

## APPENDIX F – COMPLETE IMPACT ASSESSMENT

According to Appendix 1(3) of the EIA Regulations (GN R.982 of 2014), a *Basic Assessment Report* must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—

- (v) *the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts*
  - (aa) *can be reversed;*
  - (bb) *may cause irreplaceable loss of resources; and*
  - (cc) *can be avoided, managed or mitigated;*
  
- (viii) *the possible mitigation measures that could be applied and level of residual risk;*
  
- (j) *an assessment of each identified potentially significant impact and risk, including*
  - (i) *cumulative impacts;*
  - (ii) *the nature, significance and consequences of the impact and risk;*
  - (iii) *the extent and duration of the impact and risk;*
  - (iv) *the probability of the impact and risk occurring;*
  - (v) *the degree to which the impact and risk can be reversed;*
  - (vi) *the degree to which the impact and risk may cause irreplaceable loss of resources; and*
  - (vii) *the degree to which the impact and risk can be avoided, managed or mitigated;*

A summary of the impact assessed by each of the specialist studies undertaken to inform the BA process are provided in Table 1 below. The assessments have been conducted by qualified and experienced specialists in accordance with Appendix 6 of the 2014 EIA Regulations. This appendix provides a summary of the key findings, impact assessments and recommended mitigation measures identified by the specialists based on the layout provided by Rietkloof Wind Farm.

The detailed specialist studies are provided in the Specialist Studies Volume, attached to this BAR as Appendix 'D'. Details and expertise of each specialist as well as a signed declaration of independence for each specialist are also included in the Specialist Studies Volume.

Table 1: Construction, operational and decommissioning phase impacts for all specialist assessments

	Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation	
1. Heritage Impact	<b>Construction phase</b> <b>The Destruction of Precolonial / Stone Age</b> It has been established in this report that precolonial / archaeological heritage remains occur on the flat floodplains and along water courses within the proposed project area. Therefore it is likely that more stone artefacts and possibly other material and organic material may be uncovered during the construction of Substation 7 (SS7). The stone artefacts are considered as being irreplaceable heritage resources, once the artefact or the site has been destroyed so has the information for interpretation. This impact was rated as Very High negative prior to mitigation, and Moderate negative thereafter.	Komsberg and Bon Espirange connection alternatives	A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.	<b>Construction phase</b> <b>The Destruction of Precolonial / Stone Age material (RKPL_SA1 – RKPL_SA4)</b> Duration: Permanent Extent: Regional Consequence: Very severe Probability: Definite <b>VERY HIGH -</b>	<b>Construction phase</b> <b>The Destruction of Precolonial / Stone Age material (RKPL_SA1 – RKPL_SA4)</b> Duration: Permanent Extent: Regional Consequence: Slight Probability: Definite <b>MODERATE -</b>	
	<b>Construction phase</b> <b>Damage to stone walling features</b> Only two stone packed features occur within 200 m of the proposed power line alternatives. It is unlikely that these features will be negatively impacted by the proposed project. This impact was rated Very High Negative prior to mitigation, and Moderate negative thereafter.	Komsberg and Bon Espirange connection alternatives	A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.		<b>Construction phase</b> <b>The Destruction of Stone Walling Features (RKPL_SW1 - RKPL_SW3) and associated Historical Artefact Scatters (RKPL_Hist1)</b> Duration: Permanent Extent: Study site Consequence: Very severe Probability: May occur <b>VERY HIGH -</b>	<b>Construction phase</b> <b>The Destruction of Stone Walling Features (RKPL_SW1 - RKPL_SW3) and associated Historical Artefact Scatters (RKPL_Hist1)</b> Duration: Long term Extent: Study site Consequence: Slight Probability: May occur <b>MODERATE -</b>
	<b>Construction phase</b> <b>The Destruction of Graves</b> Only two of the three areas with graves / burials encountered are within close proximity of any development activities. These family graves are mostly older than 60 years protected and should be respected. This impact was rated Very High Negative prior to mitigation and Moderate negative thereafter.	Komsberg and Bon Espirange connection alternatives	A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.		<b>Construction phase</b> <b>The Destruction of Graves (formal and informal burials) (RKPL_G1 – RKPL_G2)</b> Duration: Permanent Extent: Study site Consequence: Very severe Probability: May occur <b>VERY HIGH -</b>	<b>Construction phase</b> <b>The Destruction of Graves (formal and informal burials) (RKPL_G1 – RKPL_G2)</b> Duration: Permanent Extent: Study site Consequence: Slight Probability: May occur <b>VERY HIGH -</b>
	<b>Construction phase</b> <b>Damage to Homesteads / Farmhouse Complexes</b> Two homesteads / farm complexes (BVPL_HS1 and BVPL_HS2) were identified 200 m of the proposed power line alternatives. The homesteads are situated adjacent to the proposed power line alternatives, however, it is unlikely that they will be negatively impacted by the proposed project. BVPL_HS3 and BVPL_HS4 have merely been shown in the report for their positions and do not occur nearby, within 200m, of the proposed power line routes. This impact was rated Very High Negative prior to mitigation, and Moderate negative thereafter.	Komsberg and Bon Espirange connection alternatives	A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.		<b>Construction phase</b> <b>The Destruction of Homesteads / Farmhouse Complexes (RKPL_HS1 – RKPL_HS2)</b> Duration: Permanent Extent: Study site Consequence: Very severe Probability: Definite <b>VERY HIGH -</b>	<b>Construction phase</b> <b>The Destruction of Homesteads / Farmhouse Complexes (RKPL_HS1 – RKPL_HS2)</b> Duration: Long term Extent: Study site Consequence: Slight Probability: Definite <b>MODERATE -</b>
	<b>Operation phase</b> <b>Change of character of the region and subsequent cultural Landscape impact</b> The changing land use in the area may result in a changed cultural landscape associated with the project region. This impact was rate Very High Negative prior to mitigation, and Moderate negative thereafter.	All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative	Effective rehabilitation of the landscape after decommissioning.		<b>Operation phase</b> <b>Change of character of the region and subsequent cultural Landscape impact</b> Duration: Long term Extent: Study site Consequence: Very severe Probability: Definite <b>VERY HIGH -</b>	<b>Operation phase</b> <b>Change of character of the region and subsequent cultural Landscape impact</b> Duration: Medium term Extent: Study site Consequence: Moderate Probability: Definite <b>MODERATE -</b>
	<b>Cumulative Impact</b> <b>Impact of the construction of the proposed substation and powerlines on the cultural landscape</b> The numerous applications and proposed establishment of several wind energy and solar energy facilities between Matjiesfontein and	All alternatives	Effective rehabilitation of the landscape after decommissioning. A walk-through of the final layout of the preferred powerline alternative should be conducted before any final mitigation measures can be established.		<b>Cumulative Impact</b> <b>Impact of the construction of the proposed substation and powerlines on the cultural landscape</b> Duration: Long term Extent: Study site Consequence: Very severe	<b>Cumulative Impact</b> <b>Impact of the construction of the proposed substation and powerlines on the cultural landscape</b> Duration: Medium term Extent: Study site Consequence: Moderate Probability: Definite

