SOLAR RESERVE SA (PTY) LTD

Proposed Construction of up to a 132kV Power Line and Associated Infrastructure for the Kalkaar Solar Thermal Power Project on the Remainder of Portion 1 of the Farm Kalkaar 389 near Kimberley, Northern Cape Province

Draft Basic Assessment Report

DEA Reference No.: 14/12/16/3/3/1/1577
Issue Date: 22nd June 2016
Version No.: 1
Project Number: 13620 – Kalkaar Power Line

Date:	22nd June 2016
Document Title:	Proposed Construction of up to a 132kV Power Line and Associated Infrastructure for the Kalkaar Solar Thermal Power Project on the Remainder of Portion 1 of the Farm Kalkaar 389 near Kimberley, Free State and Northern Cape Provinces: Draft Basic Assessment Report
Author:	Shaun Taylor
Version Number:	1
Checked by:	Rebecca Thomas
Approved:	Kelly Tucker
Signature:	
For:	SiVEST Environmental Division

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:	
Application Number:	
Date Received:	

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

Kindly note that:

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

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

SOLARRESERVE SOUTH AFRICA (PTY) LTD

PROPOSED CONSTRUCTION OF UP TO A 132KV POWER LINE AND ASSOCIATED INFRASTRUCTURE FOR THE KALKAAR SOLAR THERMAL POWER PROJECT ON THE REMAINDER OF PORTION 1 OF THE FARM KALKAAR 389 NEAR KIMBERLEY, FREE STATE AND NORTHERN CAPE PROVINCES

DRAFT BASIC ASSESSMENT REPORT

Executive Summary

On the 3rd September 2015, SolarReserve South Africa (Pty) Ltd (hereafter referred to as, "SolarReserve) received environmental authorization (EA – DEA Ref: 14/12/16/3/3/2/660) for the proposed 200MW Concentrated Solar Power (CSP) facility on the Remainder of Portion 1 of the Farm Kalkaar 389 near Jacobsdal in the Free State Province (the "Kalkaar CSP Project"). On the 25th of September 2015, SolarReserve also received environmental authorisation (EA – DEA Ref: 14/12/16/3/3/2/578)for the proposed 100MW Kalkaar Photovoltaic Solar Power Project on the Remainder of Portion 1 of the Farm Kalkaar 389, Free State Province. Both projects comprise the greater "Kalkaar Solar Thermal Power Project".

Based on recent communications with Eskom the preferred evacuation point for the electricity generated by the Kalkaar CSP and PV projects is via the Kimberley Substation to Boundary Substation near Kimberley. In addition to this interconnection solution, SolarReserve is also considering the nearby Jacobsdal Substation, near Jacobsdal as a secondary evacuation point. Therefore, in order to evacuate the electricity generated as a result of the Kalkaar CSP and PV projects, a new environmental authorization process is being undertaken in order to assess the feasibility of the proposed grid connections to the aforementioned points of interconnection to the national grid.

SolarReserve have appointed SiVEST, as the independent Environmental Assessment Practitioner (EAP), to undertake the required Basic Assessment (BA) processes for the proposed 132kV power lines and associated infrastructure in the Free State and Northern Cape Provinces (the "Proposed Project").

The proposed project will comprise of the following:

- Construction of one Tern power line of up to 132kV from the proposed Kalkaar Solar Thermal Power Project. The grid connections that will be assessed include the following:
- Jacobsdal Link = approximately 19km in length;
- Kalkaar Solar Thermal Power Project via Kimberley DS to Boundary Substation Alternative 1 = approximately 61km in length; and

- Kalkaar Solar Thermal Power Project via Kimberley DS to Boundary Substation Alternative 2 = approximately 62km in length.
- Install 48 core optical ground wire (OPGW) on the line.
- Build 2 bay substations next to approved substations on the Kalkaar Solar Thermal Power Project. Proposed substations will be approximately 100m x 100m.
- Inclusive of all cable trenches.
- Install 3 x 25m lighting/lightning masts.
- Building of an access road to the substation.
- Building of a standard control room (5.5m x 12m) with top entry and cable racks. This will include a sewage system, air-conditioning and energy efficient lighting.
- Installation of a security fence with entrance gates.
- 1 x 132kV line bay and 1 x 132kV metering bay.
- Installation of a required Control Plant, AC/DC, Metering, SCADA and Telecoms.
- V drain extension of substation for drainage purposes.
- And or all extensions required (132kV yard, fencing etc.) of the connecting Eskom Assets i.e. Solar MTS.

The location of the proposed substations will be adjacent to the on-site substations of the approved layout of the Kalkaar CSP Project, authorised under the EA (DEA Ref: 14/12/16/3/3/2/660) as well as the Kalkaar PV Project authorised under the EA (DEA Ref: 14/12/16/3/3/2/578). The footprint of the proposed substations would be approximately 10 000m², respectively.

Three power line alternative corridors have been provided for assessment. Two of the three corridors are up to 2km (1km either side of the centre line) wide originating from the Kalkaar CSP and PV Project site routing via the Kimberley Distribution Substation to the Boundary Substation. The aforementioned two corridors will serve as alternatives to each other for the comparative assessment. An additional corridor of 500m in width (250m either side of the centre line) is to be established for the route option to the Jacobsdal Substation. This route will not however have a separate alternative, but environmental considerations will determine the alignment best suited to the receiving environment within this corridor. The registered servitude width will be 31 metres (15.5 metres either side of the centre line). The three power line corridors include the following:

- Corridor 1 (Green) – Kalkaar CSP to Jacobsdal Substation (approximately 20km in length);
- Corridor 2 Alternative 1 (Purple) – Kalkaar CSP via Kimberley Distribution Substation to Boundary Substation (approximately 62km in length); and
- Corridor 2 Alternative 2 (Turquoise) – Kalkaar CSP via Kimberley Distribution Substation to Boundary Substation (approximately 62km in length).

The proposed power line will also include the establishment of all associated infrastructure as required (including but not limited to access roads, control rooms, security systems etc.).

The proposed project study area is located primarily within the Free State Province, with a relatively small portion cited in the Northern Cape Province near Kimberley. The proposed power lines traverse the Lejweleputswa District Municipality in the Free State Province and the Frances Baard District Municipality in the Northern Cape Province. More specifically, the proposed power lines traverse into the Tokologo Local Municipality in the Free State Province and the Sol Plaatjie Local Municipality in

the Northern Cape Province. Land uses for the proposed project encompasses mainly vacant land, mining, industrial (renewable), agricultural farming activities and urban as well as residential areas.

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

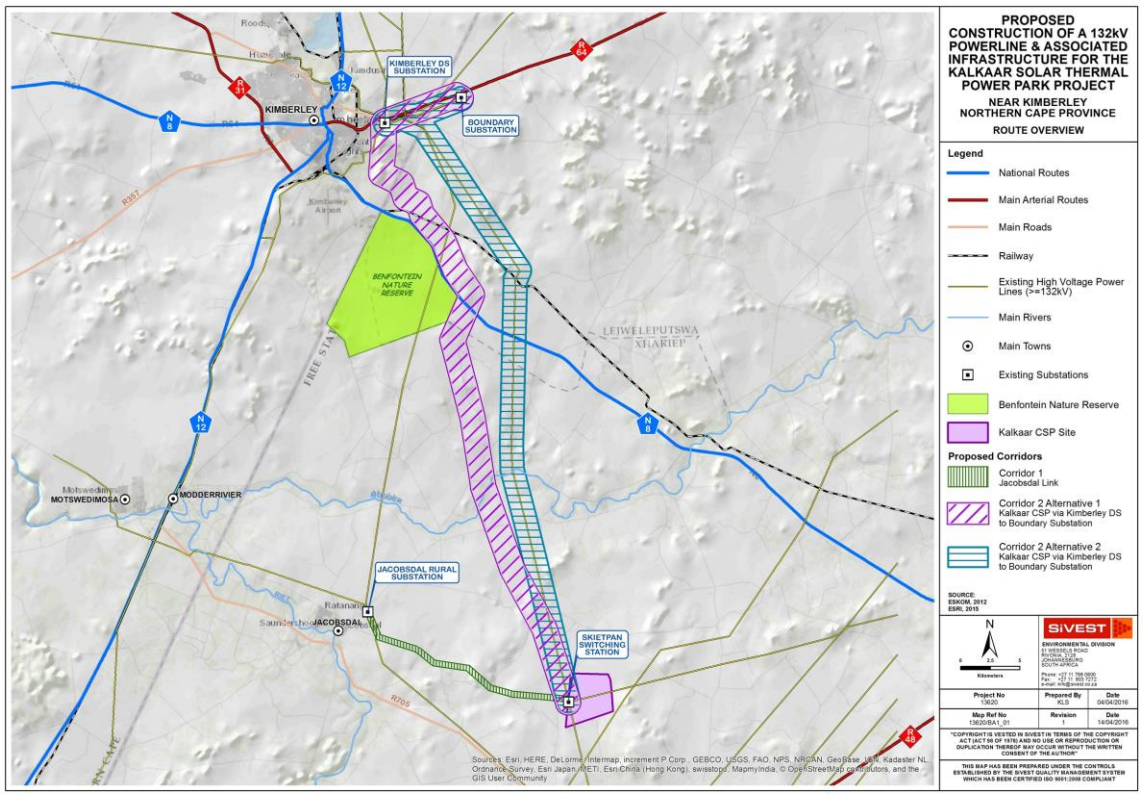

Figure i: Site Locality Map

Several specialist studies were conducted during the BA process to identify issues and legislative implications associated with the proposed development. These include the following:

- Biodiversity Assessment (fauna and flora);
- Avi-fauna Assessment;
- Wetland Assessment;
- Soils and Agricultural Potential Assessment;
- Heritage and Palaeontology Assessment;
- Visual Assessment; and
- Socio-Economic Assessment.

A summary of the findings are provided in Table i below.

Table i: Specialist Findings Summary Table

Environmental Parameter	Summary of Major Findings	Recommendations
Biodiversity	In terms of flora, within the area affected by the proposed development, vegetation types that are affected include Kimberly Thornveld and Northern Upper Karoo, Highveld Salt Pans and Vaalbos Rocky Shrubland. Within these vegetation types however, the specific habitats that are actually occurring within the proposed corridor alternatives include the following: ▪ Kimberley Thornveld – Protected and listed species include *Boscia albitrunca and Acacia erioloba*; ▪ Northern Cape Upper Karoo; ▪ Vaalbos Rocky Shrubland; ▪ Pans – Protected and listed species include; ▪ Modder River – the Modder River which is considered a sensitive feature due to the ecological significance of this area as a corridor for fauna as well as the unique aquatic habitats present here that are not represented elsewhere in the landscape of the area. There are three (3) species of conservation concern that are listed in terms of the SANBI SIBIS database (quarter degree squares 2824 DB, DD and 2924 BB). Only *Acacia erioloba* can be confirmed present and occurs mostly in the north of the site in the areas of savanna on deeper sands near Kimberly. *Aloinopsis rubrolineata* occurs in areas of exposed calcrete and may occur in the central section of the routes between Kimberly and Kalkaar where such habitat is present, but was not observed. There are however also additional species present which are either protected under the National Forests Act such as *Boscia albitrunca* and *Acacia erioloba* or protected under the Northern Cape Nature Conservation Act of 2009, which includes *Boscia foetida*, all *Mesembryanthemaceae*, all species within the *Euphorbiaceae*, *Oxalidaceae*, *Iridaceae*, all species within the genera *Nemesia* and *Jamesbrittenia*. In terms of fauna: ▪ 51 mammals have been recorded from the quarter degree squares traversed by the power line	▪ Preconstruction walk-through of power line route to identify and locate species of conservation concern that should be avoided or translocated. ▪ Affected individuals of protected species which cannot be avoided should be translocated to a safe area on the site prior to construction as far as practically possible. ▪ There are also additional species present which are either protected under the National Forests Act such as *Boscia albitrunca* and *Acacia erioloba* or protected under the Northern Cape Nature Conservation Act of 2009, which includes *Boscia foetida*, all *Mesembryanthemaceae*, all species within the *Euphorbiaceae*, *Oxalidaceae*, *Iridaceae*, all species within the genera *Nemesia* and *Jamesbrittenia*. ▪ Relevant permits (i.e. plant removal permit from NCPG DENC) should be obtained before translocation/destruction/removal of listed and protected plant or tree species takes place and before construction commences. ▪ Alien species especially large woody species such as *Propsopis glandulosa* should be cleared from the power line servitude, but indigenous species such as *Boscia albitunca* and *Boscia foetida*, should not be cleared ▪ Where the power line runs adjacent to existing power lines or access roads, the existing roads should be

Environmental Parameter	Summary of Major Findings	Recommendations
	options. However, as many as 20 of these are large mammals, introduced or maintained for game farming operations and are not considered relevant to the current study as these are managed populations regulated and confined by landowners. The remaining 30 are free ranging species which occur naturally in the area. ▪ Five listed terrestrial mammals may occur in the area, the Honey Badger *Mellivora capensis* (Endangered), Brown Hyaena *Hyaena brunnea* (Near Threatened), Black-footed cat *Felis nigripes* (Vulnerable), South African Hedgehog *Atelerix frontalis* (Near Threatened) and the Serval *Leptailurus serval* (Near Threatened). ▪ According to the SARCA database, 31 reptile species are known from the area suggesting that the reptile diversity within the site is likely to be fairly low. Species observed in the area include the Cape Skink *Trachylepis capensis*, Ground Agama *Agama aculeata aculeata*, Spotted Sand Lizard *Pedioplanis lineoocellata* and Leopard Tortoise *Stigmochelys pardalis*. There are no listed species known from the area. ▪ The site lies within the distribution range of 10 amphibian species. The only listed species which may occur in the area is the Giant Bullfrog *Pyxicephalus adspersus* which is listed as Near Threatened. Although it has not been recorded from the affected area, it is common in the wider area on account of the large number of pans in the area, which are the breeding habitat of the Giant Bullfrog. The major impacts of the development of the power line would occur during the construction phase, due to the disturbance of largely intact ecosystems that would take place at this time. Construction phase disturbance would however be transient	used and no additional permanent roads should be constructed for the power line.

Environmental Parameter	Summary of Major Findings	Recommendations
	and while impacts on flora are likely to persist for some time, impacts on fauna during operation would be very low. Due to the low overall footprint of the power line and low operational disturbance levels, impacts associated with the construction and operation of the power line would be local in nature and of low overall significance after mitigation. In terms of mitigation, avoidance of the identified sensitive features is considered the most important measure to reduce the impact of the power line to a low level. Overall and with the suggested mitigation measures applied, the impact of the Kalkaar 132 kV line would be of local extent and low significance. There are no impacts associated with the development of the power line that are considered to be high and which cannot be mitigated to a low level. As such, there are no significant ecological reasons to oppose the construction of the Kalkaar grid connections to Kimberly or to Jacobsdal.	
Avi-fauna	An estimated 313 bird species could potentially occur in the study area of which 28 are classified as Red Data species. Three Important Bird Areas (IBAs) in the vicinity including Dronfield Nature Reserve (approx. 5km north Kimberley – SA031), Kamfer's Dam (approx. 6km north of Kimberley – SA032) and Benfontein Nature Reserve (approx. 14km south east of Kimberley – SA033). There is also a vulture breeding area for White-backed Vultures (Susanna Vulture Breeding Area) that can be found covering both Corridor 2 Alternatives 1 and 2, as well as another breeding area approx. 10km outside Jacobsdal. Potential impacts during the construction and decommissioning phase include the displacement of priority species and habitat transformation. Impacts are mainly negative but low. With mitigation, these impacts can be reduced further. For the operation phase, electrocutions and collisions of red data species is the primary potential impact. Potential impacts for collisions of red data species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and	▪ Construction and de-commissioning activities should be restricted to the immediate footprint of the infrastructure. ▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ▪ Measures to control noise and dust should be applied according to current best practice in the industry. ▪ Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum. ▪ Prior to the construction of the line, a walk-through must be conducted to ascertain of any White-backed Vulture breeding pairs will be impacted by the construction activities. If any breeding pairs are potentially at risk, the construction will have to be timed to fall outside the

Environmental Parameter	Summary of Major Findings	Recommendations
	2. This can be mitigated to a low level for Corridor 1 Jacobsdal Link and a medium level for Corridor 2 Alternatives 1 and 2. Potential impacts for electrocutions of red data species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Finally, for the decommissioning phase, displacement of red data species as a result of disturbance is rated as low for Corridor 1 Jacobsdal Link and medium for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Corridor 1 Jacobsdal Link is the shortest power line route and does not transect any vulture breeding areas. All potential impacts can be mitigated to a low level. There is not much difference in preference between Corridor 2 Alternative 1 and 2 as both are relatively the same length and traverse the Susanna White-backed Vulture breeding area. There is no preference between the two alternatives.	breeding season. ▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of three years by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first three years. ▪ The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection. ▪ The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, alternating black and white. ▪ All the steel monopoles should be fitted with bird perches.
Wetlands	Two main hydrogeomorphic types were identified including well developed riparian systems (namely the Modder River) and several depression that differ in size (small pans – 0.9ha to 20ha; large pans – larger than 58ha to 401ha). Summary of assessments undertaken applied to riparian resources include the following: ▪ Modder River: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; ▪ Large Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; and ▪ Small Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision. Types of impacts to the riparian systems included: ▪ Loss of riparian habitat and ecological structure; and ▪ Changes to riparian ecological and	▪ Ensuring that during the design phase, cognisance is taken of the locality of identified freshwater resources and their associated buffers, and as far as is practicable, to avoid the placement of infrastructure within those zones unnecessarily. It is preferable that no infrastructure is placed within the river nor in the pans; ▪ Should it be absolutely essential at certain crossings to place infrastructure within the freshwater resources habitat, access to these areas must be limited to essential personnel (and construction vehicles) and the boundaries thereof are to be clearly demarcated on site. No contract laydown areas are to be permitted

Environmental Parameter	Summary of Major Findings	Recommendations
	sociocultural service provision; ▪ Impacts on riparian hydrology and sediment balance. Overall significance after mitigation is a low negative impact after management and mitigation measure implementation. Based on the findings of this study, it is the opinion of the ecologists that the proposed linear development is regarded as having low levels of impact on the surrounding freshwater resources identified, even if less than desirable mitigation of impacts occurs. With careful planning of the final layout of the powerlines and strict implementation of mitigation measures throughout all phases of the proposed project, impacts can be reduced to very low significance levels and the proposed project should, from a freshwater resource point of view, be considered favourably for development. Following the assessment of perceived impacts, consideration was given as to the preferred corridor option from a freshwater ecology perspective. As Corridor 1 was the only option provided for the routing of the powerline between the Kalkaar CSP to Jacobsdal Substation, this potion is considered to be "favourable". Depending on the final layout of the powerline within the corridor, with avoidance of most of the freshwater resources, this layout could have minimal impacts on the freshwater resources. Corridor 2, Alternative 2 is considered to be the best routing option for the powerline between Kalkaar CSP and the Kimberley Distribution Substation to Boundary Substation, as it traverses over the least amount of freshwater resources identified by this study.	within the freshwater resources habitat or associated buffer zone; ▪ Due to the degraded state of the vegetation, especially within the pans, care must be taken to ensure that as little vegetation as possible is removed, and that all exposed soils as a consequence of construction activities must be suitably protected with a geotextile to prevent erosion and sedimentation of the river, and loss of functionality of the pans; and ▪ Any freshwater resource directly impacted upon during construction activities must be immediately rehabilitated in accordance with the EMPr following the completion of such activities at that specific site.
Soils and Agricultural Potential	The proposed development is mainly on land zoned and used for agriculture. Soils on the site are predominantly shallow to moderately deep, loamy sands on underlying rock or hard-pan carbonate (Hutton, Mispah and Coega soil forms). The major limitation to agriculture is the limited climatic moisture availability. The limited depth of the soils is a further limitation.	▪ Recommended mitigation measures include implementation of an effective system of storm water run-off control to mitigate erosion; and topsoil stripping and re-spreading to mitigate loss of topsoil.

Environmental Parameter	Summary of Major Findings	Recommendations
	As a result, the site is predominantly unsuitable for cultivation and agricultural land use is limited to grazing, except for some small irrigation areas along the Modder River. The land capability of the site varies according to land type from class 5 to class 7, which is from non-arable, moderate potential grazing land to non-arable, low potential grazing land. The limitations to agriculture are aridity and lack of access to water plus shallow soil depth. Because of these constraints, agricultural land use is mostly restricted to grazing. The natural grazing capacity is predominantly 14-17 hectares per animal unit. The centre pivot lands along the Modder River are considered to be of high agricultural sensitivity. The overhead power lines as well as any infrastructure on the ground must avoid these lands. There are three factors that limit the significance of all potential agricultural impacts. The first is that the actual footprint of disturbance of the proposed power line is very small in relation to available, surrounding land. The second is that the impact of a power line on the kind of agricultural activity (predominantly grazing) along the proposed development is very minimal, as this can continue in the presence of a power line with negligible disturbance. The third factor is that the site has very low agricultural potential, limited by severe climatic moisture availability constraints and soils that include shallow ones. Four potential negative impacts of the development on agricultural resources and productivity were identified as: ▪ Loss of agricultural land use caused by direct occupation of land by the footprint of the power line infrastructure. ▪ Soil Erosion caused by alteration of the surface characteristics. ▪ Loss of topsoil in disturbed areas, causing a decline in soil fertility. ▪ Degradation of veld vegetation beyond the direct footprint due to constructional disturbance, dust	

Environmental Parameter	Summary of Major Findings	Recommendations
	and vehicle trampling. All impacts were assessed as having low significance. Recommended mitigation measures include implementation of an effective system of storm water run-off control to mitigate erosion; and topsoil stripping and re-spreading to mitigate loss of topsoil. Because of the low agricultural potential of the site and resultant low agricultural impacts, the development should, from an agricultural impact perspective, be authorised. Because of the low impacts and the uniformly low potential of the site, there is no preference between the different corridor options. There are no conditions resulting from this assessment that need to be included in the environmental authorisation.	
Heritage and Palaeontology	Heritage Findings: An archival and historical desktop study was undertaken which was used to compile a historical layering of the study area within its regional context. This component indicated that the landscape within which the project area is located has a rich and diverse history. These desktop studies were followed by a fieldwork component that comprised driving and walking through the study area. A total of 27 occurrences of heritage resources were identified within Corridor 2 Alternative 1. Fourteen of these would require mitigation before exhumation (graves) or destruction (historical structures) if development were to come within 20 m. Thirteen occurrences of heritage resources have high significance and should not be disturbed by development within 20 m. It is likely that further survey work in the study area will uncover additional heritage resources, especially graves, ruins and rock art sites on hilltops. Palaeontological Findings: An overlay of the study alignments on the	Heritage recommendations ▪ It is likely that further survey work in the study area will uncover additional heritage resources, especially graves, ruins and rock art sites on hilltops. Therefore a final walk-down must be undertaken. Palaeontology recommendations ▪ Palaeontological sensitivity ranges from Moderate to very High and will require a field assessment during the final route walk-down.

Environmental Parameter	Summary of Major Findings	Recommendations
	SAHRiS palaeontological sensitivity map provides a good indication of the palaeontological sensitivity of the study area. The palaeontological sensitivity ranges from Moderate to very High and will require a field assessment during the final route walkdown. Overall Impact Statement: The overall impact evaluation has shown that the pre-mitigation impact on heritage resources is rated as High negative. However, with the implementation of the recommended mitigation measures, this will reduce the potential impact to a low negative impact. Corridor 1 and Corridor 2 Alternative 2 are viewed as favourable options due to the low potential impact on heritage resources which can be mitigated to address envisaged impacts. Corridor 2 Alternative 1 however, is viewed as not preferred as there is a large amount of heritage resources as well as possibly large areas of palaeontological significance along this route.	
Visual	The Visual Impact Assessment (VIA) conducted for the proposed 132kV power line and associated infrastructure has demonstrated that most of the study area has a rural, partially scenic visual character which is transformed in part. The northern and south-western parts of the study area, near Kimberley and Jacobsdal respectively, are characterised by a more visually degraded landscape, which is mostly attributed to the presence of large-scale mining activities, existing electrical infrastructure as well as informal/semi-formal settlements and residential areas/communities. As such, the visual character in these parts of the study area is visually degraded, typical of a peri-urban environment. In addition, the southern and central parts of the study area are characterised by a more natural / scenic visual character due to the prevalence of the natural intact vegetation, limited human habitation and limited transformation and/or development. The visual character in these areas is thus typical of a natural rural environment. Commercial cultivation is concentrated along the Modder River in the southern parts of the study area. These	▪ Recommended mitigation measures to be implemented.

Environmental Parameter	Summary of Major Findings	Recommendations
	areas are dominated by various agricultural activities and other elements typical of a pastoral environment. The study area is not typically valued or utilised for its natural scenic value and therefore relatively few tourism, historically or culturally significant sensitive receptors were identified during the fieldwork. A desktop investigation revealed that several farmsteads are also present within the study area which may perceive the power line to be an unwelcome intrusion, depending on the perception of the viewer. The impact assessment revealed that the significance of the visual impacts resulting from the proposed power line and associated infrastructure would be low during the construction phase and medium during the operational phase. These potential impacts can be mitigated to acceptable levels provided the recommended mitigation measures are implemented. All the proposed power line corridor alternatives were assessed to determine which alternative would result in the lowest overall visual impact. Based on the assessment, Corridor 1 (Green) is considered to be a favourable alignment for the proposed power line while Corridor 2 Alternative 1 (Purple) is not considered to be a preferred alignment. Corridor 2 Alternative 2 (Turquoise) was considered to be the preferred alignment, due to the presence of existing power lines and lack of visually sensitive and potentially sensitive receptor locations within close proximity.	
Socio-Economic	The review of the relevant policy documents concluded that the project falls in line with the national and local government developmental objectives. It may also form part of the SIP10 and SIP8. Furthermore, the project is not expected to comprise the spatial visions of the three municipalities and two provinces; however, care needs to be taken when the route is chosen as to avoid green areas earmarked by the Sol Plaatje LM. The project will improve the reliability of electricity supply in the region and could lead to establishing more electricity	▪ The potentially directly affected and interested parties interviewed have not expressed objections to the project. However, it is important that these parties be properly consulted before choosing the final powerline route and servitudes before construction commences in order to not affect any commercial farming activities or future industrial projects happening on those

Environmental Parameter	Summary of Major Findings	Recommendations
	connections in the area, ultimately improving access to electricity in the municipality. The project will also have a positive albeit small impact on the national economy and local employment, as expenditure on construction activities to the value of between R60 million and R144 million, depending on the corridor chosen, is likely to stimulate between R180 million and R432 million of production revenue in the country and create up to fourteen temporary direct employment opportunities for the local communities. All three corridors have been considered. It appears that commercial livestock and game farming is the dominant land use that may be impacted by any of these corridor options and alternatives. The agricultural sector is a significant contributor to the economies of Letsemeng and Tokologo and creates approximately 33% and 22% of all job opportunities in the respective municipalities. This emphasises the need to minimise the project's potential negative impact on the dominant activities observed in the zone of influence of the project. Corridor Alternatives received the same average scores for positive and negative impacts for both before and after mitigations measures. Considering the preferences allocated to these two alternatives for each impact, no clear differentiation can be made between the alternatives and all could be equally considered.	properties. ▪ This will be undertaken by SolarReserve as part of the commnercial and contractual process when obtaining servitudes from the affected landowners.

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.

In terms of the environmentally preferred corridor between Corridor 2 Alternative 1 and 2, the following was selected as the preferred after a comparative assessment was undertaken:

Corridor 2 Alternative 2 – Kalkaar CSP via Kimberley DS to Boundary Substation (Preferred)

There is not much difference in terms of preference with regards to avi-fauna, soils and agricultural potential and socio-economic aspects. However, there are reasons against the selection of Corridor 2 Alternative 1 (heritage and palaeontology as well as visual) as well as reasons motivating for the

selection of Corridor 2 Alternative 2 (with regards to wetlands and biodiversity). As such, the selection of the Corridor 2 Alternative 2 – Kalkaar CSP via Kimberley DS to Boundary Substation as the preferred option was made taking into account the following:

- Presence of an existing line along this route will decrease the footprint and negative impact of the new line;
- Lower number of freshwater resources to be affected;
- Lowest potential impact on heritage resources and with appropriate mitigation measures, could address envisaged impacts.
- Follows existing power lines; and
- Fewer potential sensitive receptors.

Importantly, Corridor 1 – Jacobsdal link is not an alternative to the above mentioned alternative corridors and therefore did not undergo comparative assessment. All sensitivities, potential impacts and required mitigation measures were however determined and included in this report. This link is required as a mandatory second connection point to the national grid which requires environmental authorisation.

Corridor 1 – Jacobsdal Link (Preferred)

This is the only option for the second connection point for the proposed power lines. Ultimately, the following must be taken into account for this proposed corridor as being preferred:

- The Jacobsdal link has not very high sensitivity sections along the route;
- Much lower risk of avi-fauna collision mortality and avoidance of vulture breeding areas;
- Least number of freshwater resources to be affected;
- Lowest potential impact on heritage resources and with appropriate mitigation measures, could address envisaged impacts.
- Shorter route and thus less physical impact (reduced footprint);
- Reduced potential negative socio-economic impacts;
- Lowest visual impact; and
- More economically viable being the shorter route.

