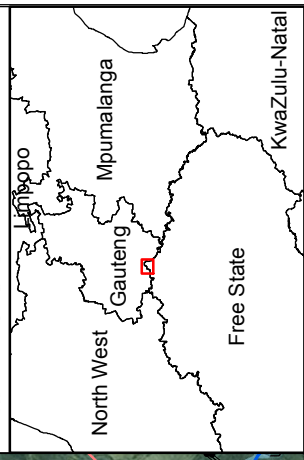
[www.savannahSA.com](http://www.savannahSA.com)

# Lethabo Solar Energy Facility

Locality map

## Legend

-  Transmission substation
-  Distribution substation
-  Existing Powerline
-  Railway Line
-  Regional road
-  Secondary road
-  Perennial river
-  Non Perennial river
-  NFEPA wetlands/waterbody
-  Proposed Lethabo Solar PV facility
-  Alternative Solar PV facility
-  Lethabo Power Station
-  Affected farm portions





TSHEBETSO YA TLHAHLOBO YA KAMEHO YA TIKOLOHO

HO THEHWA HA MOAHO O SISINTSWENG

WA LETHABO PHOTOVOLTAIC SOLAR ENERGY

POROFINSING YA FOREISTATA

BOIQALLO BA ESKOM HOLDINGS SOC LTD



TOKOMANE YA LESEDI LA DINTLHA  
TSE TSHEHETSANG TABA

Eskom Holding SOC Ltd e sisinya ho theha moaho wa 75MW photovoltaic solar energy hoo e ka bang 25 km leboya botjhabela ba Sasolburg Porofinsing ya Foreistata. Eskom Holdings SOC Limited e tshwaile setsha se loketseng haufi le moedi wa seteishene sa motlakase bakeng sa ho nahanelwa le tekanyetso ya porojeke ho ya ka ditlhokahalo tsa Melawana ya Environmental Impact Assessment (EIA). Moaho o sisintsweng kamora mona o tla bitswa Moaho wa Lethabo Photovoltaic Solar Energy, sebophele le hore e hlahlojwa ho fihla bohologeng bofe ka ho qaqileng tokomaneng ena.

## MORERO WA TOKOMANE YA LESEDI LA DINTLHA TSE TSHEHETSANG TABA

Tokomane ena e rera ho fa wena, jwaloka motho ya nang le thahasello le/kapa ya amehileng (I&AP), ka:

- » Kakaretso ya moaho o sisintsweng wa photovoltaic solar.
- » Kakaretso ya tshebetso ya EIA (ho kopanyelletsa le Mokgahlelo wa Tlhahlobo le Mokgahlelo wa EIA) le diphuputso tsa setsebi tse entsweng ho hlahloba dikamo tse ka bang teng tse amanang le porojeke e sisintsweng.
- » Dintlha tse qaqileng tsa hore o ka ba le seabo jwang tshebetso ya EIA, ho fumana lesedi, kapa hlahisa dintho tseo mohlomong di o kgathatsang le/kapa tse o thahasellisang.

## TLHOKAHALO LE TOKAFATSO BAKENG SA POROJEKE

Matjhabeng ho na le keketseho tshebedisong ya ditheknoji tsa enoji e intjhafatsang (renewable energy) bakeng sa ho fehla motlakase ka lebaka la dintho tse kgathatsang jwaloka ho fetoha ha tlelaemete le ho sebediswa hampe ha dirisoso tse sa intjhafatsang (non-renewable). Ka leano la Integrated Resource Plan (IRP), Mmuso wa Afrika Borwa o behile pakane bakeng sa enoji e intjhafatsang wa 17 GWh menehelo ya enoji e intjhafatsang ho ya ho tshebediso ya enoji ya ho qetela ke 2030, hore e hlahiswe haholo ka biomass, moya, solar le tekanyo e nyane ya hydro. Eskom e se entse e kentse ka katleho disitimi tsa PV diofising le dibaka tsa paka dikoloi ka hare ho meaho ya Eskom ho phahamisa tlhokomelo ya enoji e intjhafatsang le ho atolosa matla a yona a motlakase. Ho phaella moo, Eskom e batla ho fokotsa ka ho eketsehileng tshebediso ya bona ditsheng tsa yona kapa tseo e di sebedisang tse fapa-fapaneng ka ho kenya tshebetso Eskom's Ilanga PV Project Portfolio e rerang ho kenya 150MWp deteisheneng tsa yona tsa motlakase tse fapa-fapaneng, diofisi le di-substation, tse kopanyelletsang Moaho o Sisintsweng wa Lethabo Photovoltaic Solar Energy. Meaho ya solar PV e tla phahamisa phokotso ya ho ntsha moya wa khabone ha Eskom (carbon footprint) le ho tshetsa tlhokahalo ya lenaneo la tshebetso e atlehileng ya tsamaiso ya enoji.