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Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
	<p>Sutherland as well as the adjacent regions have sparked a concern with regards to cumulative impacts that these projects may have on the heritage resources and the cultural landscape. Therefore, it is of the utmost importance to provide a thorough documentation of the archaeological and historical heritage resources, sites and features within the specific project area. The archaeological and historical heritage resources must be appropriately mitigated at a project / site specific level so that there is less of a risk of losing the information after the construction of these alternative energy facilities. The loss of information at regional scale is at risk as these facilities cause an immense amount of surface disturbance and destruction where archaeological and historical heritage resource are at risk of being destroyed without justification.</p> <p>In addition, the cultural landscape of the wider region is inhibited by mass industrialisation of the landscape that changes the character of the landscape and hence impacts on the sense of place and aesthetic value negatively. The Karoo has been considered as a wilderness landscape whereby the cumulative impact will involve significant sterilisation of the aesthetic qualities of the landscape, the Karoo heritage and its character and sense of place.</p>		<p>Probability: Definite</p> <p><b>VERY HIGH –</b></p>	<p><b>MODERATE -</b></p>
<p>2. Impact to Palaeontology</p>	<p><b>Impacts to fossil heritage resources</b></p> <p>Bedrock excavations into potentially fossiliferous bedrocks during construction of the 132 kV distribution line pylons and associated access roads are likely to be small in volume.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p> <p>The Environmental Control Officer (ECO) responsible for the 132 kV distribution lines should be made aware of the possible occurrence of scientifically-important fossil remains within the development footprint. During the construction phase all major clearance operations (e.g. for new access roads, pylon placements) and deeper (&gt; 1 m) excavations should be monitored for fossil remains on an on-going basis by the ECO. Should substantial fossil remains – such as vertebrate bones and teeth, or petrified logs of fossil wood – be encountered at surface or exposed during construction, the ECO should safeguard these, preferably in situ. They should then alert the relevant Heritage Management Authority as soon as possible to ensure that appropriate action (i.e. recording, sampling or collection of fossils, recording of relevant geological data) can be taken by a professional palaeontologist at the developer's expense.</p>	<p><b>Construction</b></p> <p><b>Impacts to fossil heritage resources</b></p> <p>Duration: Permanent Extent: Localised Consequence: Slight Probability: Unlikely</p> <p><b>LOW –</b></p>	<p><b>Construction</b></p> <p><b>Impacts to fossil heritage resources</b></p> <p>Duration: Permanent Extent: Localised Consequence: Slight Probability: Unlikely</p> <p><b>LOW –</b></p>
	<p><b>Cumulative Impacts</b></p> <p><b>Cumulative Impact to fossil heritage resources</b></p> <p>A considerable number of alternative energy developments have been proposed or authorised in the broader south-western Karoo region within which the Rietkloof WEF study area is situated. Several of these projects entail impacts on fossil heritage resources preserved within the same rock units of the Karoo Supergroup and overlying superficial sediments that are represented within the present study area. It is noted that this region also falls within the shale gas prospecting area of Falcon Oil and Gas Ltd as well as the broader study area for the on-going Strategic Environmental Assessment for shale gas exploitation in the Karoo (fracking) that is being co-ordinated by the CSIR. Desktop- and field-based assessments for a major proportion of these projects have been carried out by the author (See References) and colleagues (e.g. Miller 2011). For example, field assessments of the Brandvalley WEF and Kareebosch WEF (Roggeveld Phase 2) project areas immediately</p>	<p>All alternatives</p> <p>Same as above.</p>	<p><b>Cumulative Impacts</b></p> <p><b>Cumulative Impact to fossil heritage resources</b></p> <p>Duration: Permanent Extent: Localised Consequence: Slight Probability: Definite</p> <p><b>LOW –</b></p>	<p><b>Cumulative Impacts</b></p> <p><b>Cumulative Impact to fossil heritage resources</b></p> <p>Duration: Permanent Extent: Localised Consequence: Slight Probability: Definite</p> <p><b>LOW –</b></p>

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<p>north of, and overlapping with, the Rietkloof WEF study area have recently been completed (Almond 2014, Almond 2016). In all cases it was concluded by the author that, despite the undoubted occurrence of scientifically-important fossil remains (notably fossil vertebrates, vertebrate trackways and burrows, petrified wood), the overall impact significance of the proposed developments was low because the probability of significant impacts on unique or rare fossils was slight. Provided that the proposed monitoring and mitigation recommendations made for these various projects are followed through, their cumulative impact on palaeontological heritage resources - including impacts envisaged for the Rietkloof WEF project – is predicted to be low (negative). On the other hand, unavoidable residual negative impacts may be partially counterbalanced by an improved understanding of Karoo palaeontology resulting from appropriate professional mitigation for these projects. This is regarded as a significant positive impact for Karoo palaeontological heritage. Cumulative impacts in this case refer to:</p> <ul style="list-style-type: none"> <li>Disturbance, damage or destruction of fossil heritage within the development footprint during the construction phase of the WEF combined with other developments in the region affecting the same sedimentary rock units (formations / members)</li> </ul> <p>It should be noted that palaeontological impacts inferred for development projects within a given region are only relevant where the same geological units (e.g. sedimentary formations or members), and hence the same fossil assemblages, are concerned. The cumulative impact assessment for the Rietkloof WEF given above has therefore focused primarily on potential impacts to fossil heritage within the lowermost portion of the Abrahamskraal Formation, the underlying Lower to Middle Ecca Group as well as various Late Caenozoic superficial deposits (e.g. older alluvium). Levels of confidence for this assessment are rated as moderate, given the large number of studies in the context of the generally low levels of bedrock exposure in the region.</p>				
<p>2. Avifauna Impacts</p>	<p><b>Construction phase</b>  <b>Disturbance during construction of the sub-stations and power lines (relevant to all power line alternatives and all four sub-station locations).</b>                      This is inevitable during the construction of the sub-stations, erection of the 132 kV powerlines, as well as the tracks (service roads) needed to install and service the powerlines. No time period is known at this stage but once development starts the duration of the construction phase is likely to be short, 12-18 months at maximum. Disturbance will cause the local displacement of mainly small scrub-dwelling birds during this phase. The disturbance will be temporary. The impact will be greatest in valley bottom areas where resources (food and breeding sites) and so bird numbers and diversity are higher than elsewhere within the WEF area.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<p>Clear only areas where absolutely necessary not from the entire servitude of the line.                      Minimise the number of service tracks.</p>	<p><b>Construction phase</b>  <b>Disturbance during construction of the sub-stations and power lines (relevant to all power line alternatives and all four sub-station locations).</b>                      Duration: Short term                      Extent: Localised                      Consequence: Slight                      Probability: Definite</p> <p><b>LOW –</b></p>
	<p><b>Construction phase</b>  <b>Loss of habitat as result of grounded features – namely the sub-stations, pylon bases, and</b></p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection</p>	<p>Clear only areas where absolutely necessary.                      Minimise the number of service tracks.</p>	<p><b>Construction phase</b>  <b>Loss of habitat as result of grounded features – namely the sub-stations, pylon bases, and</b></p>

