## BIOTHERM ENERGY

# Proposed Construction of the Tlisitseng 2 132kV Substation and Power Line near Lichtenburg, North West Province

Draft Basic Assessment Report

**DEA Reference No.:** To be confirmed
**Issue Date:** 24 March 2017
**Revision No.:** 1
**Project Number:** 13303 –Tlisitseng 2

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| **Date:** | 24 March 2017 |
| **Document Title:** | Proposed Construction of the Tlisitseng 2 132kV Substation and Power Line near Lichtenburg, North West Province: Draft Basic Assessment Report. |
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| **Revision Number:** | 1 |
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environmental affairs
Department
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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

# BIOTHERM ENERGY

# PROPOSED CONSTRUCTION OF THE TLISITSENG 2 132KV SUBSTATION AND POWER LINE NEAR LICHTENBURG, NORTH WEST PROVINCE

# DRAFT BASIC ASSESSMENT REPORT

## Executive Summary

BioTherm Energy (Pty) Ltd (hereafter referred to as BioTherm) intends to develop the Tlisitseng 2 132kV Substation and 132kV power line (hereafter referred to as the "proposed development") near Lichtenburg in the North West Province of South Africa. SiVEST SA Pty (Ltd) (hereafter referred to as SiVEST) has been appointed as Independent Environmental Assessment Practitioner (EAP) to undertake the Basic Assessment (BA) for the proposed development. The overall objective of the project is to feed the electricity generated at the Tlisitseng 2 solar photovoltaic (PV) energy facility (part of a separate ongoing process) back into the National Grid by constructing the proposed Tlisitseng 2 substation and power line.

The proposed Tlisitseng substation and power line will connect the proposed Tlisitseng 2 solar PV energy facility to the existing Eskom Watershed substation. The Tlisitseng 2 solar PV energy facility is currently subject to a separate ongoing Environmental Impact Assessment (EIA) process. This proposed PV energy facility forms one (1) of two (2) PV energy facilities with a 75MW export capacity that BioTherm are proposing to develop on Portion 25 of the Farm Houthaalboomen No 31. The Department of Environmental Affairs (DEA) reference number allocated for the other proposed PV energy facility, Tlisitseng 2 is 14/12/16/3/3/2/975. Additionally, a BA is being conducted for the proposed Tlisitseng 1 substation and power line, the DEA reference number will be provided in the Final Basic Assessment Report (FBAR). Although the two (2) proposed Tlisitseng solar PV energy facilities and the two (2) proposed substations and power lines will be assessed separately, a single public participation process is being undertaken to consider all four (4) proposed developments.

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 EIA 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.

A corridor of up to 500m was assessed for the proposed power line, however the final servitude will only be 31m. Two alternative sites for the proposed substation are being assessed. A Site Locality Map for the proposed project has been provided in **Figure i** below.

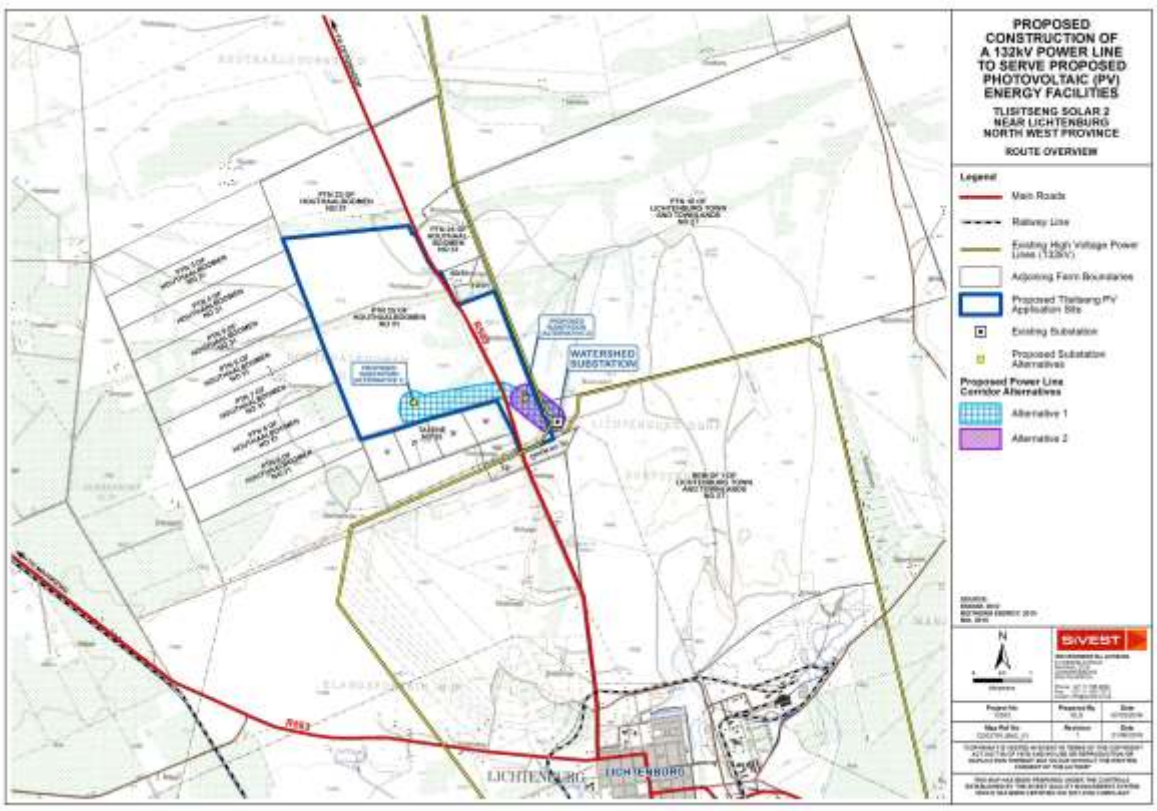


Figure i: Site Locality Map for the proposed Tlisitseng 2 Grid Connection and substation.

The proposed project is located within the North West Province approximately 8km north-west of Lichtenburg. It falls within the Ditsobotla Local Municipality that forms part of the Ngaka Modiri Molema District Municipality. The proposed 132kV substation and power line will be accessed by the R505 which traverses the site.

Several specialist studies were conducted during the BA process to identify issues or legislative implications 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;
- Visual Assessment;

- Socio-Economic Assessment; and
- Geotechnical Assessment.

**Table i: Specialist Findings Summary Table**

| Environmental Parameter | Summary of Major Findings | Recommendations |
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| Biodiversity | Local factors that may lead to parts of the sites having elevated ecological sensitivity are the potential presence of the following:<br>▪ Presence of natural vegetation on site, some of which is of elevated conservation priority.<br>▪ Potential presence of four plant species of concern, the bulb, *Boophone disticha* (occurs on site), listed as Declining, the bulb, *Crinum macowanii* (possibly occurs on site - individuals seen were not flowering), listed as Declining, the succulent herb, *Brachystelma incanum*, listed as Vulnerable, and the herb, *Cleome conrathii*, listed as Near Threatened.<br>▪ Potential presence of one protected plant species, *Harpagophytum procumbens.*<br>▪ Potential presence of three protected tree species, *Acacia erioloba*, *Combretum imberbe* and *Boscia albitrunca*. The tree *Acacia erioloba* occurs in large numbers on site.<br>▪ Potential presence of the following animals of potential conservation concern:<br>o Brown Hyaena (NT)<br>o Honey badger (NT)<br>o Southern African Hedgehog (NT)<br>o White-tailed Rat (EN)<br>o Giant Bullfrog (NT/LC)<br>o Kori Bustard (VU),<br>o Blue Crane (VU),<br>o Secretarybird (NT). | ▪ Components of the infrastructure can be re-sited to avoid sensitive habitats or features, either partially or completely.<br>▪ Create a Surface Runoff and Stormwater Management Plan to prevent damage to areas downslope / downstream of the project area.<br>▪ Create a Rehabilitation Plan to provide a framework for rehabilitating areas outside of the infrastructure footprint that will be disturbed during the construction of the proposed project.<br>▪ A preconstruction walk-through survey should be undertaken to list the identity and location of all listed and protected species.<br>▪ Search and rescue operation of all listed species within the activity footprint.<br>▪ 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).<br>▪ It is recommended that a monitoring programme be implemented to enforce continual eradication of alien and invasive species, especially within the riparian habitat, for the areas |

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| | ▪ Potential invasion of natural habitats by alien invasive plants, thus causing additional impacts on biodiversity features.<br><br>Potential risks (impacts) to the ecological receiving environment are as follows:<br>▪ Impacts on indigenous natural vegetation;<br>▪ Impacts on two listed plant species;<br>▪ Impacts on protected plant species;<br>▪ Impacts on two protected tree species;<br>▪ Mortality of sedentary animals;<br>▪ Displacement of mobile fauna;<br>▪ Mortality of birds by collision with vertical infrastructure;<br>▪ Establishment and spread of declared weeds and alien invader plants. | impacted by the proposed development<br>▪ Monitoring should be undertaken to evaluate the success of mitigation measures.<br>▪ Educate workers (permanent staff and contractors) regarding the occurrence of important ecological features and resources in the area and the importance of their protection.<br>▪ Use abatement measures to minimise fugitive dust that could have a negative effect on vegetation and habitats, especially adjacent to sensitive areas and in areas adjacent to the project site.<br>▪ No animals are to be hunted for any purpose. |
| Avifauna | Potential pre-mitigation impacts on priority avifauna range from medium negative to low negative. All impacts could be reduced to low negative with the implementation of appropriate mitigation. No fatal flaws were identified in the course of investigations from an avifaunal perspective, and the proposed development could therefore be authorised, provided all proposed mitigation measures are implemented. | ▪ Construction activity should be restricted to the immediate footprint of the infrastructure.<br>▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.<br>▪ Measures to control noise and dust should be applied according to current best practice in the industry.<br>▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.<br>▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of one year by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first |

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| | | year.<br>▪ The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection.<br>▪ The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, and alternating black and white.<br>▪ An Eskom approved bird friendly pole design must be used incorporating a bird perch, to provide safe perching substrate for birds well above the dangerous hardware.<br>▪ Substation hardware is often too complex for blanket, pro-active mitigation. It is rather recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach since Red List bird species are unlikely to frequent the substation and be electrocuted.<br>▪ De-commissioning activity should be restricted to the immediate footprint of the infrastructure.<br>▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.<br>▪ Measures to control noise and dust should be applied according to current best practice in the industry.<br>▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. |

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| Surface Water | A surface water delineation and impact assessment is provided in this report for the proposed development. Investigations were based on a method for delineating wetlands and riparian habitat as per the DWAF 2005 guidelines. Ultimately, it was found that there are no surface water resources in the proposed development areas. As such, the comparative assessment yielded no preference as to a preferred location between the proposed substation alternative sites. Both were viewed as suitable from a surface water perspective as there would be no potential impacts. Accordingly, in terms of potentially applicable environmental and water related legislature, no listed activities and/or water uses will be triggered for the proposed development. No potential impacts or cumulative impacts are therefore anticipated. From a surface water perspective, there are no concerns with respect to the proposed development. | ▪ None required as there are no surface water resources present in the proposed development areas for this component of the project. |
| Agriculture | The desk-top study indicated that the soils in the vicinity of the project were generally shallow to very shallow (<500 mm), usually sandy loam and calcareous, overlying either rock or cemented hardpan calcrete. Some rock outcrops occur in places in the landscape. However, some areas of deeper red soils, which will have a higher agricultural potential, can also occur. The soil investigation confirmed this, with virtually all of the soils observed being less than 450 mm onto hard or weathering rock. The soils are reddish-brown to brown, structureless to weakly structured and belong to the Mispah, Glenrosa and Hutton soil forms (Soil Classification Working Group, 1991). | ▪ Due to the generally low potential agricultural environment, little or no mitigation measures are required. The footprint of the development should be kept to a minimum, so that at least the effect on grazing land for livestock is reduced.<br>▪ The main mitigation would be to ensure that physical disturbance caused by soil removal and/or re-distribution is kept to a minimum. In such an area of low rainfall and hot conditions, vegetation is fragile and often difficult to re-establish.<br>▪ The loamy nature of the soils means that if exposed, there is only a small hazard of soil |

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| | | removal by wind erosion, especially in the drier winter months. However, to combat this, any bare soil should be re-vegetated as soon as possible and preventative measures, such as soil covering and windbreaks, may also be required. |
| Heritage | No heritage resources related to the archaeological and historical time period were identified. | ▪ General SAHRA management guidelines to be implemented, contained in Appendix D of the EMPr |
| Palaeontology | ▪ The study area is underlain by Vaalian aged dolomite of the Monte Christo Formation, Chuniespoort Group. Stromatolites are known to occur within these deposits and more modern fossiliferous Caenozoic cave breccias have been recorded associated with carst formation in the dolomite.<br>▪ During the fieldwork period several arbitrary finds of dolomite and chert with significantly well-defined stromatolites as well as a few potential sites with either associated sinkholes or cave breccias were recorded. | ▪ Although no significant fossils were recorded in situ in both PV sites as well as the proposed alternative route corridors for the power lines, several well-defined micro-stromatolites and possible sites with cave breccia have been identified. Depending on the results of the geotechnical investigation and where potential excavations for foundations will exceed 1.5m, the ECO must investigate the possible presence of stromatolites and/or cave breccia and inform the HIA consultants immediately for appropriate action and appointment of a qualified palaeontologist to investigate the site before destruction of fossils occurs.<br>▪ Site visits as stipulated in the management tables will include an initial 2-day site visit and then fortnightly during construction.<br>▪ Such mitigation measures will require a permit from SAHRA before mitigation can be done as well as a final destruction permit on completion of the mitigation work. |

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| Visual | ▪ The overall significance of the visual impacts as a result of the proposed development during construction and operation was assessed according to SiVEST's impact rating matrix. The assessment revealed that overall the proposed on-site Tlisitseng 2 Substation and 132kV power line would have a low visual impact during construction and a medium visual impact during operation, with a number of mitigation measures available.<br>▪ Overall it can be concluded that the visual impact of the proposed on-site Tlisitseng 2 Substation and 132kV power line would be reduced due to the presence of existing electrical infrastructure and linear elements in the study area, as well as the lack of sensitive visual receptors present. In addition, the on-site substation and power line are being proposed in order to supply the electricity generated by the two (2) proposed Tlisitseng PV energy facilities to Eskom's national grid. Thus the substation and power line would only be constructed if the proposed Tlisitseng PV energy facilities are developed as well. The substation and power line would likely form part of the PV complex, as viewed from the surrounding farmsteads and the impact would therefore be dwarfed by the large number of PV panels that would be visible. | ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible, in accordance with the recommendations of the biodiversity specialist.<br>▪ Make use of existing gravel access roads where possible.<br>▪ Ensure that dust suppression techniques are implemented on gravel access roads, in all areas where vegetation clearing has taken place, on all soil stockpiles.<br>▪ Re-vegetate all reinstated cable trenches with the same vegetation that existed prior to the cable being laid.<br>▪ Select the substation alternative that will have the least impact on visual receptors (i.e. Substation Alternative 2).<br>▪ Where possible, laydown areas and temporary construction equipment and camps should be placed in already in disturbed areas in order to minimise vegetation clearing.<br>▪ Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.<br>▪ As far as possible, limit the amount of security and operational lighting present at the on-site substation.<br>▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the substation site and power line access roads.<br>▪ Ensure that dust suppression techniques are implemented on gravel access roads, where possible. |