## TSHEBETSO YA HO KGETHA YA SETSHA

Tshebetso ya tlhahlobisiso e etswang ke Eskom ho hlahloba monyetla bakeng sa ho hloma meaho ya PV diteisheneng tsa motlakase tsa Eskom dibakeng tsa Gauteng, Free-State, Mpumalanga le KwaZulu-Natal ho fane ka pontsho ya monyetla wa boemo, ho ba teng ha setsha, le dikgetho tsa kgokahano tsa motlakase bakeng sa diteishene tsa motlakase ho kopanyeletsa le Arnot, Duvha, Kendal, Kriel, Lethabo, Majuba, Matimba, Tutuka, Camden, Komati le Ingula. Diteishene tse hlano (5) tsa motlakase tseo Eskom hajwale e etsang ditshebetso tsa EA bakeng sa tsona di kgethilwe jwaloka ditsha tse beilweng boemong ba pele mme tsona di kopanyelletsa Arnot, Duvha, Lethabo, Majuba le Tutuka. Pakane e ka tlasana ya tshebetso ya tlhahlobisiso e ne e le ho tshwaya porojeke ya tshupiso ya bobedi, ho latele seteishene sa motlakase sa Grootvlei<sup>1</sup> ho aha moaho wa build a solar PV. Diteishene tsa motlakase di ile tsa hlahlojwa ho sebediswa tekanyetso e latelang tse boletsweng ka tlase:

- » Ho sebetseha ha botegniki - ho nahanelwa dintho kaofela tsa motlakase ho kopanyeletsa le kgokahano le moaho wa motlakase o fumanehang;

<sup>1</sup>Seteishene sa motlakase sa Grootvlei se tswelapele e le porojeke ya tshupiso ya pele bakeng sa Ilanga PV Portfolio.

- » Ho ba teng ha setsha le tshusumetso ya tikoloho; le
- » Kamohelo ya llanga PV Portfolio ke di-stakeholder tsa diteishene tsa motlakase.

Ka tlhahlobisiso Eskom e ile ya phetha ka hore seteishene sa motlakase sa Lethabo se na le setsha se fumanehang bakeng sa moaho o moholo wa PV. Sebopeho sa setsha ka boholo se folete le dimela tse nyane le difate le palo e fokolang ya dithapo tsa motlakase tse tsamayang dibakeng tsa setsha tse ratwang. Dibaka tsa ho hokahanya motlakase di haufi le sebaka sa naha mme ha ho na dikotsi tse lebelletsweng ho ya ka pono ya tikoloho boemong bo phahameng. Setsha sa Lethabo PV se ka ntle ho fense e leng haufi ya seteishene sa motlakase empa e sa ntse e le hare ho moaho wa seteishene sa motlakase se sehlo moahong wa Eskom.

