



SOLAR RESERVE SOUTH AFRICA (PTY) LTD

Proposed construction of two 132kV power lines and associated infrastructure from the Silverstreams DS to the Olien MTS for the Redstone Solar Thermal Power Project near Lime Acres, Northern Cape Province


Draft Basic Assessment Report

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environmental affairs

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Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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

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SOLAR RESERVE SOUTH AFRICA (PTY) LTD

PROPOSED CONSTRUCTION OF TWO 132kV POWER LINES AND ASSOCIATED INFRASTRUCTURE FROM THE SILVERSTREAMS DS TO THE OLIEN MTS FOR THE REDSTONE SOLAR THERMAL POWER PROJECT NEAR LIME ACRES, NORTHERN CAPE PROVINCE

DRAFT BASIC ASSESSMENT REPORT

Executive Summary

SolarReserve South Africa (Pty) Ltd (hereafter referred to as SolarReserve) intends to develop two 132kV power lines and associated infrastructure from the Silverstreams Distribution Station (DS) to the Olien Main Transmission Substation (MTS) for the Redstone Solar Thermal Power Project near Lime Acres, Northern Cape Province.

Although, Environmental Authorisation (EA) was granted by the Department of Environmental Affairs (DEA) on 26 June 2013 for a 132kV power line from the proposed Redstone Solar Thermal Power Project site to the Silverstreams DS (DEA Ref. No.: 14/12/16/3/3/1/523). This project is being proposed in order to extend the already authorised power line corridor from the Silverstreams DS to the preferred Olien MTS in support of efforts to secure a firm supply and connect the power generated at the Redstone Solar Thermal Power Project onto the national grid.

This proposed project therefore forms part of the country's strategies to meet future energy consumption requirements through the use of renewable energy, as it will feed energy from the proposed solar power project onto the national grid.

SiVEST Environmental Division has been appointed as independent environmental consultant by SolarReserve to undertake a Basic Assessment (BA) for the proposed project on behalf of Eskom who will own and maintain the power line after the construction phase.

The proposed development requires environmental authorisation from the Department of Environmental Affairs (DEA). However, provincial authorities have also been consulted i.e. the Northern Cape Department of Environmental Affairs and Nature Conservation (NCDENC). The BA for the proposed development will be conducted in terms of the 2010 EIA Regulations promulgated in terms of section 24(2) and section 24(D) of the National Environmental Management Act (No. 107 of 1998) (NEMA), which regulations were amended and came into effect on 2 August 2010. In terms of these regulations, a Basic Assessment (BA) is required for the proposed project. All relevant legislations and guidelines were consulted during the BA process and will be complied with at all times.

The proposed project would comprise of the following:

- Construction of two (2) double circuit three phase 132kV Kingbird power lines or technically similar from the Silverstreams DS to the Olien MTS;
- Installation of two (2) 132kV feeder bays at the Olien MTS;
- Construction of a 3x40MVA or 1 x 120MVA 11/132kV step-up substation with 2x132kV feeder bays or technically similar at the proposed Redstone Solar Thermal Power Project site (located outside the solar field);
- Construction of a switchyard at the proposed Redstone Solar Thermal Power Project site (located outside the solar field); and
- Possible restringing of the existing power line and construction of a temporary bypass line.

The exact location of the proposed switchyards will be determined according to the layout of the Redstone Solar Thermal Power Project which was informed by the Environmental Impact Assessment (EIA) and environmental sensitivity mapping analysis undertaken by WorleyParsons for the proposed solar plant. The footprint of each proposed switchyard would be approximately 2500m².

Two (2) route corridor alternatives, that are approximately 1km wide, will be assessed during the BA for the proposed 132kV power lines (Figure i). These are as follows:

- Alternative 2A – approximately 11km
- Alternative 2B – approximately 12km

The approximately 1km wide corridors have been proposed for each route alternative to allow flexibility when determining the final route alignments, however only 31m wide servitudes would be required for each proposed 132kV power line. As such, the 31m wide servitudes would be positioned within the approved 1km wide corridor.

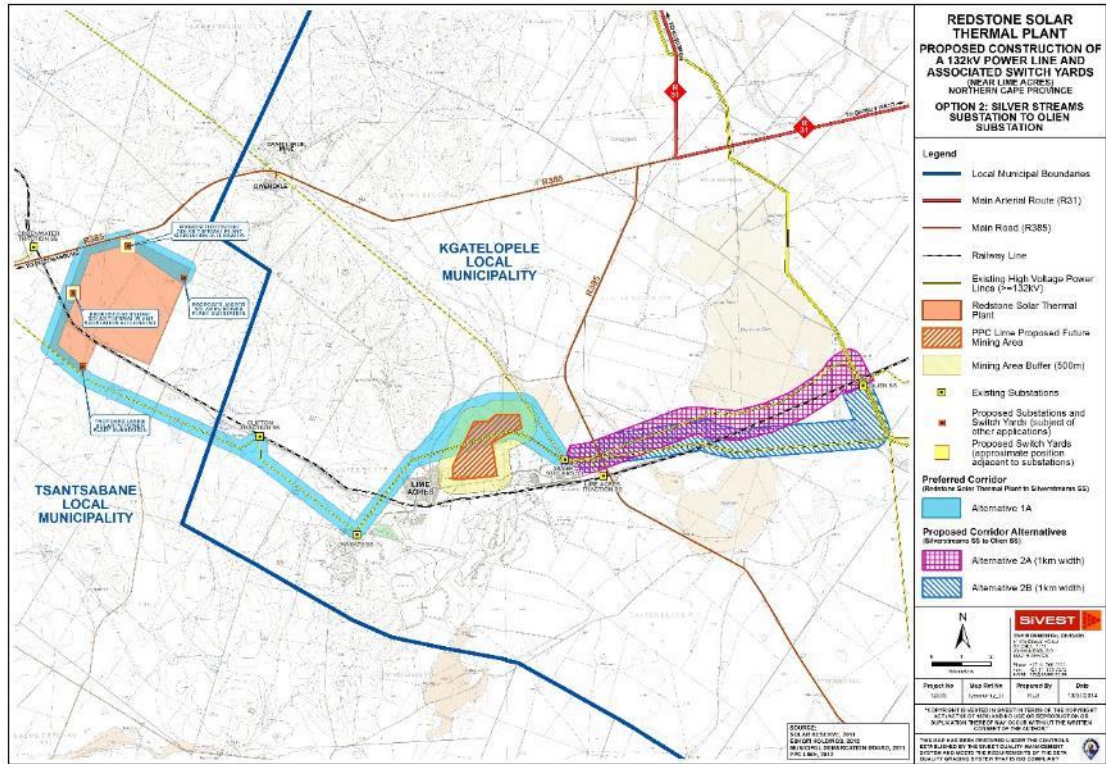


Figure i: Route Overview Map

The project is located in the Northern Cape Province between the town of Postmasburg and Danielskuil. The proposed projects are partly within the Tsantsabane Local Municipality and partly within the Kgatelopele Local Municipality, which both form part of the ZF Mgcawu District Municipality (previously Siyanda District Municipality). The largest built-up area in close proximity to the proposed projects is Lime Acres, which is accessed from the R385.

Several specialist studies were conducted during the BA to identify the issues associated with the proposed development. These include:

- Biodiversity (fauna, flora and avifauna)
- Surface water
- Agricultural potential and soil
- Heritage
- Visual
- Social
- Geotechnical

Table i: Summary of specialist studies

Environmental Parameter	Summary of major findings	Recommendations
Biodiversity	<ul style="list-style-type: none"> ▪ The two proposed power line corridors are similar in terms of the habitats present within each and overall there is little difference between the two. ▪ Alternative 2A passes near to the Great Pan and it is likely that a variety of water birds such as flamingos are attracted to this area on occasional and during this time they would be vulnerable to collisions with the power lines. ▪ The vegetated parts of the pan would be likely to attract bustards as well as raptors such as secretary bird and so on this account, alternative 2B is identified as the preferred alternative. ▪ No fine-scale conservation planning has been conducted for the area and as a result, no Critical Biodiversity Areas or Ecological Support Areas have been defined for the study area. The site does not fall within an NPAES focus area, indicating that the site is not a known broad-scale conservation priority. <p>Flora</p> <ul style="list-style-type: none"> ▪ Four vegetation types occur within the study area; the Silverstreams substation is located within Olifantshoek Plains Thornveld, but the corridors quickly give way to Ghaap Plateau Vaalbosveld which is the predominant vegetation type along the proposed routes while there are small extents of Southern 	<ul style="list-style-type: none"> ▪ Preconstruction walk-through of power line routes to identify and locate species of conservation concern that should be avoided or translocated. Micro-siting of pylons should be used where possible to reduce local impact. ▪ Affected individuals of protected species which cannot be avoided should be translocated to a safe area on the site prior to construction. This does not include trees which cannot be translocated, which should be trimmed to a minimum height of 0.5m rather than removed completely. ▪ Relevant provincial permits should be obtained before translocation of listed and protected plant species takes place and before construction commences. ▪ Where the power lines run adjacent to existing power lines or access roads, the existing roads should be used and no additional permanent roads should be constructed for the power line. ▪ Erosion control measures should be implemented in areas where slopes have been disturbed. ▪ Cleared areas should be re-vegetated and monitoring should take place to ensure recovery of these cleared areas. ▪ Alien plants should be cleared where necessary. ▪ No fuelwood collecting or fires should be allowed. ▪ Monitoring for avifaunal mortality along the power line during maintenance activities and additional mitigation measures such as bird flight diverters should be fitted if there are places where regular mortality occurs.

Environmental Parameter	Summary of major findings	Recommendations
	<p>Kalahari Mekkacha and Southern Kalahari Salt Pans present.</p> <ul style="list-style-type: none"> ▪ Only four listed species are known from the area, and at least one of these <i>Asparagus stipulaceus</i> does not actually occur in the area and is on the list as a result of the outdated taxonomy of historical species lists for the area. None of the other listed species were observed during the site visit and it is not likely that they occur within the proposed corridors. ▪ In terms of protected species, there are no nationally protected tree species within the corridors. <i>Acacia erioloba</i> is present in the wider area, but is not present at the site probably on account of the shallow calcareous soils which it does not favour. ▪ <i>Boscia albitrunca</i> also occurs occasionally in the wider area, but was not observed within the corridors. The shallow calcrete soils do however favour the presence of Wild Olives <i>Olea europea subsp. africana</i>, which is a provincially protected species, which forms dense stands within the western half of the corridors. ▪ Sensitive features present include the pans and drainage features present within both corridors. The western, well-treed section of the corridors is also considered sensitive on account of the high density of trees and the potential ecological impact that vegetation clearing of the servitudes would have in this area. <p>Fauna</p>	<ul style="list-style-type: none"> ▪ Vegetation control along servitudes should be by manual clearing and herbicides should not be used except to control alien plants in the prescribed manner. ▪ The <i>Olea europea subsp. africana</i> trees should not be cleared during maintenance activities. If there are trees present which are deemed to be too tall, these can be trimmed a lower height which complies with safety standards and it should not be necessary to remove trees. ▪ Annual monitoring for alien plant species - with follow up clearing. ▪ Annual site inspection for erosion or water flow regulation problems – with follow up remedial action where problems are identified.

Environmental Parameter	Summary of major findings	Recommendations
	<ul style="list-style-type: none"> ▪ The mammalian community is likely to be of moderate diversity, as many as 44 terrestrial mammals and 9 bat species potentially occur in the area. Habitat diversity within the study area is however relatively low and those species associated with rocky outcrops are not likely to occur within the proposed corridors. ▪ The power line corridors lie in or near the distribution range of at least 37 reptile species, this is a comparatively low total suggesting that the site has relatively low reptile species richness. Based on distribution maps and habitat requirements, the composition of the reptile fauna is likely to comprise 1 terrapin, 2 tortoises, 15 snakes, 13 lizards and skinks and 5 geckos. No species of conservation concern are known to occur in the area. ▪ The study area is located near habitat where 11 amphibian species frequently occur, indicating that the site potentially has a moderately diverse frog community. There are however no natural permanent water or artificial earth dams within the power line corridors that would hold water for a prolonged period. As a result, only those species which are relatively independent of water are likely to occur in the area. The only species of conservation concern which may occur at the site is the Giant Bullfrog <i>Pyxicephalus adspersus</i>. <p>Avifauna</p>	

Environmental Parameter	Summary of major findings	Recommendations
	<ul style="list-style-type: none"> ▪ According to the SABAP 1 and 2 databases, 217 bird species have been recorded from the area. This total results from 135 species recorded from 39 cards from SABAP 2 and 164 species from 76 cards from SABAP 1. This suggests that the area has been reasonably well sampled and that the species list is likely to be fairly comprehensive. The only notable species which was observed was the African Grey Hornbill which has only been recorded once in the QDS, in either SABAP1 or 2. Eleven listed bird species are known from the area, all of which are classified as Vulnerable or Near Threatened 	
<p>Surface Water</p>	<ul style="list-style-type: none"> ▪ It was found that there are seventeen (17) wetlands within the study area. More specifically, the wetlands include fifteen (15) depression wetlands and two (2) unchannelled valley-bottom wetlands. ▪ In terms of potentially applicable legislative implications that the proposed development may be required to adhere to, it was found that in the context of NEMA (1998), the EIA Regulations (2010), the proposed development is anticipated to trigger Activity 11 and 18 stipulated in Government Notice R. 544 Listing Notice 1 of the EIA Regulations (2010), thereby requiring Environmental Authorization. With regards to the NWA, it was found that the proposed development is likely to trigger a water use license under 	<ul style="list-style-type: none"> ▪ It is highly recommended that the proposed power line corridor Alternative 2A is used, as this will reduce potential impacts to wetlands to a minimum. As per previous recommendations, the final proposed power line route is to avoid wetlands as far as possible. ▪ The extent of the wetlands as mapped should be considered and referred to so as to adjust (where possible) the placement of the proposed developments. This is to assist in mitigating negative impacts on surface water resources.

Environmental Parameter	Summary of major findings	Recommendations
	<p>water uses (c) and (i) of the NWA. However, this must be confirmed after consultation with DWA.</p>	
<p>Agricultural potential and soils</p>	<ul style="list-style-type: none"> ▪ There is no sign of any agricultural infrastructure or irrigation. ▪ Climatic restrictions mean that this part of the Northern Cape is best suited for grazing. ▪ The grazing capacity within the study area is low. ▪ In such an area of low rainfall and hot conditions, vegetation is fragile and often difficult to re-establish. Occasional intense, erosive rainfall does still occur, and if bare soils are impacted, water erosion may result. The sandy nature of soils also makes them vulnerable to wind erosion. ▪ Purely from a soils and agricultural potential perspective, there is little that differentiates the alternatives. From the Olien Substation to Lime Acres, the routes cross almost identical terrain, with a very similar soil pattern. ▪ There is no real possibility of these soils being used for agriculture, so that the difference will be minimal, as far as a transmission line is concerned. ▪ There is no preferred alternative from an agricultural potential and soils perspective. 	<ul style="list-style-type: none"> ▪ From a soils perspective the main mitigation would be to ensure that physical disturbance caused by soil removal and/or re-distribution is kept to a minimum. ▪ Covering by geotextiles, construction of berms, terraces and run-off channels may be necessary, especially in areas with steeper slopes. ▪ Any bare soil should be re-vegetated as soon as possible and preventative measures, such as soil covering and windbreaks, may also be required.
<p>Heritage</p>	<ul style="list-style-type: none"> ▪ The area has a rich history of occupation from the Stone Age to the Iron Age period. ▪ The survey yielded three (3) heritage related sites consisting of; one (1) cemetery and two (2) historical sites. 	<ul style="list-style-type: none"> ▪ In terms of cemeteries (and possible cemeteries) it is recommended that they are enclosed with a 10 meter buffer. If the design of the development cannot be adjusted to incorporate the cemeteries then a full grave relocation which includes a comprehensive social consultation is recommended.