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<p><b>associated service tracks during the construction phase</b></p> <p>The natural vegetation of the area, karooid bush, remains predominant across a wide region. The proposed footprint of the onsite sub-stations, the shared sub-station, and the Bon Espirange sub-station is a square 200 x 200 m including a buffer halo such that habitat destruction will seldom exceed the proposed footprint area. The footprint of each support structure for the 132 kV powerlines is small but there will be greater habitat damage and effective loss along the tracks created for the installation and maintenance of the powerlines.</p> <p>The low woody bushes, the dominant vegetation of this region, are easily damaged by vehicles. They are slow growing and if damaged either do not regenerate or do so over very long periods, as exemplified by infrequently used farm tracks in the area. The footprints of the sub-stations, tracks and powerline support structures will thus result in effectively permanent (&gt;20 years) loss of habitat for local birds. The loss of habitat will be definite and will have a negative, though extremely localized, impact with no probability of mitigation.</p> <p>Elsewhere some bird species are known to be sensitive to human structures especially those that are visually intrusive and make a noise. Species sensitive to these issues may avoid otherwise unchanged habitat for some distance (variable between species) around the human structures. This results in a considerably greater habitat loss for these species than is represented by the actual footprint of the structures. Though, the extent to which bird species in the Rietkloof WEF area are sensitive and may be displaced has not been studied, in the absence of information the precautionary principle must apply and until proved otherwise it must be considered that habitat loss will affect birds, especially larger-bodied birds, over a greater area than the immediate halo around the structures.</p>	<p>alternative and Bon Espirange Substation connection alternative</p>		<p><b>associated service tracks during the construction phase.</b> Duration: Long term Extent: Localised Consequence: Slight Probability: Definite</p> <p><b>MODERATE –</b></p>	<p><b>associated service tracks during the construction phase.</b> Duration: Long term Extent: Localised Consequence: Slight Probability: Definite</p> <p><b>MODERATE –</b></p>
<p><b>Operational phase Bird mortality through collision with the overhead lines during the operational phase (relevant to all powerline alternatives).</b></p> <p>The habitat, over which the 132 kV powerlines will be developed is one of low karooid scrub. The predominant bushes seldom grow above the knee height of an average human. Most of the food for birds is on this vegetation or the ground below. Consequently, the great majority of birds that use the area have no need to fly high off the ground and their risk of collision with powerlines is inconsequential. The main concern over collision mortality risk is with larger</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<p>No powerline routes 1) near Fortuin dam and 2) through, or across, the col between Ou Mure and Fortuin farms, or for these localities only burying of the cables. Placing diverters at 5 m intervals along all powerline spans between support structures crossing valleys.</p>	<p><b>Operational phase Bird mortality through collision with the overhead lines during the operational phase (relevant to all powerline alternatives).</b> Duration: Long term Extent: Localised Consequence: Moderate Probability: Definite</p> <p><b>MODERATE –</b></p>	<p><b>Operational phase Bird mortality through collision with the overhead lines during the operational phase (relevant to all powerline alternatives).</b> Duration: Long term Extent: Localised Consequence: Moderate Probability: Definite</p> <p><b>MODERATE –</b></p>
	<p>All alternative lines barring CH1a and CH1b (see below)</p>	<p>Routing of distribution lines to avoid:</p> <ul style="list-style-type: none"> <li>• Region near Fortuin Dam</li> <li>• Through, or across, the col between Ou Mure and Fortuin Farms, or for these localities only burying the cable;</li> <li>• .</li> </ul>	<p><b>Operation phase</b> All alternative lines barring CH1a and CH1b</p> <p>Duration: Long term Extent: Localised Consequence: Moderate</p>	<p><b>Operation phase</b> All alternative lines barring CH1a and CH1b</p> <p>Duration: Long term Extent: Localised Consequence: Slight Probability: May occur</p>

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<p>birds, which are known to be less agile in avoiding powerlines and especially those that fly at night when lines are less detectable. Based on four years' experience monitoring birds in immediately adjoining areas three groups of birds are of particular concern in this region. These are: 1) bustards; 2) birds of prey; and 3) waterbirds.</p>	<p>Alternatives CH1a and CH1b</p>	<ul style="list-style-type: none"> <li>Place diverters at 5m intervals along all power line spans between the support structures that cross valleys.</li> </ul> <p>Please see the attached avifaunal impact assessment for specifics on the location of these areas.</p> <p>Same as above.</p>	<p>Probability: Definite</p> <p><b>MODERATE -</b></p>	<p><b>LOW -</b></p>
<p><b>Cumulative Impact – Electrocutation</b> The following cumulative impacts were assessed:</p> <ul style="list-style-type: none"> <li>Electrocutation</li> <li>Habitat Destruction</li> <li>Displacement</li> <li>Solar Array Collision</li> <li>Wind Turbine Collision</li> <li>Powerline Collision</li> </ul> <p>All the other developments (see cumulative map included in Appendix A) are in areas of predominantly low scrub vegetation which covers a far wider area within South Africa. This vegetation, compared with wetter areas and richer vegetation types, offers few resources to birds so species diversity and, especially, the density and size of bird populations are low. The only local exceptions are small patches of natural riparian bush and farmlands with dams, trees and cultivated (often irrigated) fields. Development of the windfarms requires widening of old farm roads and the construction of new roads to enable large vehicles to access to the hilltops where turbines, with their associated footprint areas will be located. These developments will result in considerable disturbance through the construction phase and the loss of considerable habitat. The solar power plants will also destroy habitat.</p> <p>To transfer electricity from the turbine strings to the national grid will, if all the proposed wind farms get authorisation, require a considerable number of 33kV overhead powerlines between turbine strings to one or more sub-stations and, after transformation, 132 kV lines from the sub-station(s) to the main Eskom 400 KV line. In places the 33 kV and some 132KV lines will cross valleys at right angles and also obstruct low points in ridges which are preferred flight paths of birds.</p> <p>Many birds in the region birds prefer to fly along valleys rather than cross ridges. These lines will increase collision risk. This is especially the case for those larger birds which move by night</p>	<p>All alternatives</p>	<p>Avifauna monitoring to inform the placement of all powerlines and turbines proposed for the greater study area. Eskom approved bird friendly structures to be constructed.</p>	<p><b>Operation phase</b> Alternative CH1a and CH1b</p> <p>Duration: Long term Extent: Localised Consequence: Severe Probability: Definite</p> <p><b>HIGH -</b></p>	<p><b>Operation phase</b> Alternative CH1a and CH1b</p> <p>Duration: Long term Extent: Localised Consequence: Slight Probability: Definite</p> <p><b>MODERATE –</b></p>
			<p><b>Cumulative Impact – Electrocutation</b> Duration: Long term Extent: Regional Consequence: Slight Probability: May Occur</p> <p><b>LOW –</b></p>	<p><b>Cumulative Impacts – Electrocutation</b> Duration: Long term Extent: Regional Consequence: Slight Probability: May Occur</p> <p><b>LOW –</b></p>