From the above, Corridor 2 Alternative 2 and Corridor 1 – Jacobsdal Link are both to be environmentally authorized with the implementation of mitigation measures.

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

Through the findings of the BA process and report, it is the opinion of the Environmental Assessment Practitioner (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 mitigation measures recommended by the various specialists should be strictly implemented.

- Final Environmental Management Programme (EMPr) should be approved by the DEA prior to construction.

SOLARRESERVE SOUTH AFRICA (PTY) LTD

PROPOSED CONSTRUCTION OF UP TO A 132KV POWER LINE AND ASSOCIATED INFRASTRUCTURE FOR THE KALKAAR SOLAR THERMAL POWER PROJECT ON THE REMAINDER OF PORTION 1 OF THE FARM KALKAAR 389 NEAR KIMBERLEY, FREE STATE AND NORTHERN CAPE PROVINCES

DRAFT BASIC ASSESSMENT REPORT

Contents

List of Appendices

List of Abbreviations

ASAPA	Association of South African Professional Archaeologists
BA	Basic Assessment
BAR	Basic Assessment Report
BFD	Bird Flight Diverter
C&RR	Comments and Response Report
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
GIS	Geographic Information System
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
NEMA	National Environmental Management Act, 1998 (Act No.107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NFA	National Forests Act, 1998 (Act No. 84 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
PV	Photovoltaic
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency SOC Limited
SDF	Spatial Development Framework
SG	Surveyor General
SHEQ	Safety, Health, Environment and Quality

SOLARRESERVE SOUTH AFRICA (PTY) LTD

PROPOSED CONSTRUCTION OF UP TO A 132KV POWER LINE AND ASSOCIATED INFRASTRUCTURE FOR THE KALKAAR SOLAR THERMAL POWER PROJECT ON THE REMAINDER OF PORTION 1 OF THE FARM KALKAAR 389 NEAR KIMBERLEY, FREE STATE AND NORTHERN CAPE PROVINCES

DRAFT BASIC ASSESSMENT REPORT

INTRODUCTION

On the 3rd September 2015, SolarReserve South Africa (Pty) Ltd (hereafter referred to as, "SolarReserve) received environmental authorization (EA – DEA Ref: 14/12/16/3/3/2/660) for the proposed 200MW Concentrated Solar Power (CSP) facility on the Remainder of Portion 1 of the Farm Kalkaar 389 near Jacobsdal in the Free State Province (the "Kalkaar CSP Project"). On the 25th of September 2015, SolarReserve also received environmental authorisation (EA – DEA Ref: 14/12/16/3/3/2/578)for the proposed 100MW Kalkaar Photovoltaic Solar Power Project on the Remainder of Portion 1 of the Farm Kalkaar 389, Free State Province. Both projects comprise the greater "Kalkaar Solar Thermal Power Project".

Based on recent communications with Eskom the preferred evacuation point for the electricity generated by the Kalkaar CSP and PV projects is via the Kimberley Substation to Boundary Substation near Kimberley. In addition to this interconnection solution, SolarReserve is also considering the nearby Jacobsdal Substation, near Jacobsdal as a secondary evacuation point. Therefore, in order to evacuate the electricity generated as a result of the Kalkaar CSP and PV projects, a new environmental authorization process is being undertaken in order to assess the feasibility of the proposed grid connections to the aforementioned points of interconnection to the national grid.

SolarReserve have appointed SiVEST, as the independent Environmental Assessment Practitioner (EAP), to undertake the required Basic Assessment (BA) processes for the proposed 132kV power lines and associated infrastructure in the Free State and Northern Cape Provinces (the "Proposed Project").

1. PROJECT DESCRIPTION

The proposed project will comprise of the following:

- Construction of one Tern power line of up to 132kV from the proposed Kalkaar Solar Thermal Power Project. The grid connections that will be assessed include the following:
- Jacobsdal Link = approximately 19km in length;
- Kalkaar Solar Thermal Power Project via Kimberley DS to Boundary Substation Alternative 1 = approximately 61km in length; and
- Kalkaar Solar Thermal Power Project via Kimberley DS to Boundary Substation Alternative 2 = approximately 62km in length.
- Install 48 core optical ground wire (OPGW) on the line.
- Build 2 bay substations next to approved substations on the Kalkaar Solar Thermal Power Project. Proposed substations will be approximately 100m x 100m.
- Inclusive of all cable trenches.
- Install 3 x 25m lighting/lightning masts.
- Building of an access road to the substation.
- Building of a standard control room (5.5m x 12m) with top entry and cable racks. This will include a sewage system, air-conditioning and energy efficient lighting.
- Installation of a security fence with entrance gates.
- 1 x 132kV line bay and 1 x 132kV metering bay.
- Installation of a required Control Plant, AC/DC, Metering, SCADA and Telecoms.
- V drain extension of substation for drainage purposes.
- And or all extensions required (132kV yard, fencing etc.) of the connecting Eskom Assets i.e. Solar MTS.

The location of the proposed substations will be adjacent to the on-site substations of the approved layout of the Kalkaar CSP Project, authorised under the EA (DEA Ref: 14/12/16/3/3/2/660) as well as the Kalkaar PV Project authorised under the EA (DEA Ref: 14/12/16/3/3/2/578). The footprint of the proposed substations would be approximately 10 000m².

Three power line alternative corridors have been provided for assessment. Two of the three corridors are up to 2km (1km either side of the centre line) wide originating from the Kalkaar CSP and PV Project site routing via the Kimberley Distribution Substation to the Boundary Substation. The aforementioned two corridors will serve as alternatives to each other for the comparative assessment. An additional corridor of 500m in width (250m either side of the centre line) is to be established for the route option to the Jacobsdal Substation. This route will not however have a separate alternative, but environmental considerations will determine the alignment best suited to the receiving environment within this corridor. The registered servitude width will be 31 metres (15.5 metres either side of the centre line). The three power line corridors include the following:

- Corridor 1 (Green) – Kalkaar CSP to Jacobsdal Substation (approximately 20km in length);
- Corridor 2 Alternative 1 (Purple) – Kalkaar CSP via Kimberley Distribution Substation to Boundary Substation (approximately 62km in length); and
- Corridor 2 Alternative 2 (Turquoise) – Kalkaar CSP via Kimberley Distribution Substation to Boundary Substation (approximately 62km in length).

The proposed power line will also include the establishment of all associated infrastructure as required (including but not limited to access roads, control rooms, security systems etc.).

A Site Locality Map for the proposed project has been provided in Figure 1 below.

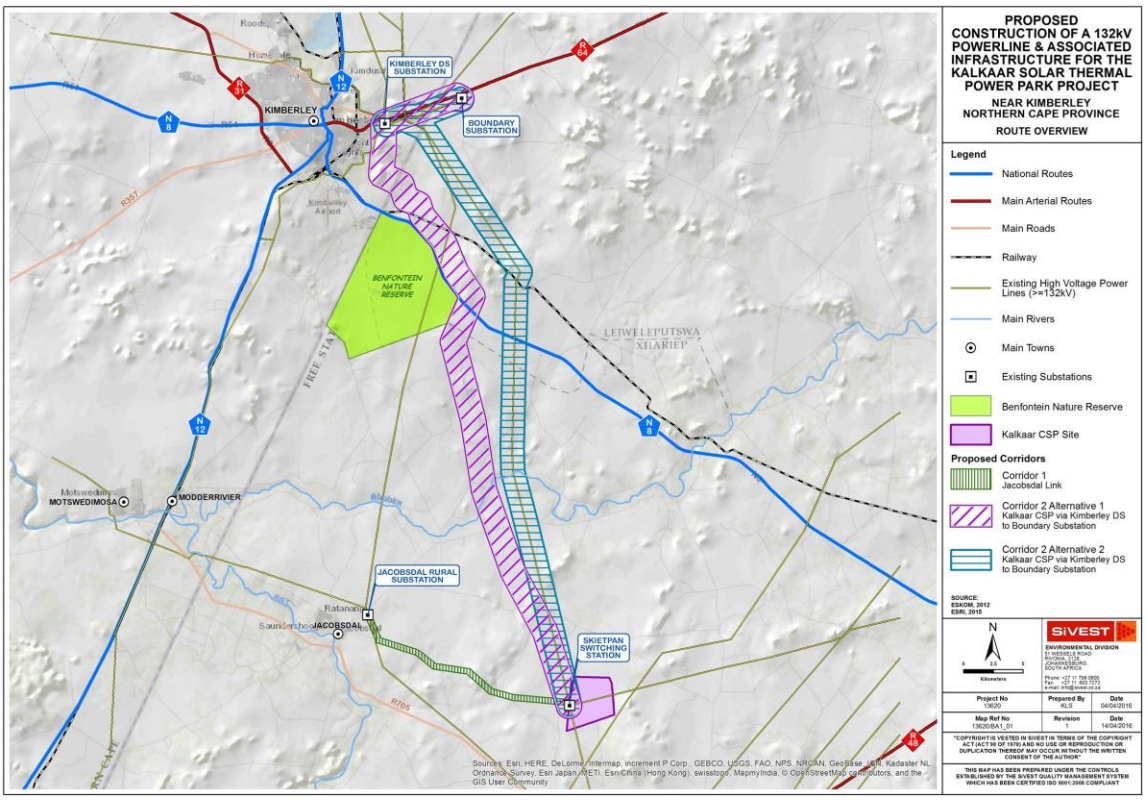

Figure 1: Site Locality Map

2. BRIEF DESCRIPTION OF THE RECEIVING ENVIRONMENT

The proposed project study area is located primarily within the Free State Province, with a relatively small portion cited in the Northern Cape Province near Kimberley. The proposed power lines traverse the Lejweleputswa District Municipality in the Free State Province and the Frances Baard District Municipality in the Northern Cape Province. More specifically, the proposed power lines traverse into the Tokologo Local Municipality in the Free State Province and the Sol Plaatjie Local Municipality in the Northern Cape Province.

Accessibility is mainly form the N8 highway to the south east of Kimberley (Figure 2). Secondary and tertiary roads can be used for access thereafter. The Modder River can be found bisecting both Corridor 2 alternatives.

Land uses for the proposed project encompasses mainly vacant land, mining, industrial (renewable), agricultural farming activities and urban as well as residential areas (Figure 3).

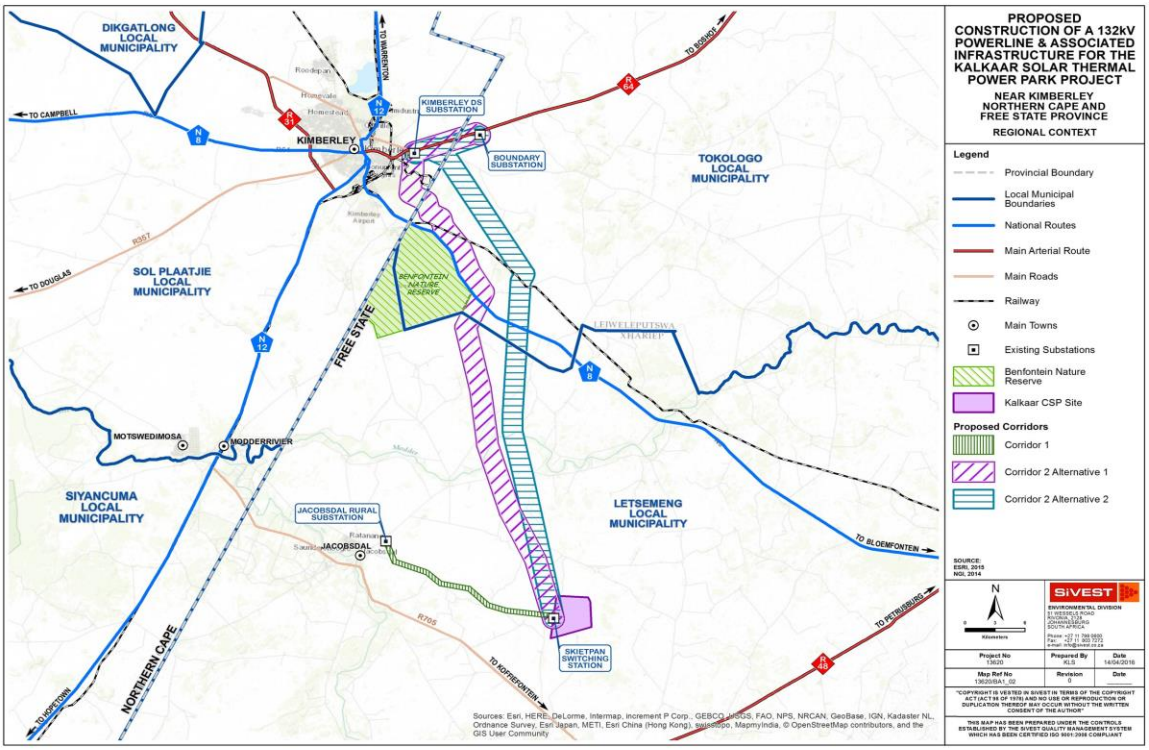

Figure 2: Regional Locality Map

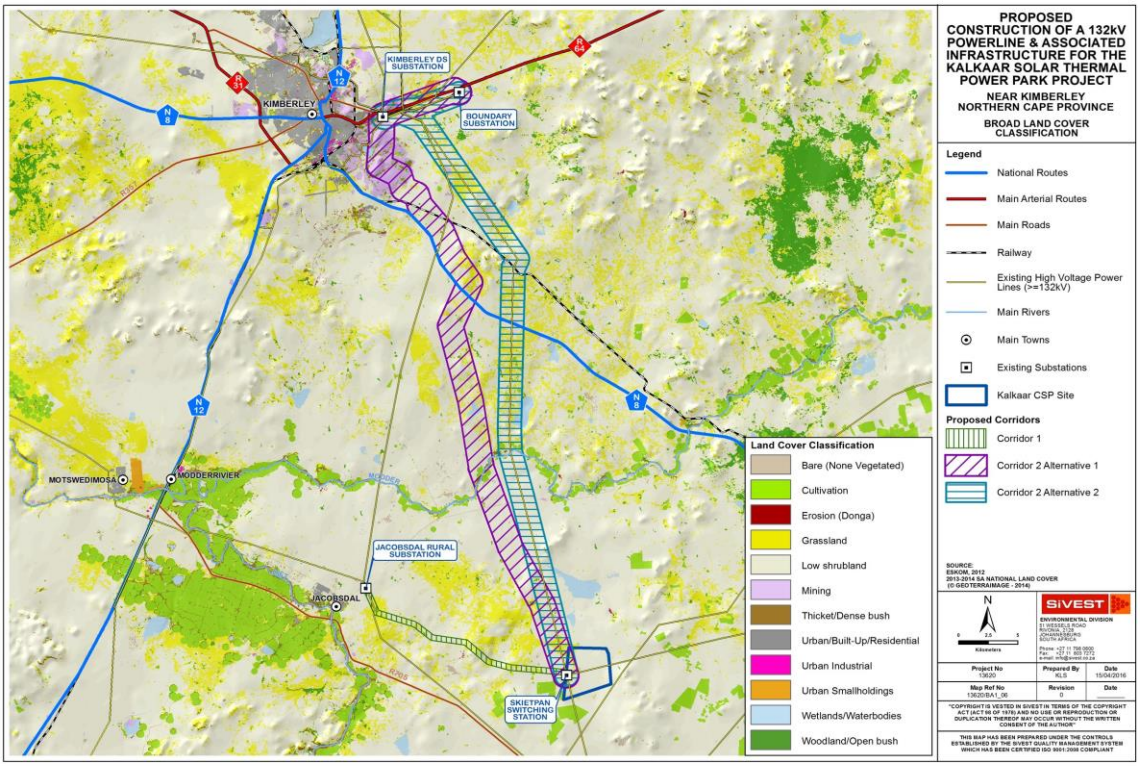

Figure 3: Land Use Map

3. EXPERTISE OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

The proposed project requires Environmental Authorisation (EA) from the Department of Environmental Affairs (DEA). However, the provincial authorities will also be consulted. The two provincial authorities include the Northern Cape Provincial Government Department of Environment and Nature Conservation (NCPG DENC) as well as the Free State Department of Economic Development, Tourism and Environmental Affairs (FS DEDTEA). The Basic Assessment (BA) for the proposed development will be conducted in terms of the EIA Regulations promulgated in terms of Chapter 5 NEMA (National Environmental Management Act), which came into effect on the 8th of December 2014 as amended. In terms of these regulations, a Basic Assessment (BA) is required for the proposed project. All relevant legislations and guidelines will be consulted during the BA process and will be complied with at all times.

SiVEST has considerable experience in the undertaking of BAs. Staff and specialists who have worked on this project and contributed to the compilation of this draft Basic Assessment Report (DBAR) are detailed in Table 1 below.

Table 1**:** Project Team

Name and Organisation	Role
Kelly Tucker – SiVEST	Project Director
Shaun Taylor – SiVEST	Environmental Assessment Practitioner (EAP) Public Participation Practitioner
Andrea Gibb – SiVEST	Visual
Kerry Schwartz – SiVEST	GIS and Mapping and Visual
Simon Todd – Simon Todd Consulting cc	Biodiversity
Chris Van Rooyen – Chris Van Rooyen Consulting cc	Avi-fauna
Scientific Aquatic Services (SAS) – Stephen Van Staden	Surface Water
Johann Lanz – Independent consultant	Agricultural Potential
Wouter Fourie – Professional Grave Solutions (Pty) Ltd	Heritage and Palaeontology
Elena Broughton, Helene Debbari – Urban-Econ Development Economists	Socio-economic
Riaan Barnard – Continuum	Public Participation Practitioner

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

Table 2: Expertise of the EAP

Environmental Project Manager	SiVEST (Pty) Ltd – Kelly Tucker
Contact Details	kellyt@sivest.co.za
Qualifications	B.Sc. Earth Sciences, B.Sc. Hons Geography and Environmental Management, M. Sc. Environmental Management, Diploma in Advanced Project Management
Expertise to carry out the BA & EMPr	Kelly is an Environmental Scientist with 10 years' experience across various sectors. She specialises in the overall management and compilation of Environmental Impact Assessments (EIAs) and Environmental Management Programmes (EMPs) primarily related to mining, energy generation and electrical transmission projects. She furthermore has been involved in undertaking and managing Public Participation Processes, Consultation, Environmental Scans and Fatal Flaw / Feasibility Studies and independent review of environmental projects. She has been involved in numerous projects to which these skills have been applied. **Environmental Impact Assessments and Environmental Management Programmes:** ▪ Colenso Power EIA and Mining Application for new Coal fired power station and Coal mine in Coleso near Ladysmith in KwaZulu Natal (2013 – current). ▪ Basic Assessment and Waste License Application for the proposed new Iveco manufacturing plant, Rosslyn, South Africa (2013 – current). Environmental Advisory Services for the Moloto Development Corridor (MDC) Project which is located between the City of Tshwane Local municipality in Gauteng Province and Groblersdal, Limpopo Province, traversing Mpumalanga Province. Project Leader, SMEC/VelaVKE, 2012 - Current ▪ Environmental Advisory Services for the Moloto Development Corridor (MDC) Project which is located between the City of Tshwane Local municipality in Gauteng Province and Groblersdal, Limpopo Province, traversing Mpumalanga Province. Project Leader, SMEC/VelaVKE, 2012 - Current ▪ 3 Year Appointment: Environmental Management Compliance for the Integrated Rapid Transit project for Polokwane Municipality. Project Leader, City of Polokwane, 2013 - Current ▪ EIA and EMPr for the proposed 150 MW Renosterberg Wind Energy Company (RWEC) Wind Farm and 75 MW Solar Photovoltaic (PV) Plant, Northern Cape Province. The EIA includes the scoping process and detailed environmental impact assessment. The project includes detailed specialist studies such as social, visual, noise, heritage and biophysical as well as a full public participation process. RWEC, 2012 -

	Current ▪ EIA and EMP for the new proposed Nsoko Integrated Sugar Mill and Ethanol Plant for Nsoko Msele, in Swaziland (2013). ▪ BA and EMP for the Proposed Bulk Storage Fuel Oil Tank installation at the Grootvlei Power Station, Mpumalanga Province (2011) ▪ BA for the Proposed development of a 19MW Photovoltaic Solar Power Plant near Kimberley, Northern Cape Province (2012); ▪ BA for the Proposed development of a 19MW Photovoltaic Solar Power Plant near Danielskuil, Northern Cape Province (2012); ▪ EIA for the proposed Wind Energy and PV Facilities for Mainstream Renewable Power near Loeriesfontein, Northern Cape (2011 – 2012). ▪ EIA for the proposed Wind Energy and PV Facilities for Mainstream Renewable Power near Prieska, Northern Cape (2011 – 2012). ▪ EIA for the proposed Wind Energy and PV Facilities for Mainstream Renewable Power near Noupoort, Northern Cape (2011 – 2012). ▪ EIA for the proposed CSP and PV Facilities for Mainstream Renewable Power near Kimberley, Northern Cape (2011).
Environmental Assessment Practitioner	SiVEST (Pty) Ltd – Shaun Taylor
Contact Details	shaunt@sivest.co.za
Qualifications	BA Geography and Environmental Science, B. Sc. Hons Geography and Environmental Studies, M. Sc.
Expertise to carry out the BA and EMPr	Shaun has 8 years' work experience and specialises in undertaking and managing Environmental Impact Assessments (EIAs), Basic Assessments (BAs) and Environmental Management Programmes (EMPrs), primarily related to energy generation (renewable) and linear electrical distribution projects. He also specialises in undertaking wetland and riparian assessments, by making use of field based methodologies/surveys and ArcGIS technology. He has experience in overseeing public participation and stakeholder engagement processes, and has been involved in environmental baseline assessments, fatal flaw / feasibility assessments and environmental negative mapping / sensitivity analyses. From a business and administrative side, Shaun is actively involved in maintaining good client relationships, mentoring junior staff and maintaining financial performance of the projects he leads. **Environmental Impact Assessments and Basic Assessments:** ▪ BA for the Proposed Installation of a 500m³ Bulk Storage Fuel Oil Tank at Grootvlei Power Station, Mpumalanga Province; ▪ BA for the Proposed development of a 19MW Photovoltaic Solar Power Plant near Kimberley, Northern Cape Province; ▪ BA for the Proposed development of a 19MW Photovoltaic Solar Power

	Plant near Danielskuil, Northern Cape Province; ▪ BA for the Frankfort Strengthening Project: 88kV Power Line from Heilbron (via Frankfort) to Villiers, Free State Province; ▪ BA for the Wilger 132kV Overhead Distribution Power Line, Northern Cape Province; ▪ BA for the Limestone 1 – 132kV Overhead Distribution Power Line, Northern Cape Province; ▪ BA for the Limestone 2 – 132kV Overhead Distribution Power Line, Northern Cape Province; ▪ BA for the Proposed Tweespruit to Welroux Power Line and Substations, Free State Province; ▪ BA for the Sir Lowry's Pass River Flood Alleviation Project, Western Cape Province; ▪ EIA for the Loeriesfontein 70MW Photovoltaic and 132kV Power Line, Northern Cape Province; ▪ EIA for the Mookodi Integration Project Environmental Impact Assessment; ▪ EIA for the Noupoort Wind Farm, Northern Cape Province; ▪ EIA for the Loeriesfontein Wind Farm and PV Plant, Northern Cape Province; ▪ EIA for the Renosterberg Wind Farm and PV Plant near De Aar, Northern Cape Province.

4. BASIC ASSESSMENT REPORT STRUCTURE

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

Statement which summarises the impacts that the proposed development may have on the environment.

- **Section E** outlines the recommendations of the Environmental Assessment Practitioner (EAP).

5. ASSUMPTIONS AND LIMITATIONS

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

- It is assumed that all technical information provided by SolarReserve is technically acceptable and accurate;
- The proposed development is still in the planning stages and therefore some of the specific technical details are not available;
- The following assumptions, uncertainties and gaps in knowledge were encountered by various specialists:
    - **Biodiversity**
        - 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 representivity of the species sampled at the time of the site visit should be critically evaluated. Although not all parts of the affected area had been sampled in the past, large sections of the pipeline corridors fall within areas that have been sampled multiple times, with the result that good temporal distribution of sampling effort on these sections has been achieved and the large amount of work done in the areas means that the ecological patterns of the area are well known to the consultant and the uncertainty associated with the field study is considered very low. As a result, the timing and duration of the site visit is not seen to pose a constraint on 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 amphibians, reptiles and mammals for the site are based on those observed at the site and on adjacent properties as well as those likely to occur in the area based on their distribution and habitat preferences. In order to counter the likelihood that the area has not been well sampled in the past and in order ensure a conservative approach, the species lists derived for the site were obtained from an area significantly larger than the study area and are likely to include a much wider array of species than actually occur at the site. This is a cautious and conservative approach which takes the study limitations into account.
    - **Avi-fauna**
        - Although a total of 118 SABAP2 data cards have been completed to date for the area indicated in Figure 2, which should provide a reasonably accurate snapshot of the avifauna in the study area, it is important to note that the southern block of

nine pentads only have a total of 18 completed full protocol cards. As a result, the reporting rates of species may not be an accurate reflection of the true densities within all the pentads.

- The author has worked extensively on avifaunal impact assessments in the Kimberley area in the past 20 years. Personal observations and past experience have therefore also been used to supplement the data that is available from SABAP2, and has been used extensively in identifying likely bird/habitat associations.
- Predictions in this study are based on experience of these and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will hold true under all circumstances; therefore, professional judgment played an important role in this assessment. It should also be noted that the impact of power lines on birds has been well researched with a robust body of published research stretching over thirty years.
- The focus of the study is on the potential impact on Red Data species.

o **Wetlands**

- The freshwater assessment is confined to the linear development and does not include the neighbouring and adjacent properties, which were only considered as part of the desktop assessment;
- The freshwater resource delineations as presented in this report are regarded as a best estimate of the freshwater resource boundaries based on the site conditions present at the time of assessment. Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required the freshwater resource zones will need to be surveyed and pegged according to surveying principles;
- Limitations in the accuracy of the delineation in some areas due to anthropogenic disturbances such as the presence of roads and agricultural activities are deemed possible and therefore the delineations presented in this report are regarded as a best estimate of the riparian habitat boundaries based on site conditions present at the time of the assessment. The presented delineations are however considered to be accurate;
- Due to the landscape in some areas being rugged and very undeveloped and with many freshwater resources occurring on extensive private properties with limited access, some freshwater resources were inaccessible. Therefore, verification points for freshwater resources were located at points as close to the freshwater resource to be verified as possible and where necessary the conditions at the exact point required were inferred or extrapolated;
- Riparian and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to wetland species. Within this transition zone some variation of opinion on the freshwater resource boundary may occur however if the DWAF 2008 method is followed, all assessors should get largely similar results; and

- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. It is, however, expected that the proposed development activities have been accurately assessed and considered, based on the field observations undertaken and the consideration of existing studies and monitoring data in terms of freshwater ecology.

- **Soils and Agricultural Potential**
  - The land type data used for this assessment is considered more than adequate for the purposes of this study and is therefore not seen as a limitation. A more detailed soil investigation is not considered likely to have added anything significant to the assessment of agricultural soil suitability for the purposes of determining the impact of the facility on agricultural resources and productivity.
  - The assessment rating of impacts is not an absolute measure. It is based on the subjective considerations and experience of the specialist, but is done with due regard and as accurately as possible within these constraints.
  - There are no other specific constraints, uncertainties and gaps in knowledge for this study.
- **Heritage and Palaeontology**
  - Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.
  - Such observed or located heritage features and/or objects may not be disturbed or removed in any way, until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. 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.
- **Visual**
  - The identification of visual receptors has been based on a combination of desktop assessment as well as field-based observation. Due to the extensive area covered by the proposed power line and the limited access to properties within the study area, not all receptor locations were visited during the fieldwork. As such, a number of broad assumptions have been made in terms of the visual intrusion of the proposed power line from each receptor location and 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, which could not be established at a desktop level. Visual perception may also depend on several factors including the age, gender, activity preferences and traditions of the viewer (Barthwal, 2002). Homesteads / farmsteads in a largely natural setting were assumed to be more sensitive from a visual

perspective than those in a more urbanised / industrial settings and were therefore included as potentially sensitive visual receptor locations that may be visually exposed to the proposed development.