Environmental Parameter	Summary of major findings	Recommendations
	<ul style="list-style-type: none"> ▪ Alternative 2B will have the most impact on identified heritage resources. ▪ Overall impact of the development on heritage resources is seen as acceptably low and can impacts can be mitigated to acceptable levels. 	<ul style="list-style-type: none"> ▪ A monitoring plan for the construction phase is required. ▪ If there are possible finds during the construction phase, an assessment of the finds are to be conducted by an archaeologist prior to commencing with the development.
Visual	<ul style="list-style-type: none"> ▪ The surrounding area has a natural and pastoral visual character it is not regarded as sensitive from a visual perspective, due to the low density of potential sensitive receptors and the presence of mining activities that occur across the area. ▪ In addition, the Olien PV Plant is proposed adjacent to the Olien MTS and the massive structures of the solar plant, along with its associated infrastructure would alter the visual character of the immediate area (once constructed). ▪ It was established that both corridor alternatives would have a medium or low visual impact on most potentially sensitive visual receptors within the study area. ▪ As such, the power lines alternatives have been rated as having a relatively equal impact on the potentially sensitive visual receptors, and there is no preferred alternative. 	<ul style="list-style-type: none"> ▪ Carefully plan to reduce the construction period. ▪ Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Make use of existing gravel access roads where possible. ▪ Align the power lines to run parallel to existing power lines as far as possible i.e. Align the power lines parallel to the existing power lines that are present within the corridor alternatives. ▪ Align the power lines as far away from sensitive receptor locations as possible.
Social	<ul style="list-style-type: none"> ▪ Overall the Basic Social Assessment (BSA) did not identify any areas that can be classified as fatal flaws. Although there are two alternative route corridors proposed, these corridors all affect similar land uses and therefore it is 	<ul style="list-style-type: none"> ▪ The alignment of the power line within the corridor must be done in consultation with the affected landowner to minimise the impact on the property and surrounding land use.

Environmental Parameter	Summary of major findings	Recommendations
	<p>not expected that any of the social impacts would be much more severe on one corridor as opposed to another corridor.</p> <ul style="list-style-type: none"> ▪ Alternative 2A would be the least socially sensitive of the two alternatives. In light of this, the social study does recommend alternative 2A. 	
Geotechnical	<ul style="list-style-type: none"> ▪ The desktop geotechnical study did not identify any fatal flaws that, from a purely geotechnical perspective, would prevent the construction of power lines along either of the two proposed route corridor alternatives. Both alternatives are considered suitable for development of power lines. ▪ Due to the close proximity of the route corridor alternatives, the very similar bedrock geology and the flat topography, similar geotechnical conditions are expected along both alternatives. ▪ A highly variable bedrock profile may be encountered in areas of the route underlain by dolomite and limestone. The depth to bedrock may vary laterally over short distances (less than 1 m). The founding conditions at each pylon and infrastructure position will need to be determined individually. ▪ Variable ground conditions, both laterally and vertically are expected in areas shown to be underlain by surface limestone (calcrete). Although hard calcrete is anticipated to be encountered at relatively shallow depth over a large proportion of this area, the 	<ul style="list-style-type: none"> ▪ Detailed investigations should be conducted on the dolomite stability to avoid the formation of sinkholes. However, the risk of sinkhole formation is considered to be low due to the anticipated shallow depth to bedrock and the consequent very thin blanket layer in which voids could develop. ▪ Further detailed geotechnical investigations are undertaken along the final corridor alignment and at the final switchyard and associated infrastructure locations in order to confirm the findings of this study. ▪ Use of berms and drainage channels to direct water away from the construction areas where necessary. ▪ Minimise earthworks and levelling at tower sites. ▪ Use existing access roads wherever possible. ▪ Rehabilitate disturbed areas as soon as possible after construction. ▪ Correct engineering design of stream and water course crossings. ▪ Correct engineering design of any new access roads.

Environmental Parameter	Summary of major findings	Recommendations
	<p>hard calcrete may be underlain by loose or soft materials. The founding conditions at each pylon and infrastructure position will need to be determined individually, by excavating into the hard calcrete</p> <ul style="list-style-type: none"> ▪ The geotechnical constraints identified from this desktop study will affect the cost of construction. As alternative 2A is approximately 1 km shorter than alternative 2B, this is considered the preferred alternative. 	

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.

Based on the findings of the specialist studies, **alternative 2A** was chosen as the preferred route corridor for the proposed project.

A thorough public participation process (PPP) was undertaken as part of the BA. During this process on-going consultation took place with various key stakeholders and organs of state, which include provincial, district and local authorities, relevant government departments, parastatals and NGO's.

It is the opinion of the EAP that the proposed project should be allowed to proceed provided that the recommended mitigation measures are implemented, and provided the following conditions are adhered to:

- All feasible mitigation measures recommended by the various specialists should be strictly implemented, where applicable to the authorised power line alignment.
- Final EMPr should be approved by DEA prior to construction.

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DRAFT BASIC ASSESSMENT REPORT

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Glossary of terms

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Basic Assessment: The process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Riparian: The area of land adjacent to a stream or river that is influence by stream induced or related processes.

List of abbreviations

BA	Basic Assessment
BAR	Basic Assessment Report
BSA	Basic Social Assessment
C&RR	Comments and Response Report
DAFF	Department of Agriculture, Forestry and Fisheries
DBAR	Draft Basic Assessment Report
DS	Distribution Station
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic Fields
EMPr	Environmental Management Programme
FBAR	Final Basic Assessment Report
GIS	Geographic Information System
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
kV	Kilovolt
MTS	Main Transmission Substation
NCDENC	Northern Cape Department of Environmental Affairs and Nature Conservation
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)
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency SOC Limited
SDF	Spatial Development Framework
SG	Surveyor General
SOC	State Owned Company

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DRAFT BASIC ASSESSMENT REPORT

INTRODUCTION

In order to connect the proposed 100MW Redstone Solar Thermal Power Project onto the national grid, SolarReserve South Africa (Pty) Ltd (hereafter referred to as SolarReserve) are assessing various alternative connection points and route alignment alternatives. Although, Environmental Authorisation (EA) was granted by the Department of Environmental Affairs (DEA) on 26 June 2013 for a 132kV power line from the proposed Redstone Solar Thermal Power Project site to Silverstreams Distribution Station (DS) (DEA Ref. No.: 14/12/16/3/3/1/523). This project is being proposed in order to extend the already authorised power line corridor from the Silverstreams DS to the preferred Olien MTS in support of efforts to secure a firm supply and connect the power generated at the Redstone Solar Thermal Power Project onto the national grid.

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1. PROJECT DESCRIPTION

The proposed project would comprise of the following:

- Construction of two (2) double circuit three phase 132kV Kingbird power lines or technically similar from the Silverstreams DS to the Olien MTS;
- Installation of two (2) 132kV feeder bays at the Olien MTS;
- Construction of a 3x40MVA or 1 x 120MVA 11/132kV step-up substation with 2x132kV feeder bays or technically similar at the proposed Redstone Solar Thermal Power Project site (located outside the solar field);
- Construction of a switchyard at the proposed Redstone Solar Thermal Power Project site (located outside the solar field); and
- Possible restringing of the existing power line and construction of a temporary bypass line.

The exact location of the proposed switchyards will be determined according to the layout of the Redstone Solar Thermal Power Project which was informed by the Environmental Impact Assessment (EIA) and environmental sensitivity mapping analysis undertaken by WorleyParsons for the proposed solar plant. The footprint of each proposed switchyard would be 2500m².

The power lines will consist of a series of towers located approximately 100-200m apart, depending on the terrain and soil conditions. The exact tower type to be used will be determined (based on load and other calculations) during the final design stages of the power lines. It is however likely that the bird friendly mono-pole self-supporting intermediate suspension (single steel pole) structure (e.g. ESKOM D-DT 7649) will be used in combination with various other structures which are usually applied as follows:

- The mono-pole guyed intermediate suspension structures (D-DT-7641) are normally installed at obvious rocky terrains, where the foundations can have a huge cost impact.
- The mono-pole angle suspension structures (D-DT-7613) are used on slight angles up to 23°.
- The mono-pole strain structures (D-DT-7615) are used as 0° in-line strainers with four diagonal stays and at angles from 1° to 110° with a variety of stay configurations to suit the specific application. The structure is also used as a terminal in situations where lines approach towards the substation feeder bay at an angle larger than 45°.
- The H-pole (D-DT-7805; 7808; 7811 and other structures from the 78-Series) are used for horizontal applications to cross over or under existing power lines where clearances are a problem and are used as terminal structures with an in-line approach to the substation feeder bay.
- The 3-pole strain structures (D-DT-7618) are normally used at very long spans crossing rivers, valleys, etc. These are very expensive structures, therefore it is not used very often.

The height of the single steel pole structure ranges between 18m and 26.5m in height (Figure 1). Where the proposed power line is aligned parallel to an existing power line the option of restringing the existing line as an alternative to building a new power line will be investigated. Sections of the existing power

line where restringing is possible will be determined during the final design stages. The option of using a double-circuit configuration for the two (2) 132kV power lines and the exact location of the towers will also be investigated during the final design stages of the power lines.



Figure 1: Tower Type

Eskom is proposing to construct a double circuit 400kV power line from Ulco Substation to the Olien Substation (part of the Eskom Kimberley Strengthening Phase 4 Project). An EIA is currently underway for the proposed 400kV power line and one of the alternative corridors being assessed as part of the EIA traverses both corridor alternative 2A and 2B approximately 7km west of the Olien MTS. As such, the possibility of connecting onto the national grid at this proposed 400kV power line will be investigated during the final design stages, once a corridor alternative has been authorised by the DEA. Connecting onto the national grid at the proposed 400kV power line would also require the construction of two switchyards (2) where the proposed 132kV power lines connects with the 400kV power line. Should this option be feasible, the length of the two (2) proposed double circuit 132kV power lines would be significantly shorter.

Two (2) route corridor alternatives, that are approximately 1km wide, will be assessed during the BA for the proposed 132kV power lines (Figure 2). These are as follows:

- Alternative 2A – approximately 11km
- Alternative 2B – approximately 12km

The approximately 1km wide corridors have been proposed for each route alternative to allow flexibility when determining the final route alignments, however only 31m wide servitudes would be required for each proposed 132kV power line. As such, the 31m wide servitudes would be positioned within the approved 1km wide corridor.

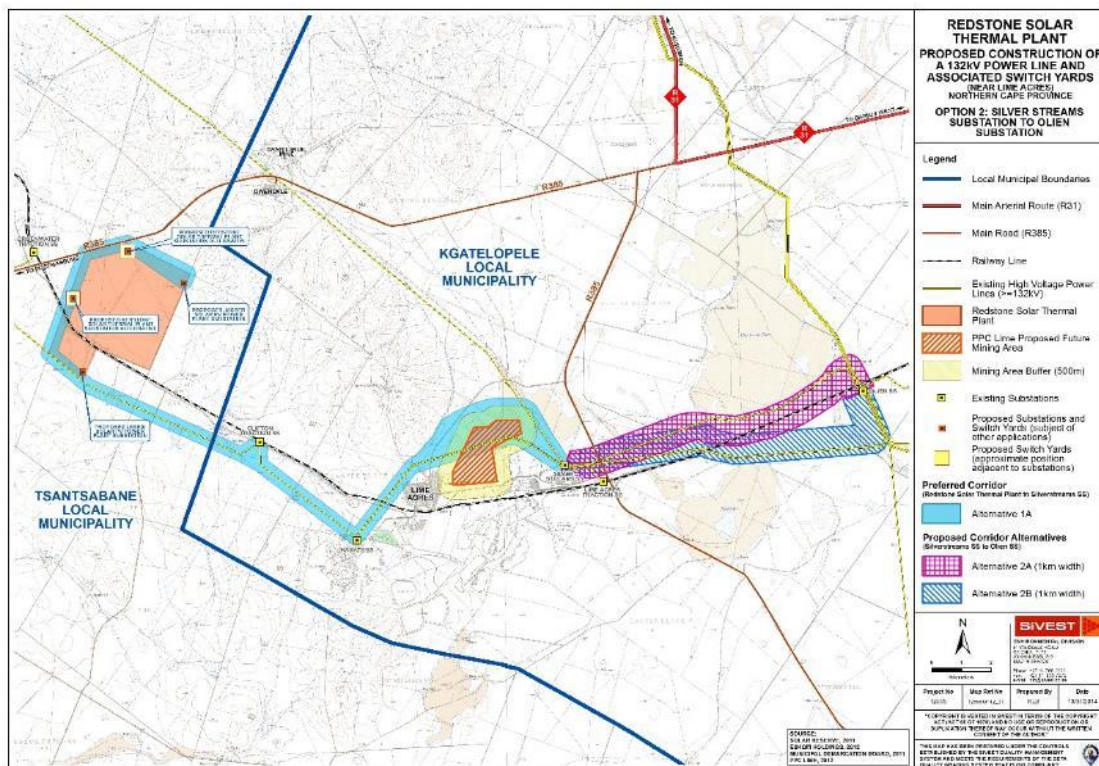


Figure 2: Route Overview Map

2. BRIEF DESCRIPTION OF THE RECEIVING ENVIRONMENT

The project is located in the Northern Cape Province between the town of Postmasburg and Daniëlskuil. The proposed project are partly within the Tsantsabane Local Municipality (proposed switchyards) and partly within the Kgatelopele Local Municipality (proposed power lines), which both form part of the ZF Mgcawu District Municipality (previously Siyanda District Municipality). The largest built-up area in close proximity to the proposed projects is Lime Acres, which is accessed from the R385.

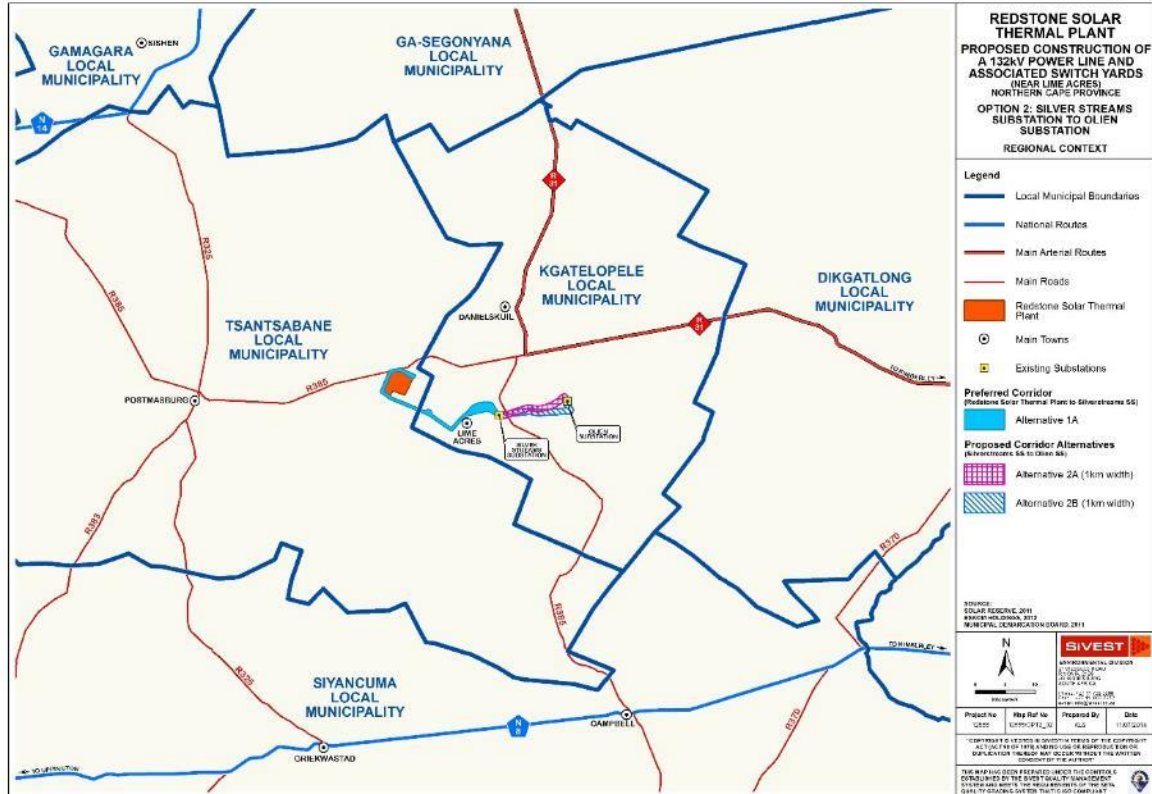


Figure 3: Regional Locality Map

3. EXPERTISE OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

Table 1: Environmental Consultants

Name and Organisation	Role
Jenny Barnard, SiVEST	Divisional Manger
Andrea Gibb, SiVEST	Project Leader / Environmental Consultant
Veronique Evans, SiVEST	Junior Environmental Consultant / Public Participation
Nicolene Venter, Zitholele Consulting	Public Participation Practitioner
Simon Todd, Simon Todd Consulting	Biodiversity (Flora and Fauna)
Shaun Taylor and Alistair Fyfe, SiVEST	Surface water

SolarReserve South Africa (Pty) Ltd

prepared by: SIVEST

132kV Power Lines from Silverstreams DS to Olien MTS – DBAR

Revision No. 1

22 August 2011

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Gary Patterson, ARC-Institute for Soil, Climate and Water	Agriculture and soils
Andrea Gibb and Veronique Evans, SiVEST	Visual impact
Wouter Fourie and Marko Hutten, PGS	Heritage
Johann Oosthuizen, Continuum	Social
Steven Bok, Jeffares and Green	Geotechnical
Kerry Schwartz, SiVEST	GIS and Mapping

Please refer to attached CV's for more information (See Appendix G1).