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| | | ▪ Align the power line within the authorised corridor as far away from Rafters Pub as possible i.e. in the northern and eastern parts of the corridor.<br>▪ Non-reflective surfaces should be utilised where possible.<br>▪ All infrastructure that is not required for the post-decommissioning use should be removed;<br>▪ Monitor rehabilitated areas post-decommissioning and implement remedial actions, as required. |
| Socio-Economic | The review of applicable key policy documents revealed that all spheres of government support the establishment of the proposed project at the envisaged location. No red flags could be identified that could impact the project from a policy perspective, although care will have to be taken to ensure that the establishment and growth of activities identified as drivers of economic development in the study area is not unduly negatively impacted by the establishment of the project in the proposed region. The proposed construction of bulk infrastructure will not only assist by providing the infrastructure for the Tlisitseng 2 development to gain access to the national grid by improving electricity supply in the region. It also has the potential to stimulate the national economy through an increase in production to the value of R239.6 million. The construction will furthermore, create or support approximately six temporary jobs, while the maintenance will create 1.5 permanent FTE opportunities. The benefit to the local community is uncertain; however, certain mitigation measures can be implemented by the | ▪ Where possible and feasible, local labour procurement should be practiced. In addition, if feasible, goods and services should be procured from local small businesses. This will increase the benefit to the local community.<br>▪ The conditions set and requested by the directly affected land owner should be adhered to in order to limit the interruption to agricultural production.<br>▪ Implement the mitigation measures recommended by the other relevant specialist (visual, noise), where feasible to limit negative impacts and their effect on the community's sense of place.<br>▪ Implement public consultation and information sessions to limit the influx of migrant job seekers.<br>▪ Strict rules of conduct and access control procedures should be enforced at all times to ensure that the personal property of the land owners on and surrounding the site is respected by all |

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| | project proponent, which would maximise the benefit to the local community. | workers/contractors of the project proponent. |
| Geotechnical | The site is possibly underlain by shallow dense pedogenic material or chert residuum. These material are likely to be suitable as founding medium for lightly to medium loaded structures. The removal of large hard rock chert boulders and or hardpan calcrete, could be problematic, on both sites, when undertaking the bulk excavation or deep trenches for the installation of services. It is likely that relatively competent construction materials will be available on both site (calcrete gravels), whilst a dolomite aggregate quarry is located some 5km south of the site. | ▪ In terms of South African National Standards SANS 1936-Parts 1 to 4 "Development of Dolomitic Land" a two phase (feasibility and design level) geotechnical and dolomite stability investigation will be needed to be undertaken on the chosen site.<br>▪ For the substation, built on a 1 hectare property, this DSI will comprise a gravity survey and the drilling of a minimum of 3 boreholes for a feasibility level (Phase 1) investigation.<br>▪ It is also evident from the Topographical maps and Google Images that a water borehole is present near both the Alternative 1 and 2 - sites. These boreholes are probably used for irrigation purpose, dewatering has a significant effect on the underlying dolomite stability.<br>▪ Either substation alternative is acceptable as both sites exhibit the same geotechnical suitability. |

An impact assessment was conducted to ascertain the level of each identified impact, as well as mitigation measures which may be required. 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.

A thorough Public Participation Process (PPP) is underway as part of the BA. During this 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.

Based on the feedback received from the public participation process the width of the proposed power line corridor was reduced to exclude portions 2, 3 and 4 of the farm Talene number 25. At the landowner Focus Group Meeting (FGM) the objection was raised that the alignment of the proposed

power line corridor traverses through these agricultural holdings. It was noted that these agricultural holdings' properties are very small and the power line would hamper any future development on the property. It was suggested that the power line be constructed on the property where the solar development is being proposed. As a result the width of the proposed corridor now ranges between 280m – 500m and is indicated in **Figure i** above.

Through the findings of the BA process and report, 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 substation should be constructed within Substation Site Alternative 2 and power line corridor alternative 2.
- 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.

# BIOTHERM ENERGY

# PROPOSED CONSTRUCTION OF THE TLISITSENG 2 132KV SUBSTATION AND POWER LINE NEAR LICHTENBURG, 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 |

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

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# PROPOSED CONSTRUCTION OF THE TLISITSENG 2 132KV SUBSTATION AND POWER LINE NEAR LICHTENBURG, NORTH WEST PROVINCE

# DRAFT BASIC ASSESSMENT REPORT

## INTRODUCTION

BioTherm intends to develop the Tlisitseng 2 132kV Substation and 132kV power line (hereafter referred to as the "proposed development") near Lichtenburg in the North West Province of South Africa. SiVEST has been appointed as independent environmental assessment practitioner (EAP) to undertake the Basic Assessment (BA) for the proposed development. The overall objective of the project is to feed the electricity generated at the Tlisitseng 2 solar photovoltaic (PV) energy facility (part of a separate ongoing process) back into the National Grid by constructing the proposed Tlisitseng 2 substation and power line.

The proposed Tlisitseng 2 substation and power line will connect the proposed Tlisitseng 2 solar PV energy facility to the existing Eskom Watershed substation. The Tlisitseng 2 solar PV energy facility is currently subject to a separate ongoing Environmental Impact Assessment (EIA) process, the reference number for Tlisitseng 2 is 14/12/16/3/3/2/975. This proposed PV energy facility forms one (1) of two (2) PV energy facilities with a 75MW export capacity that BioTherm are proposing to develop on Portion 25 of the Farm Houthaalboomen No 31. Additionally, a BA is being conducted for the proposed Tlisitseng 1 substation and power line, the DEA reference number will be provided in the FBAR. Although the two (2) proposed Tlisitseng solar PV energy facilities and the two (2) proposed substations and power lines will be assessed separately, a single public participation process is being undertaken to consider all four (4) proposed developments.

## 1. PROJECT DESCRIPTION

The proposed development will include the construction of a 132kV substation (namely Tlisitseng 2 substation), as well as a 132kV power line, which will connect the Tlisitseng 2 PV facility to the national grid. The proposed development will include the following components:

- The proposed Tlisitseng 2 substation will occupy a footprint area of up to 2.25ha;
- The capacity of the proposed on-site substation is anticipated to be up to 132kV;
- Two alternative sites for the proposed substation are being assessed;

- A power line(s) of up to 132kV is also proposed and will run from the proposed Tlisitseng 2 substation to the existing Watershed Main Transmission substation;
- A corridor of up to 500m is being assessed for the proposed power line, however the final servitude will only be 31m;
- The length of the power line will be between 2km and 4km depending on the selected substation alternative;
- The Watershed Main Transmission substation is located approximately 2.4km to the south-east of the greater application site;
- The type of power line towers which are being considered at this stage include self-supporting suspension monopole structures where the line is relatively straight and angle strain towers where the line deviates from zero degree with a large angle. The height will vary based on the terrain, but will ensure minimum overhead line (OHL) line clearances with buildings and surrounding infrastructure;
- Power line towers are expected to be situated approximately 200m to 250m apart, depending on the terrain;

Based on the feedback received from the public participation process the width of the proposed power line corridor was reduced to exclude portions 2, 3 and 4 of the farm Talene number 25. At the landowner Focus Group Meeting (FGM) the objection was raised that the alignment of the proposed power line corridor traverses through these agricultural holdings. It was noted that these agricultural holdings' properties are very small and the power line would hamper any future development on the property. It was suggested that the power line be constructed on the property where the solar development is being proposed. As a result the width of the proposed corridor now ranges between 280m – 500m and is indicated **Figure 1** below.

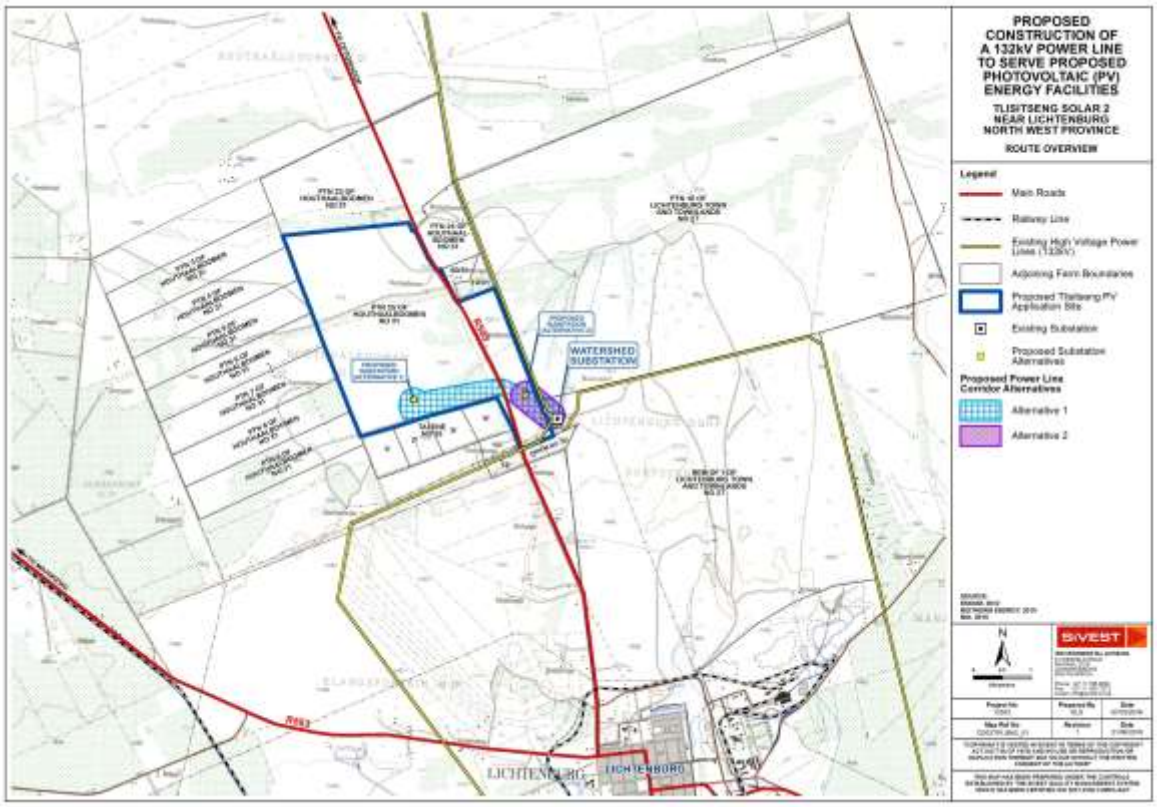


**Figure 1:** Corridor Map for the proposed Tlisitseng 2 grid connection and substation.

## 2. BRIEF DESCRIPTION OF THE RECEIVING ENVIRONMENT

The proposed project is located within the North West Province approximately 8km north-west of Lichtenburg. A regional context map has been provided in **Figure 2** below. The project falls within the Ditsobotla Local Municipality that forms part of the Ngaka Modiri Molema District Municipality. The proposed 132kV substation and power line will be accessed by the R505 which traverses the site. The project is proposed to take place on the farms:

- Houthaalboomen number 31 portion 25, and
- Lichtenburg Town and Townlands number 27 portion 10 and the remainder of 1

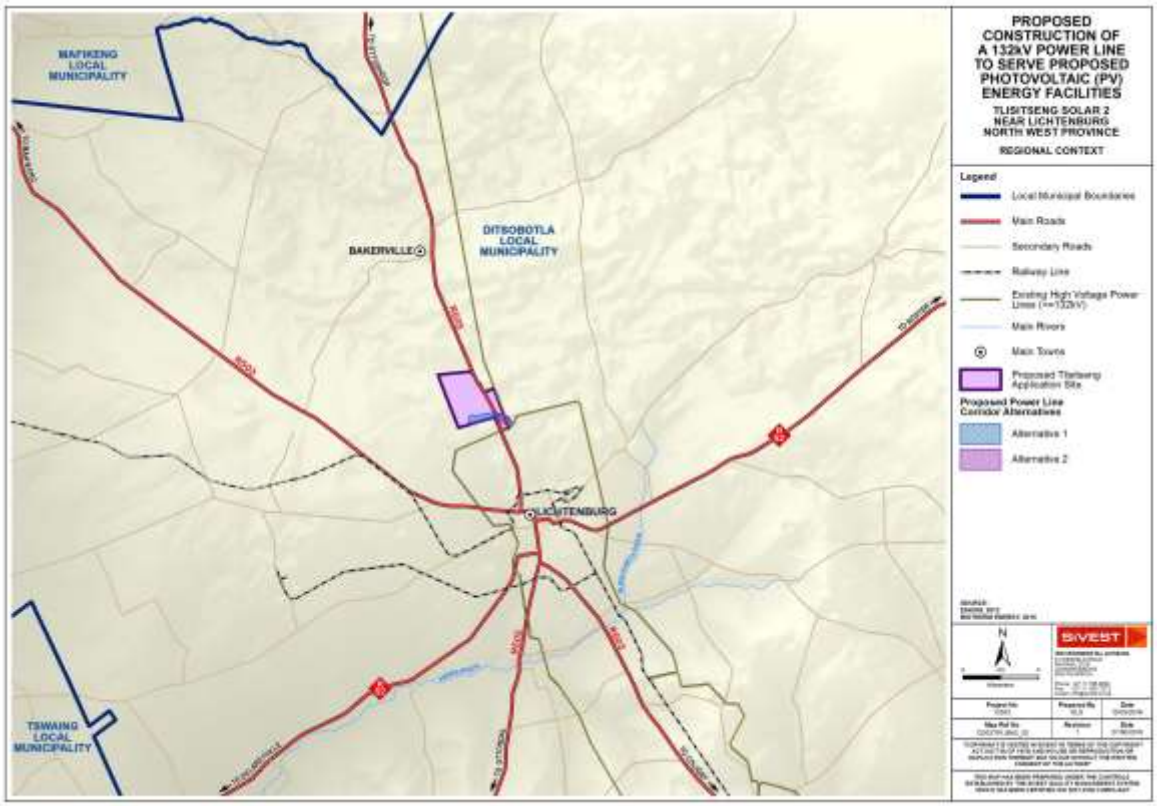


**Figure 2:** Regional Locality Map.

## 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 EIA 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 EIA is required for the proposed project. All relevant legislations and guidelines (including Equator Principles) will be consulted during the EIA process and will be complied with at all times.