## KAKARETSO YA POROJEKE E SISINTSWENG

Moaho wa Lethabo Solar Energy o sisintswe Farm 1814 le karolo e setseng ya farm Brakfontein 9, sebakeng se leng tlasa taolo ya Masepala wa Setereke sa Fezile Dabi le Masepala wa Selehae wa Metsimaholo ka hare ho Porofinsi ya Foreistata. Moaho o sisintswe ho kopanyeletsa tatellano ya diphanele tsa photovoltaic (PV) solar tse nang le bokgoni ba ho fehla hoo e ka bang 75 MW mme e akaretsa meaho e amanang le yona e latelang:

- » Tatellano ya diphanele tsa photovoltaic (PV).
- » Methoe e manamisang ho tshhehisa diphanele tsa PV.
- » Ho behwa ha dikheibole mahareng a dikhomponente tsa porojeke.
- » Di inverters/transformer tse kwalletsweng.
- » Substation e leng setsheng kapa seteishene sa motlakase.
- » Thapo ya motlakase ho thusa ka kgokahano moahong wa solar energy ho substation e fumanehang ka hare ho seteishene sa motlakase sa Lethabo.
- » Ditsela tsa phihlelo tsa ka hare.
- » Meaho (e ka kopanyeletsang sebaka sa wekeshopo bakeng sa tlhokomelo le polokelo, le ofisi e leng setsheng)

Morero wa ho desaena le tlhophiso ya moaho ke ho phahamisa tlhahiso ya motlakase ka ho pepesetsa mahlaseding a solar, ha e lekanyetsa ditjeo tsa moaho, tshebetso le tlhokomelo, le kamo ya kahisano le tikoloho. Tlhophiso ya moaho e tla itshetleha ka diphetho tsa tshebetso ya EIA tse tla etswa.

## THEKNOLOJI YA ENEJI E INTJHAFATSANG E SISINTSWENG BAKENG SA POROJEKE

Tshebediso ya solar irradiation bakeng sa ho fehla motlakase e nkwa jwaloka tshebediso e se nang tshenyo ya dirisoso tsa tlhaho tse sa hlahiseng greenhouse gas ka ho feletseng. Ho fehlwa ha eneji e intjhafatsang ho tla kenya letsoho mmarakeng wa motlakase wa Afrika Borwa, oo ho fihlelang jwale, o laolang haholo ke ho fehlwa ha motlakase ka mashala. Ntshetsopele ya eneji e intjhafatsang ho tla pele bakeng Afrika Borwa jwalokaha ho hlalositse ke Integrated Resource Plan (IRP), le ho ya ka boitlamo ba matjhaba mabapi le ho fokotsa ha digase tsa greenhouse.

Meaho ya eneji ya solar, jwaloka e sebedisang theknoloji ya PV e sebedisa eneji ho tswa letsatsing ho fehla motlakase ka tshebetso e tsejwang ka hore ke Photovoltaic Effect. Ka tsela e bonolo, ho bolela di-photons tsa lesedi tse otlang di-electrons boemong bo hodimo ba eneji ho etsa motlakase. Meaho ya PV e na le dikhomponente tse latelang:

### Photovoltaic Cell

A photovoltaic cell e entswe ka silicone e sebetsang jwaloka semiconductor e sebediswang ho hlahisa phello ya photovoltaic. Disele tsa PV ka bomong di a hokahangwa le ho behwa kamora galase e sireletsang ho etsa phanele ya PV. Tatellano ya diphanele tsa PV di tla hlongwa ho etsa moaho wa PV sebakeng se boholo bo ka bang 112ha.

## Inverter

Phello ya photovoltaic e hlahisa motlakase ka direct current. Kamora moo inverter e lokela ho sebediswa ho e fetolela alternating current. Dikarolo tsa lebalala la PV di tla kenngwa dithapo ho di-inverters tse bohareng. Di-inverters di tla kenngwa meahong e menyane e leng haufi le sebaka sa ho hokahanya diphaneleng.