4. AUTHORITY CONSULTATION

The national Department of Environmental Affairs (DEA) is the competent authority on this application.

The following consultation took place with the DEA:

- An application was submitted to the DEA on 26 May 2014. The application was acknowledged on 09 June 2014 and the following reference number was allocated for the project.
 - DEA Ref No: 14/12/16/3/3/1/1202

All authority consultation is included within Appendix J1.

5. BASIC ASSESSMENT REPORT STRUCTURE

This Draft Basic Assessment Report (DBAR) is structured as follows:

- **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** provides 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 of the proposed project. It also details the mitigation measures that may eliminate or reduce the potential impacts listed.
- **Section E** outlines the recommendations of the Environmental Assessment Practitioner (EAP).

6. ASSUMPTIONS

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

- It is assumed that all technical information provided by SolarReserve is technically acceptable and accurate.
- The scope of the study is limited to assessing the environmental impacts associated with the proposed development of two (2) double circuit 132kV power lines and infrastructure associated with this activity.
- The project is still in the planning stages and therefore some of the specific details technical details are not available. Should these become available during the BA process, they will be included in the report before submission to the DEA.
- It is assumed that the information provided by the various specialists is unbiased and accurate.
- The following assumptions, uncertainties and gaps in knowledge were encountered by the various specialists:

Biodiversity:

- The major potential limitation associated with the sampling approach is the narrow temporal window of sampling. Ideally, a site should be visited several times during different seasons to ensure that the full complement of plant and animal species present are captured. However, this is rarely possible due to time and cost constraints and therefore, the representation of the species sampled at the time of the site visit should be evaluated within this context.
- The study area was visited in winter, when the grass layer was not actively growing and many forbs were also not present. However, due to the late arrival of the summer season the grasses still had heads present and could be easily identified. In addition, several sections of the proposed study area formed part of other studies, and thus have been visited prior to this assessment. The information obtained during these previous visits were incorporated into this study. As a result, the species list compiled for the study area includes all species observed during this study, as well previous studies undertaken in the area. Based on the incorporation of this data, the timing of the site visit is viewed as having little significance with regards to constraining the results of the study and it is unlikely that any significant features or species would be revealed by additional site visits.
- The lists of avifauna, amphibians, reptiles and mammals for the site are based on those observed on site as well as those likely to occur in the area based on their distribution and habitat preferences. As such, the species lists derived for the site are likely to include a much wider array of species than those that may actually occur at the site. This is a cautious and conservative approach which takes the study limitations into account.

Surface Water:

- This study only focused on the delineation of surface water resources within the proposed corridors of the power lines. Aquatic studies of fish, invertebrates, amphibians etc. have not been included in this report. Nor has a hydrological or

groundwater study been included. Health and the ecological importance of surface water resources have also not been assessed.

- In order to delineate wetlands, it is best practice to delineate the entire HGM unit. However, some HGM units can be relatively extensive (several km's long). Due to budget and time limitations as well as the number of wetlands within the study area, the delineation exercise was undertaken primarily at a desktop level but supplemented by detailed in-field analysis and 'ground-truthing' within the proposed alternative corridors and substation assessment areas. Beyond these locations, no delineation was undertaken. Moreover, the purpose of the surface water assessment was to identify and delineate surface water resources that will be affected by the proposed development. As such, a delineation of surface water resources in the wider area was not undertaken.
- Access to wetlands in some instances was limited due to inaccessible terrain. Reference conditions from similar wetlands or from the same wetland system further upstream or downstream were taken to inform the characteristics of wetlands that were inaccessible.

Visual:

- The identification of potentially sensitive visual receptor locations has been based on a combination of desktop assessment as well as field-based observation. Initially topographical maps and Google Earth imagery was used to identify potential receptor locations within the study area. During the fieldwork most the potentially sensitive visual receptor locations were verified and visited to assist with rating the impact of the proposed power lines from each location. Where access was not available, the potentially sensitive visual receptor locations were not be visited and Google Earth imagery was used to assist with rating the impact of the proposed development from these locations.
- A number of broad assumptions were made in terms of the sensitivity of the receptor to the proposed development. It should be noted that not all receptor locations would necessarily perceive the proposed development in a negative way. This is usually dependent on the type of facility and standard use. Homesteads / farmsteads in largely natural settings were assumed to be likely to be more sensitive from a visual perspective than those in a more urbanised / industrial settings. The visual receptor locations were regarded as potentially sensitive to the proposed development as the degree of visual impact experienced from these locations will vary from one inhabitant to another, as it is largely based on the viewer's perception and sentiments toward the development and undertaking a perception survey falls outside of the scope of this VIA.
- Given the nature of the receiving environment and the height of the proposed power lines, the study area for this visual assessment is assumed to encompass a zone of 5km from the proposed development. This area was assigned as distance is a critical factor when assessing visual impacts and beyond 5km the visual impact associated with the proposed development would be significantly diminished and thus the need to assess the impact on potential receptors beyond this distance would not be warranted.
- A matrix has been developed to assess the potential visual impact of the proposed development from each potentially sensitive 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 five 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 mixed-use development. The results of the matrix do not take the perception and sentiments of the viewer into consideration.

- Viewsheds have not been generated for the proposed power lines due to the complexity associated with generating viewsheds off multiple points within the context of a 1km wide corridor. Instead distance banding from the proposed route corridors was used to gain an understanding of the level of visual exposure associated with the power line alignments. In addition each potentially sensitive visual receptor location was visited to assess the potential level of visual exposure and determine localised screening factors.
- Visualisation modelling or three dimensional simulations of the proposed development were not undertaken for the proposed development due to budget limitations. Should the need for visualisation modelling be proven by stakeholder / I&AP feedback, it 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, however any feedback from the public received during the review period of the Draft Basic Assessment Report (DBAR) will be incorporated into further drafts of this report.

Heritage:

- Not subtracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.
- 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 had 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. In the event that any graves or burial places are located during the development the procedures and requirements pertaining to graves and burials will apply as set out below.
- The field work was focussed on the centre line of 100 meters wide with selective checking of the wider 1km buffer for each corridor. Any major deviation from this 100 meter centre buffer will require the evaluation of the pylon foot print and access route areas by an archaeologist before construction commence.

Social:

- The study was carried out with the information available to the specialists at the time of executing the study, within the available timeframe and budget. The sources consulted are not exhaustive and additional information that might strengthen arguments or contradict information in this report might exist. It was assumed that the

alignments received from the project proponent were the central line of the alternative route corridors.

- The specialists did endeavour to take an evidence-based approach in the compilation of this report and did not intentionally exclude scientific information relevant to the assessment.
- It was assumed that the motivation for, and the ensuing planning and feasibility studies of the project were done with integrity, and that the information provided to date by the project proponent, and the independent Environmental Assessment Practitioner (EAP) was accurate.
- Areas that might yield socio-economic sensitivities have been identified through a desktop study in Google Earth™. The areas that have been marked are the sensitive areas visible to the social specialists at the time of the study, which are in close proximity to the proposed route alignment alternatives under investigation. However, the sensitivity map is not meant as a final, all-inclusive indication of sensitive areas.

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

The project is being proposed in order to connect the power generated at the Redstone Solar Thermal Power Project onto the national grid at the Olien MTS. Although, Environmental Authorisation (EA) was granted by the Department of Environmental Affairs (DEA) on 26 June 2013 for a 132kV power line from the proposed Redstone Solar Thermal Power Project site to the Silverstreams Distribution Station (DS) (DEA Ref. No.: 14/12/16/3/3/1/523). This project is being proposed in order to extend the already authorised power line corridor from the Silverstreams DS to the preferred Olien MTS in support of efforts to secure a firm supply and connect the power generated at the Redstone Solar Thermal Power Project onto the national grid.

The proposed project would comprise of the following:

- Construction of two (2) double circuit three phase 132kV Kingbird power lines or technically similar from the Silverstreams DS to the Olien MTS;
- Installation of two (2) 132kV feeder bays at the Olien MTS;
- Construction of a 3x40MVA or 1 x 120MVA 11/132kV step-up substation with 2x132kV feeder bays or technically similar at the proposed Redstone Solar Thermal Power Project site (located outside the solar field);
- Construction of a switchyard at the proposed Redstone Solar Thermal Power Project site (located outside the solar field); and
- Possible restringing of the existing power line and construction of a temporary bypass line.

The exact location of the proposed switchyards will be determined according to the layout of the Redstone Solar Thermal Power Project which was informed by the Environmental Impact Assessment (EIA) and environmental sensitivity mapping analysis undertaken by WorleyParsons for the proposed solar plant. The footprint of each proposed switchyard would be 2500m².

The power lines will consist of a series of towers located approximately 100-200m apart, depending on the terrain and soil conditions. The exact tower type to be used will be determined (based on load and other calculations) during the final design stages of the power lines. It is however likely that the bird friendly mono-pole self-supporting intermediate suspension (single steel pole) structure (e.g. ESKOM D-DT 7649) will be used in combination with various other structures which are usually applied as follows:

- The mono-pole guyed intermediate suspension structures (D-DT-7641) are normally installed at obvious rocky terrains, where the foundations can have a huge cost impact.
- The mono-pole angle suspension structures (D-DT-7613) are used on slight angles up to 23°.
- The mono-pole strain structures (D-DT-7615) are used as 0° in-line strainers with four diagonal stays and at angles from 1° to 110° with a variety of stay configurations to suit the specific application. The structure is also used as a terminal in situations where lines approach towards the substation feeder bay at an angle larger than 45°.
- The H-pole (D-DT-7805; 7808; 7811 and other structures from the 78-Series) are used for horizontal applications to cross over or under existing power lines where clearances are a problem and are used as terminal structures with an in-line approach to the substation feeder bay.
- The 3-pole strain structures (D-DT-7618) are normally used at very long spans crossing rivers, valleys, etc. These are very expensive structures, therefore it is not used very often.

The height of the single steel pole structure ranges between 18m and 26.5m in height (Figure 1). Where the proposed power line is aligned parallel to an existing power line the option of restringing the existing line as an alternative to building a new power line will be investigated. Sections of the existing power line where restringing is possible will be determined during the final design stages. The option of using a double-circuit configuration for the two (2) 132kV power lines and the exact location of the towers will also be investigated during the final design stages of the power lines.

Eskom is proposing to construct a double circuit 400kV power line from Ulco Substation to the Olien Substation (part of the Eskom Kimberley Strengthening Phase 4 Project). An EIA is currently underway for the proposed 400kV power line and one of the alternative corridors being assessed as part of the EIA traverses both corridor alternative 2A and 2B approximately 7km west of the Olien MTS. As such, the possibility of connecting onto the national grid at this proposed 400kV power line will be investigated during the final design stages, once a corridor alternative has been authorised by the DEA. Connecting onto the national grid at the proposed 400kV power line would also require the construction of two switchyards (2) where the proposed 132kV power lines connects with the 400kV power line. Should this option be feasible, the length of the two (2) proposed 132kV power lines would be significantly shorter.

Two (2) route corridor alternatives, that are approximately 1km wide, will be assessed during the BA for the proposed 132kV power lines. These are as follows:

- Alternative 2A – approximately 11km
- Alternative 2B – approximately 12km

The approximately 1km wide corridors have been proposed for each route alternative to allow flexibility when determining the final route alignments, however only 31m wide servitudes would be required for each proposed 132kV power line. As such, the 31m wide servitudes would be positioned within the approved 1km wide corridor.

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

Listed activity as described in GN R.544, 545 and 546	Description of project activity
<p>GN R. 544 Item 10: The construction of facilities or infrastructure for the transmission and distribution of electricity-</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p>	<p>Two (2) double circuit 132 kV power lines and an on-site 3x40MVA or 1 x 120MVA 11/132kV step-up substation are required to connect the PV plant to the grid. The power line would be located outside of an urban area.</p>
<p>GN R. 544 Item 11: The construction of:</p> <p>(x) buildings exceeding 50 square metres in size; or</p> <p>(xi) infrastructure or structures covering 50 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse.</p>	<p>The surface water impact assessment revealed that, depending on the final alignment of the power line within the corridor, it is likely that construction activities may need to take place within at least one of the (15) depression wetlands and two (2) unchannelled valley-bottom wetlands identified within the study area.</p>
<p>GN R. 544 Item 18: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from</p> <p>(i) a watercourse;</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving</p> <p>(i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</p> <p>(ii) occurs behind the development setback line.</p>	<p>The surface water impact assessment revealed that, depending on the final alignment of the power line within the corridor, it is likely that construction activities may need to take place within at least one of the (15) depression wetlands and two (2) unchannelled valley-bottom wetlands identified within the study area. During these construction activities, soil may be removed from the watercourses.</p>

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this application as required by Regulation 22(2)(h) of GN R.543. 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 alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)

Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Two (2) route corridor alternatives, that are approximately 1km wide, will be assessed during the BA for the proposed 132kV power lines. These are as follows:

- Alternative 1 – approximately 11km
- Alternative 2 – approximately 12km

For a summary of the alternative assessment, refer to Section D (2): Environmental Impact Statement.

The no-go alternative is also assessed in Section D (2): Environmental Impact Statement.

Alternative:	Latitude (S):	Longitude (E):
Alternative 2A (preferred)		
▪ Starting point of the activity	28° 21.223' S	23° 31.236' E
▪ Middle/Additional point of the activity	28° 20.501' S	23° 35.432' E
▪ End point of the activity	28° 19.898' S	23° 37.317' E
Alternative 2B (if any)		
▪ Starting point of the activity	28° 21.223' S	23° 31.236' E
▪ Middle/Additional point of the activity	28° 21.010' S	23° 32.328' E
▪ End point of the activity	28° 19.898' S	23° 37.317' E

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.

Please refer to Appendix J3 for the bend point coordinates of the power line corridor for each alignment.

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” option addresses the scenario of the status-quo remaining the same, with no development on the proposed site. The proposed activity has been assessed in this report against the no-go option as well. The “no-go” alternative would result in no 132kV power lines being constructed, thus the Redstone Solar Thermal Power Project may not be connected onto the national grid.

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:

Alternative A1¹ (preferred activity alternative)
 Alternative A2 (if any)
 Alternative A3 (if any)

Size of the activity:

m²
 m²
 m²

or, for linear activities:

Alternative:

Alternative 2A (preferred activity alternative)
 Alternative 2B (if any)

Length of the activity:

11 160m
12 300m

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

Alternative:

Alternative 2A (preferred activity alternative)
 Alternative 2B (if any)

Size of the site/servitude:

31m
31m

4. SITE ACCESS

Does ready access to the site exist?