- A matrix has been developed to assist with the assessment of the potential visual impact at each 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 sensitive receptor location by the proposed power line. The matrix should therefore be seen as a representation of the likely visual impact at each sensitive receptor location. An assessment of the visual impact from each potentially sensitive location is beyond the scope of this Visual Impact Assessment that is being undertaken as part of the Basic Assessment study.
- It is important to note that Benfontein Nature Reserve could not be accessed during the field investigation. As a result, the visual impact of the proposed development on Benfontein Nature Reserve was investigated via desktop means, making use of Google Earth.
- Although most human habitation occurs in areas surrounding the urban nodes of Kimberley and Jacobsdal and there are a high concentration of potential receptors within these areas, receptors in Kimberley and Jacobsdal are not regarded as sensitive to the visual impact of the proposed development due to the existing visual degradation within these areas. The introduction of a new power line in these settings would therefore be less intrusive considering the presence of existing infrastructure.
- Roads that are primarily used by local farmers are not regarded as visually sensitive receptor locations as they do not form part of any scenic tourist routes, and are unlikely to be valued or utilised specifically for their scenic or tourism potential.
- The assessment of receptor-based impacts has been based on the power line corridors approved by the proponent. It is recognised however that the exact route of the power line within the corridor has not been determined, and depending on this the proposed power line may result in greater or lesser visual impacts on receptor locations.
- Given the nature of the receiving environment and the height of the proposed power line towers, the study area for this visual assessment is assumed to encompass a zone of 5km from the outer boundary of the corridor alternatives. 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.
- Viewsheds have not been generated for the proposed power line due to the complexity associated with generating viewsheds off multiple points within the context of a corridor. In addition, detailed digital data was not available and the

topography within the study area is relatively flat. Generating viewsheds from coarse-grained DTMs would only take the large scale topographical variations into account and not minor topographical features, vegetative screening, or man-made structures which are important factors influencing the severity of visual impacts in this context. Distance banding from each potentially sensitive receptor location has been used to gain an understanding of the level of visual exposure associated with the proposed power line alignment.

- 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, then this will be able to be incorporated into this assessment.
- No feedback regarding the visual environment has been received from the public participation process to date, 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. In addition, undertaking a perception survey falls outside of the scope of this Basic VIA.
- Operational and security lighting will most likely be required for the proposed control room and two (2) bay substations at night. At the time of undertaking the visual study no information was available regarding the type and intensity of lighting required and therefore the potential impact of the control room and substation lighting at night has not been assessed. General measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been.
- Most rainfall within the area occurs from November to April during the summer months. The fieldwork was undertaken in April 2016 toward the end of the summer season. As such, the surrounding vegetation can be expected to provide the maximum potential screening. During winter months the visual impact of the proposed development may therefore be greater, particularly from farmhouses surrounded by tall deciduous trees.
- At the time of undertaking the visual study no specific information was available regarding the design and location of the associated infrastructure (other than the location of the proposed substation). This report therefore focusses on the impact of the proposed 132kV power line. The potential visual impact of the associated infrastructure which would include, the two (2) bay substation, cable trenches, access roads, lighting/lightning masts and a control room, has not been assessed in detail in this VIA. General impacts and measures to mitigate the impact of this infrastructure has been provided.

o **Socio-Economic**

- It is assumed that the motivation for, and the ensuing planning and feasibility studies for the project were done with integrity, and that the information provided to date by the project owner and the independent environmental assessment practitioner is accurate.

- It is assumed that the strategic importance of promoting renewable energy and improving electricity distribution is supported by the national and provincial energy policies.
- The demographic data used in the study is largely based on the results of the 2011 Census and represents the latest demographic data for the study areas under analysis. Where possible, reference is made to the latest demographic data contained in local Integrated Development Plans and other documents. While the Census 2011 data provide useful information, it should be noted that this data may be out of date and may no longer reflect the current socio-economic situation.
- The study was done with the information available to the specialist within the time-frame and budget specified. The sources consulted are not exhaustive and additional information, which might strengthen the case for or against the project, might exist.
- The review of power line corridor options in this report only considered the social and economic acceptability of such alternatives and did not take into account the technical feasibility or other specialist impact areas.
- With regard to the in-person interviews undertaken the following assumptions were made:
- Questions asked during the interviews were answered accurately and truthfully.
- That the attitudes of the respondents towards the project will remain reasonably stable over the short- to medium-term.
- The assumption is that no significant concern exists for those landowners who could not be contacted or who refused/declined consultation. However, all effort was made to determine the current level of economic activity taking place on the relevant farm portions to aid in assessment of any potential impact and its extent on the specific landowner.

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

On the 3rd September 2015, SolarReserve South Africa (Pty) Ltd (hereafter referred to as, "SolarReserve) received environmental authorization (EA – DEA Ref: 14/12/16/3/3/2/660) for the proposed 200MW Concentrated Solar Power (CSP) facility on the Remainder of Portion 1 of the Farm Kalkaar 389 near Jacobsdal in the Free State Province (the "Kalkaar CSP Project"). On the 25th of September 2015, SolarReserve also received environmental authorisation (EA – DEA Ref: 14/12/16/3/3/2/578)for the proposed 100MW Kalkaar Photovoltaic Solar Power Project on the Remainder of Portion 1 of the Farm Kalkaar 389, Free State Province. Both projects comprise the greater "Kalkaar Solar Thermal Power Project".

Based on recent communications with Eskom the preferred evacuation point for the electricity generated by the Kalkaar CSP and PV projects is via the Kimberley Substation to Boundary Substation near Kimberley. In addition to this interconnection solution, SolarReserve is also considering the nearby Jacobsdal Substation, near Jacobsdal as a secondary evacuation point. Therefore, in order to evacuate the electricity generated as a result of the Kalkaar CSP and PV projects, a new environmental authorization process is being undertaken in order to assess the feasibility of the proposed grid connections to the aforementioned points of interconnection to the national grid.

SolarReserve have appointed SiVEST, as the independent Environmental Assessment Practitioner (EAP), to undertake the required Basic Assessment (BA) processes for the proposed 132kV power lines and associated infrastructure in the Free State and Northern Cape Provinces (the "Proposed Project").

The proposed project will comprise of the following:

- Construction of one Tern power line of up to 132kV from the proposed Kalkaar Solar Thermal Power Project. The grid connections that will be assessed include the following:
- Jacobsdal Link = approximately 19km in length;

- Kalkaar Solar Thermal Power Project via Kimberley DS to Boundary Substation Alternative 1 = approximately 61km in length; and
- Kalkaar Solar Thermal Power Project via Kimberley DS to Boundary Substation Alternative 2 = approximately 62km in length.
- Install 48 core optical ground wire (OPGW) on the line.
- Build 2 bay substations next to approved substations on the Kalkaar Solar Thermal Power Project. Proposed substations will be approximately 100m x 100m.
- Inclusive of all cable trenches.
- Install 3 x 25m lighting/lightning masts.
- Building of an access road to the substation.
- Building of a standard control room (5.5m x 12m) with top entry and cable racks. This will include a sewage system, air-conditioning and energy efficient lighting.
- Installation of a security fence with entrance gates.
- 1 x 132kV line bay and 1 x 132kV metering bay.
- Installation of a required Control Plant, AC/DC, Metering, SCADA and Telecoms.
- V drain extension of substation for drainage purposes.
- And or all extensions required (132kV yard, fencing etc.) of the connecting Eskom Assets i.e. Solar MTS.

The location of the proposed substations will be adjacent to the on-site substations of the approved layout of the Kalkaar CSP Project, authorised under the EA (DEA Ref: 14/12/16/3/3/2/660) as well as the Kalkaar PV Project authorised under the EA (DEA Ref: 14/12/16/3/3/2/578). The footprint of the proposed substations would be approximately 10 000m².

Three power line alternative corridors have been provided for assessment. Two of the three corridors are up to 2km (1km either side of the centre line) wide originating from the Kalkaar CSP and PV Project site routing via the Kimberley Distribution Substation to the Boundary Substation. The aforementioned two corridors will serve as alternatives to each other for the comparative assessment. An additional corridor of 500m in width (250m either side of the centre line) is to be established for the route option to the Jacobsdal Substation. This route will not however have a separate alternative, but environmental considerations will determine the alignment best suited to the receiving environment within this corridor. The registered servitude width will be 31 metres (15.5 metres either side of the centre line). The three power line corridors include the following:

- Corridor 1 (Green) – Kalkaar CSP to Jacobsdal Substation (approximately 20km in length);
- Corridor 2 Alternative 1 (Purple) – Kalkaar CSP via Kimberley Distribution Substation to Boundary Substation (approximately 62km in length); and

- Corridor 2 Alternative 2 (Turquoise) – Kalkaar CSP via Kimberley Distribution Substation to Boundary Substation (approximately 62km in length).

The proposed power line will also include the establishment of all associated infrastructure as required (including but not limited to access roads, control rooms, security systems etc.).

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

Listed activity as described in GN 983, 984 and 985	**Description of project activity**
GN 983, Activity 11 Item (i) The development of facilities or infrastructure for the transmission and distribution of electricity – (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The proposed power line will be up to 132kV in capacity and will be located outside an urban area.
GN 983, Activity 12 Item ((xii); (a) and (c) The development of: (xii) infrastructures or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse	Due to the number and width of the watercourses (including drainage lines, wetlands and riparian zones), the powerline structures and associated infrastructure will need to be placed within watercourses as well as within 32 meters of the edge of the watercourses.
GN 983, Activity 19 Item (i) The development of infilling or depositing of any material of more than 5m³ into, or the dredging, excavation, removal or moving of soil, sand, shells, grit, pebbles or rock of more than 5m³ from - : (i) a watercourse;	The proposed powerline will need to be constructed through a number of watercourses which will involve the removal and infill of material that will be more than 5m³ from the respective affected watercourses.
GN 985 Activity 4 Item (ii) (gg); (iii); (aa) & (bb) The development of a road wider than 4 metres with a reserve less than 13,5 metres In Free State: (ii) Outside urban areas, in (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or (iii) In urban areas:	Access roads will be in excess of 4 metres wide with a reserve less than 13,5 metres within the Benfontein Nature Reserve and within Regional Open Space identified in the Sol Plaatjie SDF.

(aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose;	
GN 985 Activity 12 Item (d) (iv) The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes with a maintenance management plan. (d) In Free State: iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned as open space, conservation or had equivalent zoning.	The clearance of an area of 300 square metres or more of indigenous vegetation within areas designated as "Regional Open Space" identified in the Sol Plaatjie SDF for construction of the proposed powerline and associated infrastructure.
GN 985 Activity 14 Item (xii) (a) (c); (a) (ii) (hh); (iii) (aa) (bb) The development of – (xii) infrastructure or structures with a physical footprint of 10 square metres or more; Where such development occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse. (a) In Free State: ii. Outside urban areas, in: (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or (iii) In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose;	The proposed construction of the powerline and associated infrastructure will be within 32 metres of the identified watercourses within the Benfontein Nature Reserve and within Regional Open Space identified in the Sol Plaatjie SDF.

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

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

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

a) Site alternatives

Alternative 1		
Description	Lat (DDMMSS)	Long (DDMMSS)
N/a	N/a	N/a
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
N/a	N/a	N/a
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
N/a	N/a	N/a

In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):
Corridor 1 Jacobsdal Link (Green – Preferred)		
• Starting point of the activity	S29° 11' 1.106"	E24° 58' 26.927"
• Middle/Additional point of the activity	S29° 9' 33.123"	E24° 52' 52.899"
• End point of the activity	S29° 7' 0.833"	E24° 47' 58.023"
Corridor 2 Alternative 1 via Kimberley DS to Boundary Substation (Purple)		
• Starting point of the activity	S29° 11' 1.106"	E24° 58' 26.927"
• Middle/Additional point of the activity	S28° 55' 8.731"	E24° 52' 34.493"
• End point of the activity	S28° 43' 25.010"	E24° 52' 52.058"
Corridor 2 Alternative 2 via Kimberley DS to Boundary Substation (Turquoise – Preferred)		
• Starting point of the activity	S29° 11' 1.106"	E24° 58' 26.927"
• Middle/Additional point of the activity	S28° 54' 34.566"	E24° 55' 35.785"
• End point of the activity	S28° 43' 25.010"	E24° 52' 52.058"

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

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

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

b) Lay-out alternatives

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

c) Technology alternatives

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3

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

Alternative 1 (preferred alternative)		
Alternative 2		
Alternative 3		

e) No-go alternative

The "no-go" alternative assumes that the proposed activity does not go-ahead, implying a continuation of the current situation or the status quo. In the case of this project, the no-go alternative would result in no power line being constructed, and it would therefore not be possible to export the electricity generated at the Kalkaar Solar Thermal Power Project to the national grid. South Africa is under immense pressure to provide electricity generating capacity in order to reduce the current electricity demand in the country. With the global focus on climate change, the government is under severe pressure to explore alternative energy sources in addition to coal-fired power stations. Not establishing the proposed solar development would be detrimental to the mandate that the government has set to promote the implementation of renewable energy.

In general, the South African economy has shown a trend in significant and rapid growth over the past few years, placing tremendous strain on existing infrastructure and service delivery, as these are not capable of complying or supporting this growth trend. In order for the National Government to create an economic climate which is suitable to their growth targets, and will accommodate the existing economic growth and social development, it was found essential that basic services such as electricity provision be enhanced as a matter of urgency.

Power demand in South Africa is growing at a rate whereby power cuts due to shortages are anticipated within the next three years. Demand for electricity rose by 5.4% 2010 in comparison to 2009 with an annual forecast growth of 1.3%. In order to meet these demanding requirements, which is a clear indication of the country's future growth prospects, South Africa must facilitate the rapid build out of capacity in order not to limit the countries potential. The Proposed Project will help facilitate this increase in supply capacity to the national grid.

The current infrastructure and generation capacity of South Africa's power utility, Eskom, is unable to accommodate a rapid growing economy in which reliable electricity provision is essential. South Africa has experienced electricity blackouts during 2008 and 2009 which dampened investor confidence in South Africa as an investor destination and also hampered industrial development. Ageing power plants and the prevalence of unplanned maintenance to these plants were major contributors to the problem, which caused erratic and unreliable electricity provision to major industries as well as households throughout South Africa.

In order to manage this supply versus demand gap, South Africa has embarked on an infrastructure growth program supported by various government initiatives, including but not limited to, the National Development Plan (NDP), the Presidential Infrastructure Coordinating Commission (PICC), the

Department of Energy's Integrated Resource Plan and National Strategy for Sustainable Development, the National Climate Change Response White Paper, the Presidency of the Republic of South Africa Medium-Term Framework and National Treasury's Carbon Tax Policy Paper. These efforts are in support of, among other sectors, the ever increasing, growing demand for energy, to find solutions for the current electricity shortages, as well as the need to find more sustainable and environmentally friendly energy resources in support of Governments programs.

This being said it needs to be remembered that the bulk of South Africa's power is generated by coal fired power stations and a number of coal fired power stations are being planned to meet the ever increasing demand for power. This makes coal South Africa's primary energy resource. Beyond the fact that coal is not a renewable resource the burning of coal for the generation of electricity also has a very negative impact on the environment from the point of view that vast amounts of CO2 is being released into the atmosphere and contributing to the ever growing concern of the greenhouse effect and global warming.

The Generation Facility was designed to meet the increasing demand for clean, renewable electrical power in South Africa. The multiple benefits associated with developing renewable energy infrastructure have been recognized by both local regional and National policy-makers. Development of solar resources reduces reliance on foreign sources of fuel, promotes national energy security, diversifies energy portfolios and contributes to the reduction of greenhouse gas emissions at the same time creating a large number of jobs within a new industry at the same time raising the core knowledge bases of the country.

In addition, the Kyoto Protocol, as a result of concern about climate change, establishes the obligation of reducing green-house effect gas emissions by industrialised countries including South Africa. Energy efficiency and the use of renewable energy sources are presented as sustainable solutions leading to a reduction in CO2 emissions into the atmosphere. In the Integrated Resource Plan for Electricity 2010-2030, South Africa has committed to a target of 17.8 GW of primary energy consumption should come from renewable sources by 2030. In addition to these environmental and legislative reasons, the fact is that renewable energy sources mean a reduction in the country's energy dependence on carbon fuels, increasing the safety and quality of the energy supply and providing a valuable source of employment.

South Africa as a signatory to the United Nations Framework Convention on Climate Change committed to the stabilization of atmospheric greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system. With this commitment in place and the ever growing need for power, South Africa is urged to expand its generation capacity but through the development and utilisation of alternative resources, which are renewable and more environmentally sustainable.

South Africa's climate is ideal with regards to solar resources, with a broad time band of sunlight and a high level of energy delivered by area of land. Utilising this solar resource in combination with molten salt storage technology makes it an ideal system in the generation of renewable energy. As the additional demand for power continues to grow in other regions as older technology fossil fuel plants reach the end of their shelf lives, the project will contribute much needed on-peak power to the electrical grid serving the region.

Over and above the aforementioned, the South African Government adopted the National Infrastructure Plan in 2012 which is aimed at transforming the South African economic landscape as well as to provide the necessary aid regarding employment creation and delivery of basic services. The Plan is designed to integrate and coordinate the long term infrastructure build which is done via the Presidential Infrastructure Coordination Commission (PICC). A need assessment undertaken on behalf of this plan has led to the identification of 18 Strategic Integrated Project (SIP) – SIP 8 – 10 relates to energy generation, green energy generation and the transmission and distribution of electricity to all. With respect to SIP 10, the National Government aims to expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity. The project forms part of the National Government's endeavours to provide infrastructure readily for services deliver.

The Infrastructure Development Act, Number 23 of 2014 was promulgated on 2 June 2014 in order to "provide for the facilitation and co-ordination of public infrastructure development which is of significant economic or social importance to the Republic; to ensure that infrastructure development in the Republic is given priority in planning, approval and implementation; to ensure that the development goals of the state are promoted through infrastructure development; to improve the management of such infrastructure during all life-cycle phases, including planning, approval, implementation and operations; and to provide for matters incidental thereto". Electricity generation and provision is regarded under strategic integrated projects and conspired a national priority in terms of Annexure 1 of the Act.

The Project has been designed to assist Government in meeting the increasing demand for clean, renewable energy in South Africa by providing the necessary interconnection infrastructure to transmit the power from the point of supply to point of demand.

As such, the Kalkaar Solar Thermal Power Project forms part of the country's strategies to meet future energy consumption requirements through the use of renewable energy, as the power generated by the facility will be evacuated to the national grid.

Should the proposed development not proceed, the multiple benefits associated with developing renewable energy infrastructure as well as infrastructure to strengthen the national grid that have been recognized by both local regional and National policy-makers, will not be realised.

The proposed power line will be an Eskom owned asset, and only constructed by the Applicant under a self-build agreement with Eskom. Should the proposed development not proceed, this infrastructure will not be constructed and Eskom will not own this infrastructure. Moreover, future developments requiring water infrastructure will not be able to take advantage of the proposed power line as a possible connection point.

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

3. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	**Size of the activity:**
Alternative 1[1]	N/a – Linear activity
Alternative 2	N/a – Linear activity

or, for linear activities:

Alternative:	**Length of the activity:**
Corridor 1 Jacobsdal Link (Green – Preferred)	Approx. 19km
Corridor 2 Alternative 1 Kalkaar via Kimberley DS to Boundary Substation (Purple)	Approx. 61km
Corridor 2 Alternative 2 Kalkaar via Kimberley DS to Boundary Substation (Turquoise – Preferred)	Approx. 62km

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

Alternative:	**Size of the site/servitude:**
Corridor 1 Jacobsdal Link (Green – Preferred)	32m servitude
Corridor 2 Alternative 1 Kalkaar via Kimberley DS to Boundary Substation (Purple)	32m servitude
Corridor 2 Alternative 2 Kalkaar via Kimberley DS to Boundary Substation (Turquoise – Preferred)	32m servitude

4. SITE ACCESS

Does ready access to the site exist?	YES√ Existing roads to be used.
If NO, what is the distance over which a new access road will be built	N/A

Describe the type of access road planned:

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

5. LOCALITY MAP

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

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

An A3 locality map is included in Appendix A.

6. LAYOUT/ROUTE PLAN

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

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

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

7. SENSITIVITY MAP

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

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

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

An A3 sensitivity map is included in Appendix A.

8. SITE PHOTOGRAPHS

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

Site photographs are included in Appendix B.

9. FACILITY ILLUSTRATION

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

Facility Illustrations are included in Appendix C.

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	**YES√**		Please explain
The project in question is for the proposed construction of up to a 132kV power line and associated infrastructure, 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
The Free State Province Spatial Development Framework's (FSPSDF), 2014 energy objectives are derived from the NDP's energy directives and include, among others, promotion of the development of renewable energy supply schemes. The provincial government acknowledges the significant potential of the Province to harvest renewable energy sources, and specifically solar energy. The Xariep region has specifically been singled out as the area with the highest solar energy resource in the country, following that of Upington. This makes it "an ideal location for the development of concentrated solar power (CSP) and photovoltaic solar power generation technologies" (Dennis Moss Partnership, 2013). The Northern Cape Provincial Spatial Development Framework (NC PSDF) of 2012 recognises the potential of renewable energy sources in not only securing electricity and addressing the climate change issues, but also in unlocking the economic potential of the Province. The area, where the power line corridor alternatives are to be located has been demarcated as industrial area in the PSDF with numerous high voltage and medium voltage power lines envisaged to traverse the locality in question. Therefore, from the provincial spatial perspective, the project does not conflict with the spatial vision and is in direct alignment with the infrastructure envisaged to be developed in the area.			
(b) Urban edge / Edge of Built environment for the area	**YES√**		Please explain
The proposed development is mainly located over land zoned as agriculture. However, near Kimberley, the proposed development routes via Kimberley Distribution Substation to Boundary Substation. For this relatively small portion of the greater power line route, the proposed development will be within the urban edge of Kimberley.			
(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
From a local perspective, the Letsemeng LM, where the biggest portion of the proposed power line corridor alternatives falls into, has demarcated the area as environmentally sensitive area with pockets suitable for commercial cultivation and general agriculture. None of these activities are envisaged to be compromised by the establishment of power lines, suggesting no red flag areas from the Letsemeng SDF 2009/2010 perspective. The area where the proposed corridor alternatives are to traverse the Tokologo LM, is demarcated for agricultural use (CNdV Africa Planning and Design , 2012). The Tokologo SDF states that any non-agricultural development in this area should be subject to appropriate environmental offsets, meaning that non-agricultural projects would still be permitted in the area under certain conditions. Importantly, the proposed project will not affect the land use and if a power line traversed agricultural activities, the land would not be sterilised from agricultural use and activities would still be continued. As such, it can be argued that the project does not contradict the spatial vision of the Tokologo LM. From the Sol Plaatje LM perspective (Africon/Koplan, 2008), the portion of the power line corridor alternatives that fall within the municipality will traverse land demarcated as mining area. A Green			

Area has also been included in this portion and one of the Corridor alternatives may traverse it, which means that care will need to be taken when choosing the route to avoid this portion. aside from this, no red flag areas or possible contradictions with the spatial vision of the municipality could be identified.			
(d) Approved Structure Plan of the Municipality			Please explain
The proposed development is for service infrastructure and therefore will not have any bearing on the Municipalities' Structure Plans.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	**YES√**		Please explain
There is no current version of an EMF at a District and Local Municipal level for the proposed study area. Should one become available, this will be taken into account before finalisation of the BA for the proposed development.			
(f) Any other Plans (e.g. Guide Plan)	**YES√**		Please explain
The Frances Baard District Municipality GDS 2014/15 acknowledges that the district is not immune to challenges of poverty, unemployment, and income inequality; and therefore, recognises the district's moral obligation to address these challenges. The overarching direction of the district GDS points to a vision of economic, infrastructure and social development, safety and security, institutional development and poverty alleviation. The proposed development will contribute to infrastructure development, which will in turn support economic growth and development in the region.			
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
The timeframes for implementation of SDF's can range from short term timeframes (approx. 3 years – for example, Letsemeng SDF) to long term timeframes (up to 20 years). Some have a standard 5 year implementation plan (for example, Sol Plaatjie SDF). In all cases, the proposed development falls within the timeframes of the consulted District and Local SDFs.			
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	**YES√**		Please explain
The local communities of Kimberley and Jacobsdal are in need of electrical bulk services. The proposed project will contribute towards generating electricity and establishing the infrastructure necessary for future bulk services to be distributed from. The local community and area is therefore in need of the proposed activity which will contribute towards electricity infrastructure as well as generation and distribution.			

5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	**YES√**		Please explain
Eskom cost estimate letter (Appendix J1) states that there is capacity for 150MW to be connected to the proposed Kalkaar CSP substation on the Kalkaar Solar Thermal Power Project site.			
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	**YES√**		Please explain
No, however the proposed project will benefit the respective municipalities in that existing infrastructure will be provided by the applicant to Eskom as infrastructure which can be expanded in the future.			
7. Is this project part of a national programme to address an issue of national concern or importance?	**YES√**		Please explain
South Africa has embarked on an infrastructure growth programme supported by various government initiatives, including but not limited to, the National Development Plan (NDP), the Presidential Infrastructure Coordinating Commission (PICC), the Department of Energy's Integrated Resource Plan and National Strategy for Sustainable Development, the National Climate Change Response White Paper, the Presidency of the Republic of South Africa Medium-Term Framework and National Treasury's Carbon Tax Policy Paper. The South African Government adopted the National Infrastructure Plan in 2012 which is aimed at transforming the South African economic landscape as well as to provide the necessary aid regarding employment creation and delivery of basic services. The Plan is designed to integrate and coordinate the long term infrastructure build which is done via the Presidential Infrastructure Coordination Commission (PICC). A need assessment undertaken on behalf of this plan has led to the identification of 18 Strategic Integrated Project (SIP) – SIP 8 – 10 relates to energy generation, green energy generation and the transmission and distribution of electricity to all. With respect to SIP 10, the National Government aims to expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity. Over and above the aforementioned, the Infrastructure Development Act, Number 23 of 2014 was promulgated on 2 June 2014 in order to "provide for the facilitation and co-ordination of public infrastructure development which is of significant economic or social importance to the Republic; to ensure that infrastructure development in the Republic is given priority in planning, approval and implementation; to ensure that the development goals of the state are promoted through			

infrastructure development; to improve the management of such infrastructure during all life-cycle phases, including planning, approval, implementation and operations; and to provide for matters incidental thereto". Electricity generation and provision is regarded under strategic integrated projects and conspired a national priority in terms of Annexure 1 of the Act.

In consideration of the above, yes, the proposed project is intrinsically linked to the construction of the Kalkaar Solar Thermal Power Project, which is an issue of national concern or importance with regards to renewable energy (RE) development.

8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	**YES√**		Please explain

Much of the study area is characterised by rural areas with low densities of human settlement. Agriculture in the form of maize cultivation along the Modder River, mining near Kimberley and industrial development in the form of renewable energy development are also prevalent land uses, which has transformed the natural vegetation in some areas. However, a large portion of the study area has retained a moderately natural appearance. The most prominent anthropogenic elements in these areas include the N8 national highway, existing 132kV power lines and other linear elements, such as telephone poles, communication poles and farm boundary fences. The presence of this infrastructure will have a very limited impact visually on the land use since there are existing power lines present in the area.

9. Is the development the best practicable environmental option for this land/site?	**YES√**		Please explain

The power lines and associated infrastructure are intrinsically linked to the Kalkaar Solar Thermal Power Project, which is a National development priority. The project site already includes the N8 main road, 132kV power lines and other linear elements (such as telephone poles, communication poles and farm boundary fences). As such, the proposed development is a suitable development within this context considering that the presence of this infrastructure will have a very limited impact visually as as there is existing infrastructure present.

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	**YES√**		Please explain

The absence of the proposed power lines would mean that the Kalkaar Solar Thermal Power Project would not be connected to the national grid which would have negative consequences for the renewable energy targets in the country. The positive impacts relating to job creation would also not be realised.

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		**NO√**	Please explain

Currently there are already a number of renewable energy developments around Kimberley which has already set a precedent for the proposed land use. Additionally, Eskom have also set a precedent with existing power lines in the study area.