## Moaho o Tshehetsang

Diphanele tsa PV di tla tiiswa ho tshehetsa meaho di setwe ka engele ho fumana palo e hodimo ya mahlasedi a solar. Engele ya phanele e itshetlehlile ka bophara ba moaho o sisintsweng. Afrika Borwa, diphanele ka ho tlwaelehileng di sheba leboya mme di kobeha ka engele e mahareng a didikri tse 30 le 33. Engele ya moaho o tshehetsang e ka nna ya fetolwa ha e le mariha le lehlabula ho fumana kamoo ho kgonehang ditshobotsi tsa mahlasedi a solar a lehlabula le mariha



Setswantsho sa 1: Setshwantsho sa diphanele tsa PV (solar-energy-systems1.blogspot.com)

Ntshetsopele e sisintsweng e tla ba le tatellano ya di PV tse mmalwa tse kgonang ho fehla motlakase wa 75 MW. Kaho e tla nka hoo e ka bang dikgwedi tse 18-24 ho fela mme e tla kopanyelletsa le mesebetsi e latelang:

- » Ho levelwa ha setsha le ho tloswa ha dijalo. Dibaka tse folete di tla kgethwa moo ho kgonehang ho lekanyetsa tlhokahalo ya ho levela. Dijalo di tla tloswa ho tloha sebakeng sa kaho bakeng sa mogahlelo wa kaho.
- » Kaho le tshebediso ya mmila ya phihlelo. Ditsela tse leng teng di tla sebediswa moo ho kgonehang ho qoba/ho fokotsa tlhokahalo ya kaho ya ditsela tse ntjha. Sekele ya ho thinya ha diteraka e lokela ho nahanelwa ha ho rerwa ditsela tsena tsa ka hare. Ho tla ba le tshebediso e nyane ya phihlelo ya ditsela hang moaho o se o sebediswa.
- » Ho tjhekwa ha mekoti. Dithapo kaofela tsa DC le AC tse leng moahong wa PV di tla tjhekelwa (bolokwa tlasa mobu).
- » Metheo. Metheo ya Konkreiti bakeng sa diphanele di ka boptjwa kapa ha drilwa mekoti mobung bakeng sa ho tshehetsa sekurufu se hare-hare, ho itshetlehlile ka mekgwa ya ho manamisa e tla sebediswa.

Kamora kaho, dibaka tse amehang di tla tsosolosa mme dijalo di tla jalwa botjha. Diphanele tsa PV di etseditswe ho sebetsa ka ho tswelang pele, di sa lebelwa le ka tlhokomelo e tlase ka dilemo tse ka bang 20. Nakong ya tshebetso, tlhokomelo ya moaho e ya hloka hloko ho ho etsa bonnete ba tshebetso e atlehang. E tla kopanyelletsa tlhokomelo ya kamehla ya di PV arrays, ho kuta dimela tse ka sitisanang le tshebetso ya diphanele (ka moriti), le ho hlwekisa diphanele ho sebediswa metsi kapa moya o matla.

## TLHOKAHALO YA TSHEBETSO YA TLHAHLOBO YA KAMEHO YA TI KOLOHO

Ho ya ka karolo 24 le 24D wa NEMA, jwalokaha o badilwe le Melawana ya IEA ya GN R543

(Melawana 26-35), R544, R545 le R546 (e ntjhafaditsweng), meaho ya ho fehla motlakase o kgonang ho fehla 20MW kapa ho feta, mme ka bohlo o kwahela sebaka se kahodimo ho 20ha o hloka ho etswa ha Tlhahlobo ya Kamo ya Tikoloho. Kahoo, Eskom Holdings SOC Limited e hloka tumello ho tswa ho National Department of Environment Affairs (DEA) (therisanong le Free State Department of Economic Development, Tourism le Environmental Affairs (DETEA) bakeng sa ho etswa ha porojeke e sisintsweng. Bakeng sa ho fumana tumello, diphuputso tse keneletseng, tse ikemetseng tse tikoloho di lokela ho etswa ho latela Melawana ya EIA. Kopo ya tumello e rometswe ho DEA, mme porojeke e ngodisitse tlasa nomoro ya referense ya kopo 14/12/16/3/3/2/753. Mesebetsi e latelang e thathamisitsweng ho entswe kopo ya tsona<sup>2</sup> -