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

✓NO
Unknown – existing tracks will be used where possible.

Describe the type of access road planned:

Existing access roads will be used to access the servitude where possible, otherwise two lane tracks will be constructed where required.

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.

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

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).

A 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.

A Site Layout may indicating the alternative route alignments is included 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 DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

Various sensitivity maps for the proposed site alternatives are included in Appendix J2.

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 taken along the two (2) proposed alternative route corridors for the 132kV power lines are included in Appendix B. Key features of the site are depicted in the site photographs.

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.

A schematic drawings of the proposed tower types is 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, which will consist of 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
<p>The proposed development aims to link the Redstone Thermal Power Project onto the Eskom grid at the Olien MTS. The proposed project falls within the Northern Cape Province. According to the Northern Cape's Spatial Development Framework (SDF), the White Paper on Renewable Energy (2003) has set a target of 1000 GWh of energy to be produced from renewable energy sources. The total surface area with high radiation in South Africa amounts to approximately 194,000km² of which the largest portion falls within the Northern Cape Province. It is estimated that, if the electricity production per km² of mirror surface in a solar thermal power project were 30.2MW and only 1% of the area of high radiation were available for solar power generation, then generation potential would equate to approximately 64GW. A mere 1.25% of the area of high radiation could thus meet projected South African electricity demand in 2025 (80 GW). This would, however, require large investments in power lines from the areas of high radiation to the main electricity consumer centres. Thus the proposed development falls in line with the need to develop more power lines within the area (Northern Cape Provincial Spatial Development Framework, 2012). The main aim of the SDF for the Northern Cape Province is to build a prosperous sustainable growing economy, to eradicate poverty and improve social development within the Northern Cape 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 is to ensure that citizens have access to electricity (SDF Northern Cape Province, 2012). The policy of the SDF is to ensure that renewable energy sources comprise 25% of the province's energy generation capacity by 2020. In this way, the proposed development is aligned with the provincial SDF as it would promote economic growth and assist with the provision of electricity through renewable energy sources by feeding energy produced at the Redstone Solar Thermal Power Project onto the national grid.</p>			
(b) Urban edge / Edge of Built environment for the area		✓NO	Please explain
<p>The proposed development would fall outside the urban edge. Although the proposed development does not entirely fit the surrounding area, a large portion of the proposed corridors will run parallel to existing power lines.</p>			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	✓YES		Please explain

The proposed power lines are situated within the Tsantsabane Local Municipality which forms part of the ZF Mgcawu District Municipality (previously Siyanda District Municipality). The Integrated development Plans (IDPs) for the above mentioned municipalities have identified electricity as a service delivery need and prioritises the need to provide universal access to this service. The Tsantsabane Local Municipality identifies insufficient provision of electricity as a priority issue that needs to be resolved in order to meet their objective of providing electricity to all residents in Tsantsabane by 2020 (Tsantsabane Local Municipality IDP, 2010/2011). The proposed switchyards also falls within the Kgatelopele Local Municipality. The final IDP of the district for the Kgatelopele Local Municipality also identifies insufficient provision and maintenance of electricity as a priority issue (Siyanda District Municipality Integrated Development Plan (IDP) 5 year plan 2010/2011-2012). In the ZF Mgcawu District Municipality (previously Siyanda District Municipality)insufficient electricity infrastructural development is regarded as a priority issue (Siyanda District Municipality IDP, 2011/2012). In this way the proposed development is aligned with the municipal objectives and priorities for service delivery and infrastructural development in the area.

(d) Approved Structure Plan of the Municipality		✓NO	Please explain
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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?)		✓NO	Please explain
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The proposed development falls within Environmental Control Zone 1 of the Environmental Management Framework (EMF) for the ZF Mgcawu District Municipality (previously Siyanda District Municipality). This zone is sensitive in respect of abstraction and potential pollution of groundwater. In this regard, the proposed development is considered an appropriate activity provided all hazardous materials and substances are appropriately dealt within in accordance with the EMPr during the construction phase of the development. The EMF also recognises the need to provide electricity to all areas within the district (Siyanda District Municipality EMF, 2008). In this way the proposed development is aligned with the EMF for the district as it will assist with the provision of electricity.

(f) Any other Plans (e.g. Guide Plan)	✓YES		Please explain
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The proposed development is aligned with Eskom's Integrated Strategic Electricity Planning (ISEP) process, which is intended to provide strategic projections of supply-side and demand-side options to be implemented in order to meet long-term load forecasts. It provides the framework for Eskom to investigate a wide range of new supply-side and demand-side technologies with a view to optimising investments and returns.

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
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As mentioned above, the proposed development is situated partly within the Tsantsabane Local Municipality which forms part of the ZF Mgcawu District Municipality (previously Siyanda District Municipality). The Integrated development Plans (IDPs) for the above mentioned municipalities have identified electricity as a service delivery need and prioritises the need to provide universal access to this service. The Tsantsabane Local Municipality identifies insufficient provision of electricity as a priority issue that needs to be resolved in order to meet their objective of providing electricity to all residents in Tsantsabane by 2020 (Tsantsabane Local Municipality IDP, 2010/2011). The development also falls within the Kgatelopele Local Municipality. The final IDP of the district for the Kgatelopele Local Municipality also identifies insufficient provision and maintenance of electricity as a priority issue (Siyanda District Municipality Integrated Development Plan (IDP) 5 year plan 2010/2011-2012). In the ZF Mgcawu District Municipality insufficient electricity infrastructural development is regarded as a priority issue (Siyanda District Municipality IDP, 2011/2012). In this way the proposed development is aligned with the priority projects and programmes identified within the IDPs for the local and district municipalities.

<p>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</p>	<p>✓YES</p>	<p>Please explain</p>
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Electricity provision in South Africa is a critical issue. It is impossible to create an economically sound country without a secure and reliable energy source. As mentioned above, the proposed project forms part of the country's strategies to meet future energy consumption requirements by feeding energy into the national grid. The increased energy will encourage economic growth and may also promote residential and urban development, which in turn may provide job opportunities in various communities. The proposed development could also improve the lives of the local communities by assisting the Local Government in providing electricity to them. Local employment benefit would result during the construction of the power line.

<p>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	<p>✓YES</p>	<p>Please explain</p>
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Past experience from similar electricity projects in the area have indicated that the necessary services and adequate capacity are available. During the construction phase workers will either be accommodated at a construction camp, housed within the town or take lodging with local community members. Normally a base camp is set up and workers are dispersed from there, however as the line construction proceeds, a mobile camp is also provided for. Water will be sourced locally from the municipality. However, water will not be required in large volumes. During the construction phase, water will only be used for batching and potable water will be required for drinking and cleaning. All relevant local and district municipalities have been provided with the opportunity to comment on the proposed development as well as this DBAR. Confirmation from the Municipality in writing has been requested in writing and will be forwarded to the DEA upon receipt. Proof of request for comments from the Municipality will be included in Appendix E4 of the FBAR.

<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	<p>✓YES</p>	<p></p>	<p>Please explain</p>
<p>The development will contribute to the service infrastructure of the municipality. All relevant local and district municipalities have been provided with the opportunity to comment on the proposed development as well as this DBAR. Confirmation from the Municipality in writing has been requested in writing and will be forwarded to the DEA upon receipt. Proof of request for comments from the Municipality will be included in Appendix E4 of the FBAR.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>✓YES</p>	<p></p>	<p>Please explain</p>
<p>The proposed project forms part of the country's strategies to meet future energy consumption requirements through the use of renewable energy. The 132kV power line is required to feed the power supplied by the Redstone Solar Thermal Power Project onto the national grid.</p> <p>This is significant, as South Africa is one of the largest emitter's of greenhouse gases (GHG) in Africa and one of the most carbon emission-intensive countries in the world. Despite the worldwide concern regarding GHG emissions and climate change, South Africa continues to rely heavily on coal as its primary source of energy, while most of the countries renewable energy resources remain largely untapped (DME, 2003).</p> <p>Coupled with this, is the growing demand for electricity in South Africa. As the demand for electricity grows, so too the awareness of environmental impacts, climate change and the need for sustainable development. There is therefore an increasing need to establish a new generation capacity in South Africa within the next several years. As one of its strategies to meet future energy consumption requirements, the country is opting for the use of renewable energy technologies, which is fast becoming an important energy option for South Africa.</p> <p>According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This factor fueled by increasing economic growth and social development within Southern Africa, is placing increasing pressure on South Africa's existing power generation capacity. The need to upgrade electrical distribution infrastructure, is also critical to ensure improved electricity supply. In this way, the proposed development will help meet the increasing demand for electricity by feeding energy onto the grid and providing additional distribution infrastructure which will help stabilise the grid.</p>			
<p>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.)</p>	<p>✓YES</p>	<p></p>	<p>Please explain</p>

<p>Although the proposed development does not entirely fit the surrounding area, the proposed site alternatives are located adjacent to existing power lines. The development will also conform to the typical visual character and pattern of elements that make up the landscape form. The development would not be highly incongruous within this setting.</p>		
<p>9. Is the development the best practicable environmental option for this land/site?</p>	<p>✓YES</p>	<p>Please explain</p>
<p>Although the proposed development does not entirely fit the surrounding area, the proposed site alternatives are located adjacent to existing power lines. The development will also conform to the typical visual character and pattern of elements that make up the landscape form. The development would not be highly incongruous within this setting.</p>		
<p>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</p>	<p>✓YES</p>	<p>Please explain</p>
<p>Although, Environmental Authorisation (EA) was granted by the Department of Environmental Affairs (DEA) on 26 June 2013 for a 132kV power line from the proposed Redstone Solar Thermal Power Project site to the Silverstreams DS (DEA Ref. No.: 14/12/16/3/3/1/523). This project is being proposed in order to extend the already authorised power line corridor from the Silverstreams DS to the preferred Olien MTS in support of efforts to secure a firm supply and connect the power generated at the Redstone Solar Thermal Power Project onto the national grid. The absence of the proposed 132kV power lines would mean that the Redstone Solar Thermal Power Project would not be able to connect to the National grid at the preferred Olien MTS, which would prevent the generation of additional electricity. The development will contribute to the provision of electricity within the municipality. Any residual environmental impacts will be mitigated based on the EMPr (Appendix G). Although the impacts identified, such as visual and biodiversity impacts, would not occur if the project did not go ahead, the socio economic benefit of the proposed project are considered to outweigh the negative impacts thereof.</p>		
<p>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</p>	<p>✓NO</p>	<p>Please explain</p>
<p>Infrastructure for service provision, as proposed, would not set a precedent for similar activities in the area at large. Should additional power lines be required in the area in the future it may be beneficial to align them parallel in order to consolidate the impacts.</p>		
<p>12. Will any person's rights be negatively affected by the proposed activity/ies?</p>	<p>✓NO</p>	<p>Please explain</p>
<p>Landowners affected, as well as landowners adjacent to the proposed development have been notified timeously (see Appendix E2) about the proposed development and given opportunity to comment. A public workshop is also scheduled to be held during the review period of the DBAR. Therefore, any concerns with regards to the proposed development can be voiced by all affected I&AP's. The proposed power lines will ultimately be owned by Eskom during the operation and maintenance phase. As such, the proposed servitude and power lines are being assessed on behalf of Eskom and all Eskom procedures will be implemented and followed with regards to land acquisition and access.</p>		
<p>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</p>	<p>✓NO</p>	<p>Please explain</p>
<p>Infrastructure for service provision, as proposed, would not alter the urban edge.</p>		

14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	✓YES		Please explain
The proposed development would contribute to SIP number 10, which involves expanding the distribution network to address historical imbalances by providing access to electricity for all and supporting economic development (Provincial and Local Government conference: A Summary of the Infrastructure Plan, 2012).			
15. What will the benefits be to society in general and to the local communities?	Please explain		
In order to connect the Redstone Solar Thermal Power Project onto the national grid, SolarReserve will need the required connection infrastructure to be constructed. The facility will provide power on a national scale, thus ultimately impacting the national economy and South African society in general. The facility will have the ability to increase national revenue which will also benefit the South African society. On a local and regional scale, economies will also be stimulated in the form of job creation. The development may act as catalyst promoting economic growth in the area, which may result in future opportunities for the surrounding communities by improving education and helping reverse urbanisation.			
16. Any other need and desirability considerations related to the proposed activity?	Please explain		
As explained above the project is needed in order to support the proposed renewable energy initiatives within the ZF Mgcawu District Municipality (previously Siyanda District Municipality) as well as improve the reliability of the electricity supply to the country as a whole, to promote economic growth and create capacity for extra demand, such as mines.			
17. How does the project fit into the National Development Plan for 2030?	Please explain		
The National Development Plan sets out various goals in order to eliminate poverty and reduce inequality by 2030 (National Development Plan, 2011). It mentions the need to create 11 million more jobs and promote economic growth and development through the provision of quality, reliable and efficient energy services by 2030. Based on this statement and requirements associated herewith, the proposed power line project is aligned with the National Development Plan, as it will help promote economic growth by producing electricity to be fed onto the national grid, which in turn could promote local job opportunities.			
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) is underway for the proposed 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 specialist in order to minimise the negative impacts and maximise the benefits of the proposed project. In addition, a thorough PPP is underway as part of the BA, which involved consultation with various key stakeholders and organs of state, including provincial, district and local authorities, relevant government departments, parastatals and NGO's.

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

The principles of environmental management as set out in section 2 of the NEMA require that environmental management must place people and their needs at the forefront of development and that development must be socially, environmentally and economically sustainable. As described above; these principles have been taken into account by undertaking a thorough PPP in order to ensure that all Interested and Affected Parties (I&APs) are given the opportunity to be involved in the BA process and ultimately that their comments are taken into consideration by the DEA when reviewing the application. Several specialist studies were also undertaken to ensure that the development is sustainable and that disturbance to the environment is avoided where possible, minimised through appropriate mitigation measures and remedied via appropriate measures.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Legislation			
National Environmental Management Act, 1998 (Act No. 107 of 1998)	In terms of the NEMA the proposed development must be considered, investigated and assessed prior to implementation.	Department of Environmental Affairs (DEA)	1998
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 No. 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, 2004 (Act No. 10 of 2004)	Under the NEMBA the project proponent is required to take appropriate reasonable measures to limit the impacts on biodiversity, to obtain permits if required and to invite SANBI to provide commentary on any documentation resulting from the proposed development.	Department of Environmental Affairs (DEA) and South African National Biodiversity Institute (SANBI)	2004
National Forests Act, 1998 (Act No. 84 of 1998)	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)	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 (Act No. 93 of 1996)	All the requirements stipulated in the NRTA regarding traffic matters will need to be complied with during the construction, operation and decommissioning phases of the proposed power lines.	South African National Roads Agency Limited (SANRAL)	1996
Regulations			
EIA Regulations 2010, Government Notice (GN) No. R543 - 546	In terms of the EIA 2010 Regulations, a basic assessment process is required for this proposed project.	Department of Environmental Affairs (DEA)	2010

Guidelines				
Protected Species – Provincial Legislation	The proposed project may impact on certain animals and plant species that are under threat or which are already considered to be endangered. The provincial environmental authorities are responsible for the issuing of permits in terms of this legislation.	Northern Cape Department of Environmental Affairs and Nature Conservation (NCDENC)		
Tsantsabane Local Municipality Integrated Development Plan (IDP)	Tsantsabane Local Municipality IDP addresses pertinent issues and the proposed development should be aligned with the IDP.	Tsantsabane Local Municipality		2010/2011
Kgatelopele Local Municipality Integrated Development Plan (IDP)	Kgatelopele Local Municipality IDP addresses pertinent issues and the proposed development should be aligned with the IDP.	Kgatelopele Local Municipality		2010/2011-2012
Siyanda District Municipality IDP	ZF Mgcawu District Municipality (previously Siyanda District Municipality) IDP addresses pertinent issues and the proposed development should be aligned with the IDP.	ZF Mgcawu District Municipality		2011/2012
Integrated strategic Electricity planning (ISEP) 2005	The ISEP provides a framework for Eskom to investigate a wide range of new supply-side and demand-side technologies with a view to optimising investments and returns.	Eskom		2005
Siyanda District Municipality EMF	ZF Mgcawu District Municipality (previously Siyanda District Municipality) EMF is a decision making tool that should be used to facilitate the consideration of applications for	ZF Mgcawu District Municipality		2008

	environmental authorisation in order to protect the natural resources within the district.		
By-laws			
Municipal by-laws	All municipal by-laws applicable to the study area will need to be complied with during the construction, operation and decommissioning phases of the proposed power lines.	ZF Mgcawu District Municipality, Tsantsabane Municipality and Kgatelopele Municipality	Varies Local and Local

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

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

✓YES	
Unknown	

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

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 a registered landfill site.