SiVEST has considerable experience in the undertaking of EIAs. 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 and Visual |
| Veronique Evans – SiVEST | Environmental Consultant / Public Participation |

| Name and Organisation | Role |
|---|---|
| | Practitioner |
| Stephan Jacobs - SiVEST | Environmental Consultant / Public Participation Practitioner / Visual |
| David Hoare – David Hoare Consulting | Biodiversity |
| Chris van Rooyen – Chris van Rooyen Consulting | Avifauna |
| Shaun Taylor – SiVEST | Surface Water |
| D.G. Paterson – ARC Institute for Soil, Climate and Water | Agricultural Potential |
| Wouter Fourie – PGS | Heritage |
| Gideon Greonewald - PGS | Palaeontology |
| Elena Broughton – Urban-Econ Development Economists | Socio-economic |
| Colin Dalton - Geopractica | Geotechnical |
| Nicolene Venter – Imaginative Africa (previously Zitholele Consulting) | Senior Public Participation Practitioner |
| Kerry Schwartz – SiVEST | GIS and Mapping / Visual |

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

**Table 2:** Expertise of the EAP

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| **Environmental Practitioner** | SiVEST (Pty) Ltd – Andrea Gibb |
| **Contact Details** | andreag@sivest.co.za |
| **Qualifications** | BSc Landscape Architecture and BSc (Hons) Environmental Management |
| **Expertise to carry out the EMPr** | Andrea has 9 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.<br><br>**Environmental Impact Assessments and Basic Assessments:**<br>▪ EIA for the proposed construction of a 75MW Solar |

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| | Photovoltaic (PV) Power Plant near Dennilton, Limpopo Province.<br>▪ EIA for the proposed development of the Dwarsrug Wind Farm near Loeriesfontein, Northern Cape Province.<br>▪ 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.<br>▪ 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.<br>▪ 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.<br>▪ 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.<br>▪ 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.<br>▪ 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.<br>▪ 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.<br>▪ Amendment of the Final Environmental Impact Report for the Proposed Mookodi 1 Integration Project near Vryburg, North West Province.<br>▪ BA for the proposed 132kV power line and associated infrastructure for the proposed Redstone Solar Thermal Energy Plant near Lime Acres, Northern Cape Province.<br>▪ 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.<br>▪ BA for the proposed establishment of a Learning and Development Retreat and an Executive Staff and Client Lodge |

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| | at Mogale's Gate, Gauteng Province.<br>▪ Amendment application in order to increase the output of the proposed 40MW PV Facility on the farm Mierdam to 75MW, Northern Cape Province.<br>▪ BA for the proposed construction of a power line and substation near Postmasburg, Northern Cape Province.<br>▪ BA for the proposed West Rand Strengthening Project – 400kV double circuit power line and substation extension in the West Rand, Gauteng.<br>▪ EIA for the proposed construction of a wind farm and PV plant near Prieska, Northern Cape Province.<br>▪ 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.<br>▪ EIA assistance for the proposed construction of three Solar Power Plants in the Northern Cape Province.<br>▪ Public Participation as part of the EIA for the proposed Delareyville Kopela Power Line and Substation, North West Province.<br>▪ Public Participation as part of the EIA for the Middelburg Water Reclamation Project, Mpumalanga Province. |
| **Environmental Consultant** | SiVEST (Pty) Ltd – Veronique Evans SiVEST (Pty) Ltd – Lynsey Rimbault |
| **Contact Details** | veroniquee@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** | Veronique has 5 years of experience and has been 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.<br><br>▪ 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 |

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| | Power Lines Near Ulundi, Kwazulu-Natal Province (2013/2015) SiVEST - Graduate Environmental Consultant;<br>▪ 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;<br>▪ 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;<br>▪ 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 Associated 88/25kv Turn In Lines with 20mva Transformer Bays, Mpumalanga Province, South Africa (2013/2015) SiVEST - Graduate Environmental Consultant;<br>▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for theErmelo-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;<br>▪ 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;<br>▪ 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;<br>▪ Basic Assessment (BA) and Environmental management Plan (EMPr) for the proposed construction of a 132kv Power Line, Substation and the extension of Homestead Substation |

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| | 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;<br>▪ 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;<br>▪ Basic Assessment (BA) for the upgrade of the Silver Lakes outfall sewer pipeline (2012) SiVEST - Graduate Environmental Consultant;<br>▪ 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;<br>▪ 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;<br>▪ 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 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.<br>▪ 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.<br>▪ 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 |

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| | Environmental Scientist, GIBB. Necsa, 2011 -current.<br>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. |
| **Environmental Consultant** | SiVEST (Pty) Ltd – Stephan Jacobs |
| **Contact Details** | stephanj@sivest.co.za |
| **Qualifications** | BSc Environmental Sciences and BSc (Hons) Environmental Management and Analysis |
| **Expertise to carry out the EMPr** | Stephan joined SiVEST in May 2015 and holds the position of Graduate Environmental Consultant in the Johannesburg office. Stephan specialises in the field of Environmental Management and has been involved in the compilation of Environmental Impact Assessments (EIAs) and Basic Assessments (BAs). Stephan has also assisted extensively in the undertaking of field work and the compilation of reports for specialist studies such as surface water and visual impact assessments. Stephan also has experience in Environmental Compliance and Auditing and has acted as an Environmental Control Officer (ECO) for several infrastructure projects.<br><br>**Project Experience:**<br>▪ Environmental Control Officer (ECO) for the Polokwane Integrated Rapid Public Transport System (IRPTS), Limpopo Province.<br>▪ BA for the construction of a Non-Motorised Transport (NMT) Training and Recreational Park adjacent to the Peter Mokaba Stadium in Polokwane, Limpopo Province.<br>▪ Environmental Control Officer (ECO) for the Newmarket Retail Development, Gauteng Province.<br>▪ Visual Impact Assessment for the Helena Solar PV Plant, Northern Cape Province.<br>▪ Visual Impact Assessment for the Nsoko Msele Integrated Sugar Project, Swaziland.<br>▪ Surface Water Assessment for the Steve Tshwete Local Municipality, Mpumalanga Province.<br>▪ Surface Water Delineation and Assessment for the proposed coal Railway Siding at the Welgedacht Marshalling Yard and associated Milner Road Upgrade near Springs, Ekurhuleni Metropolitan Municipality. |

## 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-<br>(i) the EAP who prepared the report; and | Page ii<br>Section 3 |
| (ii) the expertise of the EAP, including a curriculum vitae; | Section 3<br>Appendix H |
| (b) the location of the activity, including-<br>(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<br>Section 1 |

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| (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-<br>(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-<br>(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<br>(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)<br>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)<br>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)<br>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- | Section D(1)<br>Appendix F |

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| (aa) can be reversed;<br>(bb) may cause irreplaceable loss of resources; and<br>(cc) can be avoided, managed or mitigated; | |
| (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)<br>Appendix F |
| (viii) the possible mitigation measures that could be applied and level of residual risk; | Section E<br>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 |
| (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-<br>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and<br>(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; | Section D(1)<br>Appendix F |
| (j) an assessment of each identified potentially significant impact and risk, including-<br>(i) cumulative impacts;<br>(ii) the nature, significance and consequences of the impact and risk;<br>(iii) the extent and duration of the impact and risk;<br>(iv) the probability of the impact and risk occurring;<br>(v) the degree to which the impact and risk can be reversed;<br>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and<br>(vii) the degree to which the impact and risk can be | Appendix F |

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| avoided, managed or mitigated; | |
| (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; | Appendix F |
| (I) an environmental impact statement which contains-<br>(i) a summary of the key findings of the environmental impact assessment; | Section E |
| (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and | Section A(7)<br>Appendix A |
| (iii) a summary of the positive and negative impacts and risks of the proposed activity and<br>identified alternatives; | Section D(1) |
| (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; | Section E |
| (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; | Section E |
| (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:<br>(i) the correctness of the information provided in the reports;<br>(ii) the inclusion of comments and inputs from stakeholders and l&APs;<br>(iii) the inclusion of inputs and recommendations from the | Appendix H |

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| specialist reports where relevant; and<br>(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. | |
| (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 BioTherm 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**
        - 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.
        - This study excludes invertebrates and avifauna.
    - **Avifauna**
        - A total of 62 full protocol lists have been completed to date for the 9 pentads where the study area is located (i.e. lists surveys lasting a minimum of two hours each). It was decided to use 9 pentads because the habitat is very uniform, which provides the opportunity to use a larger dataset which is more representative. The SABAP2 data was therefore regarded as a reasonably conclusive snapshot of the avifauna. For purposes of completeness, the list of species that could be encountered was further supplemented with observations from an avifaunal

monitoring programme which is being conducted on site as part of the pre-construction monitoring programme for the PV facility.

- 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. Fortunately, a robust body of research is available on birds and power line interactions, going back more than 30 years. Impacts can therefore be predicted with reasonable certainty.
- The focus of the study is on southern African Red Data species, endemics and near-endemics (referred to in the report as priority species).
- The core study area was defined as the area comprising the proposed power line corridor with a 2km buffer around it.

o **Surface Water**

- This study has only focused on the identification and in-field delineation of surface water resources within the proposed development area. Delineation of surface water resources in the wider areas were not undertaken.
- Aquatic studies of fish, invertebrates, amphibians etc. have not been included in this report. Nor has a hydrological or groundwater study been included.
- Wetland or river health, ecosystem services and the ecological importance/sensitivity have also not been assessed for identified surface water resources.
- As an avifaunal assessment is being carried out for this project, impacts as related to waterfowl are not included in this report. It is assumed that potential impacts to waterfowl is included in the avifaunal assessment.

o **Soils and Agricultural Potential**

- No assumptions and limitations were presented by the Soils and Agricultural Potential Specialist.

o **Heritage**

- Not detracting in any way from the fieldwork undertaken, it is necessary to realise that the heritage sites located during the fieldwork do not necessarily represent all the heritage sites present within the area. Should any heritage feature or objects not included in the inventory be located or observed, a heritage specialist must immediately be contacted. Such observed or located heritage features and/or objects may not be disturbed or removed in any way, until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well.
- The survey was conducted over 2 days over the extent of the total footprint area. It must be stressed that the extent of the fieldwork was based on the available field time and was aimed at determining the heritage character of the area.
- The fieldwork that covered the Tlisitseng solar PV application site is an area of 10.3 square kilometres.
- A total of 1 heritage site was marked within the application site over the extent of the fieldwork.

o **Palaeontology**

- Not detracting in any way from the fieldwork undertaken, it is necessary to realise that the palaeontological heritage sites located during the fieldwork do not necessarily represent all the heritage sites present within the area. Should any heritage features or objects not included in the inventory be located or observed, a heritage specialist must immediately be contacted. Such observed or located heritage features and/or objects may not be disturbed or removed in any way, until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to exposing of stromatolites structures as well as cave breccias.
- The survey was conducted over 1 day over the extent of the total footprint area by Dr Gideon Groenewald and David Groenewald on 17 February 2016. It must be stressed that the extent of the fieldwork was based on the available field time and was aimed at determining the palaeontological heritage character of the area.
- The fieldwork that covered the Tlisitseng Solar site as well as the proposed power line corridors covered the whole area by vehicle and on foot, with specific observations recorded as a photographic database. Detailed observation of outcrops were considered as highly important whereas loose gravel and boulders were recorded as representative examples of stromatolites structures which were out of situ observations. No obvious cave breccias or sink holes were observed and the presence of these highly sensitive structures need to be confirmed during detailed geophysical investigations for possible sink hole structures on dolomitic terrains or karts topography.

o **Visual**

- Given the nature of the receiving environment and the height of the proposed substation, power lines and associated infrastructure, the study area or visual assessment zone is assumed to encompass a zone of 5km from the proposed development – i.e. all areas within a 5km radius of the power line corridor. 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 power line corridor, 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 combination of desktop assessment as well as field-based observation. Initially Google Earth imagery was used to identify potentially sensitive receptor locations within the study area. Thereafter a site visit was undertaken to assist with rating the impact of the proposed development from each potentially sensitive visual receptor location and to eliminate receptors that are unlikely to be influenced by the proposed development. This involves establishing the visual character and level

of transformation within the study area, classifying the study area into zones of visual contrast and identifying screening factors 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.
- A matrix has been developed to assist in the assessment of the potential visual impact at each receptor location. The limitations of quantitatively assessing a largely subjective or qualitative type of impact should be noted. The matrix is relatively simplistic in considering three main parameters relating to visual impact, but provides a reasonably accurate indicative assessment of the degree of visual impact likely to be exerted on each receptor location by the proposed substation and power line. The matrix should therefore be seen as a representation of the likely visual impact at a receptor location.
- The assessment of receptor-based impacts has been based on the power line corridor and substation site alternatives provided by the proponent. It is recognised however that the exact route of the power line within the corridor has not been determined, and depending on this the proposed power line may result in greater or lesser visual impacts on receptor locations.
- 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 proposed on-site substation and associated infrastructure 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.

- Most rainfall within the area occurs from November to April during the summer months. Therefore as the fieldwork was undertaken in December during the summer season the surrounding vegetation can be expected to provide the maximum potential screening. During winter months the visual impact of the proposed development may therefore be greater, particularly from farmhouses surrounded by tall deciduous trees.

- **Socio-Economic**
  - 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.
  - The study was done with the information available to the specialist within the time frames and budget specified.
  - Possible impacts and 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.
  - It is assumed that the motivation, and ensuing planning and feasibility studies for the project were done with integrity and that all information provided to the specialist by the project proponent and its consultants to date is accurate.
  - It is assumed that the project description and infrastructure components as discussed above are reasonably accurate. These details were used to assess the potential impacts.
  - With regard to the in-person interviews undertaken the following assumptions are made:
    - Questions asked during the interviews were answered accurately and truthfully.
    - That the attitudes of the respondents towards the project will remain reasonably stable over the short- to medium-term.
  - The assumption is that no significant concern exists for those land owners who have not provided comments on the project either through personal interviews or through e-mail/letter, or it can be reasonably assumed that consultation would have been sought. Where applicable, Google Earth imagery was used to attempt to determine the current level of economic activity taking place on the relevant farm portions to aid in assessment of any potential impact and its extent on the specific land owner.
  - At the same time, it is assumed that the general concerns and opinions raised by all other land owners interviewed, such as security concerns, would also apply to the land owners who did not provide their feedback for whatever reasons.
- **Geotechnical**
  - No assumptions and limitations were presented by the Geotechnical Specialist.

# 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

BioTherm intends to develop the Tlisitseng 2 132kV substation and 132kV power line (hereafter referred to as the "proposed development") near Lichtenburg in the North West Province of South Africa. SiVEST has been appointed as independent environmental assessment practitioner (EAP) to undertake the Basic Assessment (BA) for the proposed development. The overall objective of the project is to feed electricity generated at the proposed Tlisitseng 2 solar PV energy facility into the National Grid at the existing Eskom Watershed substation.

The proposed project consists of the following main activities:

- Construction of 1 x 132kV substation (referred to as the Tlisitseng 2 substation)
- Construction of 1 x 132kV power line from the proposed Tlisitseng 2 substation to the existing Eskom Watershed substation.

The proposed power line will consist of a series of towers located approximately 200m to 250m apart. The type of power line towers which are being considered at this stage include self-supporting suspension monopole structures where the line is relatively straight and angle strain towers where the line deviates from zero degree with a large angle. The steel monopole tower type is between 18 and 25m in height. 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 diagram of the steel monopole tower type is included in Appendix C.

A power line corridor that ranges between approximately 280m and 500m wide is being proposed to allow flexibility when determining the final route alignment, however only a 31m wide servitude would be required for the proposed 132kV power line. As such, the 31m wide servitude would be positioned within the corridor.

The length of the power line will be between 2km and 4km depending on the selected substation alternative. Two alternative sites for the proposed Tlisitseng 2 132kV substation will be assessed during the Basic Assessment. The size of the substation site will be up to 2.25ha.