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<p>e.g. waterbirds moving between dams in the valleys. Together the cumulative impact of these power lines, because they are less readily seen and are more often located across bird flight routes, impose a greater threat to birds than the turbines which are all located on hilltops which, in this region, support few birds. The cumulative impacts are acceptable provided the mitigation measures are implemented.</p> <p><u>Electrocution</u> affects only those birds – mainly raptors - which readily perch on the pylons of transmission lines. Means to minimize bird risk of electrocution are well known, and largely followed by Eskom and other powerline constructors. In addition, the number of birds at risk in this overall region is very small – probably fewer than 50 individuals from all species in any one year.</p> <p>Only one red listed species is potentially at risk – the Martial Eagle. These eagles preferentially breed in trees. These have to be able to support the substantial nest; keep the nest well out of reach of four-legged predators; and of a height that provides good all-round vision. Martial Eagles have only been able to colonize this region through use of existing transmission pylons. That they do so confirms that the electrocution risk to this, and other, species must be extremely low</p>				
<p><b>Cumulative Impact – Habitat Destruction</b> The areas of habitat destruction differ greatly between solar and wind energy facilities. Solar farms have intense, but area concentrated, habitat destruction. Wind facilities have widespread habitat destruction but for scattered and far smaller areas – sub-stations, construction camps, access roads, the bases of transmission pylons, and wind turbines with their associated crane pads etc.</p> <p>The area of habitat destruction from the assorted projects – both solar and wind – across the region in which the powerline –is located is difficult to accurately assess because of the currently unknown extent of particularly wind farm developments (size of substations, number of new roads required etc.). The total area of habitat destruction is likely to be less than 2% of the region. This is considerably less than the destruction that has occurred earlier with clearance for agriculture, roads and more recently the establishment of two major Eskom transmission lines with their associated tracks and substation. Previous habitat destruction through clearance for agriculture has increased avian biodiversity in the region through provision of new foraging habitats and provision of water access. Neither solar nor wind facility habitat destruction will be positive for birds.</p> <p>The main impact of habitat destruction for solar and wind facilities is total displacement of small birds – larger bird species require greater areas in which to live and, as known from experience elsewhere, are often able to cope with scattered and small patches of habitat destruction as will</p>	All alternatives	Avoid key habitats.	<p><b>Cumulative Impact – Habitat Destruction</b> Duration: Long term Extent: Regional Consequence: Slight Probability: Will Occur</p> <p><b>LOW –</b></p>	<p><b>Cumulative Impact – Habitat Destruction</b> Duration: Long term Extent: Regional Consequence: Slight Probability: Will Occur</p> <p><b>LOW –</b></p>

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<p>result from the solar and wind projects proposed for this region. None of the species of small birds that regularly occur in this region, and that will be negatively impacted by habitat destruction, are of particular regional conservation concern (including national endemic and near-endemic species) as all occur widely, and in substantial numbers, across either the karoo or fynbos biomes.</p> <p>Provided habitat destruction is kept removed from priority bird habitats, as is recommended in the EIA reports, the cumulative habitat destruction cannot, from an avifaunal perspective, be considered other than a minor impact of low significance. Ideally, clearing of habitat should not be allowed during the breeding season which for the majority of passerines in this region is September-October (after the winter rainy season and as temperatures rise in spring). This should especially apply in valley bottom areas where a higher diversity, and number, of birds are likely to be affected than on slopes and particularly hill- or ridge-tops</p>				
<p><b>Cumulative Impact – Displacement</b> Infrastructure constructions can lead to some species of birds (usually those that are larger-bodied, and so often more shy of humans and their structures) avoiding an area around the infrastructure. On a global scale such displacement has been difficult to assess, largely because earlier developments have often already displaced species sensitive to novel structures. Also partially because studies of avoidance displacement have not extended over sufficiently long periods to assess whether, with time, initially sensitive species become adjusted to structures (as has happened with many species in urban environments e.g. Hadede Ibises and Black Sparrowhawks in urban Cape Town).</p> <p>Available information is inadequate to evaluate this impact. It is here considered to be low in view of the existing extensive areas of similar habitat outside the region.</p>	All alternatives	None provided.	<p><b>Cumulative Impact – Displacement</b> Duration: Long term Extent: Localised Consequence: Slight Probability: May Occur</p> <p><b>LOW –</b></p>	<p><b>Cumulative Impact – Displacement</b> Duration: Medium-Long term Extent: Localised Consequence: Slight Probability: May Occur</p> <p><b>LOW –</b></p>
<p><b>Cumulative Impact –Collision</b> Natural collision risk for birds in the open, effectively tree-less, karoo and fynbos biomes is negligible. There are three types of collision risk that potentially impact birds as a result of wind or solar energy developments. These will be novel risks for bird species used to the open, naturally obstruction-free karoo or fynbos areas. Structures associated with solar and wind developments pose three types of novel collision risk for regional birds. These structures are: <input type="checkbox"/> Arrays of solar panels <input type="checkbox"/> Wind turbines <input type="checkbox"/> Powerlines Powerlines are likely to have the greatest negative impact on birds in the region. This is because they: <input type="checkbox"/> are the most widespread structures that result from the solar and wind developments; <input type="checkbox"/> will often stretch across, rather than along valleys, and so create obstacles across natural long-valley flight paths; and <input type="checkbox"/> the relatively thin wires are less readily visible than the solid pylons and turbines, especially at night; Mitigation, in the form of day AND night visible bird diverters at 2m intervals, should be required on lines wherever powerlines are located near open waterbodies or cross watercourses. Cross-valley powerlines should be kept to an absolute minimum since topographical funnelling tends to focus flight paths along valleys.</p>	All alternatives	Minimise distribution lines across valleys. Day and night diverters to be installed on all lines crossing waterbodies.	<p><b>Cumulative Impact –Collision</b> Duration: Long term Extent: Regional Consequence: Moderate Probability: May Occur</p> <p><b>LOW –</b></p>	<p><b>Cumulative Impact - Collision</b> Duration: Long term Extent: Regional Consequence: Low Probability: May Occur</p> <p><b>LOW –</b></p>