12. Will any person's rights be negatively affected by the proposed activity/ies?		**NO√**	Please explain

The proposed development will impact on individuals where the power lines are to be constructed on the land on which they are residing or using for various activities. Establishment of a servitude will be

required where the power line route is to be constructed. However, compensation will be provided to landowners following negotiations before establishment of the final route and tower positions.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		**NO√**	Please explain
The proposed power line would not impact the urban edge as it is a linear infrastructure development.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	**YES√**		Please explain
The Strategic Integrated Projects (SIPs) have been identified based on a spatial analysis of the South Africa's needs. The proposed development would contribute to SIP 8 – 10 relating to energy generation, green energy generation and the transmission and distribution of electricity to all. With respect to SIP 10, the National Government aims to expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.			
15. What will the benefits be to society in general and to the local communities?			Please explain
The proposed construction of the power line infrastructure will assist by providing the infrastructure for distribution of electricity to local communities as to be determined by Eskom. At a national level, the proposed project as a critical part of the Kalkaar Solar Thermal Power Project also has the potential to stimulate the national economy through an increase in production to the value of R180 million for the power line and associated infrastructure.			
16. Any other need and desirability considerations related to the proposed activity?			Please explain
As mentioned above, the proposed project is needed in order connect the Kalkaar Solar Thermal Power Project to the national grid. The Kalkaar Solar Thermal Power Project is needed in order to produce renewable energy to feed into the national grid and contribute to fulfilling South Africa's renewable energy goals.			
17. How does the project fit into the National Development Plan for 2030?			Please explain
The National Development Plan 2010 – 2030 (NDP 2030) aims to eliminate poverty and reduce inequality by 2030. At the same time it is geared towards achieving economic growth by expanding opportunities, building capabilities, reducing poverty, and involving communities in their own development, all leading to an increase in living standards of these communities. The NDP 2030 recognises nine key challenges that need to be addressed. Although all challenges are seen to be important, the priority areas can be identified as job creation and improvement of the quality of national education. Managing the transition towards a low carbon economy is also one of the nine key national challenges; in line with this, the expansion and acceleration of a commercial RE sector is seen as a key intervention strategy. The NDP 2030 seeks to ensure that half of all electricity generation capacity is provided by renewable resources (National Planning Commission, 2011). The Kalkaar Solar Thermal Power Project is dependent on the proposed project and is therefore in line with the goals of the NDP.			
18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.			
In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the required BA and public participation process (PPP) is being undertaken for the proposed power line in			

order to investigate and assess any potential environmental impacts associated with the proposed development prior to implementation. As part of the BA process several specialist studies were conducted to evaluate the actual and potential impact that the proposed development could have on the biophysical environment, socio-economic conditions and cultural heritage within the study area. In line with the general objectives of Integrated Environmental Management, the risks and consequences of the various alternatives were assessed and mitigation measures were recommended by each specialists in order to minimise the negative impacts and maximise the benefits of the proposed project. In addition, a thorough PPP is being undertaken as part of the BA, which will involve 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 will be taken into account by undertaking a thorough PPP in order to ensure that all Interested and Affected Parties (I&APs) are given the opportunity to be involved in the BA process and ultimately that their comments are taken into consideration by the DEA when reviewing the application. Several specialist studies were also undertaken to ensure that the development is sustainable and that disturbance to the environment is avoided were possible, minimised through appropriate mitigation measures and remedied via appropriate measures.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	In terms of the NEMA the proposed development must be considered, investigated and assessed prior to implementation.	Department of Environmental Affairs (DEA)	1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	In terms of section 38 of the NHRA, the responsible heritage resources authority can call for a Heritage Impact Assessment (HIA) where a power line is being proposed.	South African Heritage Resources Authority (SAHRA)	1999
National Water Act, 1998 (Act 36 of 1998)	If the development may need to take place within a water resource or within 500m radius of a delineated wetland a water use license is likely to be	Department of Water Affairs (DWA)	1998

	required with regards to water uses (c) and (i) of the NWA.		
National Environmental Management: Biodiversity Act, 2004 (Act No. of 2004)	Under the NEMBA the project proponent is required to take appropriate reasonable measures to limit the impacts on biodiversity, to obtain permits if required and to invite SANBI to provide commentary on any documentation resulting from the proposed development.	Department of Environmental Affairs (DEA) and South African National Biodiversity Institute (SANBI)	2004
National Forests Act, 1998 (Act 84 of 1998) (NFA)	The proposed project may result in the disturbance or damage to a tree protected under the NFA.	Department of Agriculture, Forestry and Fisheries (DAFF)	1998
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) as amended in 2001 (CARA)	The construction of power lines may impact on agricultural resources and vegetation on the site. The CARA prohibits the spreading of weeds and prescribes control measures that need to be complied with in order to achieve this.	Department of Agriculture, Forestry and Fisheries (DAFF)	1983
National Road Traffic Act, 1996 (No. 93 0f 1996)	All the requirements stipulated in the NRTA regarding traffic matters will need to be complied with during the construction and operational phases of the proposed power line.	South African National Roads Agency Limited (SANRAL)	1996
Regulations			
NEMA EIA 2014 Regulations	In terms of the EIA 2014 Regulations, a basic assessment process is required for this proposed project.	Department of Environmental Affairs (DEA)	2014
Guidelines			
Northern Cape Provincial Spatial Development Framework	The SDF is one of the fundamental implementation instruments, which provides the spatial dimensions for achieving the strategies for the province. The proposed development should be aligned	Northern Cape Provincial Government	2012

	with the provincial SDF.		
Northern Cape Provincial Growth and Development Strategy (NCPGDS), 2011	The NCPGDS is one of the fundamental implementation instruments, which provides the growth and development plans for achieving the strategies for the province. The proposed development should be aligned with the provincial NCPGDS.	Northern Cape Provincial Government	2011
Free State Provincial Spatial Development Framework (FSPSDF), 2014	The SDF is one of the fundamental implementation instruments, which provides the spatial dimensions for achieving the strategies for the province. The proposed development should be aligned with the provincial SDF.	Free State Provincial Government	2014
Free State Provincial Growth and Development Strategy (FSPGDS), 2012	The FSPGDS is one of the fundamental implementation instruments, which provides the growth and development plans for achieving the strategies for the province. The proposed development should be aligned with the provincial FSPGDS.	Free State Provincial Government	2012
Xhariep District Municipality Integrated Development Plan 2015/2016	The vision of the Xhariep District Municipality Integrated Development Plan is to be a leader in sustainable development. The proposed project will contribute to achieving this vision through sustainable, renewable energy generation.	Xhariep District Municipality	2015
Lejweleputswa District Municipality IDP 2016/2017	The vision of the Lejweleputswa District Municipality Integrated Development Plan is to be a leader in sustainable development and service delivery by 2030. The proposed project will contribute to achieving this vision through sustainable, renewable energy	Lejweleputswa District Municipality	2016

	generation.		
Frances Baard District Municipality Integrated Development Plan 2015/2016	The vision of the Frances Baard District Municipality Integrated Development Plan is to be a municipality with a clear development focus to improve the quality of life of all communities in the district. The proposed project will contribute to achieving this vision through providing electrical infrastructure and electrical capacity to assist in alleviating electrical demands for society in general, thereby improving the quality of life for society.	Frances Baard District Municipality	2015
Frances Baard District Municipality Growth and Development Strategy 2014/15	The FBDGDS is one of the fundamental implementation instruments, which provides the growth and development plans for achieving the strategies for the province. The proposed development should be aligned with the provincial FBDGDS.	Frances Baard District Municipality	2014
Letsemeng Local Municipality Integrated Development Plan 2016/17	The vision of the Letsemeng Local Municipality Integrated Development Plan is to maximise quality service to local communities. The proposed project will contribute to achieving this vision through providing Eskom power line infrastructure which can be expanded to supply electricity to local communities.	Letsemeng Local Municipality	2016
Sol Plaatjie Local Municipality Integrated Development Plan 2014/15-2016/17	The vision of the Sol Plaatjie Local Municipality Integrated Development Plan is to create conditions for economic growth social development and meet the basic needs of the community and improve the quality of life of all residents. The proposed project will contribute to achieving this vision through providing	Sol Plaatjie Local Municipality	2014 & 2016

	electrical infrastructure and electrical capacity to assist in alleviating electrical demands for society in general, thereby improving the quality of life for society.		

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES√**
If YES, what estimated quantity will be produced per month?	Unknown

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

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

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

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

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

All solid waste will be disposed of at the nearest registered landfill site.

Will the activity produce solid waste during its operational phase?	**YES√**
If YES, what estimated quantity will be produced per month?	Unknown

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

All solid waste will be collected and disposed of. Waste separation and recycling will take place where possible.

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

All solid waste will be disposed of at the nearest registered landfill site.

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

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

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

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

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

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

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

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?		NO✓
If YES, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?		NO✓

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

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

If YES, provide the particulars of the facility:

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

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

The proposed activity will only require a small amount of water for the proposed project which will be trucked in. There will be no generation of waste water for the construction of the power lines and associated infrastructure.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?		NO✓
If YES, is it controlled by any legislation of any sphere of government?	YES	NO

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

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

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

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?		NO✓

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

e) Generation of noise

Will the activity generate noise?	YES✓	
If YES, is it controlled by any legislation of any sphere of government?		NO✓

Describe the noise in terms of type and level:

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

13. WATER USE

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

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

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	N/a	
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	YES✓	

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

An application for water use can only be submitted once environmental authorisation has been granted. Pre-application meeting with the Department of Water and Sanitation (DWS) will be undertaken in due course should environmental authorisation be granted.

14. ENERGY EFFICIENCY

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

The proposed development will use the electricity generated by the Kalkaar Solar Thermal Power Project during operation. Where electricity is to be used for the operation of machinery and equipment during construction, this will be generated using conventional fuel generators.

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

The proposed development will primarily use the electricity supplied from Eskom during the construction, commissioning and operation phase. The Kalkaar Solar Thermal Power Project will however indirectly provide it's own electricity by augmenting the national electricity supply through the proposed power lines.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

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

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

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

Property description/physical address:

Province	Free State and Northern Cape Provinces
District Municipality	Lejweleputswa District Municipality (Free State Province) and Frances Baard District Municipality (Northern Cape Province)
Local Municipalities	Tokologo Local Municipality (Free State Province) and Sol Plaatje Local Municipality (Northern Cape Province)
Ward Number(s)	Free State Province Wards 2 & 3; Northern Cape Province Wards 21, 25 & 28
Farm name and number	Linear Activity – Please see Appendix J2
Portion number	Linear Activity – Please see Appendix J2
SG Code	Linear Activity – Please see Appendix J2

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:

Linear Activity – Please see Appendix J2

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

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

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Corridor 1 Jacobsdal Link (Green – Preferred):

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

Corridor 2 Alternative 1 Kalkaar via Kimberley DS to Boundary Substation (Purple):

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

Corridor 2 Alternative 2 Kalkaar via Kimberley DS to Boundary Substation (Turquoise – Preferred):

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

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

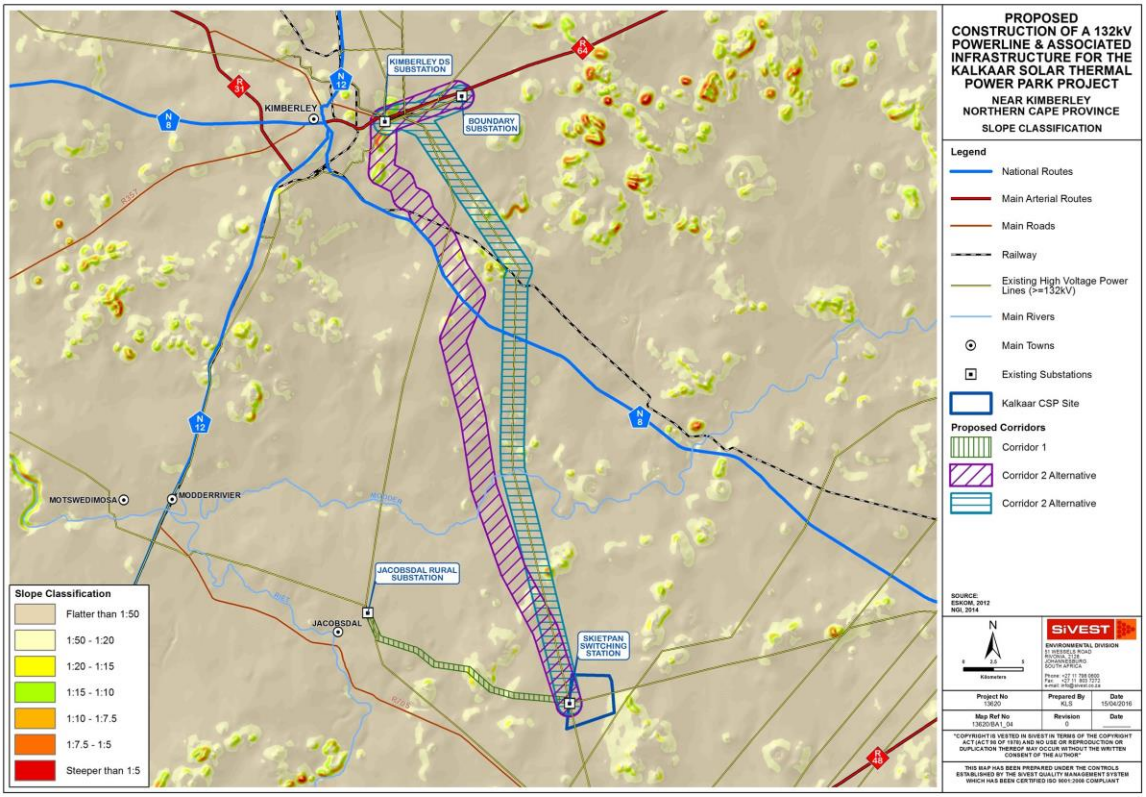

Figure 4: Slope Classification Map

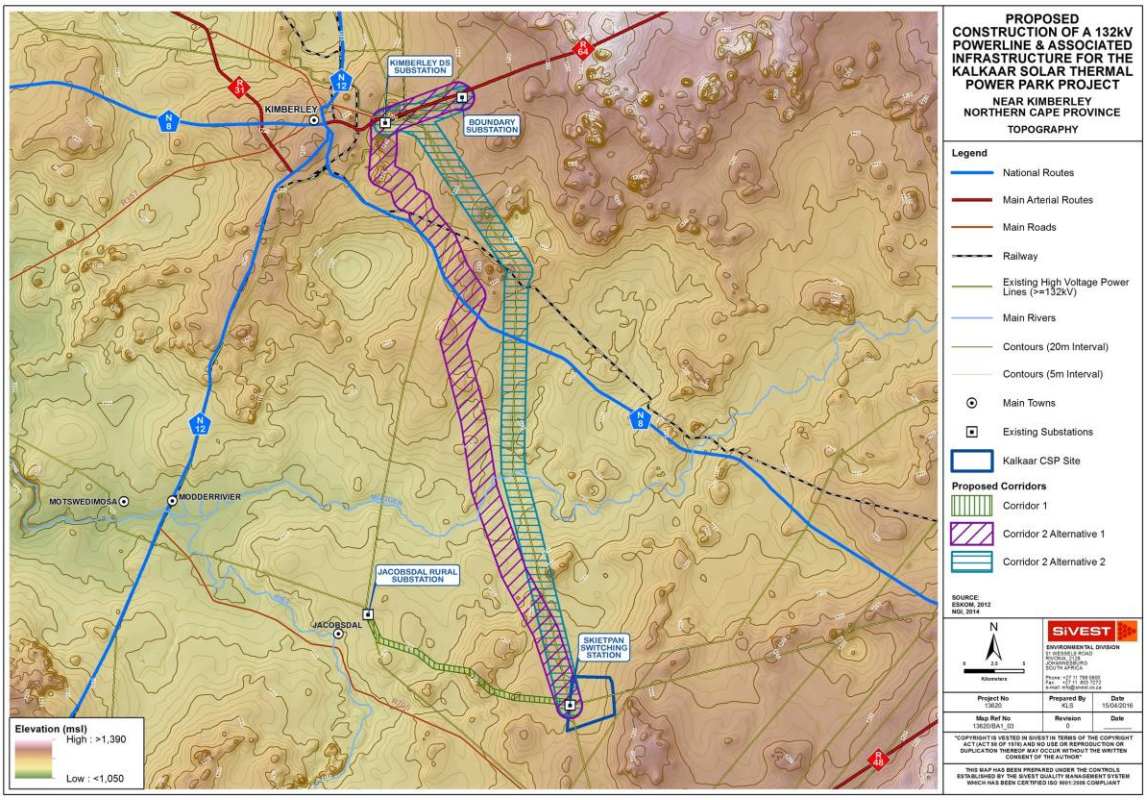

Figure 5: Topography Map

2. LOCATION IN LANDSCAPE

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

2.1 Ridgeline		2.4 Closed valley		2.7 Undulating plain / low hills	✓
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain	✓	2.9 Seafront	
2.10 At sea					

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Corridor 1 Jacobsdal Link (Green – Preferred)		Corridor 2 Alternative 1 Kalkaar via Kimberley DS to Boundary Substation (Purple)		Corridor 2 Alternative 2 Kalkaar via Kimberley DS to Boundary Substation (Turquoise – Preferred)	
Shallow water table (less than 1.5m deep)	YES✓		YES✓		YES✓	
Dolomite, sinkhole or doline areas		NO✓		NO✓		NO✓
Seasonally wet soils (often close to water bodies)	YES✓		YES✓		YES✓	
Unstable rocky slopes or steep slopes with loose soil	YES✓		YES✓		YES✓	
Dispersive soils (soils that dissolve in water)		NO✓		NO✓		NO✓
Soils with high clay content (clay fraction more than 40%)		NO✓		NO✓		NO✓
Any other unstable soil or geological feature		NO✓		NO✓		NO✓
An area sensitive to erosion		NO✓		NO✓		NO✓

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

A specialist wetland study was undertaken by Stephen Van Staden, and a soils and agricultural potential study was undertaken by Johann Lanz. These are included in Appendix D.

4. GROUNDCOVER

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

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

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

A specialist biodiversity study was undertaken by Simon Todd and is included in Appendix D.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?
Corridor 1 Jacobsdal Link (Green – Preferred)

Perennial River	YES	**NO**	UNSURE
Non-Perennial River	YES	**NO**	UNSURE
Permanent Wetland	YES	**NO**	UNSURE
Seasonal Wetland	**YES**	NO	UNSURE
Artificial Wetland	**YES – man made dams**	NO	UNSURE
Estuarine / Lagoonal wetland	YES	**NO**	UNSURE

Corridor 2 Alternative 1 Kalkaar via Kimberley DS to Boundary Substation (Purple)

Perennial River	YES	**NO**	UNSURE
Non-Perennial River	**YES – Modder river**	NO	UNSURE
Permanent Wetland	YES	**NO**	UNSURE
Seasonal Wetland	**YES**	NO	UNSURE
Artificial Wetland	**YES – man made dams**	NO	UNSURE
Estuarine / Lagoonal wetland	YES	**NO**	UNSURE

Corridor 2 Alternative 2 Kalkaar via Kimberley DS to Boundary Substation (Turquoise – Preferred)

Perennial River	YES	**NO**	UNSURE
Non-Perennial River	**YES – Modder river**	NO	UNSURE
Permanent Wetland	YES	**NO**	UNSURE
Seasonal Wetland	**YES**	NO	UNSURE
Artificial Wetland	**YES – Man made dams**	NO	UNSURE
Estuarine / Lagoonal wetland	YES	**NO**	UNSURE

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

A specialist surface water study was undertaken by Stephen Van Staden from Scientific Aquatic Services and is included in Appendix D.

6. LAND USE CHARACTER OF SURROUNDING AREA

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

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

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

Railway line – The proposed power line will need to cross the existing railway line. This will however be done by overhead crossing (as required per wayleave agreement with TRANSNET Freight Rail). As a result, the railway line will only be temporarily affected during the construction phase for the proposed power line crossing point.

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

Not applicable

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

Not applicable

An A3 Land Use Map is included in Appendix A.

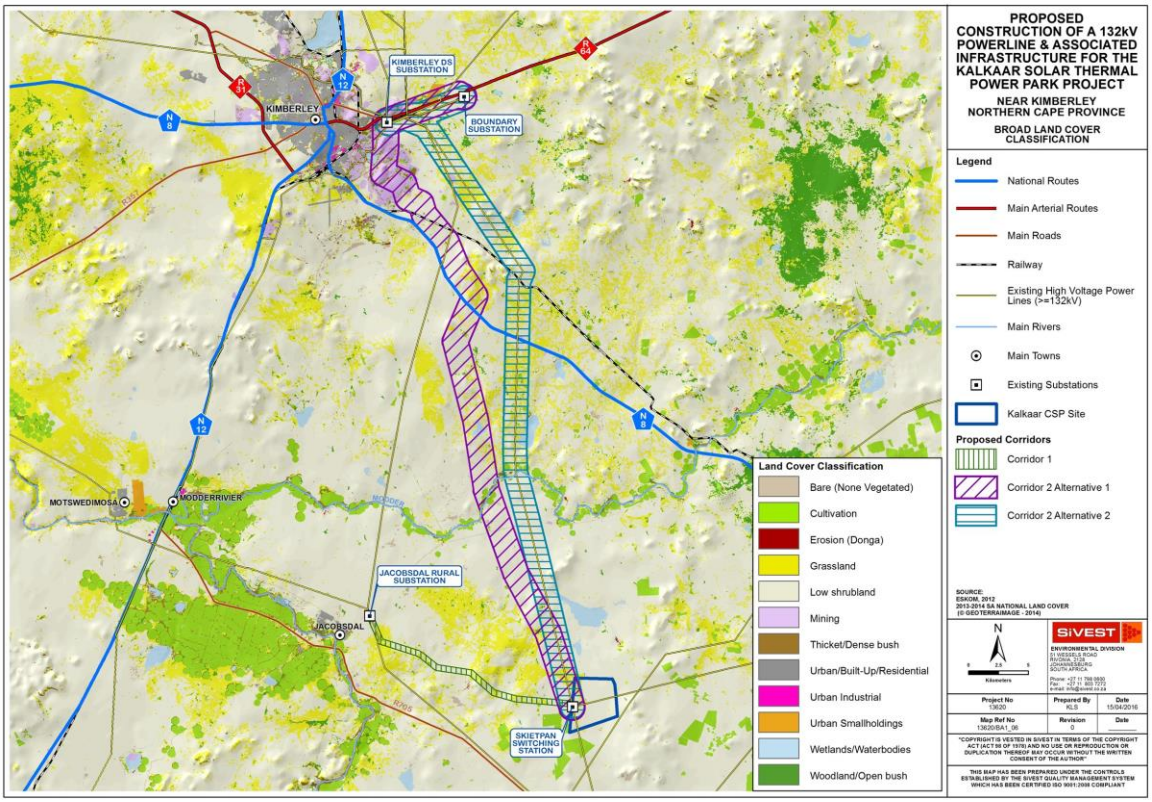

Figure 6: Land Use Map

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

Critical Biodiversity Area (as per provincial conservation plan)	YES	**NO√**
Core area of a protected area?	YES	**NO√**
Buffer area of a protected area?	YES	**NO√**

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

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

N/a

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	**Uncertain✓**
A heritage study was conducted by Wouter Fourie which included findings from a previously undertaken palaeontological study conducted by John Almond. Both findings are included in the heritage report compiled by PGS Heritage. The report is included in Appendix D.	

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 study shows that there are a total of 27 occurrences of heritage resources were identified within Corridor Alternative 2. Fourteen of these would require mitigation before exhumation (graves) or destruction (historical structures) if development were to come within 20 m. Thirteen occurrences of heritage resources have high significance and should not be disturbed by development within 20 m. It is likely that further survey work in the study area will uncover additional heritage resources, especially graves, ruins and rock art sites on hilltops. No other heritage resources were identified within the power line corridors.

The Palaeontological general desktop assessment based on the findings of the Phase 1 Palaeontological Assessments done by Rossouw (2013, 2014) as well as Groenewald (2013) indicates that large sections of the study area is underlain by Quaternary aged aeolian deposits. A wide variety of fossil remains have been reported from these deposits (although finds are often localised) and due to the fact that most of the fossils will only be exposed during the construction phase (Groenewald, 2013). Rossouw (2013, 2014) notes that the northern sections of the study area are characterised by Karoo dolerites (not palaeontological significant), deep geological formations such as the Permian Prince Albert formation and late Cenozoic deposits associated with fluvial environments along major rivers, spring areas or pans.

Such palaeontological sensitive pans occur all over the study area and with the Quaternary alluvial deposits of the Modder River can be seen as potentially high significance (Rossouw, 2014).

Palaeontological sensitivities can be found in the study area. The palaeontological sensitivity ranges from Moderate to very High and will require a field assessment during the final route walkdown.

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)?	**No✓**	
		Possibly✓ Should any heritage and/or palaeontological sensitivities be identified that cannot be avoided in the final walk-down before construction commences should environmental authorisation be granted.

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

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

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

Level of unemployment:

The Census 2011 data indicates that the Sol Plaatjie LM had about 164 394 people in the working-age population. Of these, 93 190 people were economically active; while roughly 43% of the working age population were not economically active (NEA); that is, persons aged 15–64 years who are neither employed nor unemployed at the time of the survey, including discouraged job seekers. The employed labour in the LM was estimated at 63 454; while the unemployed population was estimated at 29 736, reflecting an unemployment rate of 31.9%. This was the highest recorded unemployment rate among the delineated study areas.

In the Kimberley, 31 645 of the working age population were employed, with 9 052 of them unemployed. This means that 22.2% of the labour force in Kimberley was unemployed. On the other hand, 24 944 (38%) of the working age population were not economically active. In Jacobsdal, the unemployment rate was higher, at 27.3%.

Between 54% and 76% of the employed within the delineated study areas were employed in the formal sector. The Letsemeng LM recorded the highest percentage of informal employment

opportunities (31.4%). Private households provided for between 11.3% and 22.1% of the employment opportunities in the study areas. In Kimberley, 75.9% of the employment opportunities were provided by the formal sector and only 10.8% came from the informal sector. In Jacobsdal, 60.4% of the population is employed in the formal sector while 18.8% of the employment opportunities come from the informal sector.

In terms of skills levels, about 24.5% of the formally employed population in the Sol Plaatjie LM is highly skilled while 45% is skilled, and the remaining 30% is semi-skilled and unskilled. The majority of the employed population in Letsemeng (62.5%) and Tokologo (58.3%) is either semi-skilled or unskilled. Only 12% of the employed population in these areas is highly skilled. As the construction of power lines requires highly skilled personnel, possibly these will be sourced from Sol Plaatjie LM.

Economic profile of local municipality:

The Sol Plaatjie economy is relatively larger than the other economies under analysis; in 2013 it was valued at R16 532 million in current prices. This translates to a per capita Gross Domestic Product (GDP) of R66 650. The Letsemeng and Tokologo economies were valued at R1 927 million and R986 million in 2013 current prices, respectively. The per capita GDP for these local municipalities is considerably lower than that of the Sol Plaatjie LM with R49 885 for Letsemeng LM and R34 015 for Tokologo LM. Over a period of ten years (2003-2013), the SPM economy grew at a Compounded Average Growth Rate (CAGR) of 2.6% per year while that of the LLM grew at 2.5% per year. Although the TLM has the smallest economy, its economy grew at a higher rate of 3.3% over the same period. The comparatively high growth rate in the TLM can be attributed to the growth recorded in the wholesale, trade, and accommodation, utilities and community and personal services sectors (Quantec, 2016). In terms of economic activities, the economy of the SPM depends heavily on the tertiary sector, which made up 84.3% of GDP-R in 2013. The largest single contributing sector is the government services sector.

The economy of Letsemeng is also largely dependent on the tertiary sector; the finance and business services sector makes the most significant contribution to the local economy (19.4%), this sector's GDP generates just more than a quarter of the LM's GDP. The primary sector is also a significant contributor to the LM's economy; in 2013, agriculture contributed 12.7% to Letsemeng's GDP while mining contributed 10.3%. Within the TLM, it is evident from the manufacturing sector's contribution to the GDP of 28.6% that there is a significant amount of processing of the primary commodity output in agriculture and mining that takes place. The secondary sector significantly contributes to the LM's GDP. Other significant contributors to the LM's economy include finance and business services (16.2%), personal services (10.2%) and trade sectors (9.8%) (Quantec, 2016).

Level of education:

The SPM and Kimberley are clear examples of the phenomenon that the higher the percentage of educated people in a given community, the higher the monthly average household income. 9.6% of households in the TLM have no income, while about two thirds have an average monthly income of less than R3 200. This means that these households are unable to afford a basic minimum standard of living and are experiencing relatively low living standards and poor quality of life.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Approx. R 180 million
What is the expected yearly income that will be generated by or as a result of the activity?	Unknown – Eskom owned asset.
Will the activity contribute to service infrastructure?	YES [redacted]
Is the activity a public amenity?	[redacted] NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Approx. 15-30
What is the expected value of the employment opportunities during the development and construction phase?	Unknown – Eskom owned asset.
What percentage of this will accrue to previously disadvantaged individuals?	Approx. 45%
How many permanent new employment opportunities will be created during the operational phase of the activity?	Approx. 45%
What is the expected current value of the employment opportunities during the first 10 years?	Unknown – Eskom owned asset.
What percentage of this will accrue to previously disadvantaged individuals?	Unknown – Eskom owned asset.