Will the activity produce solid waste during its operational phase?

✓YES	
Unknown	

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

All solid waste will be collected and disposed of at a licensed/registered waste disposal facility/landfill site. Waste separation and recycling will take place where possible.

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

All solid waste will be collected and dispose 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 a resisted landfill site. The required approval will be obtained from the appropriate local municipality after environmental authorisation has been issued.

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.

All hazardous components will be discarded at a licensed hazardous waste disposal facility. The waste produced will be under that stipulated in the waste management listing activities and therefore it is not anticipated that the application will not need to be changed 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?

m³

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 than 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
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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

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

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

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

During the operational phase the power line will generate a low hissing noise, known as corona. This noise will vary depending on the weather conditions and in dry conditions; the noise level will be comparative with the usual ambient noise level in the environment.

Noise, during normal working hours associated with the construction phase of the project is anticipated. Any equipment used during the construction or operational phase will not exceed a noise level of 80 decibel amperes (dbA).

13. WATER USE

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

<input checked="" type="checkbox"/> Municipal	<input type="checkbox"/> Water board	<input type="checkbox"/> Groundwater	<input type="checkbox"/> River, stream, dam or lake	<input type="checkbox"/> Other	<input type="checkbox"/> The activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

litres

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

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

A water use license may be required in terms of the NWA should construction need to take place inside any of the water resources. Once the final alignment is established a final walk-down study would be conducted for accurate in-field delineation and to identify if a water use license would be required.

14. ENERGY EFFICIENCY

Describe the design measures, if any that 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:

The 132kV overhead distribution power line is required to connect the proposed Redstone Solar Thermal Power Project into the National Grid once constructed. As such the proposed power line will function in evacuating power generated by the solar power plant. Energy efficiency measures in this regards are not applicable as the voltage required for the short distance distribution wiring is considerably low.

The project also forms part of the country's strategies to meet future energy consumption requirements through the use of renewable energy.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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



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

2. 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.

Property description/physical address:

Province	Northern Cape Province
District Municipality	ZF Mgcawu District Municipality (previously Siyanda District Municipality)
Local Municipality	Tsantsabane Local Municipality
Ward Number(s)	5
Local Municipality	Kgatelopele Local Municipality
Ward Number(s)	2 and 3
Farm name and number	Please refer to full list in Appendix J5
Portion number	Refer to Appendix J5
SG Code	Refer to Appendix J5

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:

Unknown

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?

NO

SolarReserve South Africa (Pty) Ltd

prepared by: SiVEST

132kV Power Lines from Silverstreams DS to Olien MTS – DBAR

Revision No. 1

22 August 2014

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1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S2A:

✓ Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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Alternative S2B (if any):

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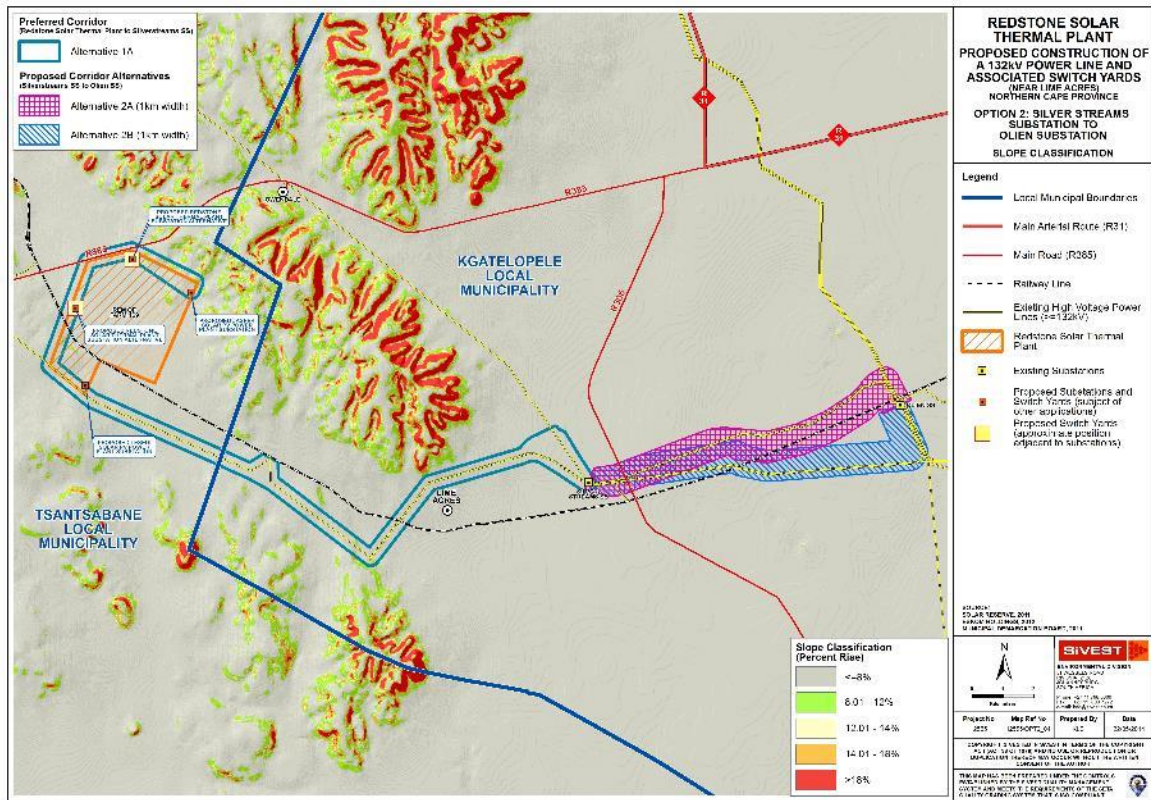


Figure 4: Slope Classification Map

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

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

4. GROUND COVER

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

✓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.

5. SURFACE WATER

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

Perennial River		✓NO
Non-Perennial River		✓NO
Permanent Wetland		✓NO
Seasonal Wetland	✓YES	
Artificial Wetland	✓YES	
Estuarine / Lagoonal wetland		✓NO

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

A specialist surface water study was undertaken by SiVEST and is included in Appendix D2.

The findings from the study indicate numerous drainage lines, one (1) riparian wetland and three (3) pan wetlands present within the study site.

According to the desktop surface water delineation; the study area traverses one (1) NFEPA identified perennial river, namely the Klein-Riet River, one (1) NFEPA identified unnamed non-perennial river, as well as a further two (2) non-perennial tributaries of the Klein-Riet River. The study area also encompasses NFEPA identified wetlands, namely, three (3) natural depression wetlands, four (4) natural hillslope seeps, and one (1) natural floodplain wetland.

The fieldwork verification and groundtruthing assessment was undertaken to scrutinise the results of the desktop study and to identify any overlooked surface water resources in the field. According to the field-assessed surface water delineation; the newly proposed power line corridors contain a total of seventeen (17) wetlands. More specifically, the wetlands include the following:

- Fifteen (15) depression wetlands, and
- Two (2) unchannelled valley-bottom wetlands.

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?

Railway line ^N – Both route corridor alternatives would traverse an east-west aligned railway line. Transnet Freight Rail has been notified of the proposed power line development in order to provide them with the opportunity to raise any issues and concerns which they may have in this regard.

Explanation of the surrounding area:

The largest built-up area in close proximity to the proposed development site is Lime Acres, which is accessed from the R385. The R385 is also located just to the north of the proposed corridor route alternatives and is the main arterial route, which provides access to Lime Acres. The area has a very low density of rural settlement. The only exception to this trend is the built-up residential area of Lime Acres and the mining related housing at Shaleje just south of the Silverstreams Substation. Livestock rearing (of cattle) as well as game farming is the predominant rural land uses in the wider area.

There are other prominent features that occur in the area and in close proximity to the proposed power line corridors; namely a railway line and a small airfield, which is 8 km south-east of the proposed switchyard sites as well as three (3) heritage related sites.

In terms of land use, it appears that there is little formal agriculture in the area and live-stock farming is more prevalent. Farm properties in the area are relatively large and the agriculture potential and production is relatively low this can be attributed to the arid climate which makes the land unsuitable for agriculture. There are a few farmsteads occurring in the immediate vicinity of the proposed development. The natural vegetation is mostly intact with limited exotic species present. Transformation is more evident in the western areas where mining activities and built-up residential form prevails.

An A3 Land Use Map is included in Appendix J2.

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:

N/A

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:

N/A

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

Critical Biodiversity Area (as per provincial conservation plan)

NO

Core area of a protected area?		✓NO
Buffer area of a protected area?		✓NO
Planned expansion area of an existing protected area?		✓NO
Existing offset area associated with a previous Environmental Authorisation?		✓NO
Buffer area of the SKA?		✓NO

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

Simon Todd conducted a biodiversity Assessment of the area and concluded that no fine-scale conservation planning has been conducted for the area and as a result, no Critical Biodiversity Areas or Ecological Support Areas have been defined for the study area. The site does not fall within an NPAES focus area, indicating that the site is not a known broad-scale conservation priority.

7. CULTURAL/HISTORICAL FEATURES

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

✓YES

Wouter Fourie of PGS conducted a Heritage Assessment of the study area and his survey yielded three (3) heritage related sites, consisting of one (1) cemetery and two (2) historical sites. It will however be possible to minimise the impact on heritage resources through alignment of the final power line to avoid the heritage resources in each of the alternative proposed.

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:

The Heritage Impact Assessment (included as Appendix D4) lists and describes all the sites in detail. The table below, gives a summary of the number of sites located in each of the Alternatives.

Heritage Resources per Corridor

	Alternatives 2A	Alternatives 2B
Site Count	2	3

From this table it is evident that Alternative 2B could have the most impact on identified heritage resources.

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

✓Yes
Uncertain

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

The dilapidated remains of the old Silverstreams Railway Station with its associated structures and infrastructure were identified at this location. The structures include the old station building and the platform, several storerooms and workshops and a few houses for the railway employees. Although the Alternatives 2B & 2A have been proposed in close proximity to the derelict station a direct impact on the station and its associated structures is not foreseen. The existing and still functional railway lines will have an effect on the placement of the proposed power line routes. Heritage significance of the site is seen as of Medium significance and rated as Generally Protected B (GP.B).

The dilapidated remains of an old farmstead across from the old Silverstreams Railway Station were identified at this location. The structure is in a very poor state and only a few walls are still standing. All the doors, windows and the roof were removed from the structure. The house was mostly constructed with baked clay bricks, but additions were constructed with more modern bricks. No plumbing or electrical systems were evident with the structure.

Due to the absence of plumbing and an electrical system and the use of old baked clay bricks, this structure is most probably older than 60 years.

Although the Corridor Alternatives 2B and 2A have been proposed in close proximity to the derelict house, a direct impact on the house is not foreseen. The existing and still functional railway lines near the house will have an effect on the placement of the routes of the proposed development of the power lines. Heritage significance of the site is seen as of Medium significance and rated as Generally Protected B (GP.B).

An informal cemetery with 5 graves was identified at this location. The graves were placed in a single line next to each other and were orientated from west to east. The graves have informal mounds of soil and packed rocks as dressings. The graves are situated approximately 120m to the west of the farmstead.

Although the Alternative 2B has been proposed in close proximity to the cemetery a direct impact on the cemetery is not foreseen. Heritage significance of the site is seen as of High significance and rated as Grade 3B.

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:

SolarReserve South Africa (Pty) Ltd

prepared by: SiVEST

132kV Power Lines from Silverstreams DS to Olien MTS – DBAR

Revision No. 1

22 August 2014

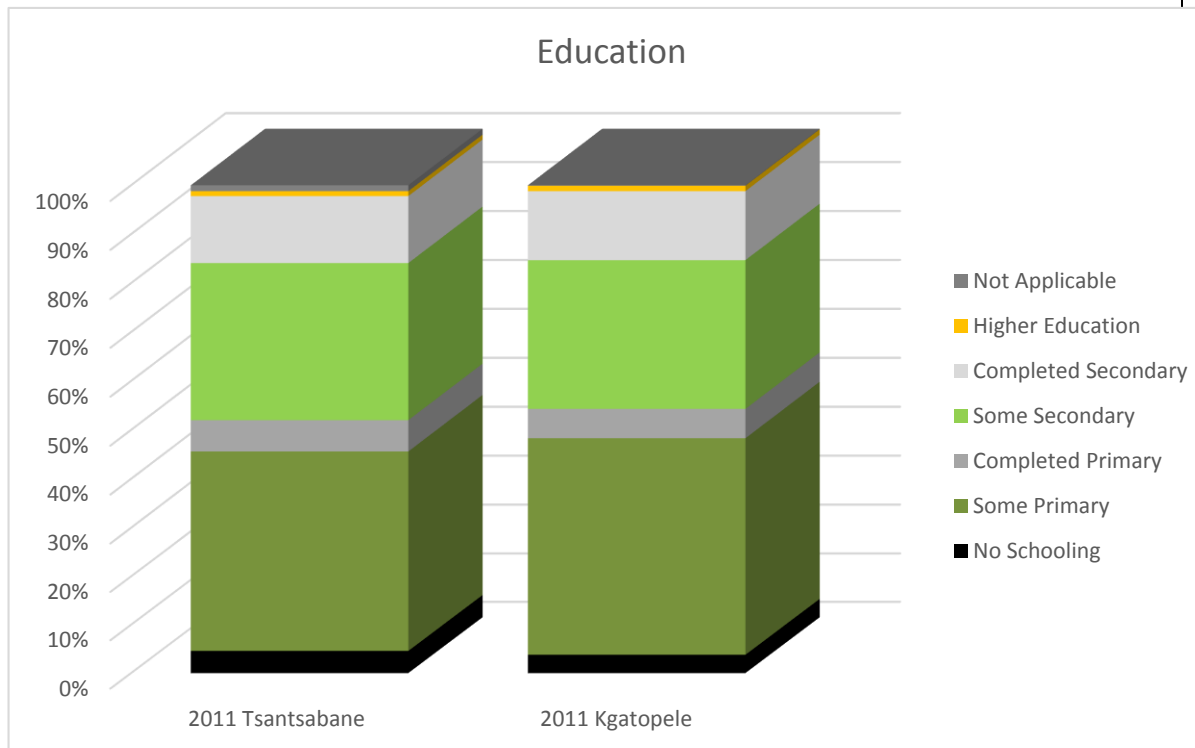
Page 41

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AG_reduced.docx

The economically active population group (defined by StatsSA as the ages between 15 and 65). In 2001 the working age accounted for close to two thirds (64%) of the total population with a slight increase to 66.4 % in 2011.

Economic profile of local municipality:

Level of education:



Overview of the Education Profiles of the Tsantsabane and Kgatelopele Local Municipality in 2011

In 2011, (4.2%) of the combined population of Tsantsabane and Kgatelopele had no form of schooling. Coupled with those individuals who only completed some form of primary education (a further 43%), this means that, in 2011, close to a half (43%) of the combined population had limited educational skills, which in turn would hinder their employability on the general job market. However, approximately the same number of people (31.2%) completed some form of secondary education, which could enhance their employability. Approximately 1% of the population went on to obtain a tertiary qualification.

b) Socio-economic value of the activity

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

Approximately R25 million

What is the expected yearly income that will be generated by or as a result of the activity?	Unknown
Will the activity contribute to service infrastructure?	YES✓
Is the activity a public amenity?	NO✓
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Approximately 15 – 30 people
What is the expected value of the employment opportunities during the development and construction phase?	Unknown
What percentage of this will accrue to previously disadvantaged individuals?	60-90%
How many permanent new employment opportunities will be created during the operational phase of the activity?	0-2 – this is a short term initiative
What is the expected current value of the employment opportunities during the first 10 years?	Unknown – the project will stimulate economic development.
What percentage of this will accrue to previously disadvantaged individuals?	Unknown - Eskom will own and get the value of the power line after construction.