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

| Listed activity as described in GN 734, 735 and 736 | Description of project activity |
|---|---|
| ***GN 983 Item 11(i):*** *The development of facilities or infrastructure for the transmission and distribution of electricity-*<br>*(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or* | **A power line with a capacity of 132kV will be constructed.** |
| ***GN 983 Item 27:*** *The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation,* | **The assessed substation site consists of an area of up to 2.25ha. All the vegetation will need to be cleared for the construction of the substation and associated infrastructure, this will amount to more than 1 hectare.** |
| ***GN 985 Item 12(a)(ii):*** *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.*<br>*(a) In the North West province;*<br>*(ii) Within critical biodiversity areas identified in bioregional plans;* | **The assessed substation site consists of an area of up to 2.25ha. All the vegetation will need to be cleared for the construction of the substation and associated infrastructure, this will amount to more than 300 square metres. The site occurs within a critical biodiversity area identified in a bioregional plan.** |

## 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**

| **Alternative 1 (Preferred)** | | |
|---|---|---|
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| Tlisitseng 2 Substation Alternative 1 | S26° 5' 18.361" | E26° 7' 6.122" |
| **Alternative 2** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| Tlisitseng 2 Substation Alternative 2 | S26° 5' 15.026" | E26° 8' 16.043" |

In the case of linear activities:

| **Alternative:** | **Latitude (S):** | **Longitude (E):** |
|---|---|---|
| Tlisitseng 2 Power Line Corridor Alternative 1 | | |
| • Starting point of the activity | S26° 5' 12.018" | E26° 7' 6.390" |
| • Middle/Additional point of the activity | S26° 5' 13.444" | E26° 7' 48.541" |
| • End point of the activity | S26° 5' 28.544" | E26° 8' 36.397" |
| Tlisitseng 2 Power Line Corridor Alternative 2 | | |
| • Starting point of the activity | S26° 5' 10.681" | E26° 8' 9.272" |
| • Middle/Additional point of the activity | S26° 5' 19.745" | E26° 8' 22.746" |
| • End point of the activity | S26° 5' 28.544" | E26° 8' 22.746" |

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, including coordinates every 250m and at bend points, are included in **Appendix J2.**

**b) Lay-out alternatives**

| Alternative 1 (preferred alternative) | | |
|---|---|---|
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| | | |
| **Alternative 2** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| | | |
| **Alternative 3** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| | | |

**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 assumes that the proposed activity does not go-ahead, implying a continuation of the current situation or the status quo. In the case of this project, the no-go alternative would result in no 132kV power line being constructed, and it would therefore not be possible to export the electricity generated at the Tlisitseng 2 solar PV energy facility to the national grid. South Africa is under immense pressure to provide electricity generating capacity in order to reduce the current electricity demand in the country. With the global focus on climate change, the government is under severe pressure to explore alternative energy sources in addition to coal-fired power stations. Although solar power is not the only solution to solving the energy crisis in South Africa, it is the best solution for the study area in question and not exporting the power produced at the proposed solar PV development would be detrimental to the mandate that the government has set to promote the implementation of renewable energy.

**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:** | **Size of the activity:** |
|---|---|
| Alternative 2 (preferred activity alternative) | up to 2.25ha |

or, for linear activities:

| **Alternative:** | **Length of the activity:** |
|---|---|
| Proposed power line corridor (preferred activity alternative) | 1km |

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

| **Alternative:** | **Size of the site/servitude:** |
|---|---|
| Proposed power line corridor (preferred activity alternative) | 31m |

## 4. SITE ACCESS

| | |
|---|---|
| Does ready access to the site exist? | **YES√** |
| If NO, what is the distance over which a new access road will be built | 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;
- 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 |
| The project in question is for the proposed construction of a 132 kV power line and substation, which will consist of a servitude within the properties it will be traversing. A change in land use will not be required and the servitude will be considered as special use within the existing land use. | | | |
| **2. Will the activity be in line with the following?** | | | |
| **(a) Provincial Spatial Development Framework (PSDF)** | **YES√** | | Please explain |
| 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. | | | |
| **(b) Urban edge / Edge of Built environment for the area** | | **NO√** | Please explain |
| The proposed development would fall outside the urban edge. Although the proposed development does not entirely fit the surrounding area, a large portion of the proposed corridor is located either on the proposed Tlisitseng 2 solar PV energy facility or in close proximity to the existing Watershed substation. | | | |

| | | | |
|---|---|---|---|
| **(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 |
| According to the Ditsobotla LM Integrated Development Plan (IDP) (2011/12 – 2015/16), the municipality's electricity provision is a joint function of the Ditsobotla LM and Eskom, with the DM being licensed to provide electricity to Lichtenburg, Blydeville, and Coligny. It furthermore states that areas without access to electricity is mostly located in the rural regions, such as Grasfontein and Bakerville, and that universal electrification will be addressed by a joint planning programme between the LM and Eskom. The IDP also states that there is a need for renovation and/or replacement of the electrical infrastructure in the Lichtenburg CBD as this infrastructure is old. There is also a requirement for the provision of the expansion of the current load supply to the CBD in order to aid the expansion of the property and business markets. Aligned with this is the identification of "low energy resources" as a critical economic factor impacting on the municipality's ability to achieve its growth and development objectives (Ditsobotla LM, 2011).<br><br>The LM's Spatial Development Framework (SDF) is not available from its website. The IDP though, includes a summary of this SDF, of 2006. The IDP also provides some feedback on the spatial development strategies set out in the 2006 SDF. Urban integration is an important strategy, aimed at moving away from the fragmented urban structure currently prevalent within the Ditsobotla LM. The vision is that a more compact system will lead to more cost-effective municipal services and public transportation infrastructure. It goes on to state that an important factor in achieving a more desirable urban settlement pattern is the provision of bulk infrastructure development in a rationalised manner. Just as important as the extension of the network, is ensuring that the existing infrastructure has sufficient capacity to deal with expected future development pressures. Upgrading of the existing electricity network in Lichtenburg, as the economic core of the municipality, is required to ensure that the expected residential and economic growth can be accommodated.<br><br>Although no mention is made of the potential for Renewable Energy (RE) projects in the Ditsobotla LM, the inference is that the implementation and operation of the proposed Tlisitseng 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 proposed development is for service infrastructure 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 |
| 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.

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):

- 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

| | | | |
|---|---|---|---|
| **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)?** | **YES√** | | Please explain |

As mentioned above, the LM's Spatial Development Framework (SDF) is not available from its website. The IDP though, includes a summary of this SDF, of 2006. The IDP also provides some feedback on the spatial development strategies set out in the 2006 SDF. Urban integration is an important strategy, aimed at moving away from the fragmented urban structure currently prevalent within the Ditsobotla LM. The vision is that a more compact system will lead to more cost-effective municipal services and public transportation infrastructure. It goes on to state that an important factor in achieving a more desirable urban settlement pattern is the provision of bulk infrastructure development in a rationalised manner. Just as important as the extension of the network, is ensuring that the existing infrastructure has sufficient capacity to deal with expected future development pressures. Upgrading of the existing electricity network in Lichtenburg, as the economic core of the municipality, is required to ensure that the expected residential and economic growth can be accommodated.

| | | | |
|---|---|---|---|
| **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.)** | **YES√** | | Please explain |

Local employment benefit would result during the construction of the power line. In addition education levels are extremely low within the surrounding area. 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 power line would also contribute to national electricity security, which would benefit the country at large, including the local community.

| | | | |
|---|---|---|---|
| **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.)** | **YES✓** | | Please explain |
| Yes, there is currently adequate capacity for the construction of the power line and substation. All relevant local and district municipalities have been provided with the opportunity to comment on the proposed development as well as this DBAR. | | | |
| **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.)** | **YES✓** | | Please explain |
| The development will contribute to the service infrastructure of the municipality. According to the LM's SDF, upgrading of the existing electricity network in Lichtenburg, as the economic core of the municipality, is required to ensure that the expected residential and economic growth can be accommodated. All relevant local and district municipalities have been provided with the opportunity to comment on the proposed development as well as this DBAR. | | | |
| **7. Is this project part of a national programme to address an issue of national concern or importance?** | **YES✓** | | Please explain |
| Yes, the project is intrinsically linked to the construction of the Tlisitseng 2 solar 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).<br><br>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.<br><br>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).

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:

- 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 |

Much of the study area is characterised by rural areas with low densities of human settlement. Agriculture in the form of maize cultivation 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 R505 main road, 132kV power lines, a substation (Watershed MTS) and other linear elements, such as 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 132kV Tlisitseng 2 substation and associated 132kV power line would result in less visual contrast where other anthropogenic elements (such as the Watershed MTS) are already present. As such, the alignment of the corridor alternatives 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 |

The power line and substation are intrinsically linked to the Tlisitseng 2 solar PV energy facility, which is a National development priority. The project site already includes the R505 main road, 132kV power lines, a substation (Watershed MTS) and other linear elements, such as telephone poles, communication poles and farm boundary fences. As such, the proposed development is a suitable development within this 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 |

The absence of the proposed 132kV power line and substation would mean that the proposed

| | | | |
|---|---|---|---|
| Tlisitseng 2 solar PV energy facility would not be connected to the grid which would have negative consequences for the renewable energy targets in the country. The positive impacts relate to job creation would also not be realised. | | | |
| **11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?** | | **NO✓** | Please explain |
| Electrical infrastructure is developed on a need basis, and there is already electrical infrastructure in the area surrounding Lichtenburg. 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 on which the Tlisitseng 2 facility is proposed to be developed, and this proposed project would therefore not negatively impact his rights. The other way in which people will be impacted is the visual impact of the proposed project, However as previously mentioned the presence of the R505 main road, 132kV power lines, a substation (Watershed MTS) and other linear elements, such as telephone poles, communication poles and farm boundary fences are important factors in this context, as the introduction of the proposed 132kV Tlisitseng 2 substation and associated 132kV power line would result in less visual contrast where other anthropogenic elements (such as the Watershed MTS) are already present. | | | |
| **13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?** | | **NO✓** | Please explain |
| The electrical infrastructure would not impact 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 because it is intrinsically linked to the proposed Tlisitseng 2 PV energy facility. 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 |
| The proposed construction of bulk infrastructure will not only assist by providing the infrastructure for the Tlisitseng 2 development to gain access to the national grid by improving electricity supply in the region, It also has the potential to stimulate the national economy through an increase in production to the value of R239.6 million. The construction will furthermore, create or support approximately six temporary jobs, while the maintenance will create 1.5 permanent FTE opportunities. 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. | | | |

The directly impacted land owner of Portion 25 of Farm Houthaalboomen 31 has indicated that alternative land can be acquired, which would allow him to continue the current levels of agriculture production. This is however, dependent on the condition that he receives some rental income in advance. No loss in agricultural production is, therefore, expected as a direct result of the development.

| **16. Any other need and desirability considerations related to the proposed activity?** | Please explain |
|---|---|

As mentioned above, the proposed project is needed in order to connect the proposed Tlisitseng 2 solar PV energy facility to the national grid at the existing Watershed substation. The Tlisitseng 2 solar PV energy facility is needed in order to produce renewable energy to feed into the national grid and contribute to fulfilling South Africa's renewable energy goals.

| **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 Tlisitseng 2 solar PV energy facility is dependent on the proposed project and 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 substation and power line 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 were 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 power line 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 No. 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 | Department of Environmental Affairs (DEA) and South African National Biodiversity Institute (SANBI) | 2004 |

| | | | |
|---|---|---|---|
| | development. | | |
| 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 power lines 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 0f 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 power line. | 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 |
| Ngaka Modiri Molema DM's Integrated Development Plan (IDP) 2012 – 2016 | States its mission as providing a developmental municipal governance system for a better life for all in the Ngaka Modiri | Ngaka Modiri Molema DM. | 2012 |

| | | | |
|---|---|---|---|
| | Molema DM. | | |
| Ditsobotla LM Integrated Development Plan (IDP) (2011/12 – 2015/16) | The IDP also states that there is a need for renovation and/or replacement of the electrical infrastructure in the Lichtenburg CBD as this infrastructure is old. | Ditsobotla LM. | 2011 |

## 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. 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 Lichtenburg registered landfill site or any other registered landfill site which is close by, should space not be available at the Lichtenburg 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. 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 Lichtenburg registered landfill site or any other registered landfill site which is close by, should space not be available at the Lichtenburg 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✓ |
|---|---|---|

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✓ |
|---|---|---|

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✓ |
|---|---|---|
| If YES, what estimated quantity will be produced per month? | | $m^3$ |
| Will the activity produce any effluent that will be treated and/or disposed of on site? | | 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✓ |
|---|---|---|

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 that exhaust emissions and dust associated with construction phase activities? | | NO✓ |
|---|---|---|
| If YES, is it controlled by any legislation of any sphere of government? | YES | NO |

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✓ | |
| If YES, is it controlled by any legislation of any sphere of government? | | NO✓ |

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.<br><br>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. |

## 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 | |
| Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs? | | NO✓ |

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

## 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. However, as mentioned above, it should be noted that the proposed project is required in order to connect the renewable energy produced at the proposed Tlisitseng 2 solar PV energy facility to the national grid. |

## SECTION B: SITE/AREA/PROPERTY DESCRIPTION

**Important notes:**

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

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

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

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

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed 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** | Ngaka Modiri Molema District Municipality |
| **Local Municipality** | Ditsobotla Local Municipality |
| **Ward Number(s)** | 14 |
| **Farm name and number** | **Houthaalboomen 31** |
| **Portion number** | 25 |
| **SG Code** | T0IP00000000003100025 |
| **Farm name and number** | **Lichtenburg Town and Townlands 27** |
| **Portion number** | Remainder of 1 |
| **SG Code** | T0IP00000000002700001 |
| **Farm name and number** | **Lichtenburg Town and Townlands 27** |
| **Portion number** | 10 |
| **SG Code** | T0IP00000000002700010 |

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 Substation 1:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **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 Substation 2:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **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 |

**Power Line Corridor:**

| | | | | | | |
|---|---|---|---|---|---|---|
| **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 |

Most of the terrain in the study area is flat. An A3 Slope Classification Map and Topography Map are included in **Appendix A.**