9. BIODIVERSITY

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

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	N/A
				N/A
				N/A

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	Approx. 2%	Vaalbos Ricky Shrubland Occurs on numerous small rocky outcrops that are present throughout the study area. These are diverse areas and are also considered important for fauna, especially reptiles and small mammals which find shelter in the rocky habitat. This habitat usually has more trees than the surrounding plains although it is not always the case. Common trees and tall shrubs include *Acacia mellifera, Acacia tortillis, Eherthia rigida, Searsia burchelli, Diospyros lycioides*, *Rhigozum obovatum* and *Euclea crispa*. The grass layer usually consists of species such as *Themeda triandra*, *Heteropogon contortus, Digitaria eriantha* and *Enneapogon scoparius*. Pans There are numerous small to moderate sized pans along the power line routes between Kalkaar and the Boundary substation. Some of these are not well developed and probably very rarely hold water but rather represent run-on areas where water collects on a reasonably temporary basis. Some of the larger pans are however well developed and clearly hold water on a regular basis and represent ecologically important features of the area that contain a variety of associated temporary water organisms and attract many waders and water birds. Apart from the terrestrial impacts, the presence of numerous birds in these areas increases the potential for avifaunal impacts in the vicinity of these areas and the pans should be avoided as much as possible. The areas around the pans are usually heavily grazed and the vegetation very short and often lawn-like as a result. Common and typical species present include *Cynodon dactylon, Eragrostis bicolor, Hemarthria altissima, Panicum coloratum* and *Sporobolus fimbriatus* and *S.ioclados*. Shrubs present around the fringes of the pans include *Lycium cinereum*, *Atriplex vestita*, *Pentzia globosa* and *Salsola glabrescens*. Modder River Both options to Kimberly traverse the Modder River which is considered a sensitive feature due to the ecological significance of this area as a corridor for fauna as well as the unique aquatic habitats present here that are not

		represented elsewhere in the landscape of the area. The river is however heavily impacted by agricultural activities and due to heavy abstraction it does not flow on a perennial basis. The banks of the river are well vegetated with woody species, mostly *Acacia karoo* with *Salix mucronata* and *Tamarix usneoides*, while there may be large stands of *Phragmites australis* in some reaches. There is also a lot of disturbance and alien invasion along the river, with various *Eucalyptus* species, *Prosopis* spp. and kikuyu being prevalent. Although the river is sensitive, it is not very wide and it is likely that the power line will be able to span the river with little impact on the river itself.
Near Natural (includes areas with low to moderate level of alien invasive plants)	85%	Kimberley Thornveld Although this vegetation unit is mapped as being largely restricted to the north of the Modder River, in practice, it occurs as a mosaic with the Northern Upper Karoo with the latter being prevalent in areas of shallow soils, especially on calcrete, while Kimberly Thornveld is prevalent on deeper sandy and dolerite-derived soils. In sandy areas, *Acacia erioloba* tends to be dominant, while in areas with more clay in the soil, *Acacia tortillis* and *Searsia lancea* tend to be dominant, while other trees present include *Acacia mellifera*, *Acacia hebeclada*, *Zizyphus mucronata* and *Ehretia alba*. The density of the tree layer is variable and there are some areas that are virtually free of trees and other areas with a very high density. The grass layer is variable and affected to a large extent by the prevailing land use. Dominant and common species include *Schmidtia pappophoroides*, *Cenchrus cilliata*, *Themeda triandra*, *Stipagrostis uniplumis* var. *uniplumis* and *Aristida stipitata*. Common shrubs include *Selago saxatilis*, *Hermannia tomentosa, Lycium cinereum*, *Pentzia globosa* and forbs such as *Hirpicium echinus*, *Monsonia angustifolia* and *Sesamum capense*. Protected trees present in these areas include *Boscia albitrunca* and *Acacia erioloba*. While Acacia erioloba is dense in some areas and are likely to be impacted by the power line servitude, Boscia albitrunca is less common and ccurs as widely scattered individuals. Northern Upper Karoo In general, this vegetation unit characterised by extensive plains with low shrubby or grassy vegetation. Common and dominant species include shrubs such as *Pentzia globosa*, *Pentzia incana, Eriocephalus spinescens, Rosenia humilis, Lycium cinereum, Aptosimum marlothii, Asparagus glaucus, Salsola calluna, Salsola rabieana* and

		grasses such as *Aristida adscensionis, Enneapogon desvauxii, Eragrostis lehmanniana and Tragus koelerioides*. Trees are generally rare but may occur along drainage lines and on rocky hills and include *Acacia mellifera, Acacia tortillis* and *Acacia karoo*.
Degraded (includes areas heavily invaded by alien plants)	0%	None
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	Approx. 13%	Roads and power line infrastructure as well as areas of cultivation around the Modder River.

c) Complete the table to indicate:

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

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

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

The majority of the routes to Kimberly are within the Kimberly Thornveld and Northern Upper Karoo vegetation types, while the option to Jacobsdal is limited largely to Northern Upper Karoo. There are however also limited extents of Highveld Salt Pans and Vaalbos Rocky Shrubland within the corridors. These are each described in greater detail below.

Kimberley Thornveld
Although this vegetation unit is mapped as being largely restricted to the north of the Modder River, in practice, it occurs as a mosaic with the Northern Upper Karoo with the latter being prevalent in areas of shallow soils, especially on calcrete, while Kimberly Thornveld is prevalent on deeper sandy and dolerite-derived soils. In sandy areas, *Acacia erioloba* tends to be dominant, while in areas with more clay in the soil, *Acacia tortillis* and *Searsia lancea* tend to be dominant, while other trees present include *Acacia mellifera*, *Acacia hebeclada*, *Zizyphus mucronata* and *Ehretia alba*. The density of the tree layer is variable and there are some areas that are virtually free of trees and other areas with a very high density. The grass layer is variable and affected to a large extent by the prevailing land use. Dominant and common species include *Schmidtia pappophoroides*, *Cenchrus cilliata*, *Themeda*

triandra, *Stipagrostis uniplumis* var. *uniplumis* and *Aristida stipitata*. Common shrubs include *Selago saxatilis*, *Hermannia tomentosa, Lycium cinereum*, *Pentzia globosa* and forbs such as *Hirpicium echinus*, *Monsonia angustifolia* and *Sesamum capense*. Protected trees present in these areas include *Boscia albitrunca* and *Acacia erioloba*. While Acacia erioloba is dense in some areas and are likely to be impacted by the power line servitude, Boscia albitrunca is less common and ccurs as widely scattered individuals.

Northern Upper Karoo

In general, this vegetation unit characterised by extensive plains with low shrubby or grassy vegetation. Common and dominant species include shrubs such as *Pentzia globosa*, *Pentzia incana, Eriocephalus spinescens, Rosenia humilis, Lycium cinereum, Aptosimum marlothii, Asparagus glaucus, Salsola calluna, Salsola rabieana* and grasses such as *Aristida adscensionis, Enneapogon desvauxii, Eragrostis lehmanniana and Tragus koelerioides*. Trees are generally rare but may occur along drainage lines and on rocky hills and include *Acacia mellifera, Acacia tortillis* and *Acacia karoo*.

Vaalbos Ricky Shrubland

Occurs on numerous small rocky outcrops that are present throughout the study area. These are diverse areas and are also considered important for fauna, especially reptiles and small mammals which find shelter in the rocky habitat. This habitat usually has more trees than the surrounding plains although it is not always the case. Common trees and tall shrubs include *Acacia mellifera, Acacia tortillis, Eherthia rigida, Searsia burchelli, Diospyros lycioides*, *Rhigozum obovatum* and *Euclea crispa*. The grass layer usually consists of species such as *Themeda triandra*, *Heteropogon contortus, Digitaria eriantha* and *Enneapogon scoparius*.

Pans

There are numerous small to moderate sized pans along the power line routes between Kalkaar and the Boundary substation. Some of these are not well developed and probably very rarely hold water but rather represent run-on areas where water collects on a reasonably temporary basis. Some of the larger pans are however well developed and clearly hold water on a regular basis and represent ecologically important features of the area that contain a variety of associated temporary water organisms and attract many waders and water birds. Apart from the terrestrial impacts, the presence of numerous birds in these areas increases the potential for avifaunal impacts in the vicinity of these areas and the pans should be avoided as much as possible. The areas around the pans are usually heavily grazed and the vegetation very short and often lawn-like as a result. Common and typical species present include *Cynodon dactylon, Eragrostis bicolor, Hemarthria altissima, Panicum coloratum* and *Sporobolus fimbriatus* and *S.ioclados*. Shrubs present around the fringes of the pans include *Lycium cinereum*, *Atriplex vestita*, *Pentzia globosa* and *Salsola glabrescens*.

Modder River

Both options to Kimberly traverse the Modder River which is considered a sensitive feature due to the ecological significance of this area as a corridor for fauna as well as the unique aquatic habitats present here that are not represented elsewhere in the landscape of the area. The river is however heavily impacted by agricultural activities and due to heavy abstraction it does not flow on a perennial basis. The banks of the river are well vegetated with woody species, mostly *Acacia karoo* with *Salix mucronata* and *Tamarix usneoides*, while there may be large stands of *Phragmites australis* in some reaches. There is also a lot of disturbance and alien invasion along the river, with various *Eucalyptus*

species, *Prosopis* spp. and kikuyu being prevalent. Although the river is sensitive, it is not very wide and it is likely that the power line will be able to span the river with little impact on the river itself.

SECTION C: PUBLIC PARTICIPATION

Details of the Public Participation process is included in Appendix E.

1. ADVERTISEMENT AND NOTICE

Publication name	Details to be included in Final Basic Assessment Report	
Date published	Details to be included in Final Basic Assessment Report	
Site notice position	**Latitude**	**Longitude**
	Details to be included in Final Basic Assessment Report	Details to be included in Final Basic Assessment Report
Date placed	Details to be included in Final Basic Assessment Report	

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

Proof of the Advertisements and Site notices to be included in Final Basic Assessment Report in Appendix E1

2. DETERMINATION OF APPROPRIATE MEASURES

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

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

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

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

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

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

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

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report
Further details to be included in Final Basic Assessment Report	Further details to be included in Final Basic Assessment Report

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 are

included in Appendix E4.

6. CONSULTATION WITH OTHER STAKEHOLDERS

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

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

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

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

A list of registered I&APs is included in Appendix E5.
Full detail of the correspondence and minutes of meetings are to be included in Final Basic Assessment Report in Appendix E6.

SECTION D: IMPACT ASSESSMENT

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

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

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

Corridor 1 Jacobsdal Link (Green – Preferred)

Activity	Impact summary	Significance	Proposed mitigation
Biodiversity	***Direct impacts:***		
	Impacts on vegetation and protected plant species	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity: ▪ There should be a preconstruction walk-through of the power line route to identify species of conservation concern that should be avoided or translocated. ▪ Areas of dense stands of protected trees should be avoided where possible. ▪ The minimum amount of woody vegetation should be cleared to conform to Eskom standards.

Activity	Impact summary	Significance	Proposed mitigation
	Direct faunal impacts	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity: ▪ The power line should be routed to avoid the pans as much as possible. ▪ 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.
	Ecological degradation during operation	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Regular erosion and alien plant control along the powerline servitude. During operation and maintenance of the powerline servitude, alien species especially large woody species such as *Propsopis glandulosa* should be cleared from the pipeline servitude, but indigenous species such as *Boscia albitunca* and *Boscia foetida*, should not be cleared as they do not pose a fire risk. If any indigenous 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.
	Decommissioning impacts on fauna	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Disturbance during decommissioning should be kept as low as possible. Staff should undergo environmental induction to ensure that they are aware of fauna-related issues and that no fauna are harmed during decommissioning activities.
	Ecological	Low negative	The following mitigation measures would

Activity	Impact summary	Significance	Proposed mitigation
	degradation due to decommissioning	impact expected after mitigation	help to limit impacts: ▪ 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 route, 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.
	Indirect impacts:		
	None identified.	None identified	None identified.
	Cumulative impacts:		
	The density of renewable energy development in the Kimberly area is moderate, with several approved projects currently being built or nearing construction. The main source of habitat loss in the area is however due to agricultural practices with extensive clearing for irrigated croplands along the Modder River as well as dryland cropping scattered across the area. Although many of the dryland cropping areas have been abandoned, the full complement of biodiversity is slow to return to such areas. It is likely that the cumulative impact due to renewable energy development will increase significantly in the future. Due the low footprint of low voltage power lines, the contribution of the Kalkaar 132kV lines to cumulative impact in the area is not considered highly significant in the context of the surrounding landscape and the large-scale impacts on habitat loss resulting from agriculture, mining and renewable energy plants. Although power lines may generate significant cumulative impact on avifaunal, the long-term interaction with terrestrial biodiversity is low after mitigation and the contribution of the current development to cumulative impact on the area is low and would not generate significant long-term impact.		
Avifauna	***Direct impacts:***		
	Displacement of Red Data species due to disturbance and habitat transformation associated with construction of the 132kV power line	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Construction activity should be restricted to the immediate footprint of the infrastructure, where possible. ▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ▪ Measures to control noise and dust should be applied according to current best practice in the industry as provided for in the EMPr. ▪ Maximum use should be made of

Activity	Impact summary	Significance	Proposed mitigation
			existing access roads and the construction of new roads should be kept to a minimum.
	Collisions of Red Data species with the proposed 132kV line (operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of three years by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first three years. ▪ The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection. ▪ The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, alternating black and white.
	Electrocutions of Red Data species on the proposed 132kV line (operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of three years by the avifaunal specialist to establish if there is any significant electrocution mortality. Thereafter the frequency of inspections will be informed by the results of the first three years. ▪ The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection. ▪ All the steel monopoles should be fitted with bird perches.
	Displacement of Red Data species due to disturbance and habitat	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ De-commissioning activity should be restricted to the immediate

Activity	Impact summary	Significance	Proposed mitigation
	transformation associated with de-commissioning of the 132kV power line.		footprint of the infrastructure, where possible. ▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ▪ Measures to control noise and dust should be applied according to current best practice in the industry. ▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	The cumulative impact of disturbance due to disturbance and habitat transformation as a result of the building of the 132kV Kalkaar power line, is likely to be insignificant for the majority of Red Data species. The one exception to this statement concerns the White-backed Vulture breeding colonies around Kimberley and specifically the Susanna breeding area. Disturbance of these breeding birds could result in a significant impact on the local population of the species, given the suite of impacts to which the birds are already subjected to. The cumulative impact of disturbance and habitat transformation on Red Data species (in this instance White-backed Vultures) could therefore be potentially MAJOR, should Corridor 2 be implemented. The risks that power lines pose, is well researched (Shaw 2013). This transmission line will further increase the already high collision risk to Ludwig's Bustards, Blue Crane, Greater Flamingo, Lesser Flamingo and Kori Bustard that power lines pose throughout their range. The key question therefore is to what extent the proposed sub-transmission line will contribute to this existing and potentially significant mortality factor in the area around Kimberley. All in all, it is envisaged that collisions of Red Data species with the proposed line will have a MODERATE cumulative impact. Electrocutions is a major threat to vultures in South Africa (Van Rooyen 2000). The proposed 132kV Kalkaar sub-transmission line could pose an electrocution risk specifically to the population of White-backed Vultures breeding around Kimberley and Jacobsdal. If the steel monopole is used with a bird perch, the risk will be significantly reduced. It is envisaged that the risk of electrocution posed by the proposed powerline is MINOR, provided the monopole is fitted with a bird perch.		
Wetlands	***Direct impacts:***		
	Large Pans – Loss of habitat and structure	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation

Activity	Impact summary	Significance	Proposed mitigation
	(construction phase)		growth should be promoted within the freshwater resource zones to protect soils; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Small Pans – Loss of habitat and ecological structure	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the freshwater resource zones to protect soils; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas; ▪ Minimize construction footprints prior to commencement of the construction and control the edge

Activity	Impact summary	Significance	Proposed mitigation
			effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; ▪ Desilt the pans affected by construction activities; and ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Large Pans – Impact on ecological and sociocultural service provision	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the large pans to protect soils and limit the possible changes to the sediment balance of the pans; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas, as to limit soil compaction; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction

Activity	Impact summary	Significance	Proposed mitigation
			activities should occur in the low flow season, during the drier winter months; and ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Small Pans – Impact on ecological and sociocultural service provision	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the large pans to protect soils and limit the possible changes to the sediment balance of the pans; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas, as to limit soil compaction; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; and ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the

Activity	Impact summary	Significance	Proposed mitigation
			area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Large Pans – Impacts on hydrological function and sediment balance (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage; ▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the pans affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the freshwater resource areas during maintenance activities to prevent soil compaction.
	Small Pans – Impacts on hydrological function and sediment balance (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater

Activity	Impact summary	Significance	Proposed mitigation
			resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage; ▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the pans affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the freshwater resource areas during maintenance activities to prevent soil compaction.
	Indirect impacts:		
	None identified	None identified	None identified
	Cumulative impacts:		
	With several current and historical activities occurring within the vicinity of the proposed development, the potential cumulative impacts of such activities in conjunction with the potential impacts of the proposed linear development, were taken into consideration. Historical and existing activities taking place within the zone of influence of the proposed linear development, which may have impacts on the freshwater systems, include, but are not limited to: ▪ Urban and Peri-urban development (including the development of infrastructure such as the road and bridge crossings); ▪ Historical and current De Beers mining activities; ▪ Agricultural activities (livestock and game farming, and crop cultivation, particularly surrounding the Modder River); ▪ Solar Renewable Energy Projects in the vicinity of the proposed linear development and within close vicinity of the Modder River These activities have already resulted in the transformation and loss of riparian habitat within the Eastern Kalahari Bushveld Group 3 and Nama Karoo WetVeg Groups. Whilst both of these WetVeg groups are classified as “Least Threatened” (SANBI, 2013), further alterations and/or losses should be minimised as much as possible. Natural freshwater systems have been artificially impounded, abstraction		

Activity	Impact summary	Significance	Proposed mitigation
	from the Modder River for agricultural irrigation purposes occurs, and, in the case of pans, vegetation communities have been transformed as a result of grazing and trampling by livestock. Since a significant proportion of the surrounding area is already fenced off, especially for game farming, the Modder River is likely to have decreased capacity to function as part of a movement or migration corridor for fauna, although it was apparent during the site visit that it does still function as such to a degree. The overall impact on the connectivity of the landscape and the further disruption of ecosystem processes associated with freshwater features by the proposed linear development would thus be reduced by the proximity to these existing developments and activities. Considering the above, the cumulative impacts on the freshwater ecology by the proposed linear development in the region, should adequate mitigation measures be implemented, is considered to be low. However, it is imperative that adequate mitigation be implemented throughout the life of the development in order to minimise the potential impacts of the proposed linear development on the receiving environment, and thus minimise the cumulative impacts.		
Soils and Agricultural Potential	***Direct impacts:***		
	Loss of agricultural land use caused by direct occupation of land by the footprint of the power line infrastructure (construction and operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ None possible.
	Soil erosion caused by alteration of the surface characteristics (construction and operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Implement an effective system of run-off control, where it is required, that collects and safely disseminates all potential accumulations of run-off water and thereby prevents potential down slope erosion. This should be in place and maintained during all phases of the development. ▪ Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site to stabilize the soil against erosion.
	Loss of topsoil caused by poor topsoil	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Strip and stockpile topsoil from all

Activity	Impact summary	Significance	Proposed mitigation
	management (burial, erosion, etc) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.) and having the effect of loss of soil fertility on disturbed areas after rehabilitation (construction phase)		areas where soil will be disturbed below surface. ▪ After cessation of disturbance, re-spread topsoil over the surface. ▪ Dispose of any sub-surface spoils from excavations where they will not impact on agricultural land (for example use as road surfacing), or where they can be effectively covered with topsoil.
	Degradation of grazing beyond the direct development footprint caused by trampling due to vehicle passage, and deposition of dust.	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Minimize road footprint and control vehicle access on roads only. ▪ Control dust as per standard construction site practice.
	Indirect impacts:		
	None identified	None identified	None identified
	Cumulative impacts:		
	There are other proposed developments that will also occupy agricultural land in the area, and because the area is suitable for solar energy developments, there are likely to be more in the future. The potential for cumulative impacts therefore exists. However, because of the low agricultural impact of this development and the low agricultural sensitivity of the area, the cumulative impact is assessed as negligible.		
Heritage and Palaeontology	***Direct impacts:***		
	The possibility of encountering previously unidentified heritage resources. As well as the impact on the identified archaeological sites (Construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Monitoring during construction by an archaeologist ▪ Mitigation through archaeological excavations and collection ▪ Walk-down of final power line route
	The possibility of encountering	Low negative impact expected	The following mitigation measures would help to limit impacts:

Activity	Impact summary	Significance	Proposed mitigation
	previously unidentified engravings. As well as the impact on the identified engraving sites	after mitigation	▪ Monitoring during construction by an archaeologist ▪ Mitigation through archaeological excavations and collection ▪ Walk-down of final power line route
	The possibility of encountering previously unidentified graves and cemeteries. As well as the impact on the identified archaeological sites	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Monitoring during construction by an archaeologist ▪ Mitigation through archaeological excavations and collection ▪ Walk-down of final power line route
	The possibility of encountering previously unidentified heritage resources	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Monitoring during construction by a palaeontologist where required ▪ Walk-down of final power line route
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	An evaluation of the possible cumulative impacts from the combined solar projects in the area on heritage resources has shown that the biggest envisaged impact could be on the graves and engravings of this proposed development. Most heritage resources are point specific and in general impacts are found to be localised and impacting on the specific resource in a development. As such the cumulative impact on archaeological and historical heritage resources area deemed to be low.		
Visual	***Direct impacts:***		
	Alteration of the natural character of the study area and exposure to visual receptors to visual impacts associated with the construction phase	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Carefully plan in order to reduce the construction period where possible. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the

Activity	Impact summary	Significance	Proposed mitigation
			proposed site as far as possible. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Ensure that dust suppression is implemented in all areas where vegetation clearing has taken place, relevant to the project site. ▪ Ensure that dust suppression techniques are implemented on all soil stockpiles. ▪ Route / align the proposed power line to completely avoid any structures such as farmsteads / homesteads / dwellings.
	Alteration of the natural character of the study area and exposure to visual receptors to visual impacts associated with the operation phase	Medium negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ As far as possible, limit the amount of security and operational lighting present at the two (2) bay substations. ▪ If possible, the control room should not be illuminated at night. ▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the substation site and power line access roads. ▪ The control room should be painted with natural tones that fit with the surrounding environment. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Align power lines to run parallel to existing power lines and other linear elements, where possible. ▪ Avoid crossing areas of high elevation, especially ridges, koppies or hills, where possible. ▪ Non-reflective surfaces should be utilised where possible.
	Indirect impacts:		

Activity	Impact summary	Significance	Proposed mitigation
	None identified.		
	Cumulative impacts:		
	None identified for this alternative power line corridor.		
Socio-economic	***Direct impacts:***		
	Stimulation of the economy during construction	Medium positive impact after mitigation is expected	The following mitigation measures would help to enhance positive impacts: ▪ Investigate the opportunity to procure services required during construction within the local economy ▪ Where practically possible, procure required services from local businesses
	Impact on employment and household income during construction	Low positive impact after mitigation is expected	The following mitigation measures would help to enhance positive impacts: ▪ Where practically feasible, source workers required to construct the necessary infrastructure from local communities.
	Impact on strengthening national grid capacity	Low positive impact	No mitigation measures could be identified for the proposed project to enhance the positive impact.
	Impact on current business activities	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ It is proposed that the final power line route and tower positions within the preferred corridor for the power line are selected in consultation with the possible affected landowners during servitude negotiations before any construction commences. The final alignment and tower positions are to be chosen in such a way as to avoid affecting business practices that could potentially be sensitive to the power lines, i.e. commercial game breeding and game hunting.
	Impact on future developments	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ It will be imperative to ensure that the design of the power line route takes into account the layout of the solar energy park planned to be built on the Farm Klipdrift 20.

Activity	Impact summary	Significance	Proposed mitigation
			▪ The developers/owners of the solar energy park project will also need to be consulted prior the selection of the final power line route and tower positions before construction commences.
	Impact on loss of property	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ Access to the construction site must be strictly controlled. ▪ Fire prevention measures must be implemented and fire control equipment must be present at strategic locations within the construction site. ▪ Where necessary, the contractor should consider recruiting workers from the local community rather than non-local workers. Local workers are better known and more identifiable to the local community, better integrated in the community and more likely to live with their families instead of living alone. All of these factors significantly reduce tendency to commit crime (i.e. stock theft and burglaries). ▪ Recruitment of workers should be planned in advance and should not take place on-site. This will reduce the probability of work seekers loitering in the area surrounding the project sites.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	The project will improve the reliability of electricity supply in the region and could lead to establishing more electricity connections in the area, ultimately improving access to electricity in the municipality. The project will also have a positive albeit small impact on the national economy and local employment, as expenditure on construction activities to the value of between R60 million and R144 million, depending on the corridor chosen, is likely to stimulate between R180 million and R432 million of production revenue in the country and create up to fourteen temporary direct employment opportunities for the local communities.		

Activity	Impact summary	Significance	Proposed mitigation
	One new development has been identified to be located in the zone of influence of the proposed project. It refers to the Pulida Solar Park that has been approved under Bid Window 3 of the RE IPPPP and is currently awaiting the construction. In light of this and other developments within the RE IPPPP taking place in the country, the proposed project will create both positive and negative cumulative effects: ▪ On one hand, the investment into the project will increase economic activity in the area and create temporary jobs. However, due to their relatively small scales in light of the greater investment stimulated through the RE IPPPP, this cumulative effect will be negligible. The positive effect on strengthening the grid capacity could though be notable, particularly considering that Pulida Solar Park will also be built in the area and will also assist in strengthening the grid capacity in the region. ▪ On the other hand, considering that the project is likely to be built after the Pulida Solar Park is developed, it may extend the duration of some of the negative effects in the zone of influence associated with the presence of construction workers in rural areas and specifically in farming communities (such as livestock theft and loss of personal property). This cumulative effect, though, is envisaged to be minor due to the relatively small number of workers to be present on site at a time.		
No-go option			
	Direct impacts:		
	The job creation and local investment expected for the local area would not occur. The expected capital injection into the LM would be prevented. The electricity generated at the Kalkaar Solar Thermal Power Project would not be connected to the grid and greater electricity security would not be achieved, South Africa would not have the benefit of the Kalkaar Solar Thermal Power Project contributing to the country's renewable energy targets.		
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	None identified.		

Corridor 2 Alternative 1 Kalkaar via Kimberley DS to Boundary Substation (Purple)

Activity	Impact summary	Significance	Proposed mitigation
Biodiversity	***Direct impacts:***		
	Impacts on vegetation and protected plant species	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity: ▪ There should be a preconstruction walk-through of the power line route to identify species of conservation concern that should be avoided or translocated. ▪ Areas of dense stands of

Activity	Impact summary	Significance	Proposed mitigation
			protected trees should be avoided where possible. ▪ The minimum amount of woody vegetation should be cleared to conform to Eskom standards.
	Direct faunal impacts	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity: ▪ The power line should be routed to avoid the pans as much as possible. ▪ 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.
	Ecological degradation during operation	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Regular erosion and alien plant control along the powerline servitude. During operation and maintenance of the powerline servitude, alien species especially large woody species such as *Propsopis glandulosa* should be cleared from the pipeline servitude, but indigenous species such as *Boscia albitunca* and *Boscia foetida*, should not be cleared as they do not pose a fire risk. If any indigenous 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.

Activity	Impact summary	Significance	Proposed mitigation
	Decommissioning impacts on fauna	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Disturbance during decommissioning should be kept as low as possible. Staff should undergo environmental induction to ensure that they are aware of fauna-related issues and that no fauna are harmed during decommissioning activities.
	Ecological degradation due to decommissioning	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ 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 route, 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.
	Indirect impacts:		
	None identified.	None identified	None identified.
	Cumulative impacts:		
	The density of renewable energy development in the Kimberly area is moderate, with several approved projects currently being built or nearing construction. The main source of habitat loss in the area is however due to agricultural practices with extensive clearing for irrigated croplands along the Modder River as well as dryland cropping scattered across the area. Although many of the dryland cropping areas have been abandoned, the full complement of biodiversity is slow to return to such areas. It is likely that the cumulative impact due to renewable energy development will increase significantly in the future. Due the low footprint of low voltage power lines, the contribution of the Kalkaar 132kV lines to cumulative impact in the area is not considered highly significant in the context of the surrounding landscape and the large-scale impacts on habitat loss resulting from agriculture, mining and renewable energy plants. Although power lines may generate significant cumulative impact on avifaunal, the long-term interaction with terrestrial biodiversity is low after mitigation and the contribution of the current development to cumulative impact on the area is low and would not generate significant long-term impact.		
Avifauna	***Direct impacts:***		
	Displacement of Red Data species due to disturbance and habitat	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Construction activity should be restricted to the immediate

Activity	Impact summary	Significance	Proposed mitigation
	transformation associated with construction of the 132kV power line		footprint of the infrastructure. ▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ▪ Measures to control noise and dust should be applied according to current best practice in the industry. ▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
	Collisions of Red Data species with the proposed 132kV line (operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of three years by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first three years. ▪ The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection. ▪ The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, alternating black and white.
	Electrocutions of Red Data species on the proposed 132kV line (operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of three years by the avifaunal specialist to establish if there is any significant electrocution mortality. Thereafter the frequency of inspections will be informed by the results of the first three years. ▪ The detailed protocol to be

Activity	Impact summary	Significance	Proposed mitigation
			followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection. ▪ All the steel monopoles should be fitted with bird perches.
	Displacement of Red Data species due to disturbance and habitat transformation associated with de-commissioning of the 132kV power line.	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ De-commissioning activity should be restricted to the immediate footprint of the infrastructure. ▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ▪ Measures to control noise and dust should be applied according to current best practice in the industry. ▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. ▪ Prior to the de-commissioning of the line, a walk-through must be conducted to ascertain of any White-backed Vulture breeding pairs will be impacted by the de-commissioning activities. If any breeding pairs are potentially at risk, the de-commissioning will have to be timed to fall outside the breeding season (April to July).
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	The cumulative impact of disturbance due to disturbance and habitat transformation as a result of the building of the 132kV Kalkaar sub-transmission line, is likely to be insignificant for the majority of Red Data species. The one exception to this statement concerns the White-backed Vulture breeding colonies around Kimberley and specifically the Susanna breeding area. Disturbance of these breeding birds could result in a significant impact on the local population of the species, given the suite of impacts to which the birds are already subjected to. The cumulative impact of disturbance and habitat transformation on Red Data species (in this instance White-backed Vultures) could therefore be potentially MAJOR, should Corridor 2 be implemented.		