GNR544 item 10(i);	Dithapo tsa motlakase tse tsamaiswang hodimo le substation e leng setsheng di tla etswa ho hokahanya moaho wa PV matleng a motlakase wa Eskom
GNR544 item 11(i)(ii)(x)(xi)	Moaho wa PV o tla kopanyelletsa kaho ya meaho (sebaka sa wekeshopo le ofisi ya setsha) le meaho (dikhebole tse ka tlasa mobu, diphanele) haufi le 32 metres moo metsi a phallang.
GNR 544 item 18(i)	Kaho ya moaho wa PV e ka nna ya hloka tlatswa kapa ho tjheka le ho tloswa ha mobu o kahodimo ho 5 cubic metres ho tloha phallong ya metsi.
GNR 544 item 22(ii)	Moaho o tla hloka kaho ya ditsela tse ntjha tsa phihlelo. Tsona di ka feta dimithara tse 8 ka bophara.
GNR 544 item 29(ii)	Sebaka sa kaho sa seteishene sa motlakase sa Lethabo se tla eketswa ka hekthara e 1 kapa ho feta ka kaho ya moaho wa PV.
GN544 item 47(ii)	Moaho o tla hloka ho katoloso ka bophara/bolelele ya ditsela tse leng hara setsha.
GN545 item 1	Moaho o sisintsweng o tla ba le tatellano ya diphanele tsa photovoltaic (PV) e nang le output ya motlakase wa 75MW.
GN545 item 15	Sebaka sa kaho sa moaho wa eneji ya solar o tla feta 20ha.
GN546 item 14(a)(i)	Moaho o sisintsweng wa eneji ya solar le meaho e amanang le yona o ka nna wa hloka hore sebaka sa dihekthara tse 5 se hlekwe kapa sebaka sa dijalo moo 75% kapa ho feta ho ka nnang ha ba le dijalo tsa tlhaho, ka ntle ho sebaka sa toropo.

Ho ya ka mesebetsi e kahodimo, Tlhahlobo le Tshebetso ya EIA ho hloka hore di etswe. Dikamo tse ka bang teng di tla hlalohwa mekgahlelong e mebedi ka tsela e latelang:

1. Mokgahlelo wa Tlhahlobo, moo dintho tse amanang le diporojeke ka bobedi di tla hlwauwa, ho hlalosa le ho hlalohwa e le karolo ya phuputso ya deske. Dibaka tse utlwelang tse hara setsha di a hlwauwa le ho hlalosa ho fumana karolo e lekotseng ya setsha bakeng sa moaho o sisintsweng.
2. Mokgahlelo wa EIA, o akaretsang tlhahlobo e keneletseng ya kamo e ka bang teng e ya hlwauwa Mokgahlelong wa Tlhahlobo. Kimollo e sebetsang le e ka fihlellwang le ditekanyetso tsa taolo di tla kgothaletswa ho Draft Environmental Management Programmes (EMPr).

Eskom Holdings SOC Ltd e kgethile Savannah Environmental, jwaloka moeletsu wa tikoloho ya ikemetseng, ho etsa tshebetso e hloka halang ya EIA. E le karolo ya tshebetso ena, I&APs e tla akaretswa tshebetsoing ya seabo sa setjhaba e tla etswa ke Savannah Environmental.

<sup>2</sup>Ho hlokomelwe hore ho nkilwe mehato ho ya ho lemosa ho fumana lenane la Mesebetsi e Thathamisitsweng hore mesebetsi kaofela e hloka halang bakeng sa porojeke e kenyeletsweng kopong. Lenane lena le ka nna la ntlafatswa nakong ya tshebetso ya EIA le mesebetsi e thathamisitsweng e ka nna ya tloswa kapa ho eketswa ho ya kamoo ho sebetsang ho itshelelele ka diphumantsho tsa tshebetso ya EIA.