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

The initial section of the site at the Silverstreams substation is mapped as the Olifantshoek Plains Thornveld vegetation type, but this quickly gives way to Ghaap Plateau Vaalbosveld which is the dominant vegetation type in the study area. The first half of the power line corridors are similar and consist of an open to fairly dense woodland dominated by *Olea europea* subsp. *africana* and *Searsia lancea* with occasional *Ziziphus mucronata* subsp. *mucronata*, *Searsia pyroides* var. *pyroides*, *Tarchonanthus camphoratus*, *Searsia tridactyla* and *Gymnosporia buxifolia* with an understorey of grasses. As areas dominated by dense stands of *Olea europea* subsp. *africana* are rare in the Northern Cape, this habitat type is considered sensitive due to the potential impact that the development might have on this protected tree species.

Towards the Olien substation, the woodland gives way to open grassland with no trees present and there are some pans present of the Southern Kalahari Salt Pans vegetation type as well as the Danielskuil River which is classified as Southern Kalahari Mekgacha. Alternative 2A passes along the margin of the Great Pan, which forms part of the Southern Kalahari Salt Pans vegetation type and along Southern Kalahari Mekgacha are considered sensitive vegetation types associated with aquatic ecosystems. There is however scope within the corridors that these sensitive features can be avoided and a significant impact on the pans and mekgacha habitat types is not anticipated. The density of listed and protected species in this area is low and while it is possible that some protected species are present, none were observed in this habitat during this or previous site visits to the area.

An A3 Vegetation Map is included in Appendix J2.

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	Diamonds Field Advertiser	
Date published	19 June 2014	
Publication name	Kalahari Bulletin	
Date published	19 June 2014	
Site notice position	Latitude	Longitude
	-28.35632	23.53417
	-28.33227	23.62335
	-28.31294	23.35454
	-28.36226	23.47415
	-28.36177	23.47561
Date placed	02 July 2014	

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 54(2)(e) and 54(7) of GN R.543.

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 54(2)(b) of GN R.543:

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
<p>Mr. Oscar Bowers PPC Lime BID Comment Form: 23 June 2014 Suggested that the PPC Lime’s Life of Mine Boundary be investigated as part of the BA process.</p> <p>Noted that PPC Lime has already engaged with SiVEST during the initial BA process hence the Life of Mine boundary being included into the locality maps. Concerning the revised alternative options PPC proposes that Alternative 4 of Option 1 is implemented.</p>	<p>As indicated SiVEST have consulted with PPC lime in order to take their Life of Mine Boundary into consideration. As such, the proposed power line corridor alternatives do not traverse the Life of Mine Boundary and are routed 500m from this boundary. Routing the power line at least 500m from PPC Lime’s future mining activities will prevent the need to divert the proposed power line in the future.</p> <p>The corridor alternatives have been assessed and a preferred alternative is indicated in this DBAR.</p>
<p>Charlie Berrington Email: 19 June 2014 Requested that the landowners at the Olien MTS are listed as I&APs</p>	<p>All landowners for whom contact details could be obtained from WinDEED have been notified of the project. The contact details for the owner of Portion 4 of the Farm 300 Barkley West, was requested for as this farm could not be found on WinDEED.</p> <p><i>Andrea Gibb, SiVEST – email 01 August 2014</i></p> <p>The contact details were thereafter provided and the landowners of the farm were notified accordingly.</p> <p>A list of I&APs (including landowners) is included in Appendix E5 and landowner letters (including proof) are included in Appendix E2.</p>

<p>AD Scheepers and C Scheepers Email: 24 June 2014</p> <p>Raised the following objections to the proposed project:</p> <ul style="list-style-type: none"> ▪ The bottling of water preformed on this farm make it a sensitive area in terms of the proposed power lines; ▪ There is a large portion of farming land that will be lost to the servitude and power lines if constructed; ▪ The farm was bought with the landowners pension in the hope of supplementing their retirement, the loss of land due to the proposed development would means a loss in cattle grazing areas and therefore a decrease in the number of calves born that then can be sold; ▪ The farm also contains springbok with the hope of converting the Western camp into a Game Farm, the fences for this development have already been erected; ▪ Concerned that the security of their farm will be compromised as in the past Eskom employees have left the gates open, not locked padlocks and have damaged his access roads. <p>Would prefer if the power line was not erected on their land.</p>	<p>A Social Impact Assessment was undertake as part of the Basic Assessment process in order to assess the social impacts as a result of the proposed power line project and recommend mitigation measures. As indicated on page 81 of the Social Impact Assessment (attached to the DBAR as Appendix D6) it recommended that;</p> <p><i>'The power line should be placed on farm boundaries as far as possible, away from productive farm land. The placement of the line should be done in consultation with the affected landowner during the negotiation process. Compensation should be paid to landowner for production losses during the construction phase and to enable landowner to replant crops in the servitude, where such crops are permitted.'</i></p> <p>It should also be noted that a 1km wide corridor is being assessed during the BA. Should an EA be granted, SolarReserve will negotiate a route with each of the affected landowners, in order to limit the impact on the activities taking place on their farm.</p> <p>The issue of security has been noted and a mitigation measure has been included in the operational phase of the EMPr (attached to the DBAR as Appendix G) that;</p> <p><i>'It must be ensured that no gates are left open and no padlocks are damaged during maintenance operations to ensure the safety of the farm on which the power line servitude traverses.'</i></p>
<p>Charlie Berrington Email: 20 June 2014</p> <p>The proposed Olien Power Plant is south of the railway line and the Olien MTS so a power line coming in from the north should not be a problem.</p>	<p>The location of the proposed Olien Power Plant will be taken into consideration when recommending a preferred route alignment.</p>

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 will be included in Appendix E4 of the FBAR. A list of the Authorities and Organs of State that will be sent the DBAR for review is 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 are included in Appendix E6. The minutes of meetings will be included in Appendix E6 of the FBAR.

SECTION D: IMPACT ASSESSMENT

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

1. 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	<i>Direct Impacts:</i>		
	Vegetation clearing for access roads, pylon foundations and potentially clearing beneath the servitudes will impact vegetation and protected plant species and in particular <i>Olea europaea subsp. africana</i> .	Medium negative	<ul style="list-style-type: none"> ▪ There should be a preconstruction walk-through of the power line route to identify species of conservation concern that should be avoided or translocated. ▪ It should not be necessary to clear the whole servitude and the existing lines in the area have not cleared the olive trees. As these trees are evergreen, they do not pose a fire risk and clearing the trees will in fact increase the fire risk as the grassland that will replace them is more prone to fires than the trees. The footprint should be restricted to a temporary access road for construction and the pylon foundations.

Activity	Impact summary	Significance	Proposed mitigation
	The power lines will represent a danger to susceptible avifauna due to the risk of collisions and electrocution. Raptors, bustards, flamingos and cranes are particularly susceptible.	Medium negative	<ul style="list-style-type: none"> ▪ The sections of the line over ridges and near wetlands and pans should be fitted with bird flight diverters (flappers) and the live components should be insulated to reduce electrocution problems. Surveys along the power line for dead birds should also be conducted after construction to ascertain if there are any sections present which are generating a high impact on avifauna.
Indirect impacts:			
	Vegetation clearing, the use of heavy machinery and human presence along the power line route during construction is likely to negatively affect resident fauna.	Low negative	The footprint of the power line should be kept as low as possible and construction staff should undergo environmental induction to ensure that they are aware of fauna-related issues and that no fauna are harmed during construction.
	Parts of the power line routes are steep and disturbance along these sections of the lines will pose a significant erosion risk in the short as well as long-term.	Medium negative	Measures should be put in place during construction to ensure that water movement on steep slopes is properly regulated and dispersed off of tracks and other disturbed areas. In addition the footprint of the power line should be kept to a minimum. If possible a single access track should be used for both lines.
	Disturbance created during construction as well as maintenance activities such as servitude clearing may lead to alien plant invasion or erosion and other forms of degradation.	Medium negative	Regular erosion and alien plant control along the power line servitudes. During operation and maintenance of the power line servitudes, alien species especially large woody species such as <i>Prosopis glandulosa</i> should be cleared from the power line servitudes, but indigenous species such as <i>Olea europea</i> subsp. <i>africana</i> , should not be cleared as they do not pose a fire risk. If any <i>Olea</i> trees are too tall to comply with safety

Activity	Impact summary	Significance	Proposed mitigation
			standards they can be trimmed to an acceptable height and it is not necessary to cut down the trees.
	Degradation of ecosystems may occur along the power lines following decommissioning.	Low negative	As the pylons are steel structures with concrete foundations, they are not easily removed and so it is likely that decommissioning would result in some disturbance along the power line routes, which should be reduced as far as possible. The use various tools to dismantle the pylons may also pose a fire risk if these generate sparks or have open flames.
Cumulative impacts:			
	The clearing would contribute to vegetation impacts in the area, but the contribution would be fairly low given the small footprint of the power lines.	Medium cumulative effect	<ul style="list-style-type: none"> ▪ There should be a preconstruction walk-through of the power line route to identify species of conservation concern that should be avoided or translocated. ▪ It should not be necessary to clear the whole servitude and the existing lines in the area have not cleared the olive trees. As these trees are evergreen, they do not pose a fire risk and clearing the trees will in fact increase the fire risk as the grassland that will replace them is more prone to fires than the trees. The footprint should be restricted to a temporary access road for construction and the pylon foundations.
	The clearing would contribute to cumulative habitat loss for fauna in the area, but the contribution would be low given the small footprint of the power lines.	Low cumulative effect	The footprint of the power line should be kept as low as possible and construction staff should undergo environmental induction to ensure that they are aware of fauna-related issues and that no fauna are harmed during construction.

Activity	Impact summary	Significance	Proposed mitigation
	The power lines are likely to contribute towards cumulative avifaunal impacts in the area, especially the sections of line which do not align with an existing power line corridor.	Medium cumulative effect	The sections of the line over ridges and near wetlands and pans should be fitted with bird flight diverters (flappers) and the live components should be insulated to reduce electrocution problems. Surveys along the power line for dead birds should also be conducted after construction to ascertain if there are any sections present which are generating a high impact on avifauna.
	Ecosystem degradation would contribute to degradation impacts in the area, but the contribution would be relatively small given the size of the contribution compared to other impacts in the area, such as mining.	Medium cumulative effect	Regular erosion and alien plant control along the power line servitudes. During operation and maintenance of the power line servitudes, alien species especially large woody species such as <i>Propraxis glandulosa</i> should be cleared from the power line servitudes, but indigenous species such as <i>Olea europea</i> subsp. <i>africana</i> , should not be cleared as they do not pose a fire risk. If any <i>Olea</i> trees are too tall to comply with safety standards they can be trimmed to an acceptable height and it is not necessary to cut down the trees.
	Degradation of ecosystems may occur along the power lines following decommissioning. This would contribute to degradation impacts in the area, but the contribution would be likely to be low.	Low cumulative effect	As the pylons are steel structures with concrete foundations, they are not easily removed and so it is likely that decommissioning would result in some disturbance along the power line routes, which should be reduced as far as possible. The use various tools to dismantle the pylons may also pose a fire risk if these generate sparks or have open flames.
Surface Water	Direct impacts:		
	Impacts associated with the construction lay-down area directly in the wetland	Medium negative	<ul style="list-style-type: none"> ▪ Pre-construction and construction activities must be scheduled to take place over the dry winter season when flows are low

Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> ▪ No vehicles or workers are to be allowed to traverse through the riparian habitat, wetlands or drainage lines where EIA and Water Use Licenses have not been obtained
	Vehicle and machinery degradation of the riparian habitat, wetlands, drainage lines and the associated buffer zones	Medium negative	<ul style="list-style-type: none"> ▪ The delineated riparian habitat, wetland areas, drainage lines and associated buffer zones must be avoided by the power line route where possible ▪ Should the necessary environmental authorisation and water use licenses be obtained for the stipulation above, the riparian habitat, wetlands, drainage lines and buffer zones are must be demarcated as “highly sensitive” areas near the proposed construction areas ▪ All vehicles and machinery are to be checked for oil or fuel leaks before entering the construction areas
	Excavation impacts on the riparian habitat and wetlands	Medium negative	<ul style="list-style-type: none"> ▪ Where any soils are to be removed from the riparian and wetland areas, these are to be stockpiled ▪ As identified above, excavated riparian habitat and wetland soils are to be used as infill in the locations where towers have been placed where appropriate
Indirect impacts:			
	Human degradation of riparian habitat, wetlands, drainage lines flora and fauna	Low negative	Construction workers not allowed in the riparian habitat, wetlands and drainage lines unless authorised construction in these areas have been granted
	Erosion, increased storm water run-off and increased	Medium negative	Authorised vegetation clearing in the riparian habitat, wetlands and drainage

Activity	Impact summary	Significance	Proposed mitigation
	sedimentation impacting on the riparian habitat, wetlands and drainage lines		lines where required must take place in a phased manner, only clearing areas that will be constructed on immediately
	Vehicle damage to the riparian habitat, wetlands and drainage lines during operation	Medium negative	<ul style="list-style-type: none"> ▪ Existing roads are used so that damage is limited ▪ If access roads are required inside the riparian habitat, wetlands and drainage lines, ideally coarse gravel should be used ▪ Where erosion begins to take place, this must be dealt with immediately to prevent severe erosion damage to the wetland
	Collision and electrocution impacts to avi-fauna	Low negative	<ul style="list-style-type: none"> ▪ During the construction phase, it is critical that the stretches of power lines that have been authorised and permitted to course through or near to the wetland areas are fitted with flight deviators or bird anti-collision devices (whichever is more appropriate) to prevent impacts to avi-fauna. The fitment of the anti-collision devices or flight deviators must take place on the ground before stringing the power lines to the towers to prevent the use of machinery or vehicles in the activity.
	Cumulative impacts:		
	Impact on wetland and watercourse functioning as a result of wetland destruction.	Medium cumulative effect	The delineated riparian habitat, wetland areas, drainage lines and associated buffer zones must be avoided by the power line route where possible
Agricultural Potential and Soils	Direct impacts:		
	None identified		
	Indirect impacts:		
	The loss of agriculturally productive soil due to the	Low negative	<ul style="list-style-type: none"> ▪ Ensure that physical disturbance caused by soil removal and/or re-

Activity	Impact summary	Significance	Proposed mitigation
	establishment of the infrastructure associated with the power lines.		<p>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.</p> <ul style="list-style-type: none"> ▪ Occasional intense, erosive rainfall does still occur, and if bare soils are impacted, water erosion may result. To avoid this, specific soil conservation measures, such as soil covering by geotextiles, construction of berms, terraces and run-off channels may be necessary, especially in areas with steeper slopes. ▪ In addition, the relatively sandy nature of the soils means that if exposed, there is a real hazard of soil removal by wind erosion, especially in the dryer winter months. 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:			
Negligible to no cumulative effects			
Heritage	Direct impacts:		
	Impacts to identified heritage sites and areas	Medium negative	Mitigation measures as recommended with each identified site and, a heritage monitoring program that will identify finds during construction will be able to mitigate the impact on the finds through scientific documentation of finds and provide valuable data on any finds made.
	Destruction of Cemeteries – Alternative 2A	High negative	<ul style="list-style-type: none"> ▪ Adjust the Corridor layout and demarcate site with at least a 10 meter buffer.

Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> ▪ In the event that the sites cannot be excluded from the Corridor a pylon placement a grave relocation process as described in Section 5 of this reports needs to be implemented.
	Indirect impacts:		
	Discovery of previously unidentified heritage sites (archaeological, historical or grave sites) during construction	Low negative	A heritage monitoring program that will identify finds during construction will be able to mitigate the impact on the finds through scientific documentation of finds and provide valuable data on any finds made.
	Discovery of previously unidentified heritage sites (archaeological, historical or grave sites) during decommissioning	Low negative	A heritage monitoring program that will identify finds during decommissioning will be able to mitigate the impact on the finds through scientific documentation of finds and provide valuable data on any finds made.
	Cumulative impacts:		
Low cumulative impact			
Visual	Direct impacts:		
	Impact on the visual character of the surrounding area and exposing sensitive visual receptor locations to visual impacts during construction.	Low negative	<ul style="list-style-type: none"> ▪ Carefully plan to reduce the construction period. ▪ Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Make use of existing gravel access roads where possible.
Indirect impacts:			

Activity	Impact summary	Significance	Proposed mitigation
	Visual impact by altering the visual character of the surrounding area and exposing potentially sensitive visual receptor locations to visual impacts. The power lines may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.	Medium negative	<ul style="list-style-type: none"> ▪ Align the power lines to run parallel to existing power lines as far as possible i.e. Align the power lines parallel to the existing power lines that are present within the corridor alternatives. ▪ Align the power lines as far away from sensitive receptor locations as possible.
Cumulative impacts:			
	A minor cumulative effect would materialise if the construction activities for the proposed power lines coincided with those for the proposed Olien Solar Facility or the infrastructure associated with the proposed solar facility. In addition, Eskom is proposing to construct a double circuit 400kV power line from Ulco Substation to the Olien MTS, however a full EIA process recently commenced for this power line and it is unlikely that the construction of this line would coincide with the proposed power lines.	Medium negative	<ul style="list-style-type: none"> ▪ Carefully plan to reduce the construction period. ▪ Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Make use of existing gravel access roads where possible.
	A minor cumulative impact could materialise should other power lines be constructed within close proximity to the proposed power lines. Eskom is proposing to construct a double circuit 400kV power line from the Ulco Substation	Medium negative	<ul style="list-style-type: none"> ▪ None identified

Activity	Impact summary	Significance	Proposed mitigation
	to the Olien MTS, as such cumulative effects would occur should this and any other additional.		
Social	Direct impacts:		
	Temporary loss of agricultural land	Low negative	<ul style="list-style-type: none"> ▪ Build a 'good neighbour' relationship with landowners by informing them upfront of when and where construction will take place on their property and stick to agreed timeframes and places. ▪ To avoid taking up too much space and causing unnecessary damage to crops or harm to game and cattle, the construction area should be restricted to the servitude and laydown areas and properly fenced off. ▪ Construction teams, construction vehicles and construction material should only access the construction site via demarcated access roads and should not be allowed to cut across fields or vacant (agricultural) land. Where this does occur, damages should be restored immediately.
Temporary employment creation	Low positive	<ul style="list-style-type: none"> ▪ Local communities should be informed upfront and in no uncertain terms that the possibility of local employment is most unlikely so that unrealistic expectations are not created in terms of job opportunities – this would also aid in minimising the in-migration of jobseekers from elsewhere. ▪ Where unskilled labour is required, it should be sourced from the local communities. Locals should be 	

Activity	Impact summary	Significance	Proposed mitigation
			<p>permanent residents from the surrounding area, whichever is the closest to the construction site. As so far that it is within the contractors' control, unskilled jobs should not be allocated to jobseekers from elsewhere.</p> <ul style="list-style-type: none"> ▪ Where project activities lead to the creation of informal job opportunities such as food stalls, contractors should be encouraged to allow such activities as long as it does not interfere with the construction activities itself or the safety of the construction site, the informal vendor and/or the construction workers.
	Sterilisation of agricultural land	Low negative	<ul style="list-style-type: none"> ▪ Lines should be placed on farm boundaries as far as possible, away from productive farm land. The placement of the line should be done in consultation with the affected landowner during the negotiation process. ▪ Negotiations for servitude rights should be undertaken according to Eskom rules, regulations and procedures. Lease agreements may be required to mitigate the losses during the construction phase.
	Permanent loss of agricultural land	Low negative	<ul style="list-style-type: none"> ▪ The final siting of the distribution power lines should be done in consultation with the respective affected landowners, to prevent fragmentation of farmland.
Indirect impacts:			
	Conflict situations arising during the construction phase	Low negative	<ul style="list-style-type: none"> ▪ Problem areas that are brought under the attention of the contractor should be rectified immediately. If

Activity	Impact summary	Significance	Proposed mitigation
			<p>the contractor is unable to so, this should be communicated to the landowner along with a plan on how and when the problem will be addressed. The landowner should be given regular feedback on the matter.</p> <ul style="list-style-type: none"> ▪ Locals should be informed upfront that it is unlikely that the project will directly employ community members to work on the project so that there are no unrealistic expectations on the part of the community or situations created where they demand jobs as it was promised to them on previous occasions.
	Risk spreading sexually transmitted infections including HIV	Medium negative	<ul style="list-style-type: none"> ▪ It is advisable that Eskom or its contractor appoint a service provider or local NGO to develop, implement and manage an HIV/AIDS prevention programme. The service provider or NGO should specialise in the field of HIV/AIDS. ▪ Eskom should ensure that it's contractors provide their workers with HIV/AIDS training and awareness that could include the distribution of condoms and education regarding safe sex practices.
	Impact on rural/agricultural and residential property values	Medium negative	<ul style="list-style-type: none"> ▪ Route distribution power lines as far away from homesteads, buildings and irrigation system as possible. ▪ Route distribution power lines close to farm boundaries. ▪ Minimise visual profile of the distribution power line by choosing

Activity	Impact summary	Significance	Proposed mitigation
			<p>routes where topography allows for visual reduction.</p> <ul style="list-style-type: none"> ▪ Make maximum use of undeveloped routings to place towers and avoid intensively developed properties when possible. ▪ Stay at least 200m away from residential areas within the urban zone whenever possible. ▪ Negotiations for servitude rights should be undertaken according to Eskom rules, regulations and procedures.
	Impact on sense of place	Low negative	<ul style="list-style-type: none"> ▪ Implement mitigation measures detailed in the Visual Impact Assessment ▪ The impact on livelihoods should be monitored and evaluated before and after the construction of the line. ▪ As far as possible, the distribution power line should follow existing infrastructure, such as roads and existing transmission power lines as this type of environment is already regarded as “stained.” ▪ A pre- and post-valuation should be conducted for properties during the negotiation process.
Cumulative impacts:			
	Cumulative impact on property values due to the construction of multiple lines in a servitude	Low cumulative effect	<ul style="list-style-type: none"> ▪ Negotiations for servitude rights should be undertaken according to Eskom rules, regulations and procedures.
	Migration of jobseekers into the area due to the perception or expectation that the project will offer employment	Low cumulative effect	<ul style="list-style-type: none"> ▪ Local communities should be informed upfront and in no uncertain terms that the possibility of local employment is most unlikely so that unrealistic expectations are not created.

Activity	Impact summary	Significance	Proposed mitigation
	Antagonism against the contractor due to one conflict situation with a particular landowner spreading to other landowners	Low cumulative effect	<ul style="list-style-type: none"> Build a 'good neighbor' relationship with landowners.
	Potential spread of sexually transmitted infections when a construction worker migrates to a new area	High cumulative effect	<ul style="list-style-type: none"> Eskom should ensure that it's contractors provide their workers with HIV/AIDS training and awareness that could include the distribution of condoms and education regarding safe sex practices
Geotechnical	Direct impacts:		
	Soil disturbance during construction at the pylon sites may destabilise the soil and lead to soil erosion. Construction and use of access roads by heavy duty vehicles and construction equipment may destabilise the soil and lead to soil erosion.	Negative low	<ul style="list-style-type: none"> Use of berms and drainage channels to direct water away from the construction areas where necessary Minimise earthworks and levelling at tower sites Use existing access roads wherever possible Rehabilitate disturbed areas as soon as possible after construction Correct engineering design of stream and water course crossings Correct engineering design of any new access roads
	Indirect impacts:		
	None identified		
	Cumulative impacts:		
None identified			
No-go option			
	Direct impacts:		
	Implications for the Redstone Solar Thermal Power Project (once constructed), as the power supplied by the plant would not be fed into to the National Grid.		
	Indirect impacts:		
	Negative implications in terms of the demand for electricity and more specifically renewable energy targets in South Africa.		

Activity	Impact summary	Significance	Proposed mitigation
	Hinder the economic injection that the Redstone Solar Thermal Power Project would provide for the town of Postmasburg, Danieslkuil and Lime Acres (should it receive a license and be constructed) in the form of short term employment, long term job creation and financial injection.		
	Cumulative impacts:		
	None anticipated		

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as Appendix F.

Due to the generic nature of the study area and the fact that the routes run in close proximity to each other (overlapping in part) for large portions of the alignments the impacts for each proposed alternative are relatively equal. A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 is included in Appendix F.

2. ENVIRONMENTAL IMPACT STATEMENT

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

Alternative 2A (preferred alternative)

Biodiversity	Alternative 2A passes near to the Great Pan and it is likely that a variety of water birds such as flamingos are attracted to this area on occasion and during this time they would be vulnerable to collisions with the power lines. In addition, the vegetated parts of the pan would be likely to attract bustards as well as raptors such as secretary bird and so on this account, Alternative 2B is identified as the preferred option.
Surface Water	There are a total of three (3) wetlands that may potentially be impacted by the proposed power line for this alternative. More specifically, this includes two (2) un-channelled valley bottom wetlands and one (1) depression wetland. With careful placement, the proposed power line can be routed to avoid several wetlands thereby decreasing the potential impact. However, both unchannelled valley bottom wetlands occupy the entire width of the proposed assessment corridor and thus will need to be spanned should this alternative be chosen. Unchannelled Valley-bottom Wetland 2 is too wide to be spanned and thus towers will likely have to be placed within the wetlands. There is roughly a 5km service

	road which runs parallel to the rail road, within the Alternative corridor, and routing the power line along this dirt road would drastically reduce any potentially impacts, and no towers would be needed to be placed within the wetland. If the routing is placed alongside the dirt road, this alternative would be considered the preferred alternative from a surface water perspective.
Agricultural Potential and Soils	There is no most preferred or least preferred alternative, as far as the soils are concerned.
Heritage	This alternative will have the least impact on identified heritage resources as only two (2) heritage related sites are located within the corridor.
Visual	Both power line corridor alternatives are rated as being favourable for the following reason: <ul style="list-style-type: none"> ▪ The power line corridor is aligned parallel to existing power lines for the entire route. ▪ The power line corridor is located on lower lying ground. ▪ The power lines would not result in a high visual impact on any potentially sensitive visual receptors. It would have a moderate visual impact on five (5) and a low visual impact on two (2) potentially sensitive visual receptors.
Socio-economic	Alternative 2A will be the preferred line route from a social perspective as it will run through the least social sensitive areas. However, it is recommended that the final alignment of the distribution power line, irrespective of which route corridor is selected, is done in close consultation with the affected landowners to ensure that the loss of land is kept to an absolute minimum and to avoid interference with people's livelihoods as far as possible.
Geotechnical	Both route corridor alternatives are considered suitable for development, from a geotechnical perspective. Due to the close proximity of the route corridor alternatives, the very similar bedrock geology and the flat topography, similar geotechnical conditions are expected along both alternatives.

Alternative 2B

Biodiversity	Due to the location of Alternative 2A which passes near to the Great Pan, Alternative 2B is regarded the preferred alternative from a biodiversity perspective.
Surface Water	There are a total of sixteen (16) wetlands that may potentially be impacted by the proposed power line for this alternative. More specifically, this includes fourteen (14) depression wetlands, and two (unchannelled valley-bottom wetlands. With careful placement, the proposed power line can be routed to avoid several wetlands thereby decreasing the potential impact. However, the two (2) unchannelled valley-bottom wetlands occupy the entire width of the proposed assessment corridor and thus will need to be spanned should this alternative be

	chosen. Both these wetlands are narrow enough in places to be spanned, and thus it is not anticipated that towers will likely have to be placed within the wetlands. In comparison, this alternative contains more wetlands, and thus a potential higher impact on surrounding wetlands when compared to Alternative 2A. This alternative is viewed as not preferred from a surface water perspective.
Agricultural Potential and Soils	There is no most preferred or least preferred alternative, as far as the soils are concerned
Heritage	Alternative 2B will have the most impact on identified heritage resources as all three (3) heritage related sites are located within the corridor.
Visual	Both power line corridor alternatives are rated as being favourable for the following reason: <ul style="list-style-type: none"> ▪ The power line corridor is aligned parallel to existing power lines for the entire route. ▪ The power line corridor is located on lower lying ground. ▪ The power lines would not result in a high visual impact on any potentially sensitive visual receptors. It would have a moderate visual impact on five (5) and a low visual impact on three (3) potentially sensitive visual receptors.
Socio-economic	This power line corridor alternative is not preferred from a social perspective as it runs through more sensitive areas than alternative 2A.
Geotechnical	Both route corridor alternatives are considered suitable for development, from a geotechnical perspective. Due to the close proximity of the route corridor alternatives, the very similar bedrock geology and the flat topography, similar geotechnical conditions are expected along both alternatives.

No-go alternative (compulsory)
<p>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.</p> <p>In the case of this project, the no go alternative would result in no 132kV power line being constructed. The absence of the new 132kV distribution power line could have implications for the Redstone Solar Thermal Power Project (once constructed), as the power supplied by the plant would not be fed into to the National Grid. This would have negative implications in terms of the demand for electricity and more specifically renewable energy targets in South Africa. Should the proposed power line not go ahead it may also hinder the economic injection that the Redstone Solar Thermal Power Project would provide for the town of Postmasburg, Danieslkuil and Lime Acres</p>

(should it receive a license and be constructed) in the form of short term employment, long term job creation and financial injection.

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.

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

- Undertake a preconstruction walk-through of power line routes to identify and locate species of conservation concern that should be avoided or translocated. Micro-siting of pylons should be used where possible to reduce local impact.
- Affected individuals of protected species which cannot be avoided should be translocated to a safe area on the site prior to construction. This does not include trees which cannot be translocated, which should be trimmed to a minimum height of 0.5m rather than removed completely.
- Relevant provincial permits should be obtained before translocation of listed and protected plant species takes place and before construction commences.
- Where the power lines run adjacent to existing power lines or access roads, the existing roads should be used and no additional permanent roads should be constructed for the power line.
- Erosion control measures should be implemented in areas where slopes have been disturbed.
- Cleared areas should be re-vegetated and monitoring should take place to ensure recovery of these cleared areas.
- Alien plants should be cleared where necessary.
- No fuelwood collecting or fires should be allowed.
- The sections of the line near wetlands and pans should be fitted with bird flight diverters (flappers) and the live components should be insulated to reduce electrocution problems.

- Monitoring for avifaunal mortality along the power line during maintenance activities and additional mitigation measures such as bird flight diverters should be fitted if there are places where regular mortality occurs.
- Vegetation control along servitudes should be by manual clearing and herbicides should not be used except to control alien plants in the prescribed manner
- The *Olea europea subsp. africana* trees should not be cleared during maintenance activities. If there are trees present which are deemed to be too tall, these can be trimmed a lower height which complies with safety standards and it should not be necessary to remove trees.
- Annual monitoring for alien plant species should follow up clearing
- Annual site inspection for erosion or water flow regulation problems should follow up remedial action where problems are identified

Recommendations of the Surface water Specialist

- In terms of surface water impacts from construction activities environmental authorisation is likely to be required with regards to activities 11 and 18 of Listing notice 1 of the EIA Regulations (2010) where the proposed development will be located inside or within 32m of the delineated riparian habitat, wetlands or drainage lines.
- The development may need to take place within a 500m radius of a delineated wetland and a water use licence is also likely to be required with regards to water uses (c) and (i) of the NWA.
- The extent the wetlands as map should be considered and referred to so as to adjust (where possible) the placement of the proposed developments. This is to assist in mitigating negative impacts on surface water resources.

Recommendations of the Agricultural Potential and Soils Specialist

The anticipated impacts from the proposed developments will have negligible negative effects, and will require little to no mitigation. A full agricultural assessment should not be necessary unless the desktop report is found to have not described the pertinent site characteristics, or potential impacts, sufficiently.