Activity	Impact summary	Significance	Proposed mitigation
	The risks that power lines pose to is well researched (Shaw 2013). This transmission line will further increase the already high collision risk to Ludwig's Bustards, Blue Crane, Greater Flamingo, Lesser Flamingo and Kori Bustard that power lines pose throughout their range. The key question therefore is to what extent the proposed sub-transmission line will contribute to this existing and potentially significant mortality factor in the area around Kimberley. All in all, it is envisaged that collisions of Red Data species with the proposed line will have a MODERATE cumulative impact. Electrocutions is a major threat to vultures in South Africa (Van Rooyen 2000). The proposed 132kV Kalkaar sub-transmission line could pose an electrocution risk specifically to the population of White-backed Vultures breeding around Kimberley and Jacobsdal. If the steel monopole is used with a bird perch, the risk will be significantly reduced. It is envisaged that the risk of electrocution posed by the proposed powerline is MINOR, provided the monopole is fitted with a bird perch.		
Wetlands	***Direct impacts:***		
	Modder River – Loss of riparian habitat and structure (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Careful planning of the placement of towers, taking into consideration the locality of riparian habitats and as much as possible, avoid placement of towers within riparian habitat, and powerlines are preferably to span over the relevant resource. ▪ Where it is impossible to avoid placing infrastructure within riparian habitat, flow connectivity must be retained by preventing fragmentation of the riparian habitat; ▪ Ensure that no canalization or further incision of the riparian resource takes place as a result of the construction activities; ▪ Vegetation clearing prior to construction must be minimized and the area re-seeded following construction with indigenous/endemic species to aid in the natural recovery of vegetation. ▪ Clearing/felling of woody vegetation should be limited to

Activity	Impact summary	Significance	Proposed mitigation
			trees/shrubs above the maximum permitted clearance height, and the understory should not be cleared. Where possible, crossing points should be chosen to avoid large riparian trees. ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr). ▪ Exposed soils to be protected with suitable geotextile coverings, such as hessian sheets, at all times during the construction phase, and no stockpiling of soils is to take place within the riparian zone or associated buffer zone. ▪ Lay down areas should be placed outside the delineated riparian corridors/buffer zones, and construction right of ways may only be created through or across watercourses if proposed for use during operations and no existing right of way exist. However it is recommended that where existing roads / accesses cross watercourses exist these be used as a primary right of way. ▪
	Large Pans – Loss of habitat and structure (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the freshwater resource zones to protect soils; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the

Activity	Impact summary	Significance	Proposed mitigation
			Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Small Pans – Loss of habitat and ecological structure	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the freshwater resource zones to protect soils; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; ▪ Desilt the pans affected by

Activity	Impact summary	Significance	Proposed mitigation
			construction activities; and ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Modder River – Loss of ecological and sociocultural service provision (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Careful planning of the placement of towers, taking into consideration the locality of riparian habitats and as much as possible, avoid placement of towers within riparian habitat, and powerlines are preferably to span over the relevant resource. ▪ During construction, use techniques which support the hydrology and sediment control functions of the freshwater resource; ▪ As much vegetation growth should be promoted within the freshwater resource to protect the soils thereof; ▪ Limit excavations to a limited extent to ensure that drainage patterns within the feature returns to normal as soon as possible after construction; ▪ Restrict construction to the drier winter months if possible to avoid sedimentation of the freshwater feature and to minimize disturbance of the features and its hydraulic function. ▪ Monitor the freshwater resource areas for erosion and incision; and ▪ Implement an alien vegetation control program within freshwater resource and ensure establishment of indigenous

Activity	Impact summary	Significance	Proposed mitigation
			species within areas where alien vegetation was identified.
	Large Pans – Impact on ecological and sociocultural service provision	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the large pans to protect soils and limit the possible changes to the sediment balance of the pans; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas, as to limit soil compaction; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; and ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Small Pans – Impact on ecological and sociocultural service provision	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the large pans to protect soils and limit the possible changes to the sediment balance of the pans;

Activity	Impact summary	Significance	Proposed mitigation
			▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas, as to limit soil compaction; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; and ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Modder River – Impacts on hydrological function and sediment balance	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage;

Activity	Impact summary	Significance	Proposed mitigation
			▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the freshwater resource areas affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the freshwater resource areas during maintenance activities to prevent soil compaction.
	Large Pans – Impacts on hydrological function and sediment balance (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage; ▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the pans affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the

Activity	Impact summary	Significance	Proposed mitigation
			freshwater resource areas during maintenance activities to prevent soil compaction.
	Small Pans – Impacts on hydrological function and sediment balance (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage; ▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the pans affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the freshwater resource areas during maintenance activities to prevent soil compaction.
	Indirect impacts:		
	None identified	None identified	None identified
	Cumulative impacts:		
	With several current and historical activities occurring within the vicinity of the proposed development, the potential cumulative impacts of such activities in conjunction with the potential impacts of the proposed linear development, were taken into consideration. Historical and existing activities taking place within the zone of influence of the proposed linear development, which may have impacts on the freshwater systems, include, but are not limited to: ▪ Urban and Peri-urban development (including the development of		

Activity	Impact summary	Significance	Proposed mitigation
	infrastructure such as the road and bridge crossings); ▪ Historical and current De Beers mining activities; ▪ Agricultural activities (livestock and game farming, and crop cultivation, particularly surrounding the Modder River); ▪ Solar Renewable Energy Projects in the vicinity of the proposed linear development and within close vicinity of the Modder River These activities have already resulted in the transformation and loss of riparian habitat within the Eastern Kalahari Bushveld Group 3 and Nama Karoo WetVeg Groups. Whilst both of these WetVeg groups are classified as "Least Threatened" (SANBI, 2013), further alterations and/or losses should be minimised as much as possible. Natural freshwater systems have been artificially impounded, abstraction from the Modder River for agricultural irrigation purposes occurs, and, in the case of pans, vegetation communities have been transformed as a result of grazing and trampling by livestock. Since a significant proportion of the surrounding area is already fenced off, especially for game farming, the Modder River is likely to have decreased capacity to function as part of a movement or migration corridor for fauna, although it was apparent during the site visit that it does still function as such to a degree. The overall impact on the connectivity of the landscape and the further disruption of ecosystem processes associated with freshwater features by the proposed linear development would thus be reduced by the proximity to these existing developments and activities. Considering the above, the cumulative impacts on the freshwater ecology by the proposed linear development in the region, should adequate mitigation measures be implemented, is considered to be low. However, it is imperative that adequate mitigation be implemented throughout the life of the development in order to minimise the potential impacts of the proposed linear development on the receiving environment, and thus minimise the cumulative impacts.		
Soils and Agricultural Potential	***Direct impacts:***		
	Loss of agricultural land use caused by direct occupation of land by the footprint of the power line infrastructure (construction and operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Implement an effective system of run-off control, where it is required, that collects and safely disseminates all potential accumulations of run-off water and thereby prevents potential down slope erosion. This should be in place and maintained during all phases of the development. ▪ Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas

Activity	Impact summary	Significance	Proposed mitigation
			throughout the site to stabilize the soil against erosion.
	Soil erosion caused by alteration of the surface characteristics (construction and operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Minimize road footprint and control vehicle access on roads only. ▪ Control dust as per standard construction site practice.
	Loss of topsoil caused by poor topsoil management (burial, erosion, etc) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.) and having the effect of loss of soil fertility on disturbed areas after rehabilitation (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Strip and stockpile topsoil from all areas where soil will be disturbed below surface. ▪ After cessation of disturbance, re-spread topsoil over the surface. ▪ Dispose of any sub-surface spoils from excavations where they will not impact on agricultural land (for example use as road surfacing), or where they can be effectively covered with topsoil.
	Degradation of grazing beyond the direct development footprint caused by trampling due to vehicle passage, and deposition of dust.	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Minimize road footprint and control vehicle access on roads only. ▪ Control dust as per standard construction site practice.
	Indirect impacts:		
	None identified	None identified	None identified
	Cumulative impacts:		
	There are other proposed developments that will also occupy agricultural land in the area, and because the area is suitable for solar energy developments, there are likely to be more in the future. The potential for cumulative impacts therefore exists. However, because of the low agricultural impact of this development and the low agricultural sensitivity of the area, the cumulative impact is assessed as negligible.		
Heritage and Palaeontology	***Direct impacts:***		
	The possibility of	Low negative	The following mitigation measures would

Activity	Impact summary	Significance	Proposed mitigation
	encountering previously unidentified heritage resources. As well as the impact on the identified archaeological sites (Construction phase)	impact expected after mitigation	help to limit impacts: ▪ Monitoring during construction by an archaeologist ▪ Mitigation through archaeological excavations and collection ▪ Walk-down of final power line route
	The possibility of encountering previously unidentified engravings. As well as the impact on the identified engraving sites	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Monitoring during construction by an archaeologist ▪ Mitigation through archaeological excavations and collection ▪ Walk-down of final power line route
	The possibility of encountering previously unidentified graves and cemeteries. As well as the impact on the identified archaeological sites	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Monitoring during construction by an archaeologist ▪ Mitigation through archaeological excavations and collection ▪ Walk-down of final power line route
	The possibility of encountering previously unidentified heritage resources	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Monitoring during construction by a palaeontologist where required ▪ Walk-down of final power line route
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	An evaluation of the possible cumulative impacts from the combined solar projects in the area on heritage resources has shown that the biggest envisaged impact could be on the graves and engravings of this proposed development. Most heritage resources are point specific and in general impacts are found to be localised and impacting on the specific resource in a development. As such the cumulative impact on archaeological and historical heritage resources area deemed to be low.		
Visual	***Direct impacts:***		
	Alteration of the natural character of the study area and	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Carefully plan to reduce the

Activity	Impact summary	Significance	Proposed mitigation
	exposure to visual receptors to visual impacts associated with the construction phase		construction period. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the proposed site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Ensure that dust suppression is implemented in all areas where vegetation clearing has taken place. ▪ Ensure that dust suppression techniques are implemented on all soil stockpiles. ▪ Select the alternatives that will have the least impact on visual receptors. ▪ Route / align the proposed power line to completely avoid any structures such as farmsteads / homesteads / dwellings.
	Alteration of the natural character of the study area and exposure to visual receptors to visual impacts associated with the operation phase	Medium negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ As far as possible, limit the amount of security and operational lighting present at the two (2) bay substations. ▪ If possible, the control room should not be illuminated at night. ▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the substation site and power line

Activity	Impact summary	Significance	Proposed mitigation
			access roads. ▪ The control room should be painted with natural tones that fit with the surrounding environment. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Align power lines to run parallel to existing power lines and other linear elements, where possible. ▪ Avoid crossing areas of high elevation, especially ridges, koppies or hills, where possible. ▪ Non-reflective surfaces should be utilised where possible.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	Planned renewable energy developments and their potential for large scale visual impacts could significantly alter the sense of place and visual character within the study area, once constructed. The cumulative visual impact experienced from each potentially sensitive visual receptor location will depend on the number of proposed renewable energy developments within viewing distance. As mentioned above, the height of the development in combination with distance are critical factors when assessing visual impacts. As such, the proposed solar energy facilities are unlikely to be visible from beyond 5km, and from beyond this distance the degree of visual impact would be considered to be insignificant. As such, only the Pulida Solar Project will be in viewing distance from the potentially sensitive receptor locations identified within the study area. For this reason it is envisaged that the biggest cumulative impact would be the change in the visual character within the southern part of the study area near the Pulida Solar Project. It should also be noted that this facility would reduce the scenic quality of the visual baseline in this part of the study area once constructed, and thereby reduce the visual impact of the proposed power line on surrounding potentially sensitive receptor locations.		
Socio-economic	***Direct impacts:***		
	Stimulation of the economy during construction	Medium positive impact after mitigation is expected	The following mitigation measures would help to enhance positive impacts: ▪ Investigate the opportunity to procure services required during construction within the local economy ▪ Where practically possible, procure required services from local businesses
	Impact on employment and	Low positive impact after	The following mitigation measures would help to enhance positive impacts:

Activity	Impact summary	Significance	Proposed mitigation
	household income during construction	mitigation is expected	▪ Where practically feasible, source workers required to construct the necessary infrastructure from local communities.
	Impact on strengthening national grid capacity	Low positive impact after mitigation is expected	No mitigation measures could be identified for the proposed project to enhance the positive impact.
	Impact on current business activities	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ It is proposed that the final power line route and tower positions within the preferred corridor for the power line are selected in consultation with the possible affected landowners during servitude negotiations before any construction commences. The final alignment and tower positions are to be chosen in such a way as to avoid affecting business practices that could potentially be sensitive to the power lines, i.e. commercial game breeding and game hunting.
	Impact on future developments	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ It will be imperative to ensure that the design of the power line route takes into account the layout of the solar energy park planned to be built on the Farm Klipdrift 20. ▪ The developers/owners of the solar energy park project will also need to be consulted prior the selection of the final power line route and tower positions before construction commences.
	Impact on loss of property	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ Access to the construction site must be strictly controlled. ▪ Fire prevention measures must be implemented and fire control equipment must be present at strategic locations within the construction site.

Activity	Impact summary	Significance	Proposed mitigation
			▪ Where necessary, the contractor should consider recruiting workers from the local community rather than non-local workers. Local workers are better known and more identifiable to the local community, better integrated in the community and more likely to live with their families instead of living alone. All of these factors significantly reduce tendency to commit crime (i.e. stock theft and burglaries). ▪ Recruitment of workers should be planned in advance and should not take place on-site. This will reduce the probability of work seekers loitering in the area surrounding the project sites.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	The project will improve the reliability of electricity supply in the region and could lead to establishing more electricity connections in the area, ultimately improving access to electricity in the municipality. The project will also have a positive albeit small impact on the national economy and local employment, as expenditure on construction activities to the value of between R60 million and R144 million, depending on the corridor chosen, is likely to stimulate between R180 million and R432 million of production revenue in the country and create up to fourteen temporary direct employment opportunities for the local communities. One new development has been identified to be located in the zone of influence of the proposed project. It refers to the Pulida Solar Park that has been approved under Bid Window 3 of the RE IPPPP and is currently awaiting the construction. In light of this and other developments within the RE IPPPP taking place in the country, the proposed project will create both positive and negative cumulative effects: ▪ On one hand, the investment into the project will increase economic activity in the area and create temporary jobs. However, due to their relatively small scales in light of the greater investment stimulated through the RE IPPPP, this cumulative effect will be negligible. The positive effect on strengthening the grid capacity could though be notable, particularly considering that Pulida Solar Park will also be built in the area and will also assist in strengthening the grid capacity in the region. On the other hand, considering that the project is likely to be built after the Pulida Solar Park is developed, it may extend the duration of some of the negative effects in the zone of influence associated with the presence of construction workers in rural		

Activity	Impact summary	Significance	Proposed mitigation
	areas and specifically in farming communities (such as livestock theft and loss of personal property). This cumulative effect, though, is envisaged to be minor due to the relatively small number of workers to be present on site at a time.		
No-go option			
	Direct impacts:		
	The job creation and local investment expected for the local area would not occur. The expected capital injection into the LM would be prevented. The electricity generated at the Kalkaar Solar Thermal Power Project would not be connected to the grid and greater electricity security would not be achieved, South Africa would not have the benefit of the Kalkaar Solar Thermal Power Project contributing to the country's renewable energy targets.		
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	None identified.		

Corridor 2 Alternative 2 Kalkaar via Kimberley DS to Boundary Substation (Turquoise – Preferred)

Activity	Impact summary	Significance	Proposed mitigation
Biodiversity	***Direct impacts:***		
	Impacts on vegetation and protected plant species	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity: ▪ There should be a preconstruction walk-through of the power line route to identify species of conservation concern that should be avoided or translocated. ▪ Areas of dense stands of protected trees should be avoided where possible. ▪ The minimum amount of woody vegetation should be cleared to conform to Eskom standards.
	Direct faunal impacts	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts, but will not affect the extent, probability, reversibility, irreplaceable loss of resources, duration, cumulative effect or intensity: ▪ The power line should be routed to avoid the pans as much as possible. ▪ The footprint of the power line should be kept as low as possible

Activity	Impact summary	Significance	Proposed mitigation
			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.
	Ecological degradation during operation	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Regular erosion and alien plant control along the powerline servitude. During operation and maintenance of the powerline servitude, alien species especially large woody species such as *Propsopis glandulosa* should be cleared from the pipeline servitude, but indigenous species such as *Boscia albitunca* and *Boscia foetida*, should not be cleared as they do not pose a fire risk. If any indigenous 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.
	Decommissioning impacts on fauna	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Disturbance during decommissioning should be kept as low as possible. Staff should undergo environmental induction to ensure that they are aware of fauna-related issues and that no fauna are harmed during decommissioning activities.
	Ecological degradation due to decommissioning	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ 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 route, which should

Activity	Impact summary	Significance	Proposed mitigation
			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.
	Indirect impacts:		
	None identified.	None identified	None identified.
	Cumulative impacts:		
	The density of renewable energy development in the Kimberly area is moderate, with several approved projects currently being built or nearing construction. The main source of habitat loss in the area is however due to agricultural practices with extensive clearing for irrigated croplands along the Modder River as well as dryland cropping scattered across the area. Although many of the dryland cropping areas have been abandoned, the full complement of biodiversity is slow to return to such areas. It is likely that the cumulative impact due to renewable energy development will increase significantly in the future. Due the low footprint of low voltage power lines, the contribution of the Kalkaar 132kV lines to cumulative impact in the area is not considered highly significant in the context of the surrounding landscape and the large-scale impacts on habitat loss resulting from agriculture, mining and renewable energy plants. Although power lines may generate significant cumulative impact on avifaunal, the long-term interaction with terrestrial biodiversity is low after mitigation and the contribution of the current development to cumulative impact on the area is low and would not generate significant long-term impact.		
Avifauna	***Direct impacts:***		
	Displacement of Red Data species due to disturbance and habitat transformation associated with construction of the 132kV power line	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Construction activity should be restricted to the immediate footprint of the infrastructure. ▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ▪ Measures to control noise and dust should be applied according to current best practice in the industry. ▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
	Collisions of Red Data species with the proposed 132kV line (operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of three

Activity	Impact summary	Significance	Proposed mitigation
			years by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first three years. ▪ The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection. ▪ The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, alternating black and white.
	Electrocutions of Red Data species on the proposed 132kV line (operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ The 132kV grid connection should be inspected at least once a quarter for a minimum of three years by the avifaunal specialist to establish if there is any significant electrocution mortality. Thereafter the frequency of inspections will be informed by the results of the first three years. ▪ The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection. ▪ All the steel monopoles should be fitted with bird perches.
	Displacement of Red Data species due to disturbance and habitat transformation associated with de-commissioning of the 132kV power line.	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ De-commissioning activity should be restricted to the immediate footprint of the infrastructure. ▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. ▪ Measures to control noise and dust should be applied according to current best practice in the

Activity	Impact summary	Significance	Proposed mitigation
			industry. ▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. ▪ Prior to the de-commissioning of the line, a walk-through must be conducted to ascertain of any White-backed Vulture breeding pairs will be impacted by the de-commissioning activities. If any breeding pairs are potentially at risk, the de-commissioning will have to be timed to fall outside the breeding season (April to July).
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	The cumulative impact of disturbance due to disturbance and habitat transformation as a result of the building of the 132kV Kalkaar sub-transmission line, is likely to be insignificant for the majority of Red Data species. The one exception to this statement concerns the White-backed Vulture breeding colonies around Kimberley and specifically the Susanna breeding area. Disturbance of these breeding birds could result in a significant impact on the local population of the species, given the suite of impacts to which the birds are already subjected to. The cumulative impact of disturbance and habitat transformation on Red Data species (in this instance White-backed Vultures) could therefore be potentially MAJOR, should Corridor 2 be implemented. The risks that power lines pose to is well researched (Shaw 2013). This transmission line will further increase the already high collision risk to Ludwig's Bustards, Blue Crane, Greater Flamingo, Lesser Flamingo and Kori Bustard that power lines pose throughout their range. The key question therefore is to what extent the proposed sub-transmission line will contribute to this existing and potentially significant mortality factor in the area around Kimberley. All in all, it is envisaged that collisions of Red Data species with the proposed line will have a MODERATE cumulative impact. Electrocutions is a major threat to vultures in South Africa (Van Rooyen 2000). The proposed 132kV Kalkaar sub-transmission line could pose an electrocution risk specifically to the population of White-backed Vultures breeding around Kimberley and Jacobsdal. If the steel monopole is used with a bird perch, the risk will be significantly reduced. It is envisaged that the risk of electrocution posed by the proposed powerline is MINOR, provided the monopole is fitted with a bird perch.		
Wetlands	***Direct impacts:***		
	Modder River –	Low negative	The following mitigation measures would

Activity	Impact summary	Significance	Proposed mitigation
	Loss of riparian habitat and structure (construction phase)	impact expected after mitigation	help to limit impacts: ▪ Careful planning of the placement of towers, taking into consideration the locality of riparian habitats and as much as possible, avoid placement of towers within riparian habitat, and powerlines are preferably to span over the relevant resource. ▪ Where it is impossible to avoid placing infrastructure within riparian habitat, flow connectivity must be retained by preventing fragmentation of the riparian habitat; ▪ Ensure that no canalization or further incision of the riparian resource takes place as a result of the construction activities; ▪ Vegetation clearing prior to construction must be minimized and the area re-seeded following construction with indigenous/endemic species to aid in the natural recovery of vegetation. ▪ Clearing/felling of woody vegetation should be limited to trees/shrubs above the maximum permitted clearance height, and the understory should not be cleared. Where possible, crossing points should be chosen to avoid large riparian trees. ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr). ▪ Exposed soils to be protected with suitable geotextile coverings, such as hessian sheets, at all times during the construction phase, and no stockpiling of soils is to take place within the riparian zone or associated buffer zone. ▪

Activity	Impact summary	Significance	Proposed mitigation
			▪ Lay down areas should be placed outside the delineated riparian corridors/buffer zones, and construction right of ways may only be created through or across watercourses if proposed for use during operations and no existing right of way exist. However it is recommended that where existing roads / accesses cross watercourses exist these be used as a primary right of way. ▪
	Large Pans – Loss of habitat and structure (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the freshwater resource zones to protect soils; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to

Activity	Impact summary	Significance	Proposed mitigation
			keep the freshwater resources habitat and its ecological structure in place.
	Small Pans – Loss of habitat and ecological structure	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the freshwater resource zones to protect soils; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; ▪ Desilt the pans affected by construction activities; and ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Modder River – Loss of ecological and sociocultural service provision (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Careful planning of the placement of towers, taking into consideration the locality of riparian habitats and as much as possible, avoid placement of towers within riparian

Activity	Impact summary	Significance	Proposed mitigation
			habitat, and powerlines are preferably to span over the relevant resource. ▪ During construction, use techniques which support the hydrology and sediment control functions of the freshwater resource; ▪ As much vegetation growth should be promoted within the freshwater resource to protect the soils thereof; ▪ Limit excavations to a limited extent to ensure that drainage patterns within the feature returns to normal as soon as possible after construction; ▪ Restrict construction to the drier winter months if possible to avoid sedimentation of the freshwater feature and to minimize disturbance of the features and its hydraulic function. ▪ Monitor the freshwater resource areas for erosion and incision; and ▪ Implement an alien vegetation control program within freshwater resource and ensure establishment of indigenous species within areas where alien vegetation was identified.
	Large Pans – Impact on ecological and sociocultural service provision	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the large pans to protect soils and limit the possible changes to the sediment balance of the pans; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas, as to limit soil compaction; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities;

Activity	Impact summary	Significance	Proposed mitigation
			▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months; and ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Small Pans – Impact on ecological and sociocultural service provision	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ As much indigenous vegetation growth should be promoted within the large pans to protect soils and limit the possible changes to the sediment balance of the pans; ▪ Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated areas, as to limit soil compaction; ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities; ▪ An alien vegetation control programme should form part of the Environmental Management Programme (EMPr) and ensure establishment of indigenous species within areas where alien vegetation was identified; ▪ As far as possible, all construction activities should occur in the low

Activity	Impact summary	Significance	Proposed mitigation
			flow season, during the drier winter months; and ▪ Desilt the pans affected by construction activities; ▪ Any area where active erosion is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is re-instated to conditions which are as natural as possible to keep the freshwater resources habitat and its ecological structure in place.
	Modder River – Impacts on hydrological function and sediment balance	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage; ▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the freshwater resource areas affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the freshwater resource areas during maintenance activities to prevent soil compaction.

Activity	Impact summary	Significance	Proposed mitigation
	Large Pans – Impacts on hydrological function and sediment balance (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is absolutely essential in order to minimize environmental damage; ▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the pans affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the freshwater resource areas during maintenance activities to prevent soil compaction.
	Small Pans – Impacts on hydrological function and sediment balance (construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Any construction-related waste must not be placed within or in the vicinity of the large pans, this will minimize possible effects on water flow into the pans; ▪ As much vegetation growth should be promoted within the freshwater resource to protect soils and to encourage water retention and flood attenuation; ▪ Limit the footprint area of the construction activity to what is

Activity	Impact summary	Significance	Proposed mitigation
			absolutely essential in order to minimize environmental damage; ▪ Upon completion of the construction phase the disturbed areas and compacted soils should be rehabilitated through reprofiling and revegetation; ▪ Desilt the pans affected by construction activities; ▪ Dumped soil must be removed and the area must be levelled to avoid sedimentation of the pans from runoff; and ▪ Vehicles should not be driven indiscriminately within the freshwater resource areas during maintenance activities to prevent soil compaction.
	Indirect impacts:		
	None identified	None identified	None identified
	Cumulative impacts:		
	None identified		
Soils and Agricultural Potential	***Direct impacts:***		
	Loss of agricultural land use caused by direct occupation of land by the footprint of the power line infrastructure (construction and operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Implement an effective system of run-off control, where it is required, that collects and safely disseminates all potential accumulations of run-off water and thereby prevents potential down slope erosion. This should be in place and maintained during all phases of the development. ▪ Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site to stabilize the soil against erosion.
	Soil erosion caused by alteration of the surface characteristics (construction and operation phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Minimize road footprint and control vehicle access on roads only. ▪ Control dust as per standard construction site practice.
	Loss of topsoil	Low negative	The following mitigation measures would

Activity	Impact summary	Significance	Proposed mitigation
	caused by poor topsoil management (burial, erosion, etc) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.) and having the effect of loss of soil fertility on disturbed areas after rehabilitation (construction phase)	impact expected after mitigation	help to limit impacts: ▪ Strip and stockpile topsoil from all areas where soil will be disturbed below surface. ▪ After cessation of disturbance, re-spread topsoil over the surface. ▪ Dispose of any sub-surface spoils from excavations where they will not impact on agricultural land (for example use as road surfacing), or where they can be effectively covered with topsoil.
	Degradation of grazing beyond the direct development footprint caused by trampling due to vehicle passage, and deposition of dust.	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Minimize road footprint and control vehicle access on roads only. ▪ Control dust as per standard construction site practice.
	Indirect impacts:		
	None identified	None identified	None identified
	Cumulative impacts:		
	There are other proposed developments that will also occupy agricultural land in the area, and because the area is suitable for solar energy developments, there are likely to be more in the future. The potential for cumulative impacts therefore exists. However, because of the low agricultural impact of this development and the low agricultural sensitivity of the area, the cumulative impact is assessed as negligible.		
Heritage and Palaeontology	***Direct impacts:***		
	The possibility of encountering previously unidentified heritage resources. As well as the impact on the identified archaeological sites (Construction phase)	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Monitoring during construction by an archaeologist ▪ Mitigation through archaeological excavations and collection ▪ Walk-down of final power line route

Activity	Impact summary	Significance	Proposed mitigation
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	An evaluation of the possible cumulative impacts from the combined solar projects in the area on heritage resources has shown that the biggest envisaged impact could be on the graves of this proposed development. Most heritage resources are point specific and in general impacts are found to be localised and impacting on the specific resource in a development. As such the cumulative impact on archaeological and historical heritage resources area deemed to be low.		
Visual	***Direct impacts:***		
	Alteration of the natural character of the study area and exposure to visual receptors to visual impacts associated with the construction phase	Low negative impact expected after mitigation	The following mitigation measures would help to limit impacts: ▪ Carefully plan to reduce the construction period. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the proposed site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Ensure that dust suppression is implemented in all areas where vegetation clearing has taken place. ▪ Ensure that dust suppression techniques are implemented on all soil stockpiles. ▪ Select the alternatives that will have the least impact on visual receptors. ▪ Route / align the proposed power line to completely avoid any structures such as farmsteads / homesteads / dwellings.
	Alteration of the natural character of	Medium negative impact	The following mitigation measures would help to limit impacts:

Activity	Impact summary	Significance	Proposed mitigation
	the study area and exposure to visual receptors to visual impacts associated with the operation phase	expected after mitigation	▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ As far as possible, limit the amount of security and operational lighting present at the two (2) bay substations. ▪ If possible, the control room should not be illuminated at night. ▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the substation site and power line access roads. ▪ The control room should be painted with natural tones that fit with the surrounding environment. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Align power lines to run parallel to existing power lines and other linear elements, where possible. ▪ Avoid crossing areas of high elevation, especially ridges, koppies or hills, where possible. ▪ Non-reflective surfaces should be utilised where possible.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	Planned renewable energy developments and their potential for large scale visual impacts could significantly alter the sense of place and visual character within the study area, once constructed. The cumulative visual impact experienced from each potentially sensitive visual receptor location will depend on the number of proposed renewable energy developments within viewing distance. As mentioned above, the height of the development in combination with distance are critical factors when assessing visual impacts. As such, the proposed solar energy facilities are unlikely to be visible from beyond 5km, and from beyond this distance the degree of visual impact would be considered to be insignificant. As such, only the Pulida Solar Project will be in viewing distance from the potentially sensitive receptor locations identified within the study area. For this reason it is envisaged that the biggest cumulative impact would be the change in the visual character within the southern part of the study area near the Pulida Solar Project. It should also be noted that this facility would reduce the scenic quality of the visual baseline in this part of the study area once constructed, and thereby reduce the visual impact of the proposed power line on surrounding potentially sensitive receptor locations.		