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	Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
3. Social Impacts	<p>Powerline pylons, and to a lesser extent wires, provide elevated vantage points for predatory birds. This will result in an un-naturally high rate of predation on smaller birds, and other animals, in the immediate vicinity of the powerlines. This impact</p> <p><b>Social and visual impact of the power line</b> The potential social impacts associated with the establishment of 33kV overhead power lines and the associated substation will be limited, specifically within the context of the establishment of the wind turbines associated with the proposed WEF. In addition, the power lines are located on the site.</p> <p>The proposed 132kV power lines for the proposed Rietkloof will cross the project area before following the existing 765kV Eskom power line for 5km before heading north for 1.2km and then follow the existing 400kV power line before linking up with the Bon Espirange substation. The short sections where the power line does not follow existing Eskom power lines are located within the development footprint. The significance of the visual and associated social impacts associated with the establishment of a new 132 kV line is therefore likely to be <b>Low Negative</b>.</p> <p>In addition, as indicated in the assessment of the 33kV lines, the impact of a power line should be viewed within the context of the establishment of the wind turbines associated with the proposed WEF. Added to this study area has been identified as a Renewable Energy Development Zone by the Strategic Environmental Assessment (SEA) for Wind and Solar PV energy in South Africa undertaken by the CSIR (2015). The area has therefore been identified as an area where renewable energy should be concentrated.</p>	<p>Alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<ul style="list-style-type: none"> <li>Reroute distribution lines, where feasible, to avoid sensitive receptors;</li> <li>Keep disturbed areas to a minimum.</li> <li>No clearing of land to take place outside the demarcated footprint.</li> <li>Contractors should avoid and minimise waste and litter on site during construction and operation phases</li> <li>The steel components within the substation should not be painted but be galvanised and allowed to oxidise naturally over time. The grey colour produced in this process will help to reduce the visual impact. Should painting be necessary to protect equipment, natural colours found in the surrounding landscape should be used.</li> <li>Carefully plan to reduce the construction period.</li> <li>New road construction must be kept to a minimum. Utilise existing roads and tracks to the extent possible.</li> </ul> <p>The final route selection of the power lines and location of the substation should be informed by current location of farm dwellings on the site and the findings of the other specialist studies.</p>	<p><b>Social and visual impact of the power line</b> Duration: Medium term Extent: Study area Consequence: Slight Probability: Probable</p> <p><b>LOW –</b></p>	<p><b>Social and visual impact of the power line</b> Duration: Medium term Extent: Study area Consequence: Slight Probability: Probable</p> <p><b>LOW –</b></p>
	<p><b>Cumulative impact</b> Based on the findings of the SIA the potential social impacts associated with the internal overhead power lines and substation will be Low Negative, specifically within the context of the establishment of the wind turbines associated with the proposed WEF.</p>	<p>All alternatives</p>	<p>Same as above.</p>	<p><b>Cumulative impact</b> Duration: Medium term Extent: Regional Consequence: Slight Probability: Probable</p> <p><b>LOW –</b></p>	<p><b>Cumulative impact</b> Duration: Medium term Extent: Regional Consequence: Slight Probability: Probable</p> <p><b>LOW –</b></p>
4. Ecological Impacts	<p><b>Construction phase</b> <b>Impact on vegetation and listed plant species due to transformation within the development footprint.</b> There are listed and protected species confirmed present at the site and it is some of these species would be impacted during site clearing. Although a preconstruction walk-through can reduce this impact, there is still likely to be some unavoidable impact on vegetation.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative, barring lines A1a, A1b, CH1a and CH1b.</p>	<ul style="list-style-type: none"> <li>Preconstruction walk-through of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible.</li> <li>Ensure that temporary infrastructure areas are within low sensitivity areas, preferably previously transformed areas if possible.</li> <li>Routes should also be adjusted within their corridors to avoid areas of high sensitivity as far as possible, as informed by a preconstruction walk-through survey.</li> <li>Train staff to keep construction activities within the demarcated areas.</li> </ul>	<p><b>Construction phase</b> <b>Impact on vegetation and listed plant species due to transformation within the development footprint.</b> Duration: Permanent Extent: Localised Consequence: Moderate Probability: Definite</p> <p><b>MODERATE –</b></p>	<p><b>Construction phase</b> <b>Impact on vegetation and listed plant species due to transformation within the development footprint.</b> Duration: Permanent Extent: Localised Consequence: Slight Probability: Probable</p> <p><b>LOW –</b></p>

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Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
		<ul style="list-style-type: none"> <li>Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development.</li> <li>Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc.</li> <li>Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to avoid using material that might entangle fauna.</li> </ul>		
<p align="center"><b>Construction phase Direct faunal impacts due to construction phase noise and physical disturbance.</b></p> <p>The construction phase will involve some disturbance at the site due to the operation of heavy machinery, human presence and noise from blasting and machinery. This will deter larger fauna from the area and smaller fauna may suffer direct habitat loss or be killed if they are unable or too slow to move away from construction activities. As the construction activities cannot be avoided, it is not possible to mitigate some of these impacts. They are however transient and disturbance levels will subside significantly in the operational phase. Construction phase faunal disturbance is considered to have a Low significance after mitigation.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative.</p>	<ul style="list-style-type: none"> <li>Preconstruction walk-through of the facility to identify areas of faunal sensitivity.</li> <li>During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.</li> <li>The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site.</li> <li>No fires should be allowed within the site as there is a risk of runaway veld fires.</li> <li>No fuelwood collection should be allowed on-site.</li> <li>No pets should be allowed on site apart from that of the landowners.</li> <li>If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards.</li> <li>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</li> <li>No unauthorized persons should be allowed onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel.</li> <li>All construction vehicles should adhere to a low speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site.</li> <li>All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition.</li> </ul>	<p align="center"><b>Construction phase Direct faunal impacts due to construction phase noise and physical disturbance.</b> Duration: Short term Extent: Localised Consequence: Severe Probability: Probable</p> <p align="center"><b>MODERATE –</b></p>	<p align="center"><b>Construction phase Direct faunal impacts due to construction phase noise and physical disturbance.</b> Duration: Short term Extent: Localised Consequence: Moderate Probability: May Occur</p> <p align="center"><b>LOW –</b></p>
<p align="center"><b>Operation phase Following construction, the site will be highly vulnerable to soil erosion</b></p> <p>Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative.</p>	<ul style="list-style-type: none"> <li>Erosion management should take place according to the Erosion and Rehabilitation Plan.</li> <li>All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the</li> </ul>	<p align="center"><b>Operation phase Following construction, the site will be highly vulnerable to soil erosion</b> Duration: Medium term Extent: Localised Consequence: Severe</p>	<p align="center"><b>Operation phase Following construction, the site will be highly vulnerable to soil erosion</b> Duration: Short term Extent: Localised</p>