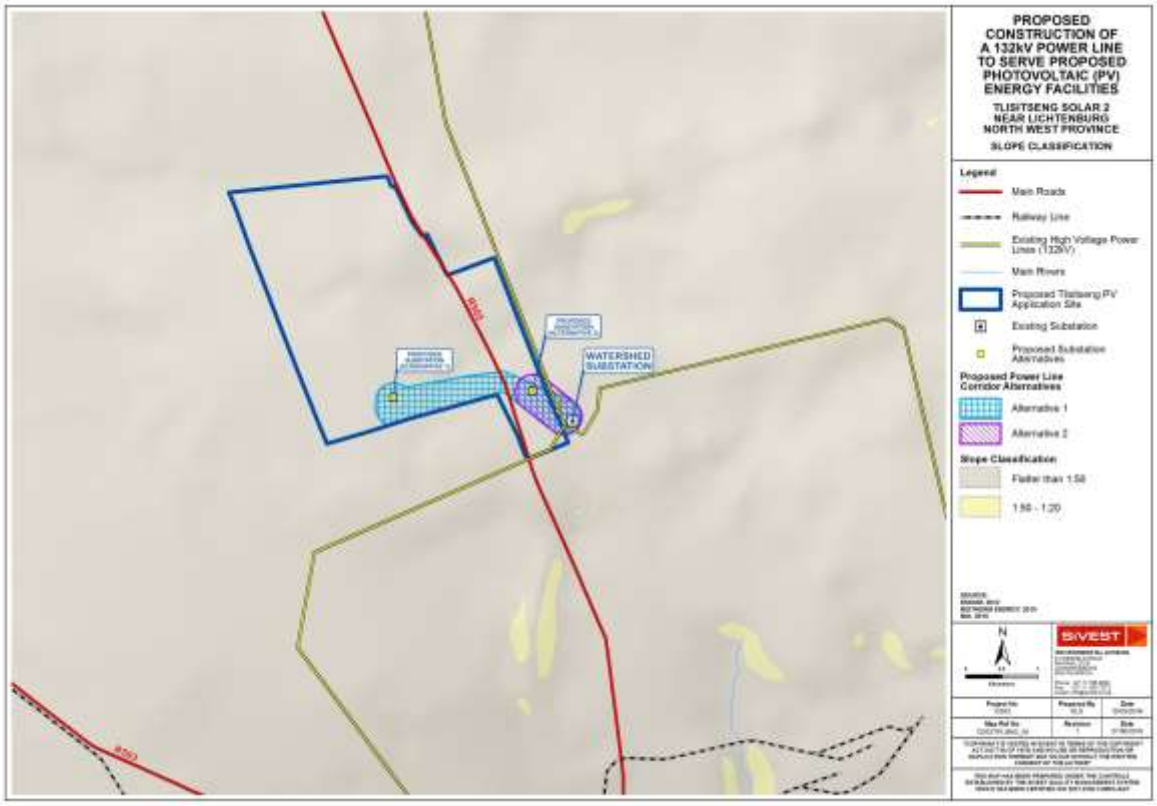


**Figure 3: Slope Classification Map**

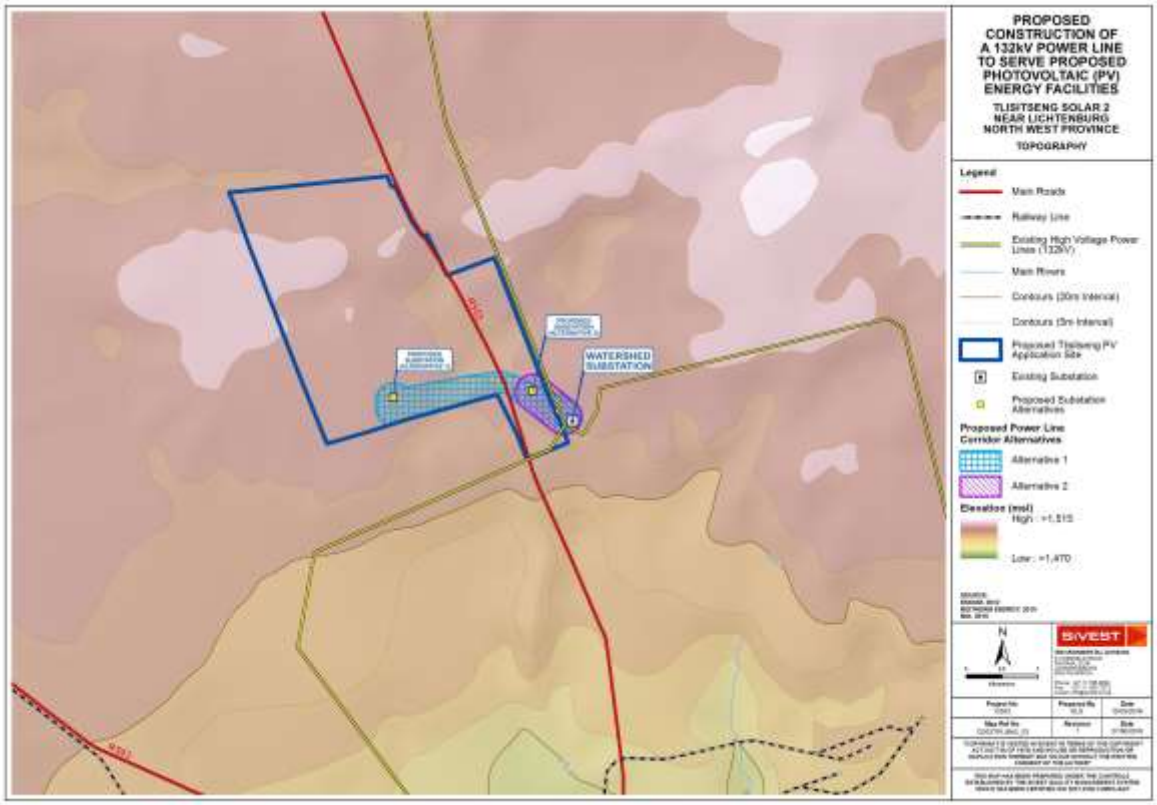


**Figure 4: Topography Map**

## 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 | ✓ | 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?

| | Tlisitseng 2 Substation Alternative 1: | Tlisitseng 2 Substation Alternative 2: | Tlisitseng 2 power line corridor: |
|---|---|---|---|
| Shallow water table (less than 1.5m deep) | NO✓ | NO✓ | NO✓ |
| Dolomite, sinkhole or doline areas | YES ✓ | YES ✓ | YES ✓ |
| Seasonally wet soils (often close to water bodies) | NO✓ | NO✓ | NO✓ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Unstable rocky slopes or steep slopes with loose soil | | NO✓ | | | NO✓ | | | NO✓ |
| Dispersive soils (soils that dissolve in water) | | NO✓ | | | NO✓ | | | NO✓ |
| Soils with high clay content (clay fraction more than 40%) | *YES ✓ | | | *YES ✓ | | | *YES ✓ | |
| Any other unstable soil or geological feature | | NO✓ | | | NO✓ | | | NO✓ |
| An area sensitive to erosion | | 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. A geotechnical study was undertaken by Colin Dalton from Geopractica, These Specialist reports are included in **Appendix D.**

*The Geotechnical report stated that Google Earth imagery suggests that this site may be underlain by well developed, shallow, undulating calcrete horizon, which is typically impermeable and thus stormwater ponding could be an issue in this area, particularly after heavy or prolong rainfall., However, this can be mitigated by a storm water management plan which will be compiled before any construction commences as well as the recommendations of the soils and agricultural specialist and surface water specialist.

## 4. GROUNDCOVER

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 D.**

## 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.

Only one small wetland (depression) was identified within the greater proposed Tlisitseng PV Application site, approximately 35m to the east of the R505. As this wetland is located a sufficient distance from the power line corridors and substation sites it is not affected by the proposed development.

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

## 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.**

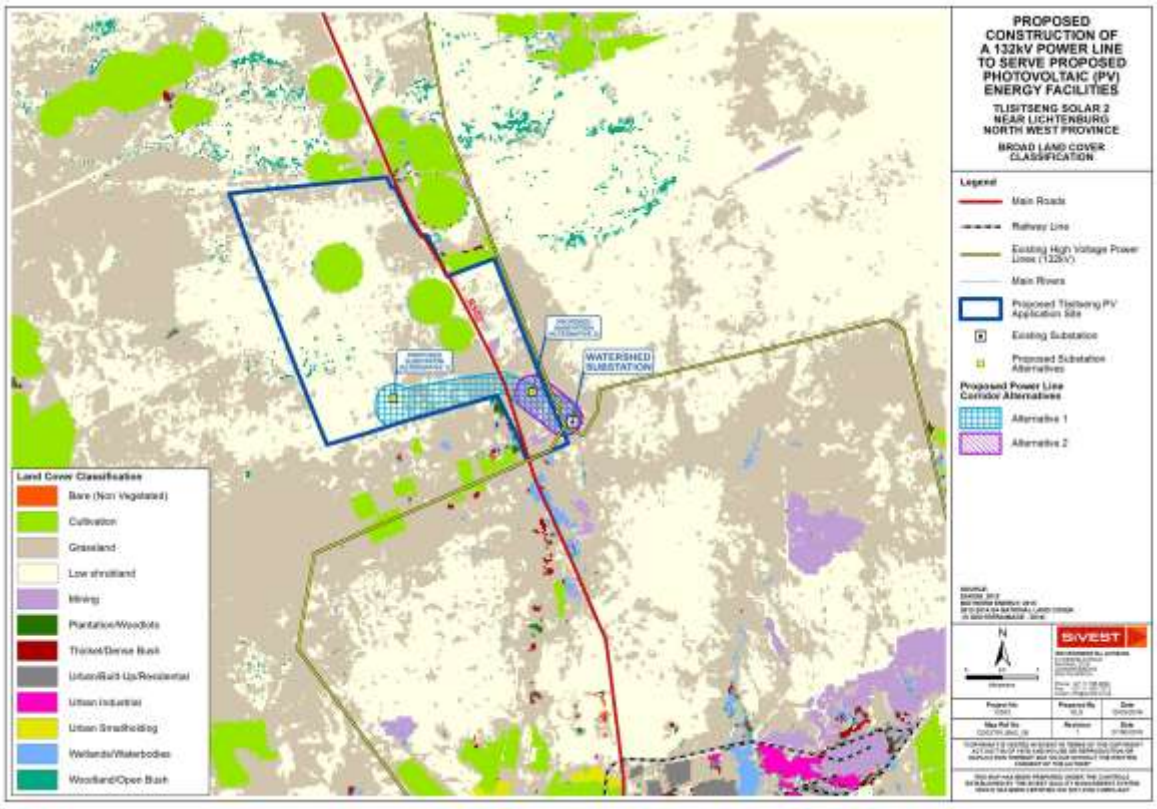


**Figure 5: Land Use Map**

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

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

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

The whole development area falls within an area classified as CBA 2. A map indicating the Critical Biodiversity Areas (CBA's) is included in **Appendix A.**

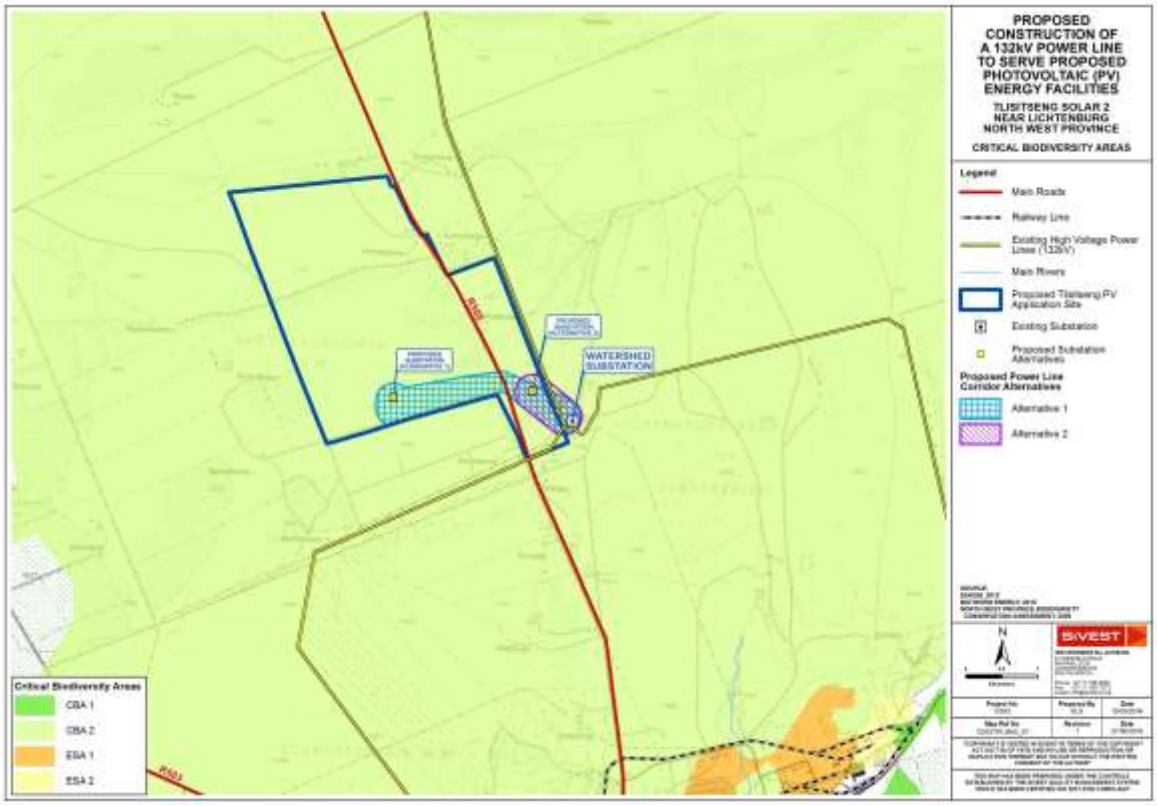


**Figure 6: Critical Biodiversity Areas (CBAs) Map**

## 7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in [redacted]

| | |
|---|---|
| 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 and a palaeontological study was conducted by Gideon Groenewald, both from PGS Heritage. A composite report covering heritage and palaeontology is included in Appendix D. No heritage features were found on the site of the proposed power line corridor or either of the substations. In terms of palaeontology, several arbitrary finds of dolomite and chert with significantly well-defined stromatolites as well as a few potential sites with either associated sinkholes or cave breccias were recorded. Confirmation of the significance of these sites will only be possible after completion of the geotechnical surveys | |

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, several arbitrary finds of dolomite and chert with significantly well-defined stromatolites as well as a few potential sites with either associated sinkholes or cave breccias were recorded. Confirmation of the significance of these sites will only be possible after completion of the geotechnical surveys.

The fieldwork findings have shown that the study area is characterised by a background scatter of Stromatolites in all the dolomite boulders on site and some areas have remains of cave breccia but no in situ outcrops were recorded.

It must be kept in mind that the fieldwork could in no way identify all palaeontological sites within the development footprint and as such the fieldwork has shown that the possibility of encountering possible cave breccias during geotechnical investigation is relatively high.

The EAP and ECO of the project must be informed of the slight possibility that significant stromatolites structures and cave breccias might be exposed during excavation of foundations deeper than 1.5m. Field observation indicated that most of the development site is underlain by deep soils and gravel deposits with a low significance for palaeontological heritage. No further mitigation for Palaeontological heritage is recommended before completion of geotechnical surveys. If any significant stromatolites structures or cave breccias are however observed, the palaeontologist must be informed immediately for appropriate action.

| | |
|---|---|
| Will any building or structure older than 60 years be affected in any way? | **NO✓** |
| Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? | **NO✓** |

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.

Level of unemployment:

The Ngaka Modiri Molema DM has a working age population (15 – 64 years of age) of 512 630 individuals – 60.8% of its total population. According to South Africa's official unemployment definition, it is estimated that 33.6% of the DM's labour force is unemployed, while 8.2% can be classified as discouraged work seekers (Stats SA, 2012). Within the Ditsobotla LM the situation improves slightly since here, according to the Census 2011, there is a working age population of 104 623. Furthermore, the LM has an approximate unemployment rate of 28.4%, while 6.8% of the population are discouraged work seekers.

As expected in the previous section, where it was revealed that the household income levels in Lichtenburg are comparatively, significantly higher than that of the municipalities being studied, and the employment situation in the town is noticeably more positive than that of the DM or LM. In Lichtenburg, where 66% of the population is of working age, unemployment is estimated at 20.5% and discouraged work seekers comprise 3.2% of the town's 17 407 working age population. It follows that Lichtenburg's labour force participation rate is also significantly higher at 61.4%, compared to the 44.3% and 50.7% in the DM and LM.