## KE DIKAMEHO DIFE TSE KA BANG TENG TSA TI KOLOHO TSE AMANANG LE POROJEKE E SISINTSWENG?

Le hoja moaho wa solar o sebedisa resoso e intjhafatsang ho fehla motlakase, kaho le tshebetso ya moaho o sisintsweng e na le monyetla wa kamo ya tikoloho ka tsela e ntle le e mpe Palo ya dikamo tsa tikoloho tse ka bang teng tse amanang le moaho o sisintsweng wa solar o se o hlwailwe mohatong ona. Dikamo tsena tse ka bang teng di tla hlahlojwa ka diphuputso tse latelang tsa setsebi:

- » Ecology, fauna le flora - kaho ya moaho le tshitiso e amehang ya dijalo e ka nna ya ama ikholoji le biodiversity ya setsha.
- » Avifauna - Kameho ya thapo ya motlakase le moaho wa PV ho dinonyana tse sebedisang sebaka seo e tla hlahlojwa.
- » Wetlands (Mokgwabo) - kaho ya moaho le tshitiso e amehang ya disistimi tsa naha e nang le metsi.
- » Ho kgokgoleha ha mobu - kaho ya moaho o sisintsweng o ka nna wa baka ho fokola le/kapa keketseho ya monyetla wa ho kgokgoleha ya mobu.
- » Monyetla wa tsa temo - meaho ya solar ka ho tlwaelehileng e baka tshitiso e tletseng ya sebaka sa kaho mme kahoo kamo ya monyetla wa tsa temo ya setsha se hlwailweng o lokela ho hlahlojwa.
- » Ditsha tsa Heritage le palaeontology - tshitiso kapa tshenyho ya ditsha tsa heritage le masaletsa a dintho tsa boholo-holo e ka ba teng nakong ya mokgahlelo wa kaho ka mesebetsi ya ho tjheka.
- » Mekgabo (Visual aesthetics) - Ho thehwa ha moaho wa indasteri wa boemo bona o na le monyetla wa ho ama mekgabo e bonahalang sebakeng sena.
- » Kahisano - kaho le tshebediso ya moaho e ka nna baka menyetla e metle ya moruo ho ya ka khiri ya selehae le kamo e mpe ho ya poloheho le tshirletseho le tshebetso ya naha.

Diphutso tsa setsebi di tla sebedisa lesedi le leng teng, tlhahlobo ya setsha le maikutlo a tswang bathong ba nkang karolo. Jwaloka I&AP, maikutlo a hao a nkwa e le karolo ya bohlokwa ya tshebetso ena, mme re o kgothalletsa hore o nke karolo.

### TSHEBETSO YA HO NKA KAROLO HA SETJHABA

Ho abelana lesedi ho bopa motheo wa tshebetso ya ho nka karolo ha setjhaba mme ho o fa monyetla wa hore o nke karolo ka mofolofolo Tshebetsong ya EIA ho tloha qalong. Dintlha le maikutlo ho tswa ho I&APs nakong ya Tlhahlobo le Mokgahlelo wa EIA di kgothaletswa ho etsa bonnete kameho e ka bang teng e ya nahanelwa nakong ya phuputso. Ho nka karolo ha setjhaba ho thusa ho etsa bonnete ba hore:

- » Lesedi le nang le dintlha tsa bohlokwa mabapi le kopo le a fumaneha ho I&APs bakeng sa tlhahlobo.
- » Ho nka karolo ho I&AP ho tsamaiswa ka tsela e utlwahalang e tla fana ka monyetla wa ho ntsha maikutlo ka porojeke e sisintsweng.
- » Nako e lekaneng ya tlhahlobo e fanwe bakeng sa I&APs ho ntslha maikutlo a hao ka diphumantsho tsa Tlhahlobo le Dittaleho tsa EIA.

Ho etsa bonnete ba ho ba le seabo ka tsela e sebetsang, tshebetso ya ho nka karolo ha setjhaba e kopanyelletsa dintho tse latelang:

- » Kaho ya Tokomane ya Lesedi le Tshehetsang Taba qalong ya tshebetso.
- » Ho hlwauwa ha I&APs ho kopanyelletsa le beng ba setsha ba leng haufi le Ditho tsa Mmuso.
- » Ho behwa ha ditsebisano tsa setsha meahong e amehang.
- » Ho behwa ha diphatlalatso dikoranteng tsa selehae le/kapa tsa sebaka.
- » Pokello ya dathabeisi ya I&AP e ntjhafatswang nakong yohle ya Tshebetso ya EIA. Kaofela I&APs ba ngodisitseng ba tla tsebiswa ka diketsahalo tsa bohlokwa tshebetsong ya EIA ka

lengolo la stakeholder.