BASIC ASSESSMENT REPORT

Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
<p>maintenance to ensure that erosion is minimised. With mitigation, this impact can however be reduced to a Low level.</p>		<p>water which may pose an erosion risk.</p> <ul style="list-style-type: none"> <li>Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.</li> <li>All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>All cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area. These can be cut when dry and placed on the cleared areas if natural recovery is slow.</li> </ul>	<p>Probability: Definite</p> <p><b>MODERATE -</b></p>	<p>Consequence: Moderate Probability: Probable</p> <p><b>LOW –</b></p>
<p><b>Operation phase</b> <b>Following construction, the site will be highly vulnerable to alien plant invasion</b> Disturbed areas are vulnerable to alien plant invasion and it is likely that disturbed areas such as roads and pylon footprints will be foci for alien plant invasion. Uncontrolled invasion can result in invasion into the intact rangeland and where woody species are involved, this can result in loss of biodiversity and a decline in ecosystem services. With regular clearing and management, this impact can be reduced to a Low significance level.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative.</p>	<ul style="list-style-type: none"> <li>Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species.</li> <li>The recovery of the indigenous shrub layer should be encouraged through leaving some areas intact through the construction phase to create a seed source for adjacent cleared areas.</li> <li>Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as <i>Prosopis</i> are already present in the area and are likely to increase rapidly if not controlled.</li> <li>Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems.</li> <li>Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.</li> </ul>	<p><b>Operation phase</b> <b>Following construction, the site will be highly vulnerable to alien plant invasion</b> Duration: Permanent Extent: Study area Consequence: Moderate Probability: Probable</p> <p><b>MODERATE –</b></p>	<p><b>Operation phase</b> <b>Following construction, the site will be highly vulnerable to alien plant invasion</b> Duration: Short term Extent: Localised Consequence: Low Probability: May occur</p> <p><b>LOW –</b></p>
<p><b>Decommissioning phase</b> <b>Faunal Impacts due to Decommissioning Phase activities such as noise and disturbance due to the presence of construction staff and the operation of heavy machinery</b> Decommissioning will require the use of heavy machinery on-site and will generate a lot of noise and disturbance which would have a negative impact on fauna. This impact would however be relatively short-lived and would ultimately result in the removal of the development and rehabilitation of the site and as such the ultimate impact of decommissioning on fauna would be Low after mitigation.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative.</p>	<ul style="list-style-type: none"> <li>Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location.</li> <li>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</li> <li>All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises.</li> <li>All above-ground infrastructure should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact.</li> </ul>	<p><b>Decommissioning phase</b> <b>Faunal Impacts due to Decommissioning Phase activities such as noise and disturbance due to the presence of construction staff and the operation of heavy machinery</b> Duration: Short term Extent: Study area Consequence: Moderate Probability: Probable</p> <p><b>MODERATE –</b></p>	<p><b>Decommissioning phase</b> <b>Faunal Impacts due to Decommissioning Phase activities such as noise and disturbance due to the presence of construction staff and the operation of heavy machinery</b> Duration: Short term Extent: Study area Consequence: Moderate Probability: May occur</p> <p><b>LOW-</b></p>
<p><b>Decommissioning phase</b> <b>Soil Erosion Risk</b> Decommissioning will result in disturbance which will leave the site vulnerable to erosion. As a result, the site should be monitored for erosion problems for at least 2 years after decommissioning or until vegetation cover has recovered to within 60% of natural levels. With mitigation, this impact can be reduced to a Low significance.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative.</p>	<ul style="list-style-type: none"> <li>Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</li> <li>There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures.</li> <li>All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.</li> </ul>	<p><b>Decommissioning phase</b> <b>Soil Erosion Risk</b> Duration: Long term Extent: Localised Consequence: Moderate Probability: Probable</p> <p><b>MODERATE –</b></p>	<p><b>Decommissioning phase</b> <b>Soil Erosion Risk</b> Duration: Medium term Extent: Localised Consequence: Slight Probability: Probable</p> <p><b>LOW –</b></p>
<p><b>Decommissioning phase</b></p>	<p>All alternatives including Central Hub</p>	<ul style="list-style-type: none"> <li>Wherever excavation is necessary for decommissioning, topsoil</li> </ul>	<p><b>Decommissioning phase</b></p>	