Activity	Impact summary	Significance	Proposed mitigation
Socio-economic	***Direct impacts:***		
	Stimulation of the economy during construction	Medium positive impact after mitigation is expected	The following mitigation measures would help to enhance positive impacts: ▪ Investigate the opportunity to procure services required during construction within the local economy ▪ Where practically possible, procure required services from local businesses
	Impact on employment and household income during construction	Low positive impact after mitigation is expected	The following mitigation measures would help to enhance positive impacts: ▪ Where practically feasible, source workers required to construct the necessary infrastructure from local communities.
	Impact on strengthening national grid capacity	Low positive impact after mitigation is expected	No mitigation measures could be identified for the proposed project to enhance the positive impact.
	Impact on current business activities	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ It is proposed that the final power line route and tower positions within the preferred corridor for the power line are selected in consultation with the possible affected landowners during servitude negotiations before any construction commences. The final alignment and tower positions are to be chosen in such a way as to avoid affecting business practices that could potentially be sensitive to the power lines, i.e. commercial game breeding and game hunting.
	Impact on future developments	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ It will be imperative to ensure that the design of the power line route takes into account the layout of the solar energy park planned to be built on the Farm Klipdrift 20. ▪ The developers/owners of the solar energy park project will also need to be consulted prior the selection

Activity	Impact summary	Significance	Proposed mitigation
			of the final power line route and tower positions before construction commences.
	Impact on loss of property	Low negative impact after mitigation is expected	The following mitigation measures would help to reduce negative impacts: ▪ Access to the construction site must be strictly controlled. ▪ Fire prevention measures must be implemented and fire control equipment must be present at strategic locations within the construction site. ▪ Where necessary, the contractor should consider recruiting workers from the local community rather than non-local workers. Local workers are better known and more identifiable to the local community, better integrated in the community and more likely to live with their families instead of living alone. All of these factors significantly reduce tendency to commit crime (i.e. stock theft and burglaries). ▪ Recruitment of workers should be planned in advance and should not take place on-site. This will reduce the probability of work seekers loitering in the area surrounding the project sites.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	The project will improve the reliability of electricity supply in the region and could lead to establishing more electricity connections in the area, ultimately improving access to electricity in the municipality. The project will also have a positive albeit small impact on the national economy and local employment, as expenditure on construction activities to the value of between R60 million and R144 million, depending on the corridor chosen, is likely to stimulate between R180 million and R432 million of production revenue in the country and create up to fourteen temporary direct employment opportunities for the local communities. One new development has been identified to be located in the zone of influence of the proposed project. It refers to the Pulida Solar Park that has been approved under Bid Window 3 of the RE IPPPP and is currently awaiting the construction. In light of		

Activity	Impact summary	Significance	Proposed mitigation
	this and other developments within the RE IPPPP taking place in the country, the proposed project will create both positive and negative cumulative effects: ▪ On one hand, the investment into the project will increase economic activity in the area and create temporary jobs. However, due to their relatively small scales in light of the greater investment stimulated through the RE IPPPP, this cumulative effect will be negligible. The positive effect on strengthening the grid capacity could though be notable, particularly considering that Pulida Solar Park will also be built in the area and will also assist in strengthening the grid capacity in the region. On the other hand, considering that the project is likely to be built after the Pulida Solar Park is developed, it may extend the duration of some of the negative effects in the zone of influence associated with the presence of construction workers in rural areas and specifically in farming communities (such as livestock theft and loss of personal property). This cumulative effect, though, is envisaged to be minor due to the relatively small number of workers to be present on site at a time.		
No-go option			
	Direct impacts:		
	The job creation and local investment expected for the local area would not occur. The expected capital injection into the LM would be prevented. The electricity generated at the Kalkaar Solar Thermal Power Project would not be connected to the grid and greater electricity security would not be achieved, South Africa would not have the benefit of the Kalkaar Solar Thermal Power Project contributing to the country's renewable energy targets.		
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	With several current and historical activities occurring within the vicinity of the proposed development, the potential cumulative impacts of such activities in conjunction with the potential impacts of the proposed linear development, were taken into consideration. Historical and existing activities taking place within the zone of influence of the proposed linear development, which may have impacts on the freshwater systems, include, but are not limited to: ▪ Urban and Peri-urban development (including the development of infrastructure such as the road and bridge crossings); ▪ Historical and current De Beers mining activities; ▪ Agricultural activities (livestock and game farming, and crop cultivation, particularly surrounding the Modder River); ▪ Solar Renewable Energy Projects in the vicinity of the proposed linear development and within close vicinity of the Modder River These activities have already resulted in the transformation and loss of riparian habitat within the Eastern Kalahari Bushveld Group 3 and Nama Karoo WetVeg Groups. Whilst both of these WetVeg groups are classified as "Least Threatened" (SANBI, 2013), further alterations and/or losses should be minimised as much as possible. Natural freshwater systems have been artificially impounded, abstraction		

Activity	Impact summary	Significance	Proposed mitigation
	from the Modder River for agricultural irrigation purposes occurs, and, in the case of pans, vegetation communities have been transformed as a result of grazing and trampling by livestock. Since a significant proportion of the surrounding area is already fenced off, especially for game farming, the Modder River is likely to have decreased capacity to function as part of a movement or migration corridor for fauna, although it was apparent during the site visit that it does still function as such to a degree. The overall impact on the connectivity of the landscape and the further disruption of ecosystem processes associated with freshwater features by the proposed linear development would thus be reduced by the proximity to these existing developments and activities. Considering the above, the cumulative impacts on the freshwater ecology by the proposed linear development in the region, should adequate mitigation measures be implemented, is considered to be low. However, it is imperative that adequate mitigation be implemented throughout the life of the development in order to minimise the potential impacts of the proposed linear development on the receiving environment, and thus minimise the cumulative impacts.		

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

A complete impact assessment in terms of Regulation 19(3) of GN R.733 is included in Appendix F and a comparison of the alternatives is included in section 2 below.

2. ENVIRONMENTAL IMPACT STATEMENT

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

Corridor 1 Jacobsdal Link (Green – Preferred)

Biodiversity	In terms of flora, within the area affected by the proposed development, vegetation types that are affected include Kimberly Thornveld and Northern Upper Karoo, Highveld Salt Pans and Vaalbos Rocky Shrubland. Within these vegetation types however, the specific habitats that are actually occurring within the proposed corridor alternatives include the following: ▪ Kimberley Thornveld – Protected and listed species include *Boscia albitrunca and Acacia erioloba*; ▪ Northern Cape Upper Karoo; ▪ Vaalbos Rocky Shrubland; ▪ Pans – Protected and listed species include; ▪ Modder River – the Modder River which is considered a

	sensitive feature due to the ecological significance of this area as a corridor for fauna as well as the unique aquatic habitats present here that are not represented elsewhere in the landscape of the area. There are three (3) species of conservation concern that are listed in terms of the SANBI SIBIS database (quarter degree squares 2824 DB, DD and 2924 BB). Only *Acacia erioloba* can be confirmed present and occurs mostly in the north of the site in the areas of savanna on deeper sands near Kimberly. *Aloinopsis rubrolineata* occurs in areas of exposed calcrete and may occur in the central section of the routes between Kimberly and Kalkaar where such habitat is present, but was not observed. There are however also additional species present which are either protected under the National Forests Act such as *Boscia albitrunca* and *Acacia erioloba* or protected under the Northern Cape Nature Conservation Act of 2009, which includes *Boscia foetida*, all *Mesembryanthemaceae*, all species within the *Euphorbiaceae*, *Oxalidaceae*, *Iridaceae*, all species within the genera *Nemesia* and *Jamesbrittenia*. In terms of fauna: ▪ 51 mammals have been recorded from the quarter degree squares traversed by the power line options. However, as many as 20 of these are large mammals, introduced or maintained for game farming operations and are not considered relevant to the current study as these are managed populations regulated and confined by landowners. The remaining 30 are free ranging species which occur naturally in the area.. ▪ Five listed terrestrial mammals may occur in the area, the Honey Badger *Mellivora capensis* (Endangered), Brown Hyaena *Hyaena brunnea* (Near Threatened), Black-footed cat *Felis nigripes* (Vulnerable), South African Hedgehog *Atelerix frontalis* (Near Threatened) and the Serval *Leptailurus serval* (Near Threatened). ▪ According to the SARCA database, 31 reptile species are known from the area suggesting that the reptile diversity within the site is likely to be fairly low. Species observed in the area include the Cape Skink *Trachylepis capensis*, Ground Agama *Agama aculeata aculeata*, Spotted Sand Lizard *Pedioplanis lineoocellata* and Leopard Tortoise *Stigmochelys pardalis*. There are no listed species known from the area. ▪ The site lies within the distribution range of 10 amphibian species. The only listed species which may occur in the area is the Giant Bullfrog *Pyxicephalus adspersus* which is listed as Near Threatened. Although it has not been recorded from the

	affected area, it is common in the wider area on account of the large number of pans in the area, which are the breeding habitat of the Giant Bullfrog. The major impacts of the development of the power line would occur during the construction phase, due to the disturbance of largely intact ecosystems that would take place at this time. Construction phase disturbance would however be transient and while impacts on flora are likely to persist for some time, impacts on fauna during operation would be very low. Due to the low overall footprint of the power line and low operational disturbance levels, impacts associated with the construction and operation of the power line would be local in nature and of low overall significance after mitigation. In terms of mitigation, avoidance of the identified sensitive features is considered the most important measure to reduce the impact of the power line to a low level. Overall and with the suggested mitigation measures applied, the impact of the Kalkaar 132 kV line would be of local extent and low significance. There are no impacts associated with the development of the power line that are considered to be high and which cannot be mitigated to a low level. As such, there are no significant ecological reasons to oppose the construction of the Kalkaar grid connections to Kimberly or to Jacobsdal.
Avi-fauna	An estimated 313 bird species could potentially occur in the study area of which 28 are classified as Red Data species. Three Important Bird Areas (IBAs) in the vicinity including Dronfield Nature Reserve (approx. 5km north Kimberley – SA031), Kamfer's Dam (approx. 6km north of Kimberley – SA032) and Benfontein Nature Reserve (approx. 14km south east of Kimberley – SA033). There is also a vulture breeding area for White-backed Vultures (Susanna Vulture Breeding Area) that can be found covering both Corridor 2 Alternatives 1 and 2, as well as another breeding area approx. 10km outside Jacobsdal. Potential impacts during the construction and decommissioning phase include the displacement of priority species and habitat transformation. Impacts are mainly negative but low. With mitigation, these impacts can be reduced further. For the operation phase, electrocutions and collisions of red data species is the primary potential impact. Potential impacts for collisions of red data species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and 2. This can be mitigated to a low level for Corridor 1 Jacobsdal Link and a medium level for Corridor 2 Alternatives 1 and 2. Potential impacts for electrocutions of red data

	species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Finally, for the decommissioning phase, displacement of red data species as a result of disturbance is rated as low for Corridor 1 Jacobsdal Link and medium for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Corridor 1 Jacobsdal Link is the shortest power line route and does not transect any vulture breeding areas. All potential impacts can be mitigated to a low level. There is not much difference in preference between Corridor 2 Alternative 1 and 2 as both are relatively the same length and traverse the Susanna White-backed Vulture breeding area.
Wetlands	Two main hydrogeomorphic types were identified including well developed riparian systems (namely the Modder River) and several depression that differ in size (small pans – 0.9ha to 20ha; large pans – larger than 58ha to 401ha). Summary of assessments undertaken applied to riparian resources include the following: ▪ Modder River: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; ▪ Large Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; and ▪ Small Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision. Types of impacts to the riparian systems included: ▪ Loss of riparian habitat and ecological structure; and ▪ Changes to riparian ecological and sociocultural service provision; ▪ Impacts on riparian hydrology and sediment balance. Overall significance after mitigation is a low negative impact after management and mitigation measure implementation. Based on the findings of this study, it is the opinion of the ecologists that the proposed linear development is regarded as having low levels of impact on the surrounding freshwater resources identified, even if less than desirable mitigation of impacts occurs. With careful planning of the final layout of the powerlines and strict implementation of mitigation measures throughout all phases of the proposed project, impacts can be reduced to very low significance levels and the proposed project should, from a freshwater resource point of view, be considered favourably for development. Following the assessment of perceived impacts, consideration was

	given as to the preferred corridor option from a freshwater ecology perspective. As Corridor 1 was the only option provided for the routing of the powerline between the Kalkaar CSP to Jacobsdal Substation, this potion is considered to be "favourable". Depending on the final layout of the powerline within the corridor, with avoidance of most of the freshwater resources, this layout could have minimal impacts on the freshwater resources. Corridor 2, Alternative 2 is considered to be the best routing option for the powerline between Kalkaar CSP and the Kimberley Distribution Substation to Boundary Substation, as it traverses over the least amount of freshwater resources identified by this study.
Soils and Agricultural Potential	The proposed development is mainly on land zoned and used for agriculture. Soils on the site are predominantly shallow to moderately deep, loamy sands on underlying rock or hard-pan carbonate (Hutton, Mispah and Coega soil forms). The major limitation to agriculture is the limited climatic moisture availability. The limited depth of the soils is a further limitation. As a result, the site is predominantly unsuitable for cultivation and agricultural land use is limited to grazing, except for some small irrigation areas along the Modder River. The land capability of the site varies according to land type from class 5 to class 7, which is from non-arable, moderate potential grazing land to non-arable, low potential grazing land. The limitations to agriculture are aridity and lack of access to water plus shallow soil depth. Because of these constraints, agricultural land use is mostly restricted to grazing. The natural grazing capacity is predominantly 14-17 hectares per animal unit. The centre pivot lands along the Modder River are considered to be of high agricultural sensitivity. The overhead power lines as well as any infrastructure on the ground must avoid these lands. There are three factors that limit the significance of all potential agricultural impacts. The first is that the actual footprint of disturbance of the proposed power line is very small in relation to available, surrounding land. The second is that the impact of a power line on the kind of agricultural activity (predominantly grazing) along the proposed development is very minimal, as this can continue in the presence of a power line with negligible disturbance. The third factor is that the site has very low agricultural potential, limited by severe climatic moisture availability constraints and soils that include shallow ones.

	Four potential negative impacts of the development on agricultural resources and productivity were identified as: ▪ Loss of agricultural land use caused by direct occupation of land by the footprint of the power line infrastructure. ▪ Soil Erosion caused by alteration of the surface characteristics. ▪ Loss of topsoil in disturbed areas, causing a decline in soil fertility. ▪ Degradation of veld vegetation beyond the direct footprint due to constructional disturbance, dust and vehicle trampling. All impacts were assessed as having low significance. Recommended mitigation measures include implementation of an effective system of storm water run-off control to mitigate erosion; and topsoil stripping and re-spreading to mitigate loss of topsoil. Because of the low agricultural potential of the site and resultant low agricultural impacts, the development should, from an agricultural impact perspective, be authorised. Because of the low impacts and the uniformly low potential of the site, there is no preference between the different corridor options. There are no conditions resulting from this assessment that need to be included in the environmental authorisation.
Heritage and Palaeontology	Heritage Findings: An archival and historical desktop study was undertaken which was used to compile a historical layering of the study area within its regional context. This component indicated that the landscape within which the project area is located has a rich and diverse history. These desktop studies were followed by a fieldwork component that comprised driving and walking through the study area. A total of 27 occurrences of heritage resources were identified within Corridor 2 Alternative 1. Fourteen of these would require mitigation before exhumation (graves) or destruction (historical structures) if development were to come within 20 m. Thirteen occurrences of heritage resources have high significance and should not be disturbed by development within 20 m. None were identified within Corridor 1 Jacobsdal Link nor Corridor 2 Alternative 2. It is likely that further survey work in the study area will uncover additional heritage resources, especially graves, ruins and rock art sites on hilltops. Palaeontological Findings:

	An overlay of the study alignments on the SAHRiS palaeontological sensitivity map provides a good indication of the palaeontological sensitivity of the study area. The palaeontological sensitivity ranges from Moderate to very High and will require a field assessment during the final route walkdown. Overall Impact Statement: The overall impact evaluation has shown that the pre-mitigation impact on heritage resources is rated as High negative. However, with the implementation of the recommended mitigation measures, this will reduce the potential impact to a low negative impact. Corridor 1 and Corridor 2 Alternative 2 are viewed as favourable options due to the low potential impact on heritage resources which can be mitigated to address envisaged impacts. Corridor 2 Alternative 1 however, is viewed as not preferred as there is a large amount of heritage resources as well as possibly large areas of palaeontological significance along this route.
Visual	The Visual Impact Assessment (VIA) conducted for the proposed 132kV power line and associated infrastructure has demonstrated that most of the study area has a rural, partially scenic visual character which is transformed in part. The northern and south-western parts of the study area, near Kimberley and Jacobsdal respectively, are characterised by a more visually degraded landscape, which is mostly attributed to the presence of large-scale mining activities, existing electrical infrastructure as well as informal/semi-formal settlements and residential areas/communities. As such, the visual character in these parts of the study area is visually degraded, typical of a peri-urban environment. In addition, the southern and central parts of the study area are characterised by a more natural / scenic visual character due to the prevalence of the natural intact vegetation, limited human habitation and limited transformation and/or development. The visual character in these areas is thus typical of a natural rural environment. Commercial cultivation is concentrated along the Modder River in the southern parts of the study area. These areas are dominated by various agricultural activities and other elements typical of a pastoral environment. The study area is not typically valued or utilised for its natural scenic value and therefore relatively few tourism, historically or culturally significant sensitive receptors were identified during the fieldwork. A desktop investigation revealed that several farmsteads are also present within the study area which may perceive the power line to be an unwelcome intrusion, depending on the perception of the viewer. The impact assessment revealed that the significance of the visual impacts resulting from the proposed power line and associated infrastructure would be low during the construction phase and medium

	during the operational phase. These potential impacts can be mitigated to acceptable levels provided the recommended mitigation measures are implemented. All the proposed power line corridor alternatives were assessed to determine which alternative would result in the lowest overall visual impact. Based on the assessment, Corridor 1 (Green) is considered to be a favourable alignment for the proposed power line while Corridor 2 Alternative 1 (Purple) is not considered to be a preferred alignment. Corridor 2 Alternative 2 (Turquoise) was considered to be the preferred alignment, due to the presence of existing power lines and lack of visually sensitive and potentially sensitive receptor locations within close proximity.
Socio-economic	The review of the relevant policy documents concluded that the project falls in line with the national and local government developmental objectives. It may also form part of the SIP10 and SIP8. Furthermore, the project is not expected to comprise the spatial visions of the three municipalities and two provinces; however, care needs to be taken when the route is chosen as to avoid green areas earmarked by the Sol Plaatje LM. The project will improve the reliability of electricity supply in the region and could lead to establishing more electricity connections in the area, ultimately improving access to electricity in the municipality. The project will also have a positive albeit small impact on the national economy and local employment, as expenditure on construction activities to the value of between R60 million and R144 million, depending on the corridor chosen, is likely to stimulate between R180 million and R432 million of production revenue in the country and create up to fourteen temporary direct employment opportunities for the local communities. All three corridors have been considered. It appears that commercial livestock and game farming is the dominant land use that may be impacted by any of these corridor options and alternatives. The agricultural sector is a significant contributor to the economies of Letsemeng and Tokologo and creates approximately 33% and 22% of all job opportunities in the respective municipalities. This emphasises the need to minimise the project's potential negative impact on the dominant activities observed in the zone of influence of the project. Corridor Alternatives received the same average scores for positive and negative impacts for both before and after mitigations measures. Considering the preferences allocated to these two alternatives for each impact, no clear differentiation can be made between the alternatives and all could be equally considered.

Corridor 2 Alternative 1 Kalkaar via Kimberley DS to Boundary Substation (Purple)	
Biodiversity	In terms of flora, within the area affected by the proposed development, vegetation types that are affected include Kimberly Thornveld and Northern Upper Karoo, Highveld Salt Pans and Vaalbos Rocky Shrubland. Within these vegetation types however, the specific habitats that are actually occurring within the proposed corridor alternatives include the following: ▪ Kimberley Thornveld – Protected and listed species include *Boscia albitrunca and Acacia erioloba*; ▪ Northern Cape Upper Karoo; ▪ Vaalbos Rocky Shrubland; ▪ Pans – Protected and listed species include; ▪ Modder River – the Modder River which is considered a sensitive feature due to the ecological significance of this area as a corridor for fauna as well as the unique aquatic habitats present here that are not represented elsewhere in the landscape of the area. There are three (3) species of conservation concern that are listed in terms of the SANBI SIBIS database (quarter degree squares 2824 DB, DD and 2924 BB). Only *Acacia erioloba* can be confirmed present and occurs mostly in the north of the site in the areas of savanna on deeper sands near Kimberly. *Aloinopsis rubrolineata* occurs in areas of exposed calcrete and may occur in the central section of the routes between Kimberly and Kalkaar where such habitat is present, but was not observed. There are however also additional species present which are either protected under the National Forests Act such as *Boscia albitrunca* and *Acacia erioloba* or protected under the Northern Cape Nature Conservation Act of 2009, which includes *Boscia foetida*, all *Mesembryanthemaceae*, all species within the *Euphorbiaceae*, *Oxalidaceae*, *Iridaceae*, all species within the genera *Nemesia* and *Jamesbrittenia*. In terms of fauna: ▪ 51 mammals have been recorded from the quarter degree squares traversed by the power line options. However, as many as 20 of these are large mammals, introduced or maintained for game farming operations and are not considered relevant to the current study as these are managed populations regulated and confined by landowners. The remaining 30 are free ranging species which occur naturally in the area.. ▪ Five listed terrestrial mammals may occur in the area, the Honey Badger *Mellivora capensis* (Endangered), Brown Hyaena *Hyaena brunnea* (Near Threatened), Black-footed cat *Felis nigripes* (Vulnerable), South African Hedgehog *Atelerix frontalis* (Near Threatened) and the Serval *Leptailurus serval* (Near Threatened).

	▪ According to the SARCA database, 31 reptile species are known from the area suggesting that the reptile diversity within the site is likely to be fairly low. Species observed in the area include the Cape Skink *Trachylepis capensis*, Ground Agama *Agama aculeata aculeata*, Spotted Sand Lizard *Pedioplanis lineoocellata* and Leopard Tortoise *Stigmochelys pardalis*. There are no listed species known from the area. ▪ The site lies within the distribution range of 10 amphibian species. The only listed species which may occur in the area is the Giant Bullfrog *Pyxicephalus adspersus* which is listed as Near Threatened. Although it has not been recorded from the affected area, it is common in the wider area on account of the large number of pans in the area, which are the breeding habitat of the Giant Bullfrog. The major impacts of the development of the power line would occur during the construction phase, due to the disturbance of largely intact ecosystems that would take place at this time. Construction phase disturbance would however be transient and while impacts on flora are likely to persist for some time, impacts on fauna during operation would be very low. Due to the low overall footprint of the power line and low operational disturbance levels, impacts associated with the construction and operation of the power line would be local in nature and of low overall significance after mitigation. In terms of mitigation, avoidance of the identified sensitive features is considered the most important measure to reduce the impact of the power line to a low level. Overall and with the suggested mitigation measures applied, the impact of the Kalkaar 132 kV line would be of local extent and low significance. There are no impacts associated with the development of the power line that are considered to be high and which cannot be mitigated to a low level. As such, there are no significant ecological reasons to oppose the construction of the Kalkaar grid connections to Kimberly or to Jacobsdal.
Avi-fauna	An estimated 313 bird species could potentially occur in the study area of which 28 are classified as Red Data species. Three Important Bird Areas (IBAs) in the vicinity including Dronfield Nature Reserve (approx. 5km north Kimberley – SA031), Kamfer's Dam (approx. 6km north of Kimberley – SA032) and Benfontein Nature Reserve (approx. 14km south east of Kimberley – SA033). There is also a vulture breeding area for White-backed Vultures (Susanna Vulture Breeding Area) that can be found covering both Corridor 2 Alternatives 1 and 2, as well as another breeding area approx. 10km outside Jacobsdal. Potential impacts during the construction and decommissioning phase include the displacement of priority species and habitat transformation.

	Impacts are mainly negative but low. With mitigation, these impacts can be reduced further. For the operation phase, electrocutions and collisions of red data species is the primary potential impact. Potential impacts for collisions of red data species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and 2. This can be mitigated to a low level for Corridor 1 Jacobsdal Link and a medium level for Corridor 2 Alternatives 1 and 2. Potential impacts for electrocutions of red data species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Finally, for the decommissioning phase, displacement of red data species as a result of disturbance is rated as low for Corridor 1 Jacobsdal Link and medium for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Corridor 1 Jacobsdal Link is the shortest power line route and does not transect any vulture breeding areas. All potential impacts can be mitigated to a low level. There is not much difference in preference between Corridor 2 Alternative 1 and 2 as both are relatively the same length and traverse the Susanna White-backed Vulture breeding area.
Wetlands	Two main hydrogeomorphic types were identified including well developed riparian systems (namely the Modder River) and several depression that differ in size (small pans – 0.9ha to 20ha; large pans – larger than 58ha to 401ha). Summary of assessments undertaken applied to riparian resources include the following: ▪ Modder River: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; ▪ Large Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; and ▪ Small Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision. Types of impacts to the riparian systems included: ▪ Loss of riparian habitat and ecological structure; and ▪ Changes to riparian ecological and sociocultural service provision; ▪ Impacts on riparian hydrology and sediment balance. Overall significance after mitigation is a low negative impact after management and mitigation measure implementation. Based on the findings of this study, it is the opinion of the ecologists that the proposed linear development is regarded as having low levels of impact on the surrounding freshwater resources identified, even if less than desirable

	mitigation of impacts occurs. With careful planning of the final layout of the powerlines and strict implementation of mitigation measures throughout all phases of the proposed project, impacts can be reduced to very low significance levels and the proposed project should, from a freshwater resource point of view, be considered favourably for development. Following the assessment of perceived impacts, consideration was given as to the preferred corridor option from a freshwater ecology perspective. As Corridor 1 was the only option provided for the routing of the powerline between the Kalkaar CSP to Jacobsdal Substation, this potion is considered to be "favourable". Depending on the final layout of the powerline within the corridor, with avoidance of most of the freshwater resources, this layout could have minimal impacts on the freshwater resources. Corridor 2, Alternative 2 is considered to be the best routing option for the powerline between Kalkaar CSP and the Kimberley Distribution Substation to Boundary Substation, as it traverses over the least amount of freshwater resources identified by this study.
Soils and Agricultural Potential	The proposed development is mainly on land zoned and used for agriculture. Soils on the site are predominantly shallow to moderately deep, loamy sands on underlying rock or hard-pan carbonate (Hutton, Mispah and Coega soil forms). The major limitation to agriculture is the limited climatic moisture availability. The limited depth of the soils is a further limitation. As a result, the site is predominantly unsuitable for cultivation and agricultural land use is limited to grazing, except for some small irrigation areas along the Modder River. The land capability of the site varies according to land type from class 5 to class 7, which is from non-arable, moderate potential grazing land to non-arable, low potential grazing land. The limitations to agriculture are aridity and lack of access to water plus shallow soil depth. Because of these constraints, agricultural land use is mostly restricted to grazing. The natural grazing capacity is predominantly 14-17 hectares per animal unit. The centre pivot lands along the Modder River are considered to be of high agricultural sensitivity. The overhead power lines as well as any infrastructure on the ground must avoid these lands. There are three factors that limit the significance of all potential agricultural impacts. The first is that the actual footprint of disturbance of

	the proposed power line is very small in relation to available, surrounding land. The second is that the impact of a power line on the kind of agricultural activity (predominantly grazing) along the proposed development is very minimal, as this can continue in the presence of a power line with negligible disturbance. The third factor is that the site has very low agricultural potential, limited by severe climatic moisture availability constraints and soils that include shallow ones. Four potential negative impacts of the development on agricultural resources and productivity were identified as: ▪ Loss of agricultural land use caused by direct occupation of land by the footprint of the power line infrastructure. ▪ Soil Erosion caused by alteration of the surface characteristics. ▪ Loss of topsoil in disturbed areas, causing a decline in soil fertility. ▪ Degradation of veld vegetation beyond the direct footprint due to constructional disturbance, dust and vehicle trampling. All impacts were assessed as having low significance. Recommended mitigation measures include implementation of an effective system of storm water run-off control to mitigate erosion; and topsoil stripping and re-spreading to mitigate loss of topsoil. Because of the low agricultural potential of the site and resultant low agricultural impacts, the development should, from an agricultural impact perspective, be authorised. Because of the low impacts and the uniformly low potential of the site, there is no preference between the different corridor options. There are no conditions resulting from this assessment that need to be included in the environmental authorisation.
Heritage and Palaeontology	Heritage Findings: An archival and historical desktop study was undertaken which was used to compile a historical layering of the study area within its regional context. This component indicated that the landscape within which the project area is located has a rich and diverse history. These desktop studies were followed by a fieldwork component that comprised driving and walking through the study area. A total of 27 occurrences of heritage resources were identified within Corridor 2 Alternative 1. Fourteen of these would require mitigation before exhumation (graves) or destruction (historical structures) if development were to come within 20 m. Thirteen occurrences of heritage resources have high significance and should not be disturbed by development within 20 m. None were identified within Corridor 1 Jacobsdal Link nor