- » Ho lokollwa ha Drafte ya Tlhahlobo le Dittaleho tsa EIA bakeng sa tlhahlobo ya setjhaba.
- » Ho tshwara diboka tsa setjhaba, le diboka tsa sehlopha le I&APs ho tsamaisa tshebetso ya bonkakaro.

### BOI KARABELO BA HAO JWALOKA I & AP

Ho ya ka Melawana ya EIA, ho hlakiswa boikarabelo ba hao jwaloka I & AP:

- » Ho nka karolo tshebetsong ya EIA, o lokela ho ingodisa dathabeising ya porojeke.
- » O lokela ho etsa bonnete ba hore dintlha leha e le dife tse mabapi le porojeke e sisintsweng di romelwa ka nako e beilweng.
- » Ho hloka hore o senole kgwebo ka kotloloho, tsa ditjhelete, dithahasello tsa botho kapa tse ding tseo o ka bang le tsona ho faneng ka tumello kapa ho hanelwa kopo bakeng sa moaho o sisintsweng wa eneji ya solar.

### O NKA KAROLO KA TSELA EFE

1. Ka ho araba ka founu, fekse kapa imeili memong ya ho nka karolo ha hao ho phatlaladitsweng koranteng ya selehae.
2. Ka ho kgutlisa foromo ya karabelo mothong ya loketseng.
3. Ka ho ba teng dibokeng tse tshwarwang nakong ya tshebetso. Jwaloka I & AP ya ngodisitsweng o tla mengwa ho ba teng dibokeng tsona. Matsatsi a diboka tsa setjhaba a tla phatlalatswa dikoranteng tsa setjhaba.
4. Ka ho ikopanya le baeletsi ka dipotso le dintlha.
5. Ka ho hlahloba le ho ntsha maikutlo ka drafte ya Tlhahlobo le Dittaleho tsa EIA nakong e beilweng ya matsatsi a 30 a tlhahlobo.

Haeba o inka jwaloka I & AP wa porojeke ena, re o kgothalletsa ho sebedisa menyetla e entsweng ke tshebetso ya ho nka karolo ha setjhaba ho fana ka maikutlo, ho hlalisa maikutlo a hao le dintho tse o kgathatsang tse o amang le/kapa tse o thahasellisang kapa kopo ya lesedi le eketsehileng. Maikutlo a hao tshebetsong ena a bopa karolo ya bohlokwa ya tshebetso ya EIA.

Ka ho tlatsa le ho romela foromo e kenyeleditsweng ya ho arabela, o ingodisa jwaloka I & AP bakeng sa porojeke ena, mme o tiisetwa hore maikutlo a hao, dintho tse o kgathatsang kapa dipotso tse hlahang mabapi le porojeke di tla ngolwa.

### DITLHALOSOLE DIPOTSO

Lebisa ditlhaloso, dipotso, kapa dikarabelo kaofela ho:

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Ho bona ditokomane tsa porojeke, etela