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Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
<p><b>Alien plant invasion will be highly likely within disturbed areas following decommissioning</b> Decommissioning will leave the site vulnerable to alien plant invasion and alien plants should be monitored and managed for at least two years following decommissioning or until an adequate cover of perennial plants has been established in disturbed areas. With mitigation, this impact can be reduced to a Low significance.</p>	<p>Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative.</p>	<p>should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species.</p> <ul style="list-style-type: none"> <li>Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned.</li> <li>Regular monitoring for alien plants within the disturbed areas for at least two years after decommissioning.</li> <li>Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.</li> </ul>	<p><b>Alien plant invasion will be highly likely within disturbed areas following decommissioning</b> Duration: Long term Extent: Study area Consequence: Moderate Probability: Probable</p> <p><b>MODERATE –</b></p>	<p><b>Decommissioning phase</b> <b>Alien plant invasion will be highly likely within disturbed areas following decommissioning</b> Duration: Medium term Extent: Localised Consequence: Slight Probability: Probable</p> <p><b>LOW –</b></p>
<p><b>Cumulative Impact</b> <b>Impacts on Critical Biodiversity Areas and broad-scale ecological processes</b> There are a large number of renewable energy projects in the area. The authorized Roggeveld and Karreebosch facilities are immediately north of the site, while there are several developments to the east as well. Due the topographic diversity of the area, the region is diverse in terms of the different vegetation types represented in the area, with the result that each development footprint tends to impact different vegetation types or plant communities. In the current context, the high-lying ridges are considered most vulnerable to cumulative impact due to their higher diversity and more limited extent. The overall footprint of the power line and on-site substations would however be low and the contribution to cumulative impact very low and it not considered significant in the broader context. The expected total footprint of the power line and substation is expected to be less than 10ha, which is a low contribution in relation to other impact sources in the area. Overall, though the predicted footprint from powerlines is low and the cumulative impact of the development is considered to be Low after mitigation.</p>	<p>All alternatives</p>	<ul style="list-style-type: none"> <li>The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas.</li> <li>Avoid impact to potential corridors such as the riparian corridors associated with the larger drainage lines within the facility area</li> </ul>	<p><b>Cumulative Impact</b> <b>Impacts on Critical Biodiversity Areas and broad-scale ecological processes</b> Duration: Long term Extent: Study area Consequence: Moderate Probability: Probable</p> <p><b>MODERATE –</b></p>	<p><b>Cumulative Impact</b> <b>Impacts on Critical Biodiversity Areas and broad-scale ecological processes</b> Duration: Long term Extent: Study area Consequence: Slight Probability: Probable</p> <p><b>LOW -</b></p>
<p>5. Traffic impacts</p>	<p><b>Construction phase and operational (maintenance phase)</b> The transport of electrical components, including mast, cables, connectors and transformers will contribute to the overall traffic in the area.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<p>Select and use the best suited transport route to ensure additional traffic still complies with the road's acceptable usage levels.</p>	<p><b>Construction phase and operational (maintenance phase)</b> Duration: Short term Extent: Regional Consequence: Slight Probability: Definite</p> <p><b>LOW –</b></p>
	<p><b>Construction phase</b> Although unlikely, should the construction phase of the project coincide with many of the other regional WEF and 132kV line projects, an elevated traffic impact will occur.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<p>Select and use the best suited transport route to ensure additional traffic still complies with the road's acceptable usage levels.</p>	<p><b>Construction phase</b> Duration: Short term Extent: Regional Consequence: Moderate Probability: Definite</p> <p><b>MODERATE –</b></p>
<p>6. Visual impact</p>	<p><b>Operation phase</b> One additional 132kV powerline will affect the sense of place. However, considering that the powerline will be in close proximity to the existing Eskom powerlines, it is anticipated to be</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<p>Route powerlines along existing powerlines as far as possible.</p>	<p><b>Operation phase</b> Duration: Long term Extent: Localised Consequence: Slight Probability: May occur</p>

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	Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
	<p>a very low impact.</p> <p>The proposed 132 kV power line options for the Rietkloof WEF will cross the project footprint approximately 5km from the R354. The connections to the Komsberg substation will follow the existing 400 kV and 765 kV power lines on the site. The sections where the power line does not follow existing Eskom power lines are located within the development footprint.</p>			<p><b>LOW –</b></p>	<p><b>LOW -</b></p>
	<p><b>Cumulative Impact</b></p> <p>Due to the fact that the proposed lines will follow alongside existing Eskom infrastructure, the visual impacts of these lines will be less significant than they otherwise would have been.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<p>Route powerlines along existing powerlines as far as possible.</p>	<p><b>Cumulative Impact</b> Duration: Long term Extent: Localised Consequence: Severe Probability: Definite</p> <p><b>HIGH –</b></p>	<p><b>Cumulative Impact</b> Duration: Long term Extent: Localised Consequence: Moderate Probability: May occur</p> <p><b>MODERATE -</b></p>
7. Surface water impacts	<p><b>Construction phase</b></p> <p>The physical removal of the riparian zones and disturbance of any alluvial watercourses by new road crossings or upgrades of existing roads are likely within the watercourses within the site. These disturbances will be the greatest during the construction and again in the decommissioning phases as the related disturbances could result in lost or damaged vegetation. Impact on riparian systems through the possible increase in surface water runoff on riparian form and function during the operational and decommissioning phases. Increase in sedimentation and erosion in the construction, operational and decommissioning phases.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<ul style="list-style-type: none"> <li>Apply for a water use licence for all construction activities within the DWS thresholds;</li> <li>Design pylon layout to avoid wetland or riverine regions where feasible;</li> <li>Ensure all appropriate licencing, registration or permitting (whichever is required by DWS), is obtained prior to construction commencing.</li> <li>Demarcate rivers and wetlands for which no EA and WULA have been obtained as no-go zones;</li> <li>Train staff members working on site regarding the nature and location of the hydrological features, and the no-go status thereof.</li> </ul>	<p><b>Construction phase</b> Duration: Short term Extent: Localised Consequence: Moderate Probability: May occur</p> <p><b>MODERATE –</b></p>	<p><b>Construction phase</b> Duration: Short term Extent: Localised Consequence: Slight Probability: Unlikely</p> <p><b>LOW -</b></p>
	<p><b>Cumulative impacts</b></p> <p>Erosion and sedimentation of the downstream systems and farming operations could result in cumulative impacts. However due to low mean annual runoff within the region this is not anticipated due to the nature of the development together with the proposed layout.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<ul style="list-style-type: none"> <li>All facilities to apply for a water use licence for all construction activities within the DWS thresholds;</li> <li>Design all pylon layouts to avoid wetland or riverine regions where feasible;</li> </ul>	<p><b>Cumulative impacts</b> Duration: Short term Extent: Localised Consequence: Moderate Probability: May occur</p> <p><b>MODERATE –</b></p>	<p><b>Cumulative impacts</b> Duration: Short term Extent: Localised Consequence: Slight Probability: Unlikely</p> <p><b>LOW -</b></p>
8. Erosion impact	<p><b>Construction phase</b></p> <p>Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p>	<ul style="list-style-type: none"> <li>Minimise earthworks and levelling at tower sites;</li> <li>Use existing access roads wherever feasible;</li> <li>Rehabilitate disturbed areas as soon as possible after construction</li> <li>Apply for a WULA where alteration is unavoidable.</li> <li>All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</li> <li>Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.</li> <li>All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>All cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area. These can be cut when dry and placed on the cleared areas if natural recovery is slow.</li> </ul>	<p><b>Construction phase</b> Duration: Short term Extent: Localised Consequence: Severe Probability: Definite</p> <p><b>MODERATE –</b></p>	<p><b>Construction phase</b> Duration: Short term Extent: Localised Consequence: Moderate Probability: Probable</p> <p><b>LOW -</b></p>
	<p><b>Decommissioning phase</b></p> <p>Areas disturbed during decommissioning will remain vulnerable to disturbance for some time</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection</p>	<ul style="list-style-type: none"> <li>Erosion management should take place according to the Erosion and Rehabilitation Plan.</li> </ul>	<p><b>Decommissioning phase</b> Duration: Long term</p>	<p><b>Decommissioning phase</b> Duration: Medium term Extent: Localised</p>