Economic profile of local municipality:

Based on current prices, the economy of the North West Province is valued at R199 551 million. This is the equivalent of a 6.5% contribution to the national GDP. At the same time, the economy of the Ngaka Modiri Molema DM was valued at R31 007 million in current prices, while the economy of the Ditsobotla LM was estimated to have a GDP of R8 122 million in current prices. The LM comprises more than a quarter (26.2%) of the GDP of the DM, and 4.1% of the North West Province's GDP is attributable to Ditsobotla LM (Quantec, 2014).

Over a ten-year period ranging from 2003 to 2013, the Ditsobotla LM's economy grew by a Compounded Average Growth Rate (CAGR) of 5%. The growth recorded in the LM is higher than the rate at which the DM and Province's respective economies grew. It is estimated that these economies grew by 3.2% and 22% in the DM and Province respectively, over the same five-year period. In turn, the growth of 2.2% recorded in the Province is below that of the country, which was estimated at 3.3% for the same ten-year period (Quantec, 2014).

The comparatively high growth rate in the LM can be attributed to the growth recorded in the Wholesale, trade, and accommodation, and Finance, insurance, and real estate sectors. Based on current prices, the Wholesale, trade, and accommodation sector comprises 23.9% of the Ditsobotla economy, with the Finance, insurance, and real estate sector accounting for a further 23% of the LM's GDP in current prices (Quantec, 2014). Thus a CAGR of 6.5% in the Wholesale, trade, and accommodation sector, and 8.5% in the Finance, insurance, and real estate sector is likely to have

driven the bulk of the LM's economic growth based on the importance and contribution of these sectors to its economy.

In terms of the structure of the economies being studied, and the most significant economic activities taking place within these, the economy of the Ditsobotla LM is not unlike that of the country. Based on current prices, the economy of South Africa is a service economy with the tertiary sector contributing 70.5% of the national GDP. The importance of tertiary activities increases slightly in the LM – here the tertiary sector comprises 77% of the economy's GDP. It can furthermore be stated that wholesale, trade, and accommodation industries are contributing more to the LM's economy when comparing the proportionate contribution to that in the country's economy (16.6%). Other significant structural differences between the Ditsobotla and the South African economy relate to manufacturing industries being a slightly more important contributor to the national GDP. This sector contributes 11.3% to South Africa's economy and 9.4% to the economy of the LM. The importance of the primary economy is also lower in the LM (8%), versus the 11.5% that the primary sector contributes to the country's GDP. In addition, the primary sector is structured differently in the LM, here agriculture is more important (6.8% of the LM's GDP), compared to the 1.2% contribution of the mining sector. In the country, the mining sector contributes 9.2% to the national GDP.

The structure of the Province's economy is remarkably different to that of the country and LM, whereas the DM's economy is structured similarly to that of the LM. In the Province the importance of the primary sector increases significantly due to the mining activities that have been so prevalent in this Province, with 30.8% of the Province's GDP being generated by mining activities. The reliance of the North West Province's economy on tertiary industries is also significantly below that of the other economies being studied. It is estimated that the tertiary sector contributes 58.1% to the Province's GDP. In contrast to this is the importance of the tertiary sector in the DM, here service activities are the most important contributor, generating 81.9% of the Ngaka Modiri Molema DM's GDP. This comparatively high reliance is mostly due to the higher than average importance of the general government services sector – 22.7% of the DM's GDP is generated by government services.

Level of education:

According to the 2011 Census, literacy levels in Lichtenburg are relatively on par with the level of literacy recorded in South Africa. The literacy levels in the municipalities being studied are below that of the country though, indicating a community that is relatively less employable than the Lichtenburg community or the broader South Africa. Approximately 17% and 15% of the DM and LM's respective populations, aged 20 years and older, have had no access to formal education, while 8.7% of the population of Lichtenburg has had no schooling. In the DM, only 20.3% of the population aged 20 years and older successfully completed matric, with 8.1% achieving a higher education. The situation is even worse in the LM, where only 19.7% of the population, aged 20 and older, has obtained a matric certificate. In Lichtenburg, 27.7% of the population has completed matric, while 12% successfully completed tertiary studies.

## b) Socio-economic value of the activity

| | |
|---|---|
| What is the expected capital value of the activity on completion? | R 78,425,000.00 |

| | |
|---|---|
| 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? | Six (6) |
| What is the expected value of the employment opportunities during the development and construction phase? | R 1,044,000.00 |
| What percentage of this will accrue to previously disadvantaged individuals? | 70% |
| How many permanent new employment opportunities will be created during the operational phase of the activity? | 1.5 |
| What is the expected current value of the employment opportunities during the first 10 years? | R3,960,000.00 |
| What percentage of this will accrue to previously disadvantaged individuals? | 66% |

## 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) | |
| | | | | **The whole development falls within an area classified as CBA2 and is therefore of potentially high conservation priority.** |

**b) Indicate and describe the habitat condition on site**

| **Habitat Condition** | **Percentage of habitat condition class (adding** | **Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries,** |
|---|---|---|

| | up to 100%) | grazing, harvesting regimes etc). |
|---|---|---|
| Natural | 78% | Grassland with scattered woody plants, typical of regional vegetation type. |
| Near Natural (includes areas with low to moderate level of alien invasive plants) | 0% | |
| Degraded (includes areas heavily invaded by alien plants) | 0% | |
| Transformed (includes cultivation, dams, urban, plantation, roads, etc) | 22% | Existing substation, roads, excavated areas. No natural habitat remaining in these areas. |

**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 unchanneled wetlands, flats, seeps pans, and artificial wetlands) | | Estuary | | Coastline | |
| | Endangered | | | | | | |
| | Vulnerable | | | | | | |
| | **Least Threatened√** | | **NO√** | | **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)**

A landcover map of the study area (Fairbanks et al. 2000) indicates that the study consists of natural vegetation, classified as “grassland”. The 1:50 000 topocadastral map of the site and a Google image of the site show essentially the same pattern, with the addition of the edges of two large centre-pivot fields in the northern part of the corridor and the Watershed Substation at the southern end.

The sites fall within the Grassland Biome (Rutherford & Westfall 1986, Mucina & Rutherford 2006). The most recent and detailed description of the vegetation of this region is part of a national map (Mucina, Rutherford & Powrie, 2005; Mucina et al. 2006). This map shows one vegetation type occurring within the area of interest, Carletonville Dolomite Grassland.

**Carletonville Dolomite Grassland**

Carletonville Dolomite Grassland is found mainly in the North-West Province but also in Gauteng and

marginally in the Free State Province. It is found in the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province. Carletonville Dolomite Grassland is characterised by slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands form a complex mosaic pattern dominated by many species.

The vegetation type that occurs on site, Carletonville Dolomite Grassland, is classified as Vulnerable, but has a wide distribution and extent. From this perspective, the natural vegetation on the sites is therefore considered to have moderately high conservation value. The area is not within a Centre of Plant Endemism, nor does it occur in close proximity to an area identified as part of the National Parks Area Expansion Strategy, but is within areas identified in Provincial Conservation Plans to be of conservation priority.

Local factors that may lead to parts of the sites having elevated ecological sensitivity are the potential presence of the following:

- Presence of natural vegetation on site, some of which is of elevated conservation priority.
- Potential presence of four plant species of concern, the bulb, *Boophone disticha* (occurs on site), listed as Declining, the bulb, *Crinum macowanii* (possibly occurs on site - individuals seen were not flowering), listed as Declining, the succulent herb, *Brachystelma incanum*, listed as Vulnerable, and the herb, *Cleome conrathii*, listed as Near Threatened.
- Potential presence of one protected plant species, *Harpagophytum procumbens*.
- Potential presence of three protected tree species, *Acacia erioloba, Combretum imberbe* and *Boscia albitrunca*. The tree *Acacia erioloba* occurs in large numbers on site.
- Potential presence of the following animals of potential conservation concern:
    - Brown Hyaena (NT)
    - Honey badger (NT)
    - Southern African Hedgehog (NT)
    - White-tailed Rat (EN)
    - Giant Bullfrog (NT/LC)
    - Kori Bustard (VU),
    - Blue Crane (VU),
    - Secretarybird (NT).

Bats do not appear, from this initial assessment, to be of major concern. There is a maximum of three species of low conservation concern that could be affected. All species are listed as Near Threatened in South Africa and globally as Least Concern. The key factor is the presence of roosting habitats nearby, which is of higher concern in areas close to mountainous or rocky hillside topography. There are no such topographical features in close proximity to the project study area.

One protected amphibian species, the Giant Bullfrog, and one protected reptile, the Southern African Python, have a geographical distribution that includes the site. These species are protected according to the National Environmental Management: Biodiversity Act (Act No 10 of 2004). Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species. The Giant Bullfrog is most likely to be found near seasonal pans or water sources and the Southern African Python in rocky kloofs, usually near water.

The study area consists mostly of natural vegetation, with the exception of a centre-pivot irrigation area under cultivation, which is mapped as transformed. These transformed and degraded areas in the project study area have low sensitivity and conservation value. Most areas have medium-high sensitivity.

# 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 Noordwester newspaper | |
| **Date published** | 15 January 2016 | |
| **Site notice position** | **Latitude** | **Longitude** |
| | 26° 4'19.35"S | 26° 7'29.32"E |
| | 32°56'55.09"S | 22°32'37.35"E |
| **Date placed** | 1 December 2015 | |

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

| Summary of main issues raised by I&APs | Summary of response from EAP |
|---|---|
| Mr Samore enquired as to whether the proposed project would create permanent jobs for the surrounding community, expressing his acceptance of the project if this was the case. He also requested that BioTherm Energy avoid causing harm to the local community.<br>**Godfrey Samore**<br>North West Provincial Government<br>Email: 2 December 2016 | The proposed project would directly create several permanent jobs as well as a large number temporary jobs during construction. It is also expected that the project would indirectly cause the creation of several jobs due to the stimulation of the local economy. As part of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), project developers are required to provide a socio-economic development plan which aims to improve the socio-economic standing of the local community. This will be done prior to the start of the project to ensure that, as far as possible, the project developer avoids causing harm and benefits the local community. A detailed Socio-economic Impact Assessment is currently being undertaken to assess both the positive and negative impacts of the development. This will be made available for public review and comment during the EIA phase of the project.<br>**Lynsey Rimbault, SiVEST** |
| Eskom provided their requirements for work at or near Eskom infrastructure. They also requested copies of all documents on CD via registered mail.<br>**John Geeringh**<br>Eskom GC: Land Development<br>Email: 11 January 2016 | Eskom's requirements will be included in the Environmental Management Programme (EMPr) to ensure that any development at or near Eskom infrastructure will adhere to the prescribed requirements. The CD containing all relevant documents was sent to Eskom via registered mail.<br>**Lynsey Rimbault, SiVEST** |
| Air Traffic Navigation Services (ATNS) stated that a PV project at the proposed project site location would not affect any of the Annex 14 surfaces or Flight Procedures, however they requested that they be kept informed if the development changes. ATNS also commented that they will duly conduct the general assessment as required when the project is ready for construction<br>**Simphiwe Masilela**<br>ATNS<br>Email: 12 February 2016 | The comments from ATNS are noted, and they will continue to be kept informed as the project progresses. All relevant technical details will be provided to ATNS prior to the start of construction.<br>**Lynsey Rimbault, SiVEST** |
| The Endangered Wildlife Trust (EWT) stated that they have reviewed the Avifaunal Specialist | EWT will continue to receive all project reports and updates. |

| | |
|---|---|
| Report and that they have no comments at this stage, but that they would like to be kept up to date with further correspondence on the project.<br>**Lourens Leeuwner**<br>Endangered Wildlife Trust<br>Email: 16 February 2016 | **Lynsey Rimbault, SiVEST** |
| The project team was informed regarding a previous incident experienced by the owners of Talene Agricultural Holdings when the owner of the farm Houthaalboomen (the site for the proposed development) applied for a water use license for irrigation on his farm. The negative impact thereof was so severe to the Talene Agricultural Holdings that their boreholes dried up and also resulted in huge financial impacts as they had to sink new boreholes to reinstate their water supply. Due to above-mentioned negative experience it was enquired where BioTherm will be sourcing their water requirements from during the construction and the cleaning of the panels.<br>**Fazel Yarihawa**<br>Landowner: Talene Agricultural Holdings No 4<br>FGM: 14 March 2016 | The project team take note of Talene Agricultural Holdings' concerns and mistrust in the process followed for the water related matter. According to current information available to BioTherm, there is sufficient water supply at the site where the proposed project is located and would be sufficient for both the construction and operational phase of the project. Should additional water supply be needed, discussion will take place with Ditsobotla Local Municipality.<br>**Irene Bezuidenhout, BioTherm Energy** |
| Concern was expressed regarding the possible impact that the proposed development would have on their existing business. Patrons visit their establishment to escape the town / city to experience calm atmosphere and the nature.<br>**Jackie Hector**<br>Landowner: Talene Agricultural Holdings No 1 &<br>Owner: Rafters Busch & Sports Bar<br>FGM: 14 March 2016 | The visual impact has been assessed in the Visual Impact Assessment which is included in this Draft Basic Assessment Report (DBAR). In addition, one of the mitigation measures suggested is that trees be planted along the perimeter of the development, which will lessen the view of the panels.<br>**Stephan Jacobs, SiVEST** |
| Displeasure was expressed that only one landowner will gain financial advantage from the proposed development. It was mentioned that the adjacent landowners who will be on the receiving end of negative impacts are not receiving any compensation.<br>**Fazel Yarihawa**<br>Landowner: Talene Agricultural Holdings No 4<br>FGM: 14 March 2016 | It is standard practice that the owner on whose property a development is being proposed be compensated. Should there be any negative impacts on surrounding properties, these impacts must be mitigated as recommended by the relevant environmental specialist in the draft EMPr. If the proposed power line traverses the adjacent agricultural holdings, the relevant landowners(s) will receive compensation for the registered servitude.<br>**Irene Bezuidenhout, BioTherm Energy** |
| Objection was raised regarding the proposed power line corridor through Talene Agricultural Holdings and strongly objected to. The agricultural holdings' properties are very small | In order to take the landowner's objections into consideration, the width of the proposed power line corridor was reduced to exclude portions 2, 3 and 4 of the farm Talene number 25. As a result |

| | |
|---|---|
| and it would hamper any future development on the property. It is being proposed that the power lines be constructed on the property where the solar development is being proposed.<br>**Fazel Yarihawa**<br>Landowner: Talene Agricultural Holdings No 4<br>FGM: 14 March 2016 | the width of the proposed corridor was reduced to be approximately 285m in part as indicated in **Error! Reference source not found.** below.<br><br>**Lynsey Rimbault, SiVEST** |

## 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.

The Comments and Response Report (C&RR) is included in **Appendix E3.**

## 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 in included in **Appendix E4.**

## 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.

A list of registered I&APs is included in **Appendix E5.**
Full detail of the correspondence and minutes of meetings are included in **Appendix E6.**