Recommendations of the Heritage Specialist

- In terms of cemeteries (and possible cemeteries) it is recommended that they be enclosed with a 10 meter buffer. If the design of the development cannot be adjusted to incorporate the cemeteries then a full grave relocation which includes a comprehensive social consultation is recommended.
- Corridors and the position of pylons should be adjusted to avoid historical structures.
 - If the development crosses at the farm worker sites of PGS11-13 and ACO13 a watching brief and monitoring during the construction phase is required as there could be a possibility of infant burials. It is recommended that test excavations be conducted to determine the presence or absence of infant burials at these sites.
 - A destruction permit will be required for the farmstead and structure ACO02 under Section 34 of the NHRA if this site cannot be excluded from the development.
- A monitoring plan for the development phases is required.

If there are possible finds during the construction phase, an assessment of the finds are to be conducted by an archaeologist prior to commencing with the development.

Recommendations of the Visual Specialist

- Carefully plan to reduce the construction period.
- Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Maintain a neat construction site by removing rubble and waste materials regularly.
- Make use of existing gravel access roads where possible.
- Align the power lines to run parallel to existing power lines as far as possible i.e. Align the power lines parallel to the existing power lines that are present within the corridor alternatives.
- Align the power lines as far away from sensitive receptor locations as possible.

Recommendations of the Social Specialist

Preconstruction:

Sterilisation / Permanent Loss of Land

- It is suggested that the affected landowners are consulted and involved in the discussions for the selection of the final route so as to minimise the impact on the property and surrounding land use.
- Power lines should be placed on farm boundaries as far as possible, away from productive farm land.

Negotiations for servitude rights should be undertaken according to Eskom rules, regulations and procedures. Change in Property Values

- Route distribution power lines as far away from homesteads, buildings and irrigation system as possible.
- Route distribution power lines close to farm boundaries.
- Minimise visual profile of the distribution power line by choosing routes where topography allows for visual reduction.
- Make maximum use of undeveloped routings to place towers and avoid intensively developed properties when possible.
- Stay at least 200m away from residential areas within the urban zone whenever possible.

Negotiations for servitude rights should be undertaken according to Eskom rules, regulations and procedures. Sense of Place

- As far as possible, the power line should follow existing infrastructure, such as roads and existing power lines as this type of environment is already regarded as “stained.”
- A pre- and post-valuation should be conducted for properties during the negotiation process.

Construction:

Temporary Loss of Agricultural Land:

- Build a ‘good neighbour’ relationship with landowners by informing them upfront of when and where construction will take place on their property and stick to agreed timeframes and places.
- To avoid taking up too much space and causing unnecessary damage to crops or harm to game and cattle, the construction area should be restricted to the servitude and laydown areas and properly fenced off.

- Construction teams, construction vehicles and construction material should only access the construction site via demarcated access roads and should not be allowed to cut across fields or vacant (agricultural) land. Where this does occur, damages should be restored immediately.

Temporary Employment:

- Local communities should be informed upfront and in no uncertain terms that the possibility of local employment is most unlikely so that unrealistic expectations are not created in terms of job opportunities – this would also aid in minimising the in-migration of jobseekers from elsewhere.
- Where unskilled labour is required, it should be sourced from the local communities. Locals should be permanent residents from Lime Acres, Shaleje, Metsimatala, Danielskuil and the greater Postmasburg area, whichever is the closest to the construction site. As so far that it is within the contractors' control, unskilled jobs should not be allocated to jobseekers from elsewhere.
- Where project activities lead to the creation of informal job opportunities such as food stalls, contractors should be encouraged to allow such activities as long as it does not interfere with the construction activities itself or the safety of the construction site, the informal vendor and/or the construction workers.

Accommodation for Construction Workers

- Construction workers should only be housed in rooms within formal houses, i.e. no 'backyard shacks' should be permitted – this is to avoid people expanding their houses informally to accommodate construction workers and to ensure that all construction workers enjoy the same standard of living.
- A formal application process should be developed whereby households can apply if they wish to house a construction worker. The house must be a formal house and meet certain minimum criteria such as running water, ablution facilities, electricity, furnished room, etc.
- The monthly rent payable to a 'landlord/landlady' must be reasonable and should take a proportion of the utilities service bill into account. A formal rental agreement should be in place that sets out the monthly rent amount and the terms and conditions of the rental agreement.
- Remedial steps must be taken against households that accommodate construction workers but who fail to comply with the minimum requirements of the rental agreement. These households should first be requested in writing to rectify any problem areas within a given timeframe and if they fail to do so, the rental agreement should be suspended and the construction worker moved to a different household.

Conflict

- Problem areas that are brought under the attention of the contractor should be rectified immediately. If the contractor is unable to do so, this should be communicated to the landowner along with a plan on how and when the problem will be addressed. The landowner should be given regular feedback on the matter.
- Locals should be informed upfront that it is unlikely that the project will directly employ community members to work on the project so that there are no unrealistic expectations on the part of the community or situations created where they demand jobs as it was promised to them on previous occasions.

Implementation of an HIV/AIDS Prevention Plan

- It is advisable that Eskom or its contractor should appoint a service provider or local NGO to develop, implement and manage an HIV/AIDS prevention programme. The service provider or NGO should specialise in the field of HIV/AIDS.
- All construction related activities; such as HIV/AIDS prevention programmes, housing, training etc. should be executed as per Eskom's standard procedures.

Operations and Maintenance:

Sense of Place

The impact on livelihoods should be monitored and evaluated before and after the construction of the line.

Recommendations of the Geotechnical Specialist

- Detailed investigations should be conducted on the dolomite stability to avoid the formation of sinkholes. However, the risk of sinkhole formation is considered to be low due to the anticipated shallow depth to bedrock and the consequent very thin blanket layer in which voids could develop.
- Further detailed geotechnical investigations should be undertaken along the final corridor alignment at pylon and structure locations and at the final switchyard locations in order to confirm the findings of this study.
- Use of berms and drainage channels to direct water away from the construction areas where necessary.
- Use existing access roads wherever possible.
- Rehabilitate disturbed areas as soon as possible after construction.
- Correct engineering design of stream and water course crossings.
- Correct engineering design of any new access roads.

General Recommendations of the EAP

- All feasible mitigation measures recommended by the various specialists should be strictly implemented, where applicable to the authorised power line alignment.
- Final EMPr should be approved by DEA prior to construction.

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.

Andrea Gibb

NAME OF EAP



07 August 2014

SIGNATURE OF EAP

DATE

Section F: Appendixes

The following appendixes 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

REFERENCES

- ARC-ISCW, 2004. Overview of the status of the agricultural natural resources of South Africa (First Edition). ARC-Institute for Soil, Climate and Water, Pretoria
- Bolton, DR, and Sick, KA (1999). Power Lines and Property Values: The Good, the Bad and the Ugly. The Urban Lawyer.
- Brink, A.B.A. (1979). Engineering Geology of South Africa Volume 1. Building Publications Pretoria.
- Brink, A.B.A. (1985). Engineering Geology of South Africa Volume 4. Building Publications Pretoria.
- Beaumont, P. B. & Boshier A. K. 1974. Report on Test Excavations in a Prehistoric Pigment Mine near Postmasburg, Northern Cape. The South African Archaeological Bulletin, Vol. 29, No. 113/114 (Jun., 1974), pp. 41-59
- Collins, S. 1973. Rock-Engravings of the Daniëlskuil Townlands. The South African Archaeological Bulletin, Vol. 28, No. 109/110 (Jun., 1973), pp. 49-57.
- Cronje, J. 2006. The Griqua of the Northern Cape: Land ownership, identity and leadership. Sol Plaatjie Educational Trust, 32 Angel Street, Kimberley, 8301.
- Burke, H., Leader-Elliott, L. & Malthy, R. (2004). Understanding cultural Landscapes. http://ehlt.flinders.edu.au/humanities/exchange/asri/define_cl.html
- Collins, N.B., 2005: Wetlands: The basics and some more. Free State Department of Tourism, Environmental and Economic Affairs.
- Department of Water Affairs and Forestry (DWAf), 2005: A practical field procedure for identification and delineation of wetlands and riparian areas (edition 1). DWAf, Pretoria.
- Delaney, C. J. and Timmons, D. (1990). High Voltage Power Lines: Do They Affect Residential Property Value? Journal of Real Estate Research.
- Eloff, J.F., Idema, S.W.J. & Bennie, A.T.P., 1986. Land types of the map 2822 Postmasburg. Field information. Mem. Nat. Agric. Res. S. Afr. No. 3. ARC-Institute for Soil, Climate and Water, Pretoria.
- Eskom Specification 34-1657 (2011) Procedure for conventional stay planting and compaction, pole planting and compaction and rock anchor installation and testing.
- Evans, M.R. and H. Malone. (1992). People and plants: A case study in the hotel industry. In: D. Relf (ed.). The role of horticulture in human well-being and social development: A national symposium. Timber Press: Portland
- Farnum, J., Hall, T., Troy and Kruger, L. E. (2005). Sense of place in natural resource recreation and tourism: An evaluation and assessment of research findings. Portland, OR: U.S. Department of Agriculture.
- Fourie, Wouter. 2008. Archaeological Impact Assessments within South African Legislation. South African Archaeological Bulletin 63 (187): 77–85, 2008
- Geological Survey, 1977. 1:250 000 scale geological map 2822 Postmasburg. Department of Mineral and Energy Affairs, Pretoria.
- Griqualand West. IMP. Blue Book, 1871. N 3772, Kimberley Public Library Correspondence Respecting the Affairs of the Cape of Good Hope, Presented to both houses of Parliament by Command of the Majesty 17th August 1871. William Clowes & Sons, Stamford Street & Claring Gross for her Majesty's Stationary Office

- Gauteng Department of Agriculture, Conservation and Environment (GDACE), 2005: Minimum Requirements for Biodiversity Assessments (Version 2). Directorate of Nature Conservation.
- Henderson, Zoë. 2000. Transgariep Brach Outing to Excavate an Ostrich Eggshell Cache on Thomas's farm, Belmont, Northern Cape. *The Digging Stick*: Vol 17 (2).
- Humphries, A.J.B. Note on the Southern Limits of Iron Age Settlement in the Northern Cape. *The South African Archaeological Bulletin*, Vol. 31, No. 121/122 (Jun., 1976), pp. 54-57
- Humphreys, A.J.B. & Thackeray, A. I. (1983) Ghaap and Gariiep: Later Stone Age studies in the Northern Cape. *The South African Archaeological Society Monograph Series No 2*. Cape Town.
- Howe, C. P., Claridge, G. F., Hughes, R & Zuwendra, 1991: Manual of Guidelines for Scoping EIA in Tropical Wetlands, PHPA/Asian Wetland Bureau, Sumatra Wetland Project Report No. 5, Bogor.
- Howell, B. (2003). *Cultural Attachment to Place: A Framework for Identifying and Working with Traditionally Associated Peoples in Southern Appalachia*. The University of Tennessee
- Johnson, M.R., Anhauser, C.R., Thomas, R.J. (1996). *The Geology of South Africa*. The Geological Society of South Africa and the Council for Geoscience.
- Koch, F.G.L. & Kotze, A.V., 1986. Climate data. In: Land types of the maps SE27/20 Witdraai, 2720 Noenieput, 2722 Kuruman, 2724 Christiana, 2820 Upington, 2822 Postmasburg. *Mem. Agric. nat. Res. S. Afr. No. 3*. Department of Agriculture and Water Supply, Pretoria.
- Kalibbala, F and da Cruz, P. 2011. *Tourism Assessment: Construction of the proposed Humansrus Concentrating Solar Power Plant*. SiVEST – Johannesburg.
- MacVicar, C.N., de Villiers, J.M., Loxton, R.F, Verster, E., Lambrechts, J.J.N., Merryweather, F.R., le Roux, J., van Rooyen, T.H. & Harmse, H.J. von M., 1977. *Soil classification. A binomial system for South Africa*. ARC-Institute for Soil, Climate & Water, Pretoria.
- MasterQ Research (2007a). *Post hoc study: social impacts in constructing high voltage transmission power lines*.
- Mucina L., and Rutherford M.C., (eds) 2006. *The Vegetation of South Africa, Lesotho and Swaziland*. *Strelitzia 19*. South African National Biodiversity Institute, Pretoria.
- MasterQ; *Basic Social Assessment for the Proposed Construction of a 7km 132Kv Power Line, Postmasburg, Northern Cape Province (2012/03/21)*
- Morris, David. 2008. *Archaeological and Heritage Impact Assessment on Remainder of Carter Block 458, near Lime Acres, Northern Cape*. McGregor Museum.
- Morris, David, 2010. *Specialist input for the Scoping Phase of the Environmental Impact Assessment for the proposed Pofadder Solar Thermal Facility, Northern Cape Province*. McGregor Museum.
- Morris, David & Beaumont, P.B. 1994. *Ouplaas 2: Rock engravings, Daniëlskuil*. McGregor Museum.
- Naledi Local Municipality: *Integrated Development Plan 2010/2011*.
- Naledi Local Municipality: *Spatial Development Framework 2007*.
- Oberholzer, B. 2005. *Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1*. CSIR Report No ENV-S-C 2005 053 F. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.
- Ouzman, S. 2005. *The Magical Art of a Raider Nation: Central South Africa's Korana Rock Art*. Goodwin Series: Vol 9.

- PGS Heritage & Grave Relocation Consultants, 2010. Perseus Hydra Transmission Line, Archaeological Walk down. Completed for Eskom
- PGS Heritage & Grave Relocation Consultants, 2010. Heritage Scoping, Prospecting activities on the Portions 1 and 2 of Farms 558 “Lovedale”, 559 “Kleinbegin” and 521 “Rooigrond”, Hay District, Northern Cape Province
- Petrich, C.H. (1993). Science and the inherently subjective: The evolution of aesthetic assessment since NEPA. In Hildebrand, S.G & Cannon, J.B (Eds). Environmental Analysis: The NEPA Experience (pp. 294-273)
- Pretorius (2006). Electric and magnetic field from Overhead Power Lines. A summary of technical and biological aspects. Final Report. Empetus Close Corporation.
- ROSS, R. 1975. The !Kora Wars on the Orange River, 1830-1880. The Journal of African History. 16(4)
- Shillington, K. 1985. The Colonisation of the Southern Tswana, 1870-1900. Ravan Press (Pty) Ltd. Braamfontein.
- Snyman, P.H.R. 1988. Danielskuil, van Griekwa-buitepos tot dienssentrum. HSRC. Pretoria.
- Snyman, P.H.R. 1988. Safety and Health in the Northern Cape Blue Asbestos Belt. Historia: Vol 33, No. 1.
- SANBI, 2009: Further Development of a Proposed National Wetland Classification System for South Africa. Primary Project Report. Prepared by the Freshwater Consulting Group (FCG) for the South African National Biodiversity Institute (SANBI).
- StatsSA (2007). Community Survey 2007. Available online at: <http://www.statssa.gov.za/>
- Sims, S. and Dent, P. (2005). High-voltage Overhead Power Lines and Property Values: A Residential Study in the UK. Urban Studies.
- Thompson, M.W., 1999. South African National Land-cover Database Project. CSIR Environmentek, ENV/P/C 98136, Pretoria.
- Thackeray, A. I, Thackery, J.F. & Beaumont, P.B. (1983) Excavations at the Blinkklipkop Specularite Mine near Postmasburg, Northern Cape. South African Archaeological Bulletin Vol 38, No 137:17-25
- Vanclay, F. (2002). ‘Conceptualising Social Impacts.’ Environmental Impact Assessment Review 22 (2002: pp. 183– 211)
- Webley, L. 2010. Heritage Impact Assessment of Proposed Groenwater Solar Array, Northern Cape Province. ACO cc
- Wilman, M. 1933. The rock engravings of Griqualand West and Bechuanaland, South Africa. Cambridge: Deighton, Bell & Co. Ltd.
- Weinert, H.H. (1980). The Natural Road Construction Materials of Southern Africa. H & R Academica.