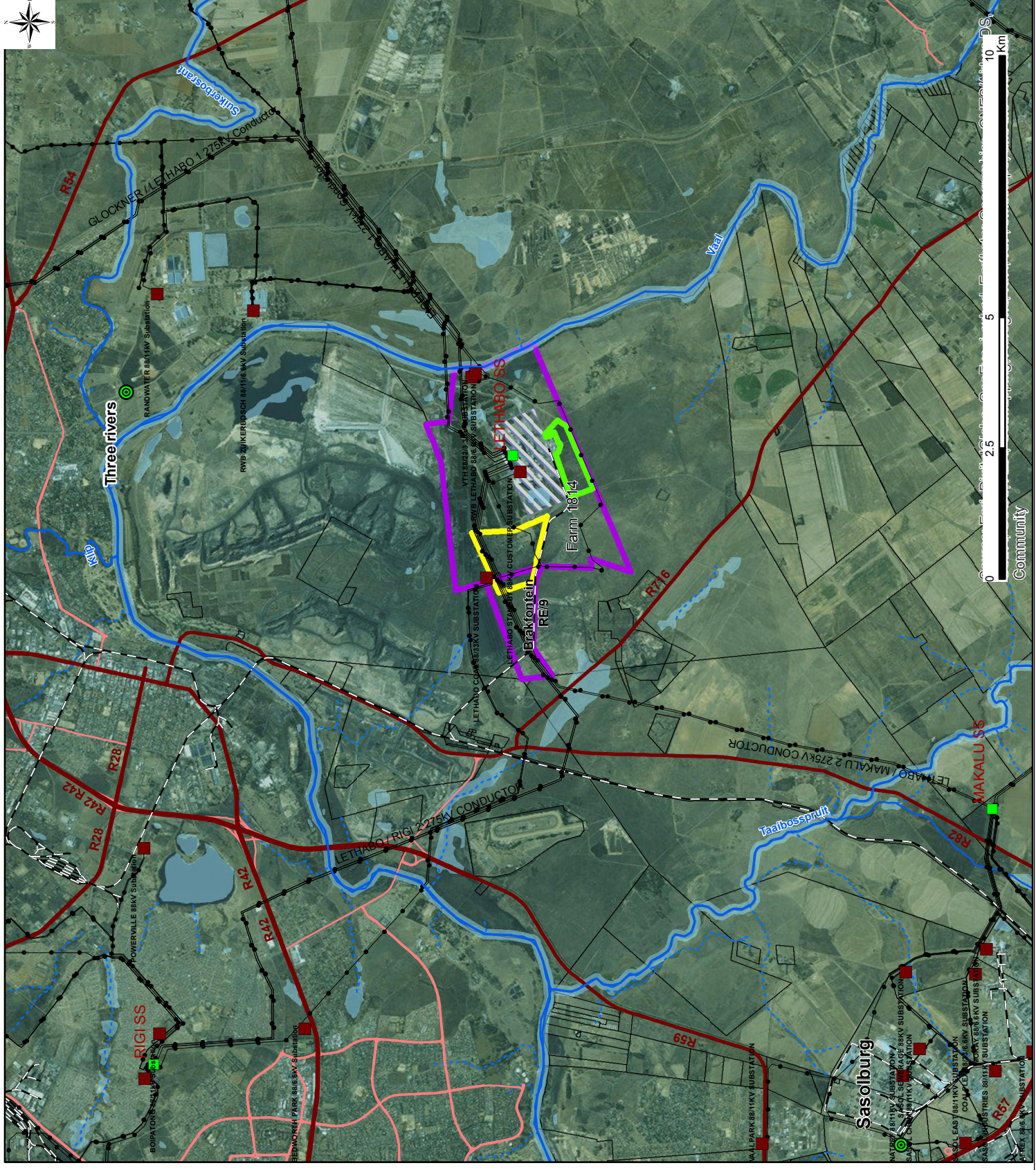
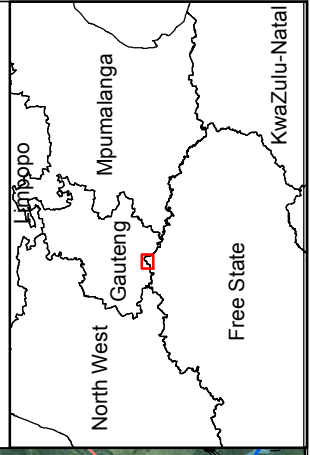
[www.savannahSA.com](http://www.savannahSA.com)

# Lethabo Solar Energy Facility

Locality map

## Legend

- Transmission substation
- Distribution substation
- Existing Powerline
- Railway Line
- Regional road
- Secondary road
- Perennial river
- Non Perennial river
- NFEPA wetlands/waterbody
- Proposed Lethabo Solar PV facility
- Alternative Solar PV facility
- Lethabo Power Station
- Affected farm portions



Community