# 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, degradation or fragmentation of vegetation within power line corridor. | Low negative impact expected. | The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity:<br>1 .Compile a rehabilitation programme.<br>2. Compile an Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas. |
| | Loss, degradation or fragmentation of vegetation at the substation site. | Medium negative impact expected. | The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity:<br>1 .Compile a rehabilitation programme.<br>2. Compile an Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas. |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | Loss of individuals of listed plants | Low negative impact expected. | The following mitigation measures would help to limit impacts:<br>1. It is a legal requirement to obtain permits for specimens that will be lost.<br>2. A pre-construction walk-through survey will be required to locate any listed plants.<br>3. Near threatened and Declining plants lost to the development can be rescued and planted in appropriate places in surrounding areas. This will reduce the probability as well as the cumulative effect.<br>4. If any listed plants are located during the pre-construction survey, a Plant Rescue Plan would be required to manage the process of attempting to rescue such individuals.<br>5. If any threatened species are found (only *Brachystelma incanum* listed for this area), the infrastructure layout would need to be adjusted to allow in situ conservation of affected plants as well as a suitable buffer zone. An Ecological Management Plan would need to be compiled to manage the locality where it occurs. |
| | Loss of individuals of protected plants, as per NEM:BA and provincial legislation. | Low negative impact expected. | The following mitigation measures would help to limit impacts:<br>1. It is a legal requirement to obtain permits for specimens that will be lost.<br>2. A pre-construction walk-through survey will be required to locate any protected plants.<br>3. Plants lost to the development can be rescued and planted in appropriate places in surrounding areas. This will reduce the irreplaceable loss of resources as well as the cumulative effect.<br>4. If any protected plants are located during the pre-construction survey, a Plant Rescue Plan would be required to manage the process of attempting to rescue such individuals. |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | Loss of individuals of protected trees, as per National Forests Act. | Low negative impact expected. | The following mitigation measures would help to limit impacts:<br>1. It is a legal requirement to obtain permits for specimens that will be lost.<br>2. A pre-construction walk-through survey will be required to locate any protected trees and record information about each specimen. |
| | 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 limit impacts:<br>1. It is a legal requirement to obtain permits for specimens that will be lost.<br>2. A pre-construction walk-through survey will be required to locate any individuals and move them to surrounding habitats. |
| | Mortality of birds by collision with vertical infrastructure | Low negative impact expected. | Visibility devices could be placed on overhead power lines, if necessary. This will reduce the probability slightly, but not to an extent that it will change the impact rating scores. The mitigation measure is therefore not required unless monitoring identifies this as an issue during operation. |
| | ***Indirect impacts:*** | | |
| | Establishment and spread of declared weeds and alien invader plants | Low negative impact expected. | Compile and implement an alien management plan.<br>Undertake regular monitoring to detect alien invasions early so that they can be controlled. Implement control measures. |
| | ***Cumulative impacts:*** | | |
| | None identified. | | |
| Avifauna | ***Direct impacts:*** | | |
| | Displacement of priority species due to disturbance and habitat transformation associated with construction of the 132kV power line. | Low negative impact expected. | • Construction activity should be restricted to the immediate footprint of the infrastructure.<br>• Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.<br>• Measures to control noise and dust should be applied according to current best practice in the industry.<br>• Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. |
| | Displacement of priority species due | Low negative impact | • Construction activity should be restricted to the immediate footprint of the |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | to disturbance and habitat transformation associated with construction of the substation. | expected. | infrastructure.<br>• Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.<br>• Measures to control noise and dust should be applied according to current best practice in the industry.<br>• Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. |
| | Collisions of priority species with the proposed 132kV line. | Medium negative impact expected. | • The 132kV grid connection should be inspected at least once a quarter for a minimum of one year by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first year.<br>• The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection.<br>• The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, and alternating black and white. |
| | Electrocutions of priority species on the proposed 132kV line and in the substation. | Medium negative impact expected. | • An Eskom approved bird friendly pole design must be used incorporating a bird perch, to provide safe perching substrate for birds well above the dangerous hardware.<br>• Substation hardware is often too complex for blanket, pro-active mitigation. It is rather recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach since Red List bird species are unlikely to frequent the substation and be electrocuted. |
| | ***Indirect impacts:*** | | |
| | Displacement of priority species due to disturbance and habitat transformation associated with de- | Low negative impact expected. | • De-commissioning activity should be restricted to the immediate footprint of the infrastructure.<br>• Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | commissioning of the 132kV power line. | | species.<br>• Measures to control noise and dust should be applied according to current best practice in the industry.<br>• Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. |
| | Displacement of priority species due to disturbance and habitat transformation associated with de-commissioning of the substation | Low negative impact expected. | • De-commissioning activity should be restricted to the immediate footprint of the infrastructure.<br>• Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.<br>• Measures to control noise and dust should be applied according to current best practice in the industry.<br>• Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum |
| | ***Cumulative impacts:*** | | |
| | The potential cumulative impact of displacement and especially direct mortality of priority species linked to the proposed 132kV grid connection, in combination with the existing and planned power line network in this area | Medium- high negative impact expected. | • Construction activity should be restricted to the immediate footprint of the infrastructure.<br>• Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.<br>• Measures to control noise and dust should be applied according to current best practice in the industry.<br>• Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. |
| Surface Water | ***Direct impacts:*** | | |
| | There are no wetlands or watercourses in the proposed development areas for this component of the project, there are no potential impacts anticipated | | |
| | ***Indirect impacts:*** | | |
| | None Identified | | |
| | ***Cumulative impacts:*** | | |
| | None identified. | | |
| Agriculture | ***Direct impacts:*** | | |
| | The loss of agriculturally productive soil due to the establishment of | Low negative impact expected. | Due to the generally low potential agricultural environment, little or no mitigation measures are required. The footprint of the development should be kept |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | the 132kV power line and substation | | to a minimum, so that at least the effect on grazing land for livestock is reduced. |
| | ***Indirect impacts:*** | | |
| | The loss of topsoil by being exposed to wind action due to construction processes | Medium negative impact expected. | The main mitigation would be to ensure that physical disturbance caused by soil removal and/or re-distribution is kept to a minimum. In such an area of low rainfall and hot conditions, vegetation is fragile and often difficult to re-establish.<br><br>The loamy nature of the soils means that if exposed, there is only a small hazard of soil removal by wind erosion, especially in the drier winter months. However, to combat this, any bare soil should be re-vegetated as soon as possible and preventative measures, such as soil covering and windbreaks, may also be required. |
| | ***Cumulative impacts:*** | | |
| | Potential of increased dust production as a result of construction activities, especially in the drier months | Medium negative impact expected. | The main mitigation measures would include ensuring that the topsoil remains moist if possible, and that the construction footprint is as small as possible, with minimum soil surface disturbance due to construction activities. |
| Heritage | ***Direct impacts:*** | | |
| | The possibility of encountering previously unidentified heritage resources and specifically Stone Age archaeological sites. As well as the impact on the identified archaeological sites | Medium negative impact expected. | General management guidelines to be implemented |
| | ***Indirect impacts:*** | | |
| | None identified. | | |
| | ***Cumulative impacts:*** | | |
| | None identified. | | |
| Palaeontology | ***Direct impacts:*** | | |
| | The possibility of encountering previously | High negative impact expected. | Mitigation through palaeontological excavations and collection if Geotechnical Survey indicates necessity for mitigation |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | unidentified heritage resources and specifically Palaeontological sites. As well as the impact on the identified palaeontological sites | | Monitoring during construction by palaeontologist if fossils are exposed during excavation of more than 1.5m of soil cover |
| | ***Indirect impacts:*** | | |
| | None identified. | | |
| | ***Cumulative impacts:*** | | |
| | None identified. | | |
| Visual | ***Direct impacts:*** | | |
| | Visual impacts of the proposed on-site Tlisitseng 2 Substation and 132kV power line (including associated infrastructure) during construction | Low negative impact expected. | • Plan carefully to reduce the construction period.<br>• Minimise vegetation clearing and rehabilitate cleared areas as soon as possible, in accordance with the recommendations of the biodiversity specialist.<br>• Vegetation clearing should take place in a phased manner.<br>• Make use of nurseries to speed up recovery of vegetation.<br>• Maintain a neat construction site by removing rubble and waste materials regularly.<br>• Make use of existing gravel access roads where possible.<br>• Limit the number of vehicles and trucks travelling to and from the proposed site.<br>• Ensure that dust suppression techniques are implemented on gravel access roads, where possible.<br>• Ensure that dust suppression is implemented in all areas where vegetation clearing has taken place.<br>• Ensure that dust suppression techniques are implemented on all soil stockpiles.<br>• Re-vegetate all reinstated cable trenches with the same vegetation that existed prior to the cable being laid.<br>• Select the substation alternative that will have the least impact on visual receptors (i.e. Substation Alternative 1). |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | | | • 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.<br>• Where possible, laydown areas and temporary construction equipment and camps should be placed in already disturbed areas in order to minimise vegetation clearing.<br>• Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.<br>• Where possible, protect existing local trees and maintain natural vegetation outside the development footprint. |
| | Visual impacts of the proposed on-site Tlisitseng 2 Substation and 132kV power line (including associated infrastructure) during operation | Medium negative impact expected. | • Light fittings for security at night should reflect the light toward the ground and prevent light spill.<br>• As far as possible, limit the amount of security and operational lighting present at the on-site substation.<br>Alternatively, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself).<br>• If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself);<br>Make use of minimum lumen or wattage in fixtures;<br>• Limiting mounting heights of lighting fixtures, or alternatively using foot-light or bollard level lights;<br>• If possible, make use of motion detectors on security lighting.<br>• As far as possible, limit the number of maintenance vehicles which are allowed to access the substation site and power line access roads.<br>• Ensure that dust suppression techniques are implemented on gravel access roads, where possible.<br>• Only clear vegetation which is required to be cleared for the correct operation of the development.<br>• Ensure that the associated infrastructure |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | | | are not located within 500m from any of the surrounding farmhouses, in order to limit the visual impact of the development on these dwellings.<br>• Align the power line within the authorised corridor as far away from Rafters Pub as possible i.e. in the northern and eastern parts of the corridor.<br>• Non-reflective surfaces should be utilised where possible.<br>• If overhead power lines are required, align power lines to run parallel to other linear elements and the farm boundaries, where possible.<br>• The O&M buildings should be painted with natural tones that fit with the surrounding environment.<br>Select the alternatives that will have the least impact on visual receptors (i.e. Substation Alternative 2). |
| | ***Indirect impacts:*** | | |
| | None identified. | | |
| | ***Cumulative impacts:*** | | |
| | None identified. | | |
| Socio-Economic | ***Direct impacts:*** | | |
| | Construction, and to some degree maintenance, of the proposed substation and power line will create or support employment in the relevant sectors as a result of direct, indirect, and induced effects. | Low positive impact expected. | Where possible and feasible, local labour procurement should be practised. In addition, if feasible, goods and services should be procured from local small businesses. This will increase the benefit to the local community. |
| | The proposed 132 kV substation and power line will provide the required access for the proposed Tlisitseng 2 PV facility to the national grid. | Medium positive impact expected. | No mitigation measures exist. |
| | The construction of the proposed | Medium negative | • The conditions set and requested by the directly affected land owner and set out in |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | substation will neutralise the land for agricultural purposes. At the same time, the construction activities and corresponding influx of construction workers to the sight will result in a change of sense of place for the local community; once completed, the physical presence of the electrical infrastructure constructed will contribute towards this change. | impact expected. | the Socio-economic Assessment Report should be adhered to if possible in order to limit the interruption to agricultural production.<br>• Implement the mitigation measures recommended by the other relevant specialist (visual, noise), where feasible to limit negative impacts and their effect on the community's sense of place.<br>• Implement public consultation and information sessions to limit the influx of migrant job seekers.<br>• Strict rules of conduct and access control procedures should be enforced at all times to ensure that the personal property of the land owners on and surrounding the site is respected by all workers/contractors of the project proponent.<br>• The power lines should try and not traverse the portions of farms, owned by those land owners objecting to the development. The existing farm should preferably be used for the development of the power line. |
| | ***Indirect impacts:*** | | |
| | The proposed substation and power line will require capital expenditure for goods and services during its construction. This will directly and indirectly contribute to revenue generation of those industries related to this sector by increasing the demand for goods and services for respective businesses | 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. |
| | ***Cumulative impacts:*** | | |
| | None identified. | | |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| **No-go option** | | | |
| | ***Direct impacts:*** | | |
| | The job creation and local investment expected for the Lichtenburg area would not occur. The expected capital injection into the LM would be prevented. The electricity generated at the Tlisitseng 2 solar PV energy facility would not be connected to the grid and greater electricity security would not be achieved, South Africa would not have the benefit of the Tlisitseng 2 solar PV energy facility contributing to the country's renewable energy targets. | | |
| | ***Indirect impacts:*** | | |
| | None identified. | | |
| | ***Cumulative impacts:*** | | |
| | 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 and a comparison of the alternatives is included in section 2 below.

## 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.

**Tlisitseng 2 Substation Alternative 1**

| | |
|---|---|
| Biodiversity | • There is no preference between substation alternatives, primarily because they have a similar effect on the ecological receiving environment and affect similar habitats. |
| Avifauna | • Substation alternative 1 is favourable as the impacts on avifauna as a result from this substation site will have insignificant impacts. |
| Surface Water | • Both alternatives are suitable for the placement of the substation from a surface water perspective as there are no wetlands or watercourses within any of the two alternative sites nor within close proximity (500m) to any surface water resources in the nearby area. There is no preference between the two alternative sites and both are suitable for the location of the Substation. |
| Agriculture | • Substation alternative 1 is preferred from an agricultural and soils point of view as this site has shallow soils and low agricultural potential. |
| Heritage | • An assessment of the two substation options indicates that neither |

| | |
|---|---|
| | of the two will have an impact on heritage resources and thus no preference for either exists<br>• The overall impact on heritage resources is seen as acceptable and the proposed mitigation measures to be incorporated in the EMP will provide the necessary actions to address any impacts on heritage resources. |
| Palaeontology | • There is no preference between the alternatives because no significant palaeontological heritage resources have been identified before the geotechnical report is available.<br>• The project may have palaeontological heritage resources present on the property. This has been confirmed through archival research and evaluation of aerial photography of the sites. Confirmation of actual presence of significant finds will only be possible after the completion of the geotechnical surveys for this project. |
| Visual | • The proposed substation site and power line corridor alternative is situated in a relatively natural area, however existing electrical infrastructure and other linear elements are also present within close proximity. The Watershed MTS can be found approximately 2.3km to the south-east of the proposed on-site substation site. Four (4) potentially sensitive visual receptor locations can be found within 500m of the proposed substation site and power line corridor alternative, within the high impact zone. It must be noted that twenty (20) potentially sensitive receptor locations can be found within 2km of the proposed substation site and power line corridor alternative, within the moderate impact zone. The rest of the potentially sensitive visual receptor locations are located further than 2km. In addition, two (2) visually sensitive receptor locations, namely VR 14 – Rafters Pub and VR 64 – Lichtenburg Game Breeding Centre, are also situated within 2km of the proposed alternative, within the moderate impact zone. One (1) visually sensitive receptor, namely VR 58 – Lichtenburg Vakansie Oord, is however located further than 2km from the proposed substation and power line corridor alternative, within the low impact zone. Although not the preferred alternative, Substation and Power Line Corridor Alternative 1 is still considered to be a favourable option as it would impact on fewer visually sensitive receptor locations, but is situated closer to more potentially sensitive visual receptors. It is also important to note that Substation Alternative 1 will result in the proposed 132kV power line being routed along a shorter distance. Substation Alternative 1 is thus expected to result in a lower visual impact. In addition, the substation would only be constructed if the proposed Tlisitseng solar 1 PV energy facility was developed as well. The impact of the substation would therefore be dwarfed by the large number of PV panels that would be visible. |
| Socio-Economic | • Considering the location of the sensitive receptors identified from |

| | |
|---|---|
| | the consultation process suggest that substation site alternative 2 may be associated with a notably lower negative effect on the sensitive receptors than that of site alternative 1. This is mainly due to site alternative 2 being associated with a shorter power line route and located further away from the sensitive receptors observed on Portion 1 of Farm Talene 25 and Portion 3 of Farm Talene. Considering the fact that all other impacts evaluated will be the same regardless of the site alternative chosen, site alternative 2 is indeed the preferred alternative from a socio-economic perspective. |
| Geotechnical | • No preference exists between the substation alternatives as both sites exhibit the same geotechnical suitability. |