	Corridor 2 Alternative 2. It is likely that further survey work in the study area will uncover additional heritage resources, especially graves, ruins and rock art sites on hilltops. Palaeontological Findings: An overlay of the study alignments on the SAHRiS palaeontological sensitivity map provides a good indication of the palaeontological sensitivity of the study area. The palaeontological sensitivity ranges from Moderate to very High and will require a field assessment during the final route walkdown. Overall Impact Statement: The overall impact evaluation has shown that the pre-mitigation impact on heritage resources is rated as High negative. However, with the implementation of the recommended mitigation measures, this will reduce the potential impact to a low negative impact. Corridor 1 and Corridor 2 Alternative 2 are viewed as favourable options due to the low potential impact on heritage resources which can be mitigated to address envisaged impacts. Corridor 2 Alternative 1 however, is viewed as not preferred as there is a large amount of heritage resources as well as possibly large areas of palaeontological significance along this route.
Visual	The Visual Impact Assessment (VIA) conducted for the proposed 132kV power line and associated infrastructure has demonstrated that most of the study area has a rural, partially scenic visual character which is transformed in part. The northern and south-western parts of the study area, near Kimberley and Jacobsdal respectively, are characterised by a more visually degraded landscape, which is mostly attributed to the presence of large-scale mining activities, existing electrical infrastructure as well as informal/semi-formal settlements and residential areas/communities. As such, the visual character in these parts of the study area is visually degraded, typical of a peri-urban environment. In addition, the southern and central parts of the study area are characterised by a more natural / scenic visual character due to the prevalence of the natural intact vegetation, limited human habitation and limited transformation and/or development. The visual character in these areas is thus typical of a natural rural environment. Commercial cultivation is concentrated along the Modder River in the southern parts of the study area. These areas are dominated by various agricultural activities and other elements typical of a pastoral environment. The study area is not typically valued or utilised for its natural scenic value and therefore relatively few tourism, historically or culturally significant sensitive receptors were identified during the fieldwork. A desktop investigation revealed that several farmsteads are also present within

	the study area which may perceive the power line to be an unwelcome intrusion, depending on the perception of the viewer. The impact assessment revealed that the significance of the visual impacts resulting from the proposed power line and associated infrastructure would be low during the construction phase and medium during the operational phase. These potential impacts can be mitigated to acceptable levels provided the recommended mitigation measures are implemented. All the proposed power line corridor alternatives were assessed to determine which alternative would result in the lowest overall visual impact. Based on the assessment, Corridor 1 (Green) is considered to be a favourable alignment for the proposed power line while Corridor 2 Alternative 1 (Purple) is not considered to be a preferred alignment. Corridor 2 Alternative 2 (Turquoise) was considered to be the preferred alignment, due to the presence of existing power lines and lack of visually sensitive and potentially sensitive receptor locations within close proximity.
Socio-economic	The review of the relevant policy documents concluded that the project falls in line with the national and local government developmental objectives. It may also form part of the SIP10 and SIP8. Furthermore, the project is not expected to comprise the spatial visions of the three municipalities and two provinces; however, care needs to be taken when the route is chosen as to avoid green areas earmarked by the Sol Plaatje LM. The project will improve the reliability of electricity supply in the region and could lead to establishing more electricity connections in the area, ultimately improving access to electricity in the municipality. The project will also have a positive albeit small impact on the national economy and local employment, as expenditure on construction activities to the value of between R60 million and R144 million, depending on the corridor chosen, is likely to stimulate between R180 million and R432 million of production revenue in the country and create up to fourteen temporary direct employment opportunities for the local communities. All three corridors have been considered. It appears that commercial livestock and game farming is the dominant land use that may be impacted by any of these corridor options and alternatives. The agricultural sector is a significant contributor to the economies of Letsemeng and Tokologo and creates approximately 33% and 22% of all job opportunities in the respective municipalities. This emphasises the need to minimise the project's potential negative impact on the dominant activities observed in the zone of influence of the project. Corridor Alternatives received the same average scores for positive and

		negative impacts for both before and after mitigations measures. Considering the preferences allocated to these two alternatives for each impact, no clear differentiation can be made between the alternatives and all could be equally considered.

Corridor 2 Alternative 2 Kalkaar via Kimberley DS to Boundary Substation (Turquoise – Preferred)

Biodiversity	In terms of flora, within the area affected by the proposed development, vegetation types that are affected include Kimberly Thornveld and Northern Upper Karoo, Highveld Salt Pans and Vaalbos Rocky Shrubland. Within these vegetation types however, the specific habitats that are actually occurring within the proposed corridor alternatives include the following: ▪ Kimberley Thornveld – Protected and listed species include *Boscia albitrunca and Acacia erioloba*; ▪ Northern Cape Upper Karoo; ▪ Vaalbos Rocky Shrubland; ▪ Pans – Protected and listed species include; ▪ Modder River – the Modder River which is considered a sensitive feature due to the ecological significance of this area as a corridor for fauna as well as the unique aquatic habitats present here that are not represented elsewhere in the landscape of the area. There are three (3) species of conservation concern that are listed in terms of the SANBI SIBIS database (quarter degree squares 2824 DB, DD and 2924 BB). Only *Acacia erioloba* can be confirmed present and occurs mostly in the north of the site in the areas of savanna on deeper sands near Kimberly. *Aloinopsis rubrolineata* occurs in areas of exposed calcrete and may occur in the central section of the routes between Kimberly and Kalkaar where such habitat is present, but was not observed. There are however also additional species present which are either protected under the National Forests Act such as *Boscia albitrunca* and *Acacia erioloba* or protected under the Northern Cape Nature Conservation Act of 2009, which includes *Boscia foetida*, all *Mesembryanthemaceae*, all species within the *Euphorbiaceae*, *Oxalidaceae*, *Iridaceae*, all species within the genera *Nemesia* and *Jamesbrittenia*. In terms of fauna: ▪ 51 mammals have been recorded from the quarter degree squares traversed by the power line options. However, as many as 20 of these are large mammals, introduced or maintained for game farming operations and are not considered relevant to the current study as these are managed populations regulated and confined by landowners. The remaining 30 are free ranging species which occur naturally in the area.. ▪ Five listed terrestrial mammals may occur in the area, the Honey Badger *Mellivora capensis* (Endangered), Brown Hyaena *Hyaena brunnea* (Near Threatened), Black-footed cat *Felis nigripes* (Vulnerable), South African Hedgehog *Atelerix frontalis*

	(Near Threatened) and the Serval *Leptailurus serval* (Near Threatened). ▪ According to the SARCA database, 31 reptile species are known from the area suggesting that the reptile diversity within the site is likely to be fairly low. Species observed in the area include the Cape Skink *Trachylepis capensis*, Ground Agama *Agama aculeata aculeata*, Spotted Sand Lizard *Pedioplanis lineoocellata* and Leopard Tortoise *Stigmochelys pardalis*. There are no listed species known from the area. ▪ The site lies within the distribution range of 10 amphibian species. The only listed species which may occur in the area is the Giant Bullfrog *Pyxicephalus adspersus* which is listed as Near Threatened. Although it has not been recorded from the affected area, it is common in the wider area on account of the large number of pans in the area, which are the breeding habitat of the Giant Bullfrog. The major impacts of the development of the power line would occur during the construction phase, due to the disturbance of largely intact intact ecosystems that would take place at this time. Construction phase disturbance would however be transient and while impacts on flora are likely to persist for some time, impacts on fauna during operation would be very low. Due to the low overall footprint of the power line and low operational disturbance levels, impacts associated with the construction and operation of the power line would be local in nature and of low overall significance after mitigation. In terms of mitigation, avoidance of the idenitified sensitive features is considered the most important measure to reduce the impact of the power line to a low level. Overall and with the suggested mitigation measures applied, the impact of the Kalkaar 132 kV line would be of local extent and low significance. There are no impacts associated with the development of the power line that are considered to be high and which cannot be mitigated to a low level. As such, there are no significant ecological reasons to oppose the construction of the Kalkaar grid connections to Kimberly or to Jacobsdal.
Avi-fauna	An estimated 313 bird species could potentially occur in the study area of which 28 are classified as Red Data species. Three Important Bird Areas (IBAs) in the vicinity including Dronfield Nature Reserve (approx. 5km north Kimberley – SA031), Kamfer's Dam (approx. 6km north of Kimberley – SA032) and Benfontein Nature Reserve (approx. 14km south east of Kimberley – SA033). There is also a vulture breeding area for White-backed Vultures (Susanna Vulture Breeding Area) that can be found covering both Corridor 2 Alternatives 1 and 2, as well as another breeding area approx. 10km outside Jacobsdal.

	Potential impacts during the construction and decommissioning phase include the displacement of priority species and habitat transformation. Impacts are mainly negative but low. With mitigation, these impacts can be reduced further. For the operation phase, electrocutions and collisions of red data species is the primary potential impact. Potential impacts for collisions of red data species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and 2. This can be mitigated to a low level for Corridor 1 Jacobsdal Link and a medium level for Corridor 2 Alternatives 1 and 2. Potential impacts for electrocutions of red data species are rated as medium for Corridor 1 Jacobsdal Link and high for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Finally, for the decommissioning phase, displacement of red data species as a result of disturbance is rated as low for Corridor 1 Jacobsdal Link and medium for Corridor 2 Alternatives 1 and 2. All Corridors can be mitigated to a low level after mitigation. Corridor 1 Jacobsdal Link is the shortest power line route and does not transect any vulture breeding areas. All potential impacts can be mitigated to a low level. There is not much difference in preference between Corridor 2 Alternative 1 and 2 as both are relatively the same length and traverse the Susanna White-backed Vulture breeding area.
Wetlands	Two main hydrogeomorphic types were identified including well developed riparian systems (namely the Modder River) and several depression that differ in size (small pans – 0.9ha to 20ha; large pans – larger than 58ha to 401ha). Summary of assessments undertaken applied to riparian resources include the following: ▪ Modder River: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; ▪ Large Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision; and ▪ Small Pans: PES-C; EI & ES-C; REC-C; Moderately Low Ecological Function and Service Provision. Types of impacts to the riparian systems included: ▪ Loss of riparian habitat and ecological structure; and ▪ Changes to riparian ecological and sociocultural service provision; ▪ Impacts on riparian hydrology and sediment balance. Overall significance after mitigation is a low negative impact after management and mitigation measure implementation. Based on the

	findings of this study, it is the opinion of the ecologists that the proposed linear development is regarded as having low levels of impact on the surrounding freshwater resources identified, even if less than desirable mitigation of impacts occurs. With careful planning of the final layout of the powerlines and strict implementation of mitigation measures throughout all phases of the proposed project, impacts can be reduced to very low significance levels and the proposed project should, from a freshwater resource point of view, be considered favourably for development. Following the assessment of perceived impacts, consideration was given as to the preferred corridor option from a freshwater ecology perspective. As Corridor 1 was the only option provided for the routing of the powerline between the Kalkaar CSP to Jacobsdal Substation, this potion is considered to be "favourable". Depending on the final layout of the powerline within the corridor, with avoidance of most of the freshwater resources, this layout could have minimal impacts on the freshwater resources. Corridor 2, Alternative 2 is considered to be the best routing option for the powerline between Kalkaar CSP and the Kimberley Distribution Substation to Boundary Substation, as it traverses over the least amount of freshwater resources identified by this study.
Soils and Agricultural Potential	The proposed development is mainly on land zoned and used for agriculture. Soils on the site are predominantly shallow to moderately deep, loamy sands on underlying rock or hard-pan carbonate (Hutton, Mispah and Coega soil forms). The major limitation to agriculture is the limited climatic moisture availability. The limited depth of the soils is a further limitation. As a result, the site is predominantly unsuitable for cultivation and agricultural land use is limited to grazing, except for some small irrigation areas along the Modder River. The land capability of the site varies according to land type from class 5 to class 7, which is from non-arable, moderate potential grazing land to non-arable, low potential grazing land. The limitations to agriculture are aridity and lack of access to water plus shallow soil depth. Because of these constraints, agricultural land use is mostly restricted to grazing. The natural grazing capacity is predominantly 14-17 hectares per animal unit. The centre pivot lands along the Modder River are considered to be of high agricultural sensitivity. The overhead power lines as well as any infrastructure on the ground must avoid these lands.

	There are three factors that limit the significance of all potential agricultural impacts. The first is that the actual footprint of disturbance of the proposed power line is very small in relation to available, surrounding land. The second is that the impact of a power line on the kind of agricultural activity (predominantly grazing) along the proposed development is very minimal, as this can continue in the presence of a power line with negligible disturbance. The third factor is that the site has very low agricultural potential, limited by severe climatic moisture availability constraints and soils that include shallow ones. Four potential negative impacts of the development on agricultural resources and productivity were identified as: ▪ Loss of agricultural land use caused by direct occupation of land by the footprint of the power line infrastructure. ▪ Soil Erosion caused by alteration of the surface characteristics. ▪ Loss of topsoil in disturbed areas, causing a decline in soil fertility. ▪ Degradation of veld vegetation beyond the direct footprint due to constructional disturbance, dust and vehicle trampling. All impacts were assessed as having low significance. Recommended mitigation measures include implementation of an effective system of storm water run-off control to mitigate erosion; and topsoil stripping and re-spreading to mitigate loss of topsoil. Because of the low agricultural potential of the site and resultant low agricultural impacts, the development should, from an agricultural impact perspective, be authorised. Because of the low impacts and the uniformly low potential of the site, there is no preference between the different corridor options. There are no conditions resulting from this assessment that need to be included in the environmental authorisation.
Heritage and Palaeontology	Heritage Findings: An archival and historical desktop study was undertaken which was used to compile a historical layering of the study area within its regional context. This component indicated that the landscape within which the project area is located has a rich and diverse history. These desktop studies were followed by a fieldwork component that comprised driving and walking through the study area. A total of 27 occurrences of heritage resources were identified within Corridor 2 Alternative 1. Fourteen of these would require mitigation before exhumation (graves) or destruction (historical structures) if development

	were to come within 20 m. Thirteen occurrences of heritage resources have high significance and should not be disturbed by development within 20 m. None were identified within Corridor 1 Jacobsdal Link nor Corridor 2 Alternative 2. It is likely that further survey work in the study area will uncover additional heritage resources, especially graves, ruins and rock art sites on hilltops. Palaeontological Findings: An overlay of the study alignments on the SAHRiS palaeontological sensitivity map provides a good indication of the palaeontological sensitivity of the study area. The palaeontological sensitivity ranges from Moderate to very High and will require a field assessment during the final route walkdown. Overall Impact Statement: The overall impact evaluation has shown that the pre-mitigation impact on heritage resources is rated as High negative. However, with the implementation of the recommended mitigation measures, this will reduce the potential impact to a low negative impact. Corridor 1 and Corridor 2 Alternative 2 are viewed as favourable options due to the low potential impact on heritage resources which can be mitigated to address envisaged impacts. Corridor 2 Alternative 1 however, is viewed as not preferred as there is a large amount of heritage resources as well as possibly large areas of palaeontological significance along this route.
Visual	The Visual Impact Assessment (VIA) conducted for the proposed 132kV power line and associated infrastructure has demonstrated that most of the study area has a rural, partially scenic visual character which is transformed in part. The northern and south-western parts of the study area, near Kimberley and Jacobsdal respectively, are characterised by a more visually degraded landscape, which is mostly attributed to the presence of large-scale mining activities, existing electrical infrastructure as well as informal/semi-formal settlements and residential areas/communities. As such, the visual character in these parts of the study area is visually degraded, typical of a peri-urban environment. In addition, the southern and central parts of the study area are characterised by a more natural / scenic visual character due to the prevalence of the natural intact vegetation, limited human habitation and limited transformation and/or development. The visual character in these areas is thus typical of a natural rural environment. Commercial cultivation is concentrated along the Modder River in the southern parts of the study area. These areas are dominated by various agricultural activities and other elements typical of a pastoral environment. The study area is not typically valued or utilised for its natural scenic value

	and therefore relatively few tourism, historically or culturally significant sensitive receptors were identified during the fieldwork. A desktop investigation revealed that several farmsteads are also present within the study area which may perceive the power line to be an unwelcome intrusion, depending on the perception of the viewer. The impact assessment revealed that the significance of the visual impacts resulting from the proposed power line and associated infrastructure would be low during the construction phase and medium during the operational phase. These potential impacts can be mitigated to acceptable levels provided the recommended mitigation measures are implemented. All the proposed power line corridor alternatives were assessed to determine which alternative would result in the lowest overall visual impact. Based on the assessment, Corridor 1 (Green) is considered to be a favourable alignment for the proposed power line while Corridor 2 Alternative 1 (Purple) is not considered to be a preferred alignment. Corridor 2 Alternative 2 (Turquoise) was considered to be the preferred alignment, due to the presence of existing power lines and lack of visually sensitive and potentially sensitive receptor locations within close proximity.
Socio-economic	The review of the relevant policy documents concluded that the project falls in line with the national and local government developmental objectives. It may also form part of the SIP10 and SIP8. Furthermore, the project is not expected to comprise the spatial visions of the three municipalities and two provinces; however, care needs to be taken when the route is chosen as to avoid green areas earmarked by the Sol Plaatje LM. The project will improve the reliability of electricity supply in the region and could lead to establishing more electricity connections in the area, ultimately improving access to electricity in the municipality. The project will also have a positive albeit small impact on the national economy and local employment, as expenditure on construction activities to the value of between R60 million and R144 million, depending on the corridor chosen, is likely to stimulate between R180 million and R432 million of production revenue in the country and create up to fourteen temporary direct employment opportunities for the local communities. All three corridors have been considered. It appears that commercial livestock and game farming is the dominant land use that may be impacted by any of these corridor options and alternatives. The agricultural sector is a significant contributor to the economies of Letsemeng and Tokologo and creates approximately 33% and 22% of all job opportunities in the respective municipalities. This emphasises the need to minimise the project's potential negative impact on the

	dominant activities observed in the zone of influence of the project. Corridor Alternatives received the same average scores for positive and negative impacts for both before and after mitigations measures. Considering the preferences allocated to these two alternatives for each impact, no clear differentiation can be made between the alternatives and all could be equally considered.

No-go alternative (compulsory)

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

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

Although the potential impacts identified (such as visual impacts) would not occur if the project did not go ahead, it must be noted that the socio economic benefit of the proposed project should equally not be overlooked. The No-Go alternative has thus been eliminated due to the fact that the identified environmental impacts can be suitably mitigated and that by not building the project, the socio-economic benefits would be lost.

Preferred Power Line Alternative Corridor Summary

	Preferred Kalkaar Powerline Corridor Alternative		
Environmental Aspect	**Corridor 2 Alternative 1 – Kalkaar CSP via Kimberley DS to Boundary Substation (Purple)**	**Corridor 2 Alternative 2 – Kalkaar CSP via Kimberley DS to Boundary Substation (Turquoise – Preferred)**	**Corridor 1 – Jacobsdal Link (Green – Preferred)**
Biodiversity	Favourable	Preferred	Favourable
Avi-fauna	No preference	No preference	Preferred
Wetlands	Favourable	Preferred	Favourable
Agricultural	No preference	No preference	No preference

Potential and Soils			
Heritage and Palaeontology	Not preferred	Favourable	Favourable
Socio-economic	No preference	No preference	No preference
Visual	Not preferred	Favourable	Favourable

As per the summary of the preferred power line corridors shown above, the following reasons substantiate the final selection of the following preferred alternatives (**Figure 7**):

Corridor 2 Alternative 2 – Kalkaar CSP via Kimberley DS to Boundary Substation (Turquoise – Preferred)
There is not much difference in terms of preference with regards to avi-fauna, soils and agricultural potential and socio-economic aspects. However, there are reasons against the selection of Corridor 2 Alternative 1 (heritage and palaeontology as well as visual) as well as reasons motivating for the selection of Corridor 2 Alternative 2 (with regards to wetlands and biodiversity). As such, the selection of the Corridor 2 Alternative 2 – Kalkaar CSP via Kimberley DS to Boundary Substation as the preferred option was made taking into account the following:

- Presence of an existing line along this route will decrease the footprint and negative impact of the new line;
- Lower number of freshwater resources to be affected;
- Lowest potential impact on heritage resources and with appropriate mitigation measures, could address envisaged impacts.
- Follows existing power lines; and
- Fewer potential sensitive receptors.

Importantly, Corridor 1 – Jacobsdal link is not an alternative to the above mentioned alternative corridors and therefore did not undergo comparative assessment. All sensitivities, potential impacts and required mitigation measures were however determined and included in this report. This link is required as a mandatory second connection point to the national grid which requires environmental authorisation.

Corridor 1 – Jacobsdal Link (Green – Preferred)
This is the only option for the second connection point for the proposed power lines. Ultimately, the following must be taken into account for this proposed corridor as being preferred:
The Jacobsdal link has not very high sensitivity sections along the route;
Much lower risk of avi-fauna collision mortality and avoidance of vulture breeding areas;

- Least number of freshwater resources to be affected;
- Lowest potential impact on heritage resources and with appropriate mitigation measures, could address envisaged impacts.
- Shorter route and thus less physical impact (reduced footprint);
- Reduced potential negative socio-economic impacts;
- Lowest visual impact; and
- More economically viable being the shorter route.

From the above, Corridor 2 Alterantive 2 (Turquoise) and Corridor 1 – Jacobsdal Link (Green) are both to be environmentally authorized with the implementation of mitigation measures.

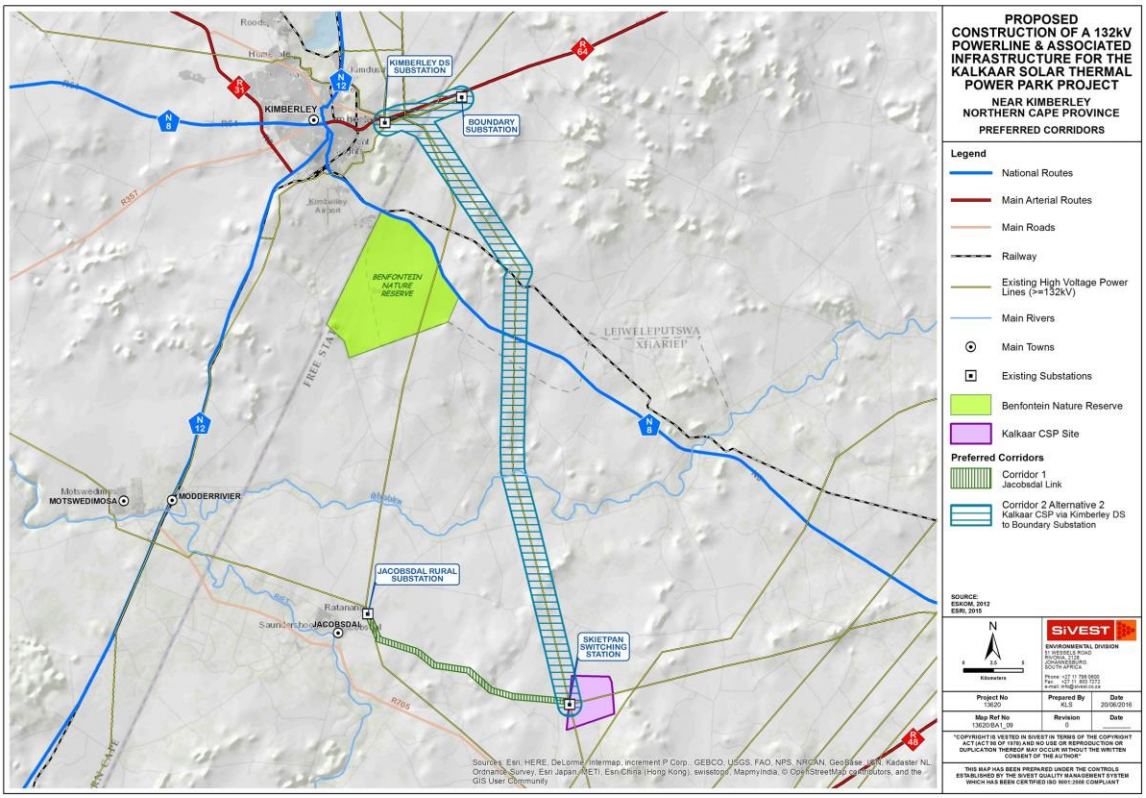

Figure 7. Preferred Powerline Corridors – Corridor 1 Jacobsdal Link & Corridor 2 Alternative 2

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

- Preconstruction walk-through of power line route to identify and locate species of conservation concern that should be avoided or translocated.
- Affected individuals of protected species which cannot be avoided should be translocated to a safe area on the site prior to construction as far as practically possible.
- There are also additional species present which are either protected under the National Forests Act such as *Boscia albitrunca* and *Acacia erioloba* or protected under the Northern Cape Nature Conservation Act of 2009, which includes *Boscia foetida*, all *Mesembryanthemaceae*, all species within the *Euphorbiaceae*, *Oxalidaceae*, *Iridaceae*, all species within the genera *Nemesia* and *Jamesbrittenia*.
- Relevant permits (i.e. plant removal permit from NCPG DENC) should be obtained before translocation/destruction/removal of listed and protected plant or tree species takes place and before construction commences.
- Alien species especially large woody species such as *Propsopis glandulosa* should be cleared from the power line servitude, but indigenous species such as *Boscia albitunca* and *Boscia foetida*, should not be cleared
- Where the power line runs 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, if possible.

Recommendations of the Avi-faunal Specialist

- Construction and de-commissioning activities should be restricted to the immediate footprint of the infrastructure.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species.
- Measures to control noise and dust should be applied according to current best practice in the industry.
- Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum.
- Prior to the construction of the line, a walk-through must be conducted to ascertain of any White-backed Vulture breeding pairs will be impacted by the construction activities. If any breeding pairs are potentially at risk, the construction will have to be timed to fall outside the

breeding season (April to July).

- The 132kV grid connection should be inspected at least once a quarter for a minimum of three years by the avifaunal specialist to establish if there is any significant collision mortality. Thereafter the frequency of inspections will be informed by the results of the first three years.
- The detailed protocol to be followed for the inspections will be compiled by the avifaunal specialist prior to the first inspection.
- The line should be marked with Bird Flight Diverters (BFDs) for its entire length on the earth wire of the line, 5m apart, alternating black and white.
- All the steel monopoles should be fitted with bird perches.

Recommendations of the Wetlands Specialist

- Ensuring that during the design phase, cognisance is taken of the locality of identified freshwater resources and their associated buffers, and as far as is practicable, to avoid the placement of infrastructure within those zones unnecessarily. It is preferable that no infrastructure is placed within the river nor in the pans;
- Should it be absolutely essential at certain crossings to place infrastructure within the freshwater resources habitat, access to these areas must be limited to essential personnel (and construction vehicles) and the boundaries thereof are to be clearly demarcated on site. No contract laydown areas are to be permitted within the freshwater resources habitat or associated buffer zone;
- Due to the degraded state of the vegetation, especially within the pans, care must be taken to ensure that as little vegetation as possible is removed, and that all exposed soils as a consequence of construction activities must be suitably protected with a geotextile to prevent erosion and sedimentation of the river, and loss of functionality of the pans; and
- Any freshwater resource directly impacted upon during construction activities must be immediately rehabilitated in accordance with the EMPr following the completion of such activities at that specific site.

Recommendations of the Soils and Agriculture Specialist

- Recommended mitigation measures include implementation of an effective system of storm water run-off control to mitigate erosion; and topsoil stripping and re-spreading to mitigate loss of topsoil.

Recommendations of the Heritage and Palaeontology SpecialistHeritage recommendations

- It is likely that further survey work in the study area will uncover additional heritage resources, especially graves, ruins and rock art sites on hilltops. Therefore a final walk-down must be undertaken.

Palaeontology recommendations

- Palaeontological sensitivity ranges from Moderate to very High and will require a field assessment during the final route walk-down.

Recommendations of the Visual Specialist

- Recommended mitigation measures to be implemented.

Recommendations of the Socio-Economic Specialist

- The potentially directly affected and interested parties interviewed have not expressed

objections to the project. However, it is important that these parties be properly consulted before choosing the final powerline route and servitudes before construction commences in order to not affect any commercial farming activities or future industrial projects happening on those properties.

- This will be undertaken by SolarReserve as part of the commnercial and contractual process when obtaining servitudes from the affected landowners.

General Recommendations of the EAP

- All mitigation measures recommended by the various specialist should be strictly implemented.
- 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. This includes the following:

- Competent Authority Consultation (Appendix J1)
- A3 Maps (Appendix J2)
- Co-ordinate Spreadsheet (Appendix J3)
- EMF Report (Appendix J4)
- Property Descriptions (Appendix J5)
- Peer Review Letters (Appendix J6)
- Eskom Cost Estimate Letter (Appendix J7)

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

SECTION F: APPENDICES

The following appendices must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information