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Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
into the operational phase and will require regular maintenance to ensure that erosion is minimised.	alternative and Bon Espirange Substation connection alternative	<ul style="list-style-type: none"> <li>All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</li> <li>Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.</li> <li>All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> </ul> <p>All cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area. These can be cut when dry and placed on the cleared areas if natural recovery is slow.</p> <ul style="list-style-type: none"> <li>Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</li> <li>There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures.</li> <li>All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.</li> </ul>	<p>Extent: Localised Consequence: Moderate Probability: Probable</p> <p align="center"><b>MODERATE –</b></p>	<p>Consequence: Slight Probability: Probable</p> <p align="center"><b>LOW -</b></p>
<b>Cumulative soil erosion from adjacent project works</b>	All alternatives	Provided appropriate erosion control measures are put into effect for each project in the broader region, this impact may be reduced cumulatively.	<p><b>Cumulative impact</b> Duration: Short term Extent: Regional Consequence: Moderate Probability: Definite</p> <p align="center"><b>MODERATE –</b></p>	<p><b>Cumulative impact</b> Duration: Short term Extent: Localised Consequence: Slight Probability: May occur</p> <p align="center"><b>LOW -</b></p>
9. Impact on energy production;	<p align="center"><b>Operation phase</b></p> <p>This project does not produce energy; however, without these power lines the energy developed by the WEF will remain unused as it cannot be benefited in a meaningful way. Thus this project contributed indirectly to energy production nationally.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p> <p>Mitigate the negative impacts related to the project, and enhance the positive impacts for the project.</p>	<p><b>Operation phase</b> Duration: Long term Extent: National Consequence: Slight Probability: Definite</p> <p align="center"><b>MODERATE +</b></p>	<p><b>Operation phase</b> Duration: Long term Extent: National Consequence: Moderately beneficial Probability: Definite</p> <p align="center"><b>MODERATE +</b></p>
10. Impact to soil and land capabilities	<p align="center"><b>Construction phase</b></p> <p><b>Loss of agricultural land. The proposed layout avoids all cultivated land. Once construction is completed, the servitude can continue to be used as grazing.</b></p> <p>Loss of agricultural land. The proposed layout avoids all cultivated land. Once construction is completed, the servitude can continue to be used as grazing.</p>	<p>All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative</p> <ul style="list-style-type: none"> <li>High potential grazing and seed cropping areas should be avoided;</li> <li>The footprint areas should be clearly demarcated prior to commencement of construction activities.</li> <li>All construction related activities should be confined to the demarcated areas and minimised where possible;</li> <li>An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase;</li> <li>All areas disturbed by construction related activities should be rehabilitated at the end of the construction phase. The rehabilitation plan should be informed by input from a botanist with experience in arid regions;</li> <li>The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed.</li> <li>The specifications for the rehabilitation programme should be drawn up the Environmental Consultants appointed to undertake the EIA;</li> <li>The implementation of the Rehabilitation Programme should be monitored by the ECO;</li> </ul>	<p align="center"><b>Construction phase</b></p> <p><b>Loss of agricultural land. The proposed layout avoids all cultivated land. Once construction is completed, the servitude can continue to be used as grazing.</b></p> <p>Duration: Short term Extent: Study area Consequence: Slight Probability: Probable</p> <p align="center"><b>LOW -</b></p>	<p align="center"><b>Construction phase</b></p> <p><b>Loss of agricultural land. The proposed layout avoids all cultivated land. Once construction is completed, the servitude can continue to be used as grazing.</b></p> <p>Duration: Short term Extent: Study area Consequence: Slight Probability: Probable</p> <p align="center"><b>MODERATE -</b></p>

**BASIC ASSESSMENT REPORT**

Impact	Alternative	Mitigation Measures	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
		<ul style="list-style-type: none"> <li>All workers should receive training/ briefing on the reasons for and importance of not driving in undesignated areas;</li> <li>EMP measures (and penalties) should be implemented to strictly limit all vehicle traffic to designated roads and construction areas. Under no circumstances should vehicles be allowed to drive into the veld;</li> <li>Disturbance footprints should be reduced to the minimum.</li> </ul>		
	<p align="center"><b>Cumulative impact</b>  <b>Cumulative soil erosion from adjacent project works</b></p>	All alternatives	Same as above.	<p align="center"><b>Cumulative impact</b>  <b>Cumulative soil erosion from adjacent project works</b>                      Duration: Short term                      Extent: Regional                      Consequence: slight                      Probability: Probable</p> <p align="center"><b>LOW –</b></p>
11. Noise impacts associated with the construction phase	<p align="center"><b>Construction phase</b>  <b>Construction phase activities will incur elevated noise levels through machinery, staff on site and vehicles</b></p> <p>Construction phase activities will incur elevated noise levels through machinery, staff on site and vehicles.</p>	All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative	<ul style="list-style-type: none"> <li>Ensure all vehicles and machinery remains well maintained</li> <li>Use low-noise generating components where feasible</li> </ul>	<p align="center"><b>Construction phase</b>  <b>Construction phase activities will incur elevated noise levels through machinery, staff on site and vehicles</b>                      Duration: Short term                      Extent: Study area                      Consequence: Slight                      Probability: Definite</p> <p align="center"><b>LOW –</b></p>
12. Dust impacts associated with the construction phase impacting on SALT, SKA or SAOA	<p align="center"><b>Construction phase</b>  <b>Construction phase activities will liberate greater quantities of dust than the current land use, albeit temporarily</b></p> <p>Construction phase activities will liberate greater quantities of dust than the current land use, albeit temporarily</p>	All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative	<ul style="list-style-type: none"> <li>Apply dust suppression techniques on dirt roads</li> <li>Maintain a 40km/h speed limit on-site at all times</li> <li>Limit vegetation clearing to only the regions included in the site plan</li> </ul>	<p align="center"><b>Construction phase</b>  <b>Construction phase activities will liberate greater quantities of dust than the current land use, albeit temporarily</b>                      Duration: Short term                      Extent: Study area                      Consequence: Slight                      Probability: Definite</p> <p align="center"><b>LOW –</b></p>
	<p align="center"><b>Cumulative impact</b>                      While unlikely, should the construction phase for the wider regions' construction projects coincide, short term elevated dust creation may occur.</p>	All alternatives including Central Hub Substation connection alternative; Komsberg Substation connection alternative and Bon Espirange Substation connection alternative	<ul style="list-style-type: none"> <li>All construction projects in the region should commit to dust control of their own, which will reduce overall dust levels.</li> </ul>	<p align="center"><b>Cumulative impact</b>                      Duration: Short term                      Extent: Study area                      Consequence: Slight                      Probability: Definite</p> <p align="center"><b>LOW –</b></p>

The specialists used the CES assessment methodology to determine the significance of each impact. Additional impacts were identified and assessed by the EAP.

The significance level was determined with and without mitigation to determine whether the impact could be acceptable if mitigation measures are implemented. The CES assessment methodology are included in Appendix D. All alternatives were rated of equal significance and therefore the impact table included above are relevant to all alternatives.