**Tlisitseng 2 Substation Alternative 2**

| | |
|---|---|
| Biodiversity | • There is no preference between substation alternatives, primarily because they have a similar effect on the ecological receiving environment and affect similar habitats. |
| Avifauna | • Substation alternative 2 is preferred as the impacts on avifauna will be slightly lower than those at substation alternative 1 due to the shorter length of the power line associated with substation alternative 2. |
| Surface Water | • Both alternatives are suitable for the placement of the substation from a surface water perspective as there are no wetlands or watercourses within any of the two alternative sites nor within close proximity (500m) to any surface water resources in the nearby area. There is no preference between the two alternative sites and both are suitable for the location of the Substation. |
| Agriculture | • Substation alternative 2 is favourable as there is a possibility of deeper soils with a moderate to high agricultural potential at this site. |
| Heritage | • An assessment of the two substation options indicates that neither of the two will have an impact on heritage resources and thus no preference for either exists.<br>• The overall impact on heritage resources is seen as acceptable and the proposed mitigation measures to be incorporated in the EMPr will provide the necessary actions to address any impacts on heritage resources. |
| Palaeontology | • There is no preference between the alternatives because no significant palaeontological heritage resources have been identified before the geotechnical report is available.<br>• The project may have palaeontological heritage resources present on the property. This has been confirmed through archival research and evaluation of aerial photography of the sites. Confirmation of actual presence of significant finds will only be possible after the completion of the geotechnical surveys for this project. |
| Visual | • The proposed substation site and power line corridor alternative is |

| | |
|---|---|
| | situated in a relatively natural area, however existing electrical infrastructure and other linear elements are also present within close proximity. The Watershed MTS can be found approximately 500m to the south-east of the proposed on-site substation site. It should be noted that no sensitive receptor locations can be found within 500m of the proposed substation site and power line corridor alternative, within the high impact zone. However, two (2) potentially sensitive visual receptors can be found within 500m of the proposed alternative, within the high impact zone. Fifteen (15) potentially sensitive receptor locations can be found within 2km of the proposed substation site and power line corridor alternative, within the moderate impact zone. In addition, one (1) visually sensitive receptor location, namely VR 64 – Lichtenburg Game Breeding Centre, can be found within 2km of the proposed alternative, within the moderate impact zone. It should also be noted that two (2) visually sensitive receptor locations, namely VR 14 – Rafters Pub and VR 58 – Lichtenburg Vakansie Oord, are situated further than 2km from the proposed substation site and power line corridor alternative, within the low impact zone. As such, Substation and Power Line Corridor Alternative 2 is considered to be the preferred alternative as it would be located further from one (1) of the sensitive visual receptor locations, as well as a few potentially sensitive receptors, and would therefore impact on slightly fewer sensitive and/or potentially sensitive receptor locations. In addition, the power line route is shorter and the substation would only be constructed if the proposed Tlisitseng solar 2 PV energy facility was developed as well. The impact of the substation would therefore be dwarfed by the large number of PV panels that would be visible. |
| Socio-Economic | • Considering the location of the sensitive receptors identified from the consultation process suggest that substation site alternative 2 may be associated with a notably lower negative effect on the sensitive receptors than that of site alternative 1. This is mainly due to site alternative 2 being associated with a shorter power line route and located further away from the sensitive receptors observed on Portion 1 of Farm Talene 25 and Portion 3 of Farm Talene. Considering the fact that all other impacts evaluated will be the same regardless of the site alternative chosen, site alternative 2 is indeed the preferred alternative from a socio-economic perspective. |
| Geotechnical | • No preference exists between the substation alternatives as both sites exhibit the same geotechnical suitability. |

**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.

In the case of this project, the no-go alternative would result in no 132kV power line being constructed, and it would therefore not be possible to export the electricity generated at the Tlisitseng 2 solar PV energy facility to the national grid. South Africa is under immense pressure to provide electricity generating capacity in order to reduce the current electricity demand in the country. With the global focus on climate change, the government is under severe pressure to explore alternative energy sources in addition to coal-fired power stations. Although solar power is not the only solution to solving the energy crisis in South Africa, it is the best solution for the study area in question and not exporting the power produced at the proposed solar PV development would be detrimental to the mandate that the government has set to promote the implementation of renewable energy.

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 due to the fact that the identified environmental impacts can be suitably mitigated and that by not building the project, the socio-economic benefits would be lost.

**Preferred Substation Summary**

| | **Preferred Substation Alternative** | |
|---|---|---|
| **Environmental Aspect** | **Substation Alternative 1** | **Substation Alternative 2** |
| Biodiversity | No Preference | No Preference |
| Avifauna | Favourable | Preferred |
| Surface Water | No Preference | No Preference |
| Agricultural Potential and Soils | Preferred | Favourable |
| Heritage | No Preference | No Preference |
| Palaeontology | No Preference | No Preference |
| Visual | Favourable | Preferred |
| Socio-economic | Not Preferred | Preferred |
| Geotechnical | No Preference | No Preference |

As per the summary of the preferred substation site shown above, substation **alternative 2 and power line corridor alternative 2** is regarded as the preferred site alternative for the proposed Tlisitseng 2 substation and power line, from an avifauna, visual, socio-economic point of view. However, the rest of the specialists found that there was no preference between substation alternatives, except from a Soils and Agriculture point of view. From the Soils and Agriculture perspective substation alternative 1 was preferred due to the Shallow soils and low agricultural potential in comparison to substation alternative 2. It should be noted that no fatal flaws were identified for either of the substation site alternatives and therefore they are both considered to be feasible alternatives that are environmentally acceptable.

## 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**

- Compile a rehabilitation programme.
- Compile an Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas.
- It is a legal requirement to obtain permits for specimens that will be lost.
- A pre-construction walk-through survey will be required to locate any listed plants.
- No animal are to be hunted for any purposes.
- Near threatened and Declining plants lost to the development can be rescued and planted in appropriate places in surrounding areas. This will reduce the probability as well as the cumulative effect.
- If any listed plants are located during the pre-construction survey, a Plant Rescue Plan would be required to manage the process of attempting to rescue such individuals.
- If any threatened species are found (only *Brachystelma incanum* listed for this area), the infrastructure layout would need to be adjusted to allow in situ conservation of affected plants as well as a suitable buffer zone. An Ecological Management Plan would need to be compiled to manage the locality where it occurs.
- Visibility devices could be placed on overhead power lines, if necessary. This will reduce the probability slightly, but not to an extent that it will change the impact rating scores. The mitigation measure is therefore not required unless monitoring identifies this as an issue during operation.
- Undertake regular monitoring to detect alien invasions early so that they can be controlled. Implement control measures.

**Recommendations of the Avifaunal Specialist**

- 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.

- The 132kV grid connection should be inspected at least once a quarter for a minimum of one year by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first year.
- The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection.
- The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, and alternating black and white.
- An Eskom approved bird friendly pole design must be used incorporating a bird perch, to provide safe perching substrate for birds well above the dangerous hardware.
- Substation hardware is often too complex for blanket, pro-active mitigation. It is rather recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach since Red List bird species are unlikely to frequent the substation and be electrocuted.
- 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 use should be made of existing access roads and the construction of new roads should be kept to a minimum.

**Recommendations of the Surface Water Specialist**

- None required as there are no surface water resources present in the proposed development areas for this component of the project.

**Recommendations of the Soils and Agriculture Specialist**

- Due to the generally low potential agricultural environment, little or no mitigation measures are required. The footprint of the development should be kept to a minimum, so that at least the effect on grazing land for livestock is reduced.
- The main mitigation would be to ensure that physical disturbance caused by soil removal and/or re-distribution is kept to a minimum. In such an area of low rainfall and hot conditions, vegetation is fragile and often difficult to re-establish.
- The loamy nature of the soils means that if exposed, there is only a small hazard of soil removal by wind erosion, especially in the drier winter months. However, to combat this, any bare soil should be re-vegetated as soon as possible and preventative measures, such as soil covering and windbreaks, may also be required.

**Recommendations of the Heritage Specialist**

- In the event that an area previously not included in an archaeological or cultural resources survey is to be disturbed, the SAHRA needs to be contacted. An enquiry must be lodged with them into the necessity for a Heritage Impact Assessment.
- In the event that a further heritage assessment is required it is advisable to utilise a qualified heritage practitioner, preferably registered with the Cultural Resources Management Section (CRM) of the Association of Southern African Professional Archaeologists (ASAPA).
- It is advisable that an information section on cultural resources be included in the SHEQ training given to contractors involved in surface earthmoving activities.

- In the event that a possible find is discovered during construction, all activities must be halted in the area of the discovery and a qualified archaeologist contacted.
- The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures.
- If mitigation is necessary, an application for a rescue permit must be lodged with SAHRA.
- After mitigation, an application must be lodged with SAHRA for a destruction permit. This application must be supported by the mitigation report generated during the rescue excavation. Only after the permit is issued may such a site be destroyed.
- If during the initial survey sites of cultural significance are discovered, it will be necessary to develop a management plan for the preservation, documentation or destruction of such a site. Such a program must include an archaeological/palaeontological monitoring programme, timeframe and agreed upon schedule of actions between the company and the archaeologist.
- In the event that human remains are uncovered, or previously unknown graves are discovered, a qualified archaeologist needs to be contacted and an evaluation of the finds made.
- If the remains are to be exhumed and relocated, the relocation procedures as accepted by SAHRA need to be followed. This includes an extensive social consultation process.

**Recommendations of the Palaeontological Specialist**

- It is essential that the results of the Geotechnical Surveys be provided to the HIA team and palaeontologist to assess the possible presence of sinkholes and cave breccia sites on all the proposed development areas;
- Field assessment indicated the presence of both stromatolites structures and cave breccia but all the observed examples were out of situ;
- If excavation of deeper than 1.5m is planned, the palaeontologist must assess the results of the geotechnical information and given the opportunity to comment on the likelihood of significant finds of fossils in all the planned development areas;
- If any excavation or collection of fossils are recommended, such mitigation measures will require a permit from SAHRA before mitigation can be done as well as a final destruction permit on completion of the mitigation work.
- Due to the large number of boulders with stromatolites present on site it is recommended that a palaeontologist be appointed to monitor geotechnical investigations during construction as part of a watching brief. The aim being the identification and mitigation of any newly discovered palaeontological sites. Site visits should include an initial 2-day site visit and then fortnightly during construction.
- Where required the sites identified from the geotechnical reports will then need mitigation measures developed that will need to be completed before construction can commence;
- Such mitigation measures will require a permit from SAHRA before mitigation can be done as well as a final destruction permit on completion of the mitigation work.

**Recommendations of the Visual Specialist**

- Plan carefully to reduce the construction period.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible, in accordance with the recommendations of the biodiversity specialist.
- Vegetation clearing should take place in a phased manner.

- Make use of nurseries to speed up recovery of vegetation.
- 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.
- Select the substation alternative that will have the least impact on visual receptors (i.e. Substation Alternative 2).
- 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.
- Where possible, laydown areas and temporary construction equipment and camps should be placed in already disturbed areas in order to minimise vegetation clearing.
- Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Where possible, protect existing local trees and maintain natural vegetation outside the development footprint.
- 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 at the on-site substation.
- Light sources should be shielded by physical barriers (walls, vegetation, or the structure itself).
- If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself);
- Make use of minimum lumen or wattage in fixtures;
- Limiting mounting heights of lighting fixtures, or alternatively using foot-light or bollard level lights;
- If possible, make use of motion detectors on security lighting.
- As far as possible, limit the number of maintenance vehicles which are allowed to access the substation site and power line access roads.
- Ensure that dust suppression techniques are implemented on gravel access roads, where possible.
- Only clear vegetation which is required to be cleared for the correct operation of the development.
- Ensure that the associated infrastructure are not located within 500m from any of the surrounding farmhouses, in order to limit the visual impact of the development on these dwellings.
- Align the power line within the authorised corridor as far away from Rafters Pub as possible i.e. in the northern and eastern parts of the corridor.
- Non-reflective surfaces should be utilised where possible.
- If overhead power lines are required, align power lines to run parallel to other linear elements

and the farm boundaries, where possible.
- All infrastructure that is not required for the post-decommissioning use should be removed;
- Rehabilitate all cleared areas as soon as possible, in accordance with the recommendations of the biodiversity specialist; and
- Monitor rehabilitated areas post-decommissioning and implement remedial actions, as required.

**Recommendations of the Socio-Economic Specialist**

- Where possible and feasible, local labour procurement should be practised. In addition, if feasible, goods and services should be procured from local small businesses. This will increase the benefit to the local community.
- The conditions set and requested by the directly affected land owner and set out in the Socio-economic Assessment Report should be adhered to if possible in order to limit the interruption to agricultural production.
- Implement the mitigation measures recommended by the other relevant specialist (visual, noise), where feasible to limit negative impacts and their effect on the community's sense of place.
- Implement public consultation and information sessions to limit the influx of migrant job seekers.
- Strict rules of conduct and access control procedures should be enforced at all times to ensure that the personal property of the land owners on and surrounding the site is respected by all workers/contractors of the project proponent.
- The power lines should try and not traverse the portions of farms, owned by those land owners objecting to the development. The existing farm should preferably be used for the development of the power line.

**Recommendations of the Geotechnical Specialist**

- Due to fact that this entire site is underlain at depth by dolomite, it is a legal requirement that a Dolomite Stability Investigation (DSI) be undertaken in accordance with the South African National Standards SANS 1936-Parts 1 to 4 Development of Dolomitic Land.
- For the substation, build on a 1 hectare property, this DSI will comprise a gravity survey and the drilling of a minimum of 3 boreholes for a feasibility level (Phase 1) investigation.

**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 substation should be constructed within Substation Site Alternative 2 and power line corridor alternative 2.
- 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:

- A preferred substation site has been identified which is less environmentally sensitive compared to the other site considered during the BA.
- The power line corridor is environmentally acceptable and will not result in significant impacts, provided that the recommended mitigation measures are implemented.
- 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 132kV substation and power line can be mitigated to acceptable levels.

The date on which the activity and post construction monitoring will be concluded cannot be determined at this stage as they are based on the timeframes dictated by the REIPPPP bid windows. The date of the next round of bid submissions has not yet been announced. The construction of the 132kV substation and power line is dependent on the Tlisitseng 2 solar PV energy facility being selected as a preferred bidder. The project will therefore require an authorisation of at least 5 years.

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)
- Confirmation on Municipal Services (Appendix J3)

**Andrea Gibb**

NAME OF EAP

**23 March 2017**

SIGNATURE OF EAP | DATE